

**ESTONIAN ACADEMY OF SCIENCES  
COMMISSION OF METEORITICS  
INSTITUTE OF GEOLOGY**

**CATALOGUE  
OF METEORITES  
IN THE ESTONIAN  
COLLECTION**



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## The Estonian Meteorite Collection

The meteorite collection of Estonia undoubtedly represents a big cultural and scientific value. The collection has a rather famous history and is widely known among the specialists of meteoritics.

What gave a rise to such a collection? There were probably several reasons, but first of all, a happy coincidence of some accidental circumstances. Meteorites have rather frequently visited the territory of Estonia. At least five arrivals of Cosmic Emissaries have been registered during the last two centuries. On 4 July, 1821, a stone meteorite of the size of a man's head fell at the village of Kaiavere. Unfortunately, the fragments of it were lost and were not recovered by scientists (Aaloe 1971). On 11 May, 1855 a stony meteorite shower occurred at the village of Kaanda in the north-western part of the Island of Saaremaa (Goebel 1856), which in the meteoritic literature is known by the older name of "Oesel". A few days later in the same year, on 17 May, the Iigaste meteorite fell in South Estonia. It had a glassy, slaggy appearance different from the usual stone and iron meteorites. After closely examining the material Grewingk and Schmidt (1864) suggested its terrestrial origin. The main part of this material happened to find its way into the possession of Shimashko in St. Petersburg. In 1961 O'Keefe and Lowman identified the found of Iigaste as a tektite. In the Catalogue of Meteorites (Graham et al. 1985) it is erroneously recorded as Iggast from Latvia. At present the Estonian collection contains only two small fragments of Iigaste material. On 8 August 1863 a stony meteorite shower occurred at Pilstvere in the Central Estonia (Grewingk & Schmidt 1864) and, on 28 June 1872, a stone meteorite fell at Tännasilma (Schilling 1873, 1882), not far from Pilstvere.

Up to present, two groups of ancient meteorite craters have been established on Estonian territory: Kaali on the Island of Saaremaa (Reinwaldt 1938) and Ilumetsa in South-East Estonia (Аалое 1960, 1963). In addition, three other craters have been recorded: small crater Tsõõrikmäe (Пиррус & Тийрмаа 1985) not far from Ilumetsa, Simuna, discovered in 1984 (Pirrus & Tiiirmaa 1991) and giant meteorite crater Kärkla (Плура et al. 1989), on the Island of Hiiumaa, buried under Ordovician and Silurian sediments. Most likely Estonia has the first place of meteorite craters frequency measured on a unit all over the world.

The conditions in the last century were favourable for the examination of meteorites while the awareness of the people in Estonia was relatively high as well as due to the influence of the Tartu University and by the action of some amateur naturalists - German estate owners. As a result, many fragments of meteorites found their way into the scientific institutions. The local private collections consisted of finds from exotic regions brought to Estonia by the world travellers. Eventually, these specimens found their way

into the collection of the Tartu University in the form of gifts and donations. The number of meteorites in the collection of the University soon increased also through a scientific exchange of specimens.

The first specimens of meteorites were bought for Tartu University in 1803 together with a private collection of minerals containing three fragments of the Pallas Iron, found in 1749 at the Jenissei River south of Krasnojarsk in Siberia. Until 1863 the number of specimens in the collection increased mainly through gifts and purchases. Hoffman, a student and later Professor of the Tartu University acquired the Honolulu meteorite from a world trip organized by Kotzebue in 1823-26. The meteorite fell, rather fortuitously, on 25 September 1825 "in the presence" of the members of the expedition.

Some stone meteorites were received from Latvia: the Lixna meteorite, which fell on 12 July 1820, the Buschoff meteorite fell on 2 June 1863, and the Nerft meteorite which fell 12 April 1864, since there was no possibility to farther examination in Latvia (Kuhlberg 1867).

Estonian meteorite collection has exciting history and dynamical development. The continuous growth the number of meteorites has had certain relapses, depending on the reestimation of the origin and genesis of the specimens: some of the supposed meteorites turned out to be terrestrial (Scriba, Sarnaka, Niakornak, Sterlitamak, Rutherford Co., Bittburg, Ovikak, etc.)

The first Catalogue of the collection was compiled by Crewingk, Professor of Mineralogy of the Tartu University. Owing to his enthusiasm, the number of exhibits grew between 1863-1882 from six to 131 with a total mass of 46.9 kg (Grewingk 1863, 1867, 1882). The next Catalogue of Professor Loewinson-Lessing from 1897 includes 167 meteorites with a total mass of about 58.4 kg. At the beginning of the 20th century work on the collection came to a standstill and was not revived until Reinwald undertook research on the Kaali meteorite crater. Thirty fragments were found and sent for examination to London, Washington, New York and Moscow. In exchange, fragments of five meteorites were received including Hoba and Henbury.

Up until 1946 the collection of meteorites belonged to Tartu University, later it was handed over to the Institute of Geology of the Estonian Academy of Sciences. The most important year in the development of the collection is 1952 when an exchange of meteorites with the Meteorite Committee of Academy of Sciences of the USSR took place. In the following two years 13 new specimens were delivered to the Institute of Geology. Among them were specimens from Sikhote-Alin, Kunashaki, Elenovka and Canyon Diablo. The Catalogue compiled by Orviku (Орвику 1955) included 172 meteorites with a total mass of 62 kg.

The authors of the next Catalogue were Aaloe and Nestor (Аалюэ & Нестор 1963). It consisted of 187 different samples with the total mass of 127.6 kg.

The number of meteorite specimens in the following catalogues (Тийрмаа 1983; Tiirmaa 1987) did not essentially change (191) though the total mass increased to over 1130 kg. The increase in the mass was mainly due to the material obtained from the expeditions of Estonian scientists to Sikhote-Alin 1967-79 and in 1987. From there, individual specimens (more than 200) and fragments (more than 7000) were brought with a total mass of about 1000 kg. The active exchange at the end of the 1980's and the beginning of the 1990s with the collections of the USA, Finland and Denmark resulted in the growth of the specimens to 225.

The specimens in the collection are mostly small, weighing from a few grams to 30 grams. Tens of them have a weight in excess 250 grams. The largest well-preserved

specimen is from Sikhote-Alin (100 kg), then follows the Agpalilik (13.5 kg), the Pilistvere-Aukamäe (10.3 kg), Alfianello (6.4 kg), Nerft (3 kg), Tännasilma (2 kg) and Forest City (2 kg). The total mass of meteorite fragments from Kaali is about 3 kg.

The stony meteorites are the most abundant (65%) represented mainly by ordinary chondrites (92%). There are, for instance, Elenovka (Ukraine), Ivanovka (Russia), Misshof (Latvia), New Concord (USA), Ski (Norway). The enstatite and carbonaceous chondrites in the collection amount to ten in number including Hvittis (Finland), Pilistvere (Estonia), Orgueil, Alais (France) and Renazzo (Italy). Besides seven specimens of the amphoterites are also represented: Ensisheim (France), Lake Labyrinth (Australia), Okniny (Ukraine), Soko Banja (Serbia), Valkeala Finland), etc.. Comparatively well represented are achondrites. There are the aubrites Bishopville (USA) and Staroje Pesjanoje (Russia), the eucrites Stanner (Moravia), Juvinas (France), Millbillillie (Australia), the howardites Luotolax (Finlandia), Petersburg (USA), Bialystok (Poland), the diogenites Ibbenbrühren (Germany), Shalka (India) and the chassignite Chassigny (France).

The collection contains numerous stony-irons meteorites (5%) such as the Pallas Iron and Bragin (Russia), Brenham (USA), Heinholt (Germany), Vaca Muerta (Chile).

The main part of the iron meteorites are octahedrites (85%): Kaali (Estonia), Verkhne Dnieprovsk (Ukraine), Verkhne Udinsk (Russia), Bella Roca and Toluca (Mexico) and Merceditas (Chile). The hexaedrites are represented by Braunau (Czechia), Coahuila (Mexico), Hex River Mountain (South Africa) and Kendall County (USA). Of ataxites the collection contains Chinge (Russia), Chesterville (USA), Hoba (Namibia) and Santa Catharina (Brazil).

The most important meteorite showers are represented by Knjaginja (Ukraine), Pultusk (Poland), Allende (Mexico), Mocs (Romania), Sikhote-Alin and Tsarev (Russia).

The main part of the collection is curated at the Institute of Geology in Tallinn, and about 100 specimens are exhibited in the Museum of Geology of the Tartu University.

In the present Catalogue (on May 1, 1996) the name of meteorites are given in alphabetical order and for each meteorite have been indicated 1) place where it fell or was found, 2) time when it fell or was found, 3) class and type of meteorite, 4) the number and mass of the specimen in the collection and a brief characterization.

The following abbreviations have been used: ind. sp. - individual specimen; piece of ind. sp. - piece with fusion crust; fragm. - no crust.

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## METEORITES

### Agen

France, Lot-et-Garonne  
Fell September 5, 1814  
Stone. Olivine Bronzite Chondrite (H5)  
[41] fragment 2.5 grams

### Agpalilik

Greenland  
Found 1963  
Iron. Medium Octahedrite (IIIA-Om)  
[237] polished flags 104; 343 grams  
polished flag 13,500 grams

### Alais

France, Gard  
Fell March 15, 1806  
Stone. Carbonaceous Chondrite (CI)  
[42] powder 2.1 grams

### Alessandria

Italy, Piemonte  
Fell February 2, 1860  
Stone. Olivine Bronzite Chondrite (H5)  
[43] piece of ind. sp. 31 grams

### Alfianello

Italy, Lombardy  
Fell February 16, 1883  
Stone. Olivine Hypersthene Chondrite (L6)  
[44] pieces of ind. sp. 6,419.2; 421.9 grams

### Allende

Mexico, Chihuahua  
Fell February 8, 1969  
Stone. Carbonaceous Chondrite (CV3)  
[213] ind. sp. 46.8; 21.6; 11.2 grams

### Augusta County

U.S.A., Virginia  
Found 1858-59  
Iron. Medium Octahedrite (IIIA)  
[159] flag 74 grams

### Ausson

France, Haute Garonne  
Fell December 9, 1858  
Stone. Olivine Hypersthene Chondrite (L5)  
[45] fragment 10.2 grams  
powder 0.1 gram

### Barbotan

France, Gers  
Fell July 24, 1790  
Stone. Olivine Bronzite Chondrite (H5)  
[46] fragment 0.5 gram

**Bella Roca**

Mexico, Durango

Known 1888

Iron. Medium Octahedrite (IIIB)

[47] flag 611 grams  
fragments 1.3; 0.2 grams

**Bendego**

Brazil, Bahia

Found 1784

Iron. Coarse Octahedrite (IC)

[48] sawed-piece 30 grams

**Bialystok**

Poland

Fell October 5, 1827

Stone. Achondrite, Ca-rich. Howardite (AHOW)

[50] piece of ind. sp. 81.4 grams  
powder 1 gram

**Bielokrynitschie**

Ukraine, Volhynia

Fell January 1, 1887

Stone. Olivine Bronzite Chondrite (H4)

[2] flag 30.8 grams

**Bischtübe**

Kazakhstan, Turgai

Found 1888

Iron. Coarse Octahedrite (IA)

[3] flag 72 grams

**Bishopville**

U.S.A., South Carolina

Fell March 25, 1843

Stone. Achondrite, Ca-poor. Aubrite (AUB)

[51] fragments 3.3 grams  
powder 1.0 gram

**Bjelaja Zerkov**

Ukraine, Kiev

Fell January 15, 1796

Stone. Olivine Bronzite Chondrite (H6)

[1] piece of ind. sp. 90 grams

**Bjurböle**

Finland

Fell March 12, 1899

Stone. Olivine Hypersthene Chondrite (L4)

[222] piece without crust 830 grams

**Black Mountain**

U.S.A., North Carolina

Found 1839

Iron. Coarse Octahedrite (IA)

[53] flag 19 grams

**Bluff**

U.S.A., Texas  
Found 1878  
Stone. Olivine Hypersthene Chondrite (L5)  
[54] flag 152 grams

**Boxhole**

Australia  
Found 1937, June  
Iron. Medium Octahedrite (IIIA)  
[55] piece of ind. sp. 28 grams  
fragment 2.0 grams

**Brahin**

Belarus  
Found 1807-1968  
Stony-iron. Pallasite (PAL)  
[4] flag 156.4 grams  
powder 1.0 gram

**Brandon**

U.S.A., Nebraska  
Found 1975  
Stone. Olivine Hypersthene Chondrite (L6-7)  
[230] flag 107.7 grams

**Braunau**

Czechia, Bohemia  
Fell July 14, 1847  
Iron. Hexahedrite (IIA)  
[56] flag 15 grams

**Bremervörde**

Germany, Niedersachsen  
Fell May 13, 1855  
Stone. Olivine Bronzite Chondrite (H3)  
[57] piece of ind. sp. 28 grams  
fragment 2.0 grams

**Brenham**

U.S.A., Kansas  
Found 1882  
Stony-iron. Pallasite (PAL)  
[58] flags 379; 40.5; 6.2 grams  
9 ind. sp. 324.5 grams  
powder 3.7 grams

**Burns Flat**

U.S.A., Oklahoma  
Stone. Olivine Hypersthene Chondrite (L6)  
[229] flag 45.8 grams

**Buschhof**

Latvia

Fell June 2, 1863

Stone. Olivine Hypersthene Chondrite (L6)

[5] piece of ind. sp. 1,014 grams

fragment 1.0 gram

crumb 2.6 grams

**Butler**

U.S.A., Missouri

Found before 1874

Iron. Plessitic Octahedrite (IRANOM)

[59] flag 44 grams

**Butsura**

India, Bihar

Fell May 12, 1861

Stone. Olivine Bronzite Chondrite (H6)

[60] flag 98.6 grams

**Cambria**

U.S.A., New York

Found 1818

Iron. Fine Octahedrite (IRANOM)

[60] flag 98 grams

**Canyon Diablo**

U.S.A., Arizona

Found 1891

Iron. Coarse Octahedrite (IA)

[62] sp. 166 grams

**Carichic**

Mexico, Chihuahua

Found 1983

Stone. Olivine Bronzite Chondrite (H5)

[215] flag with crust 82.9 grams

**Carlton**

U.S.A., Texas

Found 1887

Iron. Fine Octahedrite (IIIC)

[63] flag 634 grams

**Carnegie**

U.S.A., Oklahoma

Found 1963

Stone. Olivine Hypersthene Chondrite (L6)

[231] flag 52.6 grams

**Carthage**

U.S.A., Tennessee

Found 1840

Iron. Medium Octahedrite (IIIA)

[64] flag 141 grams

**Castalia**

U.S.A., North Carolina  
Fell May 14, 1874  
Stone. Olivine Bronzite Chondrite (H5)  
[65] flag 8.9 grams

**Castine**

U.S.A., Maine  
Fell May 20, 1848  
Stone. Olivine Hypersthene Chondrite (L6)  
[66] powder 0.4 grams

**Cereseto**

Italy, Piemonte  
Fell July 17, 1840  
Stone. Olivine Bronzite Chondrite (H5)  
[67] fragment 29 grams  
powder 1.5 grams

**Chantonay**

France, Vendee  
Fell August 5, 1812  
Stone. Olivine Hypersthene Chondrite (L6)  
[68] flag 37 grams

**Charsonville**

France, Loiret  
Fell November 23, 1810  
Stone. Olivine Bronzite Chondrite (H6)  
[69] fragments 0.9; 2.5 grams

**Chassigny**

France, Haute Marne  
Fell October 3, 1815  
Stone. Achondrite, Ca-poor. Chassignite (ACANOM)  
[70] powder 0.2 grams

**Château-Renard**

France, Loiret  
Fell June 12, 1841  
Stone. Olivine Hypersthene Chondrite (L6)  
[71] fragment 54 grams

**Chebankol**

Russia, Novosibirsk  
Found 1938  
Iron. Coarse Octahedrite (IRANOM)  
[194] fragment 162 grams

**Chesterville**

U.S.A., South Carolina  
Found before 1849  
Iron. Hexahedrite (IIA)  
[72] flag 44 grams

**Chinge**

Russia, Tuva

Found 1913

Iron. Ataxite Ni-rich (IVB-ANOM)

[195] ind. sp. 845; 600 grams

**Coahuila**

Mexico, Coahuila

Known 1837

Iron. Hexahedrite (II)

[73] 3 flags 109; 290; 4.9 grams

**Cold Bokkeveld**

South Africa, Cape Province

Fell October 13, 1838

Stone. Carbonaceous Chondrite (CM2)

[74] piece of ind. sp. 4.7 grams

**Collescipoli**

Italy, Umbria

Fell February 3, 1890

Stone. Olivine Bronzite Chondrite (H5)

[75] piece of ind. sp. 14 grams

**Coolac**

Australia

Found 1874

Iron. Coarse Octahedrite (IA)

[76] flag 149 grams

**Coopertown**

U.S.A., Tennessee

Known 1860

Iron. Coarse Octahedrite (IIIIE)

[184] sawed-fragment 30.2 grams

**Cosby's Creek**

U.S.A., Tennessee

Known before 1837

Iron. Coarse Octahedrite (IA)

[88] ind. sp. 2.9 grams

**Cosina**

Mexico, Guanajuato

Fell January 11, 1844

Stone. Olivine Bronzite Chondrite (H5)

[79] piece of ind. sp. 8.1 grams

**Dalgety Downs**

Australia

Known 1941

Stone. Olivine Hypersthene Chondrite (L4)

[199] fragment 43.0 grams

**Denton County**

U.S.A., Texas

Known since 1856

Iron. Medium Octahedrite (IIIA)

[81] flag 45 grams

**Dhurmsala**

India, Himachal Pradesh

Fell July 14, 1860

Stone. Olivine Hypersthene Chondrite, amphoterite (LL6)

[82] piece of ind. sp. 83.8 grams

**Dolgaja Volja**

Ukraine

Fell Juny 26, 1864

Stone. Olivine Hypersthene Chondrite (L6)

[8] piece of ind. sp. 67.0 grams

**Doroninsk**

Russia, Irkutsk

Fell April 6, 1805

Stone. Olivine Bronzite Chondrite (H6)

[9] piece of ind. sp. 2.3 grams

**Drake Creek**

U.S.A., Tennessee

Fell May 9, 1827

Stone. Olivine Hypersthene Chondrite (L6)

[83] flag 3.5 grams

**Duel Hill**

U.S.A., North Carolina

Found 1873

Iron. Coarse Octahedrite (IA)

[84] flag 17 grams

**Elbogen-Loket**

Czechia, Bohemia

Fell 1400(?), recognized 1811

Iron. Medium Octahedrite (IID)

[85] flag 4.9 grams

fragment 7.6 grams

**Elenovka**

Ukraine, Donetsk

Fell October 17, 1951

Stone. Olivine Hypersthene Chondrite (L5)

[10] piece of ind. sp. 905 grams

**Ensisheim**

France, Alsace

Fell November 16, 1492

Stone. Hypersthene Olivine Chondrite, amphoterite (LL6)

[86] fragment 17.8 grams

**Erleben**

Germany, Magdeburg  
Fell April 15, 1812  
Stone. Olivine Bronzite chondrite (H6)  
[87] fragment 21.9 grams

**Etter**

U.S.A., Texas  
Found 1965, recognized 1966  
Stone. Olivine Bronzite Chondrite (H6)  
[12] polished flag 126.3 grams

**Farmington**

U.S.A., Kansas  
Fell June 25, 1890  
Stone. Olivine Hypersthene Chondrite (L5)  
[89] fragment 45.4 grams

**Favars**

France, Aveyron  
Fell October 21, 1844  
Stone. Olivine Bronzite Chondrite (H5)  
[90] fragment 1.3 grams

**Flandrau, S.D.**

U.S.A., South Dakota  
Found 1983  
Stone. Olivine Bronzite Chondrite (H5)  
[233] flag 230 grams

**Forest City**

U.S.A., Iowa  
Fell May 2, 1890  
Stone. Olivine Bronzite Chondrite (H5)  
[91] ind. sp. 2,093 grams  
fragments 7; 1.8 grams  
powder 2.6 grams

**Forrest (b)**

Australia  
Found 1980, October  
Stone. Olivine Hypersthene Chondrite (L6)  
[217] polished flag 110.0 grams

**Forsyth**

U.S.A., Georgia  
Fell May 8, 1829  
Stone. Olivine Hypersthene Chondrite (L6)  
[92] powder 2.3 grams

**Fort Pierre**

U.S.A., South Dakota  
Found 1856  
Iron. Medium Octahedrite (IIIA)  
[93] flag 10.6 grams

**Gaines County Park**

U.S.A., Texas

Found 1987

Stone. Olivine Bronzite Chondrite (H5)

[232] flag 38.5 grams

**Galapian**

France, Agen

Fell August (?), 1826

Stone. Olivine Bronzite Chondrite (H5)

[94] fragment 90 grams

**Gibeon**

Namibia

Known before 1836

Iron. Fine Octahedrite (IVA)

[49] flag 41 grams

**Girgenti**

Italy, Sicily

Fell February 10, 1853

Stone. Olivine Hypersthene Chondrite (L6)

[95] fragment 31 grams

powder 18.2 grams

**Great Bend**

U.S.A., Kansas

Found 1983

Stone. Olivine Bronzite Chondrite (L6)

[214] polished flag 99.2 grams

**Gressk**

Belarus, Minsk

Found 1954

Iron. Hexahedrite (IIA)

[188] flag 705 grams

**Grosnaja**

Russia

Fell June 28, 1861

Stone. Carbonaceous Chondrite (III)

[6] sawed-fragment 24 grams

crumb 0.5 grams

**Grossliebenthal**

Ukraine

Fell November 19, 1881

Stone. Olivine Hypersthene Chondrite (L6)

[7] piece of ind. sp. 8.6 grams

fragments 1.6; 16.0 grams

**Grüneberg**

Poland, Silesia

Fell March 22, 1841

Stone. Olivine Bronzite Chondrite (H4)

[96] fragment 0.9 grams

### **Gütersloh**

Germany, Nordrhein-Westfalen  
Fell April 17, 1851  
Stone. Olivine Bronzite Chondrite (H4)  
[97] fragment 2.8 grams

### **Hainholz**

Germany, Minden  
Found 1856  
Stony-iron. Mesosiderite (MES)  
[98] fragment 13.6 grams

### **Harrison County**

U.S.A., Indiana  
Fell March 28, 1859  
Stone. Olivine Hypersthene Chondrite (L6)  
[99] fragment 0.7 grams

### **Henbury**

Australia, Northern Territory  
Found 1931  
Iron. Medium Octahedrite (III A)  
[100] ind. sp. 62; 33; 27 grams  
flags 221; 112 grams  
fragment 353 grams  
3 fragments 32 grams

### **Hessle**

Sweden, Uppsala  
Fell January 1, 1869  
Stone. Olivine Bronzite Chondrite (H5)  
[101] sp. 98; 3.3 grams  
ind. sp. 0.3 grams

### **Hex River Mountains**

South Africa, Cape Province  
Found 1882  
Iron. Hexahedrite (II A)  
[102] flag 240 grams

### **Hoba**

Namibia, Grootfontein  
Found 1920  
Iron. Ataxite, Ni-rich (IV B)  
[103] fragment 250 grams  
powder 0.1 grams

### **Homestead**

U.S.A., Iowa  
Fell February 12, 1875  
Stone. Olivine Hypersthene Chondrite (L5)  
[104] fragments 77.2; 8.9 grams

**Honolulu**

U.S.A., Hawaii  
Fell September 27, 1825  
Stone. Olivine Hypersthene Chondrite (L5)  
[105] piece of ind. sp. 288.8; 1.7 grams  
powder 0.9 grams

**Hvittis**

Finland  
Fell October 21, 1901  
Stone. Enstatite Chondrite (E6)  
[223] flag with crust 46.1 grams

**Ibbenbüren**

Germany, Nordrhein-Westfalen  
Fell June 17, 1870  
Stone. Achondrite Ca-poor. Diogenite (ADIO)  
[106] fragment 1.1 gram  
powder 0.1 gram

**Imilac**

Chile, Atacama  
Known 1822  
Stony-iron. Pallasite (PAL)  
[107] ind. sp. 68 grams

**Ivanovka**

Russia, Tatarstan  
Found 1983  
Stone. Olivine Bronzite Chondrite (H5)  
[205] piece of ind. sp. 37.8 grams

**Jelica**

Serbia  
Fell December 1, 1889  
Stone. Hypersthene Olivine Chondrite, amphoterite (LL6)  
[108] piece of ind. sp. 32.5 grams

**Julesburg**

U.S.A., Colorado  
Found 1983  
Stone. Olivine Bronzite Chondrite (H3)  
[216] polished flag 91.7 grams

**Juvinas**

France, Ardeche  
Fell June 15, 1821  
Stone. Achondrite with feldspar. Eucrite (AEUC)  
[109] piece of ind. sp. 9.3 grams

**Kaali**

Estonia, Saaremaa Island  
Found 1937  
Iron. Coarse Octahedrite (IA)  
[200] crater 3: fragments 5.2 grams  
crumbs 206.0 grams

crater 4: fragments 45.6 grams  
          crumbs 961.7 grams  
crater 5: fragments 113.0 grams  
          2 fragments 10.9; 28.2 grams  
          crumbs 593.6 grams  
crater 6: fragments 5.1 grams  
          crumbs 21.6 grams  
crater 7: 2 fragments 8.7; 9.2 grams  
          fragments 450.0 grams  
          crumbs 1,134.3 grams

**Kaande=Oesel**

Estonia, Saaremaa Island, Kaanda village  
Fell May 11, 1855  
Stone. Olivine Hypersthene Chondrite (L6)  
[14] piece of ind. sp. 439 grams  
      piece of ind. sp. 601.7 grams  
      fragments and crumbs 7.4 grams  
      "                  "          6.3 grams

**Kargapole**

Russia, Kurgan  
Found 1961, July  
Stone. Olivine Bronzite Chondrite (H4)  
[198] fragments 26.3; 34 grams

**Kendall County**

U.S.A., Texas  
Found 1887  
Iron. Hexahedrite (IRANOM)  
[110] flag 197 grams

**Kenton County**

U.S.A., Kentucky  
Found 1889  
Iron. Octahedrite (IIIA)  
[111] flag 83 grams

**Kernouve**

France, Morbihan  
Fell May 22, 1869  
Stone. Olivine Bronzite Chondrite (H6)  
[112] fragment 3.0 grams

**Klein-Wenden**

Germany, Erfurt  
Fell September 16, 1843  
Stone. Olivine Bronzite Chondrite (H6)  
[113] fragments 1.8; 1.3 grams

**Knyahinya**

Ukraine  
Fell June 9, 1866  
Stone. Olivine Hypersthene Chondrite (L5)  
[114] ind. sp. 150 grams

**Krymka**

Ukraine

Fell January 21, 1946

Stone. Olivine Hypersthene Chondrite, amphoterite (LL3)

[202] piece of ind. sp. 25.3 grams

**Kukshin**

Ukraine

Fell June 11, 1938

Stone. Olivine Hypersthene Chondrite (L6)

[203] fragment with crust 13.6 grams

**Kuleschovka**

Ukraine

Fell March 12, 1811

Stone. Olivine Hypersthene Chondrite (L6)

[15] piece of ind. sp. 103.3 grams

**Kunashak**

Russia

Fell June 11, 1949

Stone. Olivine Hypersthene Chondrite (L6)

[189] fragments 5.8; 16.3; 109; 118; grams

**Kuznetzovo**

Russia

Fell May 26, 1932

Stone. Olivine Hypersthene Chondrite (L6)

[190] piece of ind. sp. 76 grams

**La Caille**

France, Grasse

Found 1828

Iron. Medium Octahedrite (IRANOM)

[115] flag 50 grams

**L'Aigle**

France, Orne

Fell April 26, 1803

Stone. Olivine Hypersthene Chondrite (L5-6)

[116] ind. sp. 91 grams

**Lake Labyrinth**

Australia

Found 1924

Stone. Hypersthene Olivine Chondrite, amphoterite (LL6)

[117] fragment 240.2 grams

**Lenarto**

Slovakia, Saros

Found 1814

Iron. Medium Octahedrite (IIIA)

[118] flag 51.9 grams

**Liksna**

Latvia

Fell July 12, 1820

Stone. Olivine Bronzite Chondrite (H4)

[16] piece of ind. sp. 139.1 grams  
powder 0.7 grams

**Lissa**

Czechia, Bohemia

Fell September 3, 1808

Stone. Olivine Hypersthene Chondrite (L6)

[119] crumb 0.1 gram

**Little Piney**

U.S.A., Missouri

Fell February 13, 1839

Stone. Olivine Hypersthene Chondrite (L5)

[120] powder 1.8 grams

**Long Island**

U.S.A., Kansas

Found 1891

Stone. Olivine Hypersthene Chondrite (L6)

[182] fragment 4.3 grams

**Luotolax**

Finland

Fell December 13, 1813

Stone. Achondrite, Ca-rich. Howardite (AHOW)

[121] piece of ind. sp. 19.7 grams

**Macy**

U.S.A., New Mexico

Found 1984

Stone. Olivine Hypersthene Chondrite (L6)

[210] flag 212.9 grams

**Madoc**

Kanada, Ontario

Found 1854

Iron. Medium Octahedrite (IIIA)

[122] flag 28 grams

**Magura**

Slovakia, Arva

Found 1840

Iron. Coarse Octahedrite (IA)

[123] fragments 12; 12; 5.3; 2.4 grams  
flag 110 grams

**Marion (Iowa)**

U.S.A., Iowa

Fell February 25, 1847

Stone. Olivine Hypersthene Chondrite (L6)

[124] piece of ind. sp. 20.5; 35 grams

**Marjalahti**

Russia, Karelia  
Fell June 1, 1902  
Stony-iron. Pallasite (PAL)  
[224] fragment 70 grams

**Markovka**

Russian, Altay  
Found 1967  
Stone. Olivine Bronzite Chondrite (H4)  
[220] piece of ind. sp. 146.4 grams

**Mauerkirchen**

Austria, Ober-Österreich  
Fell February 25, 1847  
Stone. Olivine Hypersthene Chondrite (L6)  
[124] piece of ind. sp. 17 grams

**Menow**

Germany, Potsdam  
Fell October 7, 1862  
Stone. Olivine Bronzite Chondrite (H4)  
[126] fragment 1.8 grams

**Merceditas**

Chile, Atacama  
Found 1884  
Iron. Medium Octahedrite (III A)  
[127] flag 881 grams

**Mckenzie Draw (a)**

U.S.A., Texas  
Found 1989  
Stone. Olivine Bronzite Chondrite (H4)  
[234] flag 98.5 grams

**Metsakyla**

Finland  
Found 1938  
Stone. Olivine Bronzite Chondrite (H4)  
[225] fragment with crush 61.2 grams

**Mezo-Madaras**

Romania, Harghita  
Fell September 4, 1852  
Stone. Olivine Pyroxene Chondrite (L3)  
[128] fragment 48 grams

**Millbillillie**

Australia  
Found 1960, recovered 1970  
Stone. Achondrite, Ca-rich. Eucrite (AEUC)  
[218] flag with crush 40.9 grams  
ind. sp. 8.7 grams

**Mincy**

U.S.A., Missouri  
Found 1857  
Stony-iron. Mesosiderite (MES)  
[129] flag 2,498.4 grams

**Misshof**

Latvia  
Fell April 10, 1890  
Stone. Olivine Bronzite Chondrite (H4)  
[17] fragment with crush 97 grams

**Misteca**

Mexico, Oaxaca  
Known 1804  
Iron. Coarse Octahedrite (IA)  
[130] fragment 2.3 grams

**Mocs**

Romania  
Fell February 3, 1882  
Stone. Olivine Hypersthene Chondrite (L6)  
[131] ind. sp. 98.2 grams

**Monroe**

U.S.A., North Carolina  
Fell October 31, 1849  
Stone. Olivine Bronzite Chondrite (H4)  
[132] fragment 29 grams

**Mordvinovka**

Ukraina, Ekaterinoslav  
Fell May 19, 1826  
Stone. Olivine Hypersthene Chondrite (L6)  
[18] fragment with crush 889 grams

**Mundrabilla**

Australia  
Found 1911  
Iron. Octahedrite, with silicate inclusions (IRANOM)  
[221] ind. sp. 384.7 grams

**Musljumovo**

Russia, Tatarstan  
Fell March 10, 1964  
Stone. Olivine Bronzite Chondrite (H4)  
[206] piece of ind. sp. 260.0 grams

**Nechaevo**

Russia, Kaluga  
Found 1846  
Iron. Medium Octahedrite (IIE-ANOM)  
[20] flag 73.1 grams  
fragments 4.1; 1.7 grams  
powder 0.1 grams

**Nelson County**

U.S.A., Kentucky

Found 1856

Iron. Coarsest Octahedrite (IIIF)

[183] flag 478 grams

**Nerft**

Latvia

Fell April 12, 1864

Stone. Olivine Hypersthene Chondrite (L6)

[19] sp. with crush 3,301 grams

" " 1,467.3; 192.7 grams

fragment and powder 3 grams

**New Concord**

U.S.A., Ohio

Fell May 1, 1860

Stone. Olivine Hypersthene Chondrite (L6)

[133] fragments 1.5; 0.4 grams

crumbs 36.3 grams

**Nikolskoe**

Russia, Solnechnogorsk

Fell March 6, 1954

Stone. Olivine Hypersthene Chondrite (L4-5)

[191] fragment 2.3 grams

**Odessa**

U.S.A., Texas

Found before 1922

Iron. Octahedrite, coarse (IA-Og)

[208] ind. sp. 764.8 grams

**Okhansk**

Russia, Perm

Fell August 30, 1887

Stone. Olivine Bronzite Chondrite (H4)

[23] piece of ind. sp. 50.2 grams

fragments 53.9; 11.6; 3.1 grams

powder 0.3 grams

**Okniny**

Ukraine, Volynia

Fell January 8, 1834

Stone. Hypersthene Olivine Chondrite, amphoterite (LL6)

[22] piece of ind. sp. 1.7 grams

**Orgueil**

France, Tarn-et-Garonne

Fell May, 14, 1864

Stone. Carbonaceous Chondrite (CI)

[134] fragments 5.4 grams

powder crumbs 42.1 grams

**Orvinio**

Italy

Fell August 31, 1872

Stone. Olivine Hypersthene Chondrite (L6)

[135] sawed-fragment 35 grams  
powder 0.5 grams**Ozona**

U.S.A., Texas

Found 1929

Stone. Olivine Bronzite Chondrite (H6)

[211] flag 111.1 grams  
fragment 5.4 grams**Owasco**

U.S.A., Nebraska

Found 1984

Stone. Olivine Hypersthene Chondrite (L6)

[209] flag 160.4 grams

**Pallas Iron**

Russia

Found 1749

Stony-iron. Pallasite (PAL)

[24] sp. 128; 104; 38 grams

**Parnallee**

India, Tamil Nadu

Fell February 28, 1857

Stone. Olivine Hypersthene Chondrite, amphoterite (LL3)

[136] fragment 60 grams

**Pervomaisky Posiolok**

Russia

Fell December 26, 1933

Stone. Olivine Hypersthene Chondrite (L6)

[192] piece of ind. sp. 29.5 grams

**Petersburg**

U.S.A., Tennessee

Fell August 5, 1855

Stone. Achondrite, Ca-rich. Howardite (AHOW)

[137] sp. 22.5 grams

**Pilistvere**

Estonia

Fell August 8, 1863

Stone. Enstatite Chondrite (E6)

[25] Saviaugu ind. sp. 158.8 grams  
Aukamäe ind. sp. 10,350 grams**Plainview (1917)**

U.S.A., Texas

Found 1917

Stone. Olivine Bronzite Chondrite (H5)

[235] flag 50.6 grams

**Pohlitz**

Germany, Gera

Fell October 13, 1819

Stone. Olivine Hypersthene Chondrite (L5)

[138] fragment 9.5 grams

**Pultusk**

Poland

Fell January 30, 1868

Stone. Olivine Bronzite Chondrite (H5)

[139] ind. sp. 616.0 grams

65 ind. sp.: 242.0; 102.0; 61.1; 51.7; 50.5;  
47.5; 38.3; 28.4; 26.9; 26.8; 26.0; 26.0; 25.3;  
22.0; 19.6; 19.6; 18.9; 18.5; 16.3; 16.2; 16.1;  
16.0; 15.3; 14.6; 13.5; 13.0; 12.8; 12.2; 12.1;  
12.0; 12.0; 12.0; 11.9; 11.8; 11.7; 11.0; 10.7;  
9.6; 8.7; 8.5; 8.5; 7.3; 7.0; 6.9; 6.6; 6.6; 6.3;  
6.2; 5.7; 5.6; 5.4; 5.1; 5.0; 4.8; 4.6; 4.5; 4.5;  
4.0; 3.5; 2.9; 2.8; 2.1; 1.9; 1.4; 1.3

- total 1,250.2 grams

**Puquios**

Chile, Atacama

Found 1885

Iron. Medium Octahedrite (IID)

[140] flag 219 grams

**Putnam County**

U.S.A., Georgia

Found 1839

Iron. Fine Octahedrite (IVA)

[141] flag 28 grams

**Quenggouk**

Burma

Fell December 27, 1857

Stone. Olivine Bronzite Chondrite (H4)

[142] powder 2.4 grams

**Queretano**

Mexico

Found 1950

Stone. Olivine Bronzite Chondrite (H4)

[236] piece 44.9 grams

**Rakovka**

Russia

Fell November 20, 1878

Stone. Olivine Hypersthene Chondrite (L6)

[126] piece of ind. sp. 276.9 grams

**Renazzo**

Italy, Emilia

Fell January 15, 1824

Stone. Carbonaceous Chondrite (CM2)

[143] fragment 6.7 grams

**Richmond**

U.S.A., Virginia

Fell June 4, 1828

Stone. Olivine Hypersthene Chondrite (L5)

[144] powder 1.0 grams

**Ruff's Mountain**

U.S.A., South Carolina

Found 1844

Iron. Medium Octahedrite (IIIA)

[145] flag 35 grams

**Russel Gulch**

U.S.A., Colorado

Found 1863

Iron. Medium Octahedrite (IIIA)

[146] flag 35 grams

**Salla**

Finland, Lappi

Found 1963

Stone. Olivine Hypersthene Chondrite (L6)

[227] sp. 93.4 grams

**Salt River**

U.S.A., Kentucky

Found about 1850

Iron. Plessitic Octahedrite (IIC)

[147] flag 81 grams

**Santa Catharina**

Brazil, Santa Catharina

Found 1875

Iron. Ataxite Ni-rich (IRANOM)

[148] fragment 48 grams

**Saratov**

Russia

Fell October 6, 1918

Stone. Olivine Pyroxene Chondrite (L4)

[27] piece of ind. sp. 227.1 grams

**Sarepta**

Russia

Found 1854

Iron. Coarse Octahedrite (IA)

[28] flag 41.1 grams

**Schwetz**

Poland, Kwidzyn

Found 1850

Iron. Medium Octahedrite (IIIA)

[149] flag 162 grams

**Seeläsgen**

Poland

Found 1847

Iron. Coarse Octahedrite (IA)

[150] flag 104; 13 grams

fragments 3; 0.9 grams

**Sena**

Spain, Huesca

Fell November 17, 1773

Stone. Olivine Bronzite Chondrite (H4)

[151] fragments 1.3; 0.4; 0.1 grams

**Seneca Falls**

U.S.A., New York

Found 1850

Iron. Medium Octahedrite (IIIA)

[152] flag 50 grams

**Sevriukovo**

Russia

Fell May 11, 1874

Stone. Olivine Hypersthene Chondrite (L4)

[29] piece of ind. sp. 194.7 grams

**Shalka**

India, West Bengal

Fell November 30, 1850

Stone. Achondrite, Ca-poor. Diogenite (ADIO)

[153] powder 1.7 grams

**Sierra Blanca**

Mexico, Chihuahua

Found 1784

Iron. Coarse Octahedrite (IA)

[154] flag 228 grams

**Sikhote-Alin**

Russia

Fell February 12, 1947

Iron. Coarsest Octahedrite (IIB-anom.)

[30] ind. sp. 49,000 grams

sp. 14,120 grams

sp. 2,474 grams

Special catalogue

**Ski**

Norway, Oslo

Fell December 27, 1848

Stone. Olivine Hypersthene Chondrite (L6)

[155] piece 0.8 grams

**Soko Banja**

Serbia, Aleksinac

Fell October 13, 1877

Stone. Hypersthene Olivine Chondrite, amphoterite (LL4)

[156] piece 155.3 grams

**Stannern**

Czechia, Iglau

Fell May 22, 1808

Stone. Achondrite, Ca-rich. Eucrite (AEUC)

[158] piece of ind. sp. 27.5 grams

**Staroje Pesjanoje**

Russia

Fell October 2, 1933

Stone. Achondrite, CA-poor. Aubrite (AUB)

[193] sp. 5.7; 4.1 grams

**Stanton**

U.S.A., Virginia

Found 1869

Iron. Coarse Octahedrite (IIIE)

[159] flag 74 grams

**Stavropol**

Russia

Fell March 24, 1857

Stone. Olivine Hypersthene Chondrite (L6)

[31] flag 3.7 grams

**Ställdalen**

Sweden, Örebrö

Fell June 28, 1876

Stone. Olivine Bronzite Chondrite (H5)

[157] piece 4.7 grams

**Steinbach**

Germany, Erzgebirge

Found 1724

Stony-iron. Siderophyre

[160] flag 80.6 grams

**St.Michel=Mikkeli**

Finland

Fell July 12, 1910

Stone. Olivine Hypersthene Chondrite (L6)

[226] piece of ind. sp. 62.3 grams

**Tabor**

Czechia, Bohemia

Fell July 3, 1753

Stone. Olivine Bronzite Chondrite (H5)

[161] piece of ind. sp. 3.5 grams

**Tadjera**

Algeria, Constantine

Fell June 9, 1867

Stone. Olivine Hypersthene Chondrite (L5)

[162] piece 1.0 gram

**Tazewell**

U.S.A., Tennessee

Found 1853

Iron. Finest Octahedrite (IIICD)

[163] flag 56 grams

**Tieschitz**

Czechia

Fell July 15, 1878

Stone. Olivine Pyroxene Chondrite (H3)

[164] piece 7.6 grams

**Timokhina**

Russia

Fell March 25, 1807

Stone. Olivine Bronzite Chondrite H5)

[33] piece of ind. sp. 44.9 grams

**Toluca**

Mexico

Before 1776

Stone. Coarse Octahedrite (IA)

[165] ind. sp. 1230 grams

flag 7.3; 35.2 grams

**Tourinnes-la-Grosse**

Belgium, Tirlemont

Fell December 7, 1863

Stone. Olivine Hypersthene Chondrite (L6)

[166] fragment 17.6

**Trenzano**

Italy, Lombardia

Fell November 12, 1856

Stone. Olivine Bronzite Chondrite (H6)

[167] piece of ind. sp. 206 grams

**Tsarev**

Russia

Fell December 6, 1922 (?)

Stone. Olivine Hypersthene Chondrite (L5)

[204] piece of ind. sp. 353.8 grams

**Tucson**

U.S.A., Arizona

Known before 1850

Iron. Ataxite, Ni-rich (IRANOM)

[168] fragment 12.5 grams

**Tännasilma**

Estonia

Fell Juny 28, 1872

Stone. Olivine Pyroxene Chondrite (L4)

[32] piece of ind. sp. 1,920 grams

sp. with crust 100.5 grams

fragments 16.6; 6.5; 6.3; 5.3 grams;

crumbs 2.5; 2.2 grams

**Union County**

U.S.A., Georgia

Found 1853

Iron. Coarsest Octahedrite (IC)

[169] crumbs 7.3 grams

**Vaca Muerta**

Chile, Atacama

Recognized 1861

Stony-iron. Mesosiderite (MES)

[170] fragment 3.5 grams

**Dona Inez**

Found 1888

[180] piece 19.2 grams

**Llano del Inca**

[181] piece 17 grams

**Valkeala**

Finland

Found 1962

Stone. Olivine Hypersthene Chondrite (L6)

[228] piece of ind. sp. 252.5 grams

**Vengerovo**

Russia

Fell October 11, 1950

Stone. Olivine Bronzite Chondrite (H5)

[186] piece of ind. sp. 3; 2 grams

**Verkhne Dnieprovsk**

Ukraine, Ekaterinoslav

Found 1876

Iron. Finest Octahedrite (IIE)

[187] fragment 2.2 grams

**Verkhne Udinsk**

Russia

Found 1854

Iron. Medium Octahedrite (IIIA)

[21] piece of ind. sp. 115.9 grams

**Vouille**

France, Vienne

Fell May 13, 1831

Stone. Olivine Hypersthene Chondrite (L6)

[171] fragment 16 grams

**Waconda**

U.S.A., Kansas

Found 1873

Stone. Olivine Hypersthene Chondrite (L6)

[172] piece of ind. sp. 455 grams

fragment 3.0 grams

**Welland**

Kanada, Ontario  
Found 1888  
Iron. Medium Octahedrite (IIIa)  
[173] flag 515 grams

**Weston**

U.S.A., Connecticut  
Fell December 14, 1807  
Stone. Olivine Bronzite Chondrite (H4)  
[174] fragment 2.8 grams  
powder 2.2 grams

**Wichita County**

U.S.A., Texas  
Found 1836  
Iron. Coarse Octahedrite (IA)  
[175] flag 398 grams

**Wold Cottage**

England, Yorkshire  
Fell December 13, 1795  
Stone. Olivine Hypersthene Chondrite (L6)  
[176] sp. 14.9 grams

**Yamysheva**

Kazakhstan, Semipalatinsk  
Found 1885  
Stony-iron. Pallasite (PAL)  
[34] flag 49 grams

**Yardymly**

Azerbaijan, Lenkoran  
Fell November 24, 1959  
Iron. Coarse Octahedrite (IA)  
[207] crumbs 29.2 grams

**Yatoor**

India, Andhra Pradesh  
Fell January 23, 1852  
Stone. Olivine Bronzite Chondrite (H5)  
[177] fragments 2.9; 2.0 grams

**Yurtuk**

Ukraine  
Fell April 2, 1936  
Stone. Achondrite, Ca-rich. Howardite (AHOW)  
[196] piece of ind. sp. 5.3 grams

**Zaboritsa**

Ukraine  
Fell April 11, 1818  
Stone. Olivine Hypersthene Chondrite (L6)  
[13] piece of ind. sp. 19.3 grams

**Zagora**

Marocco

Found 1987

Iron. Octahedrite (IAB) with silicate inclusions

[219] flag 9.3 grams

**Zacatecas (1792)**

Mexico

Known before 1792

Iron. Polycrystalline Octahedrite (IRANOM)

[178] flag 27 grams

**Zhigailovka**

Ukraine

Fell October 12, 1787

Stone. Hypersthene Olivine Chondrite (LL6)

[11] piece of ind. sp. 34.3 grams

**Zhovtnevyi Khutor**

Ukraine

Fell October 9, 1938

Stone. Olivine Bronzite Chondrite (H5)

[12] piece of ind. sp. 330.4 grams

**Zvonkovo**

Ukraine

Fell September 2, 1955

Stone. Olivine Bronzite Chondrite (H6)

[201] sp. 13.3; fragments 0.2; 0.6 grams

**TEKTITES AND OTHER NATURAL GLASSES****Aouelloul**

Adrar, Mauritania

silica glass 5 pieces

**Barringer Crater**

U.S.A., Arizona

shale balls 18 pieces 123.2 grams

old impactites 53 pieces 50.2 grams

new impactites 42 pieces 59.1 grams

**Dianbai**

China, Guangdong

3 sp. 15.0; 6.0; 4.0 grams

**Henbury**

Found 1931

silica glass 2.9 grams

**Iigaste**

Estonia, Iigaste

Fell May 17, 1855

2 fragments 0.21; 0.35 grams

**Zhamanshin**

Aktybinsk

46 pieces 30.7 grams



EESTI AKADEEMILINE RAAMATUKOGU



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