

Chapter 2

Argentina

“The earliest Spanish explorers to enter the region that now is northern Argentina heard marvelous stories from the Indians of a large block of iron that had supposedly fallen from the sky. The place where it lay was called Pigüem Nonraltá, or, in Spanish, Campo del Cielo (Field of the Heaven). In 1576 a military expedition visited the site, returning with a few small pieces of a very large mass, which came to be known as the Mesón de Fierro (Large Table of Iron) estimated to weight about 500 Q (23 mt)” (Cassidy et al. 1965). Campo del Cielo is the flagship of the Argentine meteorites. Chaco, the main mass, is the second largest known meteorite (as a single piece) at the Earth’s surface.

Lists of all known Argentine meteorites were published by Giacomelli (1969), and Acevedo and Rocca (2008, 2010, 2011). In addition, data for all specimens hitherto identified (Fig. 2.1) are included here.

Argentine meteorites are protected by National Law N° 26,306. Any meteorite found or fall in Argentina is a cultural treasure of the Argentine Nation and its commerce is forbidden.

Achiras. 33° 10' S, 64° 57' W. Río Cuarto, Córdoba. Stone, olivine-hypersthene chondrite, (L₆). Fell on 1902, 780 g were recovered. Museo Provincial de Ciencias Naturales “Bartolomé Mitre”, Córdoba (Argentina), Smithsonian Institution collections (USA), Natural History Museum (UK). Olsacher (1951a).

Agua Blanca. 28° 55' S, 66° 57' W. Pinchas, Castro Barros, La Rioja. Iron, octahedrite, (IIIAB). Collected in 1938, 49 kg obtained. Museo “Inca Huasi”, La Rioja (Argentina), Natural History Museum. Herrero Ducloux and Loyarte (1939).

Aguada. 31° 36' S, 65° 14' W. Pocho, Córdoba. Stone, olivine-hypersthene chondrite, (L₆). Fell on September, 1930, 1.62 kg were recovered. Museo de Mineralogía y Geología, Facultad de Ciencias Exactas, Físicas y Naturales, Córdoba, Smithsonian Institution collections, Natural History Museum. Olsacher (1951b). Fig. 2.2.

Aguas Calientes. 25° 30' S, 68° 24' W. Catamarca. Stone, olivine-bronzite chondrite, (H). Find, 1971, 257 g.

Águila Blanca. 30° 52' S, 64° 33' W. Río Dolores, Punilla, Córdoba. Stone, olivine-hypersthene chondrite, (L). Date of find: 1920, 1.44 kg. Museo Argentino



Fig. 2.1 Argentine meteorites. Modified from © 2013 Inav/Geosistemas SRL

de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires. (Herrero Ducloux 1939).

Árbol Solo. 33° S, 66° W. Socoscora, San Luis. Stone, olivine-bronzite chondrite, (H₅). Fell on September 11, 1954, 809 g. Universidad Nacional de Cuyo, Mendoza (Argentina). The Permanent Commission on Meteorites of the International Geological Congress (1964b); Giacomelli (1969). Fig. 2.3.

Fig. 2.2 Aguada. *Credit:*
Eduardo Jawerbaum



Fig. 2.3 Árbol Solo. *Credit:*
Eduardo Jawerbaum



Fig. 2.4 Arroyo Aguiar. *Credit:* Matteo Chinellato



Arroyo Aguiar. $31^{\circ} 25' \text{ S}$, $60^{\circ} 40' \text{ W}$. Santa Fe. Stone, olivine-bronzite chondrite, (H_5). Fall, 1950, 7.45 kg. Museo de la Facultad de Ingeniería Química, Santa Fe (Argentina), Smithsonian Institution collections, Natural History Museum. Benet (1961). The Permanent Commission on Meteorites of the International Geological Congress 1962b). Fig. 2.4.

Balcarce. $37^{\circ} 52' \text{ S}$, $58^{\circ} 15' \text{ W}$. Cerro Amarante, Balcarce. Buenos Aires Province. Stone, olivine-bronzite chondrite, (H_4). Found on June, 2000, 2.28 kg. Turone (2001). (It has not been officially classified). Fig. 2.5.

Belville. $32^{\circ} 20' \text{ S}$, $64^{\circ} 52' \text{ W}$. Unión, Córdoba. Stone, chondrite. Fell on December, 1937. Unknown mass.

Berduc. $31^{\circ} 55' \text{ S}$, $58^{\circ} 20' \text{ W}$. Entre Ríos. Stone, chondrite, (L_6), $S_4 W_0$. Seen falling on April 6, 2008. Several kilograms were drawn from Argentina. Some

Fig. 2.5 Balcarce. *Credit:* Eduardo Jawerbaum



Fig. 2.6 Berduc. *Credit:* Michael Farmer



pieces have been treasured by Asociación Entrerriana de Astronomía. MNCNA-AS (Weisberg et al. 2009; Varela et al. 2010). Fig. 2.6.

Cacharí. $36^{\circ} 24' S$, $59^{\circ} 30' W$. Cacharí, Azul, Buenos Aires Province. Achondrite, eucrite. Collected in 1916, 23.5 kg. Museo de La Plata (Argentina), Smithsonian Institution collections, Natural History Museum. (Herrero Ducloux 1929; Abdu et al. 2005a, b). Fig. 2.7.

Campo de Pucara. $27^{\circ} 40' S$, $67^{\circ} 07' W$. Andalgalá, Catamarca. Iron, hexahedrite. Find, 1879, 4 kg. Specimens can be found in the collections of many European museums. Giacomelli (1969).

Campo del Cielo. $27^{\circ} 30' S$, $61^{\circ} 42' W$. Chaco, Iron, octahedrite, (IAB). Findings from 1576. Several tons recovered. The meteorite field consists, at least, of 20 meteorite craters with an age of about 4000 years.

A lot of papers can be consulted on the subject (Nágera 1926; Fossa Mancini 1948; Cassidy 1967, 1968, 1971; Villar 1968; Cassidy and Renard 1996; Cassidy et al. 1965; Acevedo and Rocca 2005; Cabanillas and Palacios 2006; Wright et al. 2007).

The area is composed of sandy-clay sediments of Quaternary-Recent age. The impactor was an Iron-Nickel Apollo-type asteroid (octahedrite meteorite type IA) and plenty of meteorite specimens survived the impact. Impactor's diameter is estimated to 5–20 m. Its diameter pre-atmospheric was estimated (based on



Fig. 2.7 Cacharí. *Credit:* Museo de La Plata

measurements of cosmogenic radioisotopes) such as about 3 m and a mass of about 840 t (Liberman et al. 2002). Touring a solar orbit calculated some years ago (Renard and Cassidy 1971), the impactor came from the SW and entered into the Earth's atmosphere in a low angle of about 9° . As a consequence, the asteroid broke in many pieces before creating the craters. The first meteorite specimens were discovered during the time of the Spanish colonization. Craters and meteorite fragments are widespread in an oval area of 18.5×3 km (SW-NE), thus Campo del Cielo is one of the largest meteorite crater fields known in the world.

Crater n° 3, called “Laguna Negra” is the largest with a diameter of 115 m. Inside crater n° 10, called “Gómez”, (diameter about 25 m), a huge meteorite specimen called “El Chaco”, of 37.4 tons, was found in 1980. Inside crater n° 9, called “La Perdida” (diameter: 25×35 m.) several meteorite pieces were discovered weighing in total about 5200 kg. Other best known crater is Rubin de Celis with an enormous schreibersite-bearing metallic block (Acevedo et al. 2002).

The following is a list of large meteorite specimens (more than 200 kg) from this area cited by Rocca (2006). Information is given in the name of the meteorite its weight, and date of discovery and its current location:

- (1) El Abispón. 460 kg. 1936. Museo Argentino de Ciencias Naturales (MACN), Buenos Aires city. The Permanent Commission on Meteorites of the International Geological Congress (1962a).
- (2) El Chaco. 37.4 tons. 1980. Gancedo, Chaco, Argentina. This specimen is the second heaviest meteorite known in the World. Fig. 2.8.
- (3) El Mataco. 998 kg. 1937. Museo Provincial, Rosario, Santa Fe, Argentina. The Permanent Commission on Meteorites of the International Geological Congress (1962a).

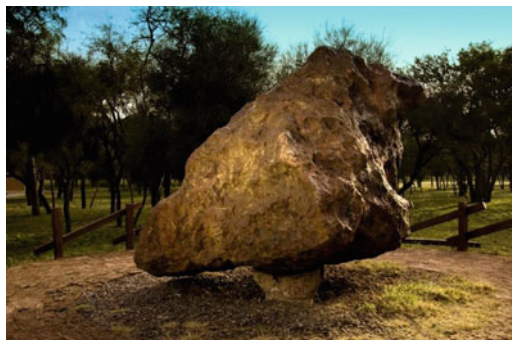


Fig. 2.8 El Chaco. *Credit: L.M. Villar*

- (4) El Mocoví. 732 kg. 1925. MACN, Buenos Aires city.
 - (5) El Patio. 350 kg. Found before 1960. Estancia el Taco, Chaco, Argentina. The Permanent Commission on Meteorites of the International Geological Congress (1965).
 - (6) El Taco. 1998 kg. 1962. Main mass at National Museum of Natural History, Smithsonian Institution collections. 600 kg. at Planetarium of Buenos Aires city. The Permanent Commission on Meteorites of the International Geological Congress (1965). Fig. 2.9.
 - (7) El Toba. 4,210 kg. 1923. MACN, Buenos Aires city.
 - (8) El Toconoté. 850 kg. 1931. Planetarium, Buenos Aires city. The Permanent Commission on Meteorites of the International Geological Congress (1962a).
 - (9) La Perdida (1). 1,625 kg. 1965. Planetarium, Buenos Aires city.
 - (10) La Perdida (2). 3,370 kg. 1965. Still in the crater.
 - (11) Mesón de Fierro. 15 tons. 1576. Lost.
 - (12) Runa Pocito. 750 kg. 1803. British Museum, London.
 - (13) No Name. 10 tons. 1997. Near its finding site, Chaco.
 - (14) La Sorpresa. 7/10 tons. 2005. Still in the crater.
- And others recently discovered such as Adolfo 9,760 kg, Quimili 8,000 kg, Santiagueño 7,850 kg and Carmen Sosa 5,680 kg.

Caperr. 45° 17' S, 70° 29' W. Río Senguerr, Chubut. Iron, octahedrite, (IIIA or IIIB). Collected in 1869, is a single stone of 114 kg. Museo de La Plata, Smithsonian Institution collections, Natural History Museum. Fletcher (1899), Turone (2002). Fig. 2.10.

Capilla del Monte. 30° 53' S, 64° 33' W. Córdoba. Stone, olivine-bronzite chondrite, (H₆). Fell on 1934. Fragment of approximately 1 kg is at the Museum of the Dirección Nacional de Geología y Minería in Buenos Aires, Smithsonian

Fig. 2.9 El Taco. *Credit:*
Unknown



Fig. 2.10 Caperr. *Credit:*
Museo de La Plata



Institution collections and Natural History Museum. The Permanent Commission on Meteorites of the International Geological Congress (1965), Giacomelli (1969). Fig. 2.11.

Casilda. $33^{\circ} 06' S$, $61^{\circ} 08' W$. Casilda, Santa Fe. Stone, olivine-bronzite chondrite, (H₅). Find, 1937, 5.25 kg. Universidad Nacional de Tucumán (Argentina), Smithsonian Institution collections, Natural History Museum. Toselli and Brodtkorb (1973). Clarke Jr. (1974). Fig. 2.12.

Cerro Mesa. $46^{\circ} 51' S$, $68^{\circ} 08' W$. Santa Cruz. Stone, chondrite (L or LL₆). Found in 2006, 10.5 kg. (It has not been officially classified). Fig. 2.13.

Chajarí. $30^{\circ} 47' S$, $58^{\circ} 03' W$. Federación, Entre Ríos. Stone, olivine-hypersthene chondrite, (L₅). Seen falling on November 29, 1933, 18.3 kg were recovered. The Permanent Commission on Meteorites of the International Geological Congress (1961), Teruggi (1968), Giacomelli (1969). Fig. 2.14.

Fig. 2.11 Capilla del Monte.
Credit: Eduardo Jawerbaum



Fig. 2.12 Casilda. *Credit:*
Eduardo Jawerbaum



Fig. 2.13 Cerro Mesa.
Credit: McCartney collection



Claromecó. $38^{\circ} 48' 16''$ S, $60^{\circ} 07' 23''$ W. Claromecó, Buenos Aires Province. Stone, Ordinary chondrite, (L), $S_5 W_2$. Olivine $Fe_{75.0} Fa_{25.0}$, Pyroxene $En_{80.21} Fs_{18.45} Wo_{1.34}$. Two reddish brown meteoritic stones of 13 kg each were found in 1963 leaning against a windmill in a farm. Museo Aníbal Paz (Argentina). Acevedo and Subías (2012). It is not yet officially classified. Fig. 2.15.

Coronel Arnold. $33^{\circ} 04'$ S, 61° W. San Lorenzo, Santa Fe. Stone, olivine-hypersthene chondrite, (L). Collected in 1962, 450 g were recovered.

Cruz del Eje. $30^{\circ} 45'$ S, $64^{\circ} 47'$ W. Córdoba. Iron, coarsest octahedrite, (IAB complex). Ni = 68.8 mg/g. This iron of 14 kg was found in 1971. Cascadia Meteorite Laboratory, Portland (USA), Lakehead University, Ontario (Canada). Weisberg et al. (2010).

Dadin. $38^{\circ} 55'$ S, $69^{\circ} 12'$ W. Plaza Huincul, Neuquén. Iron, octahedrite. Ni = 6.7 wt %. Find, 1949, 37.3 kg. Museo de la Plata. Herrero Ducloux (1949) (Fig. 2.16).

Fig. 2.14 Chajarí. *Credit:*
Eduardo Jawerbaum



Fig. 2.15 Claromecó.
Credit: Fermín Massigoge



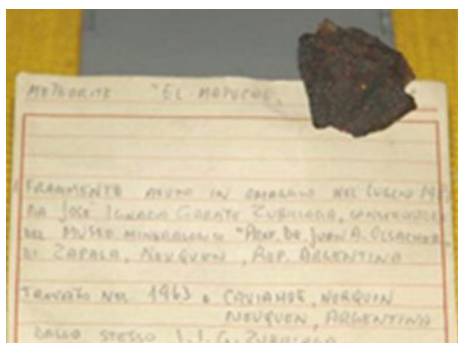
Fig. 2.16 Dadin. *Credit:*
Museo de La Plata



Deán Funes. $30^{\circ} 26' S$, $64^{\circ} 12' W$. Deán Funes, Córdoba. Stone, ordinary chondrite, (H₅), S₂ W₁. Fa_{19.6} Fs_{17.4} Wo_{1.3}. Fall in 1977, 9.26 kg. Grossman (1998).

Distrito Quebracho. $31^{\circ} 53' S$, $60^{\circ} 28' W$. Paraná, Entre Ríos Stone, olivine-bronzite chondrite, (H). Fell on March 13, 1957, 400 g were recovered. Museo de Entre Ríos (Argentina), Natural History Museum. Gordillo (1959), The Permanent Commission on Meteorites of the International Geological Congress (1962a).

D'Orbigny. $37^{\circ} 40' S$, $61^{\circ} 39' W$. D'Orbigny, Coronel Suárez, Buenos Aires Province. Achondrite, angrite. A single piece of 16.55 kg was found in July, 1979, whereas peasants were plowing a field. Grossman and Zipfel (2001), Kurat et al.

Fig. 2.17 D'Orbigny.*Credit:* Jeff Kuyken**Fig. 2.18** El Mapuche.*Credit:* Unknown

(2001, 2003, 2005), Varela et al. (2001, 2003a, b, 2005), Eugster et al. (2002), Jotter et al. (2002, 2003), Mittlefehldt et al. (2002), Kubny et al. (2003), Jagoutz et al. (2003), Scorzelli et al. (2004), Abdu (2005a, b). Fig. 2.17.

El Aybal. 24° 52' S, 65° 29' W. International airport, Salta. Meteorite with wüstite and silicides (gupeiite, xifengite, fersilicite and ferdasilicite). Was found in 1998, 30 g. Morello and Anesa (2000). (Not officially listed yet in the Meteoritical Bulletin Database).

El Mapuche. 37° 52' S, 71° 05' W. Caviahue, Neuquén. Stone, chondrite. Find, 1963. Weight unknown. The meteorite belonged to the collection of the Museum. Prof. Dr. John A. Olsacher (Zapala, Neuquén) while José Ignacio Garate Zubillaga was the curator. C.f. Ñorquín-co meteorite (found 18 years before 45 km away to the northeast). (It has not been officially classified). See Fig. 2.18.

El Perdido. 38° 41' S, 61° 06' W. Buenos Aires Province. Stone, olivine-bronzite chondrite, (H₅). Found in 1905, possibly belonging to the meteorite fall of Indio Rico (Herrero Ducloux 1911), 30.25 kg were recovered. Museo de La Plata, Smithsonian Institution collections, Natural History Museum. Fossa Mancini (1947a). Fig. 2.19.

Fig. 2.19 El Perdido. *Credit:*
Eduardo Jawerbaum



Fig. 2.20 El Sampil. *Credit:*
Woreczko Jan & Wadi



El Sampil. 44° 32' S, 70° 22' W. Nueva Lubecka, Chubut. Iron, octahedrite, (IIIAB). Find, 1973, 142 kg. Smithsonian Institution collections, Natural History Museum. Lewis et al. (1974), Clarke Jr. (1975). Fig. 2.20.

El Simbolar. 30° 38' S, 64° 53' W. Cruz del Eje, Córdoba. Iron, octahedrite. Find, 1938, 40 kg. Museo Provincial de Ciencias Naturales “Bartolomé Mitre”, Natural History Museum. Olsacher (1939), The American Mineralogist (1955) and reference cited therein, The Permanent Commission on Meteorites of the International Geological Congress (1958a).

El Timbú. 33° 07' S, 60° 58' W. San Lorenzo, Santa Fe. Iron. Found in 1942, 500 kg. Dirección de Geología y Minería, Buenos Aires (Argentina). The Permanent Commission on Meteorites of the International Geological Congress (1962a), Giacomelli (1969).

Esquel. 42° 54' S, 71° 20' W. Esquel, Chubut. Stony-Iron, pallasite. One specimen weight about 1,500 kg of the most beautiful meteorite of the world was found in 1951. Thanks to its extraordinary beauty is a meteorite found in many private collections. Smithsonian Institution collections, Natural History Museum. Giacomelli (1962, 1969), The Permanent Commission on Meteorites of the International Geological Congress (1964a). Fig. 2.21.

Fortuna. 35° 08' S, 65° 22' W. San Luis. Achondrite, winonaite, $W_{0/1} S_2$. $Fa_{4.3-5.1}$, $Fs_{5.5-6.7}$ $Wo_{1.1-1.7}$ y $Fs_{2.4-2.9}$ $Wo_{45.6-46.5}$, $An_{14.5-16}$. Fe-Ni and troilite. $^{170}TM = +1.61$ ‰, $^{180}TM = +4.68$ ‰. Find, 1998, 312 g. Russell et al. (2003) (Fig. 2.22).

Gan Gan. 42° 40' S, 68° 05' W. Gan-Gan, Chubut. Iron, octahedrite, (IVA). Bulk metal Ni = 9.12 w%. Find, 1984, 83 kg. Institute of Geophysics & Planetary Physics, University of Los Angeles, California (IGPP-UCLA) (USA), Natural History Museum. Grossman (1999). Fig. 2.23.

Fig. 2.21 Esquel. *Credit:*
Robert Haag



Fig. 2.22 Fortuna. *Credit:*
Eduardo Jawerbaum



Garabato. 28° 52' S, 60° 12' W. Santa Fe. Stone, ordinary chondrite, (H₅). Fa₁₉, Fs₁₇. 25 % Fe-Ni and troilite. Find, 1995, 160 kg. Grossman (1996). Fig. 2.24.

Gualeguaychú. 33° 00' S, 58° 37' W. La Constancia, Entre Ríos. Stone, olivine-bronzite chondrite, (H). Fell on October, 1932, 22 kg were raised. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux (1940).

Hinojal. 32° 22' S, 60° 09' W. Victoria, Entre Ríos. Stone, olivine-hypersthene chondrite, (L₆). Found in 1927 while plowing a field. 50 kg. Smithsonian Institution collections. The Permanent Commission on Meteorites of the International Geological Congress (1964a), Giacomelli (1969). Fig. 2.25.

Hinojo. 36° 52' S, 60° 10' W. Hinojo, Olavarría, Buenos Aires Province. Stone, olivine-bronzite chondrite, (H). Find, 1928, 1,155 kg. Museo de La Plata. Herrero Ducloux (1928a).

Fig. 2.23 Gan Gan. *Credit:*
Woreczko Jan & Wadi

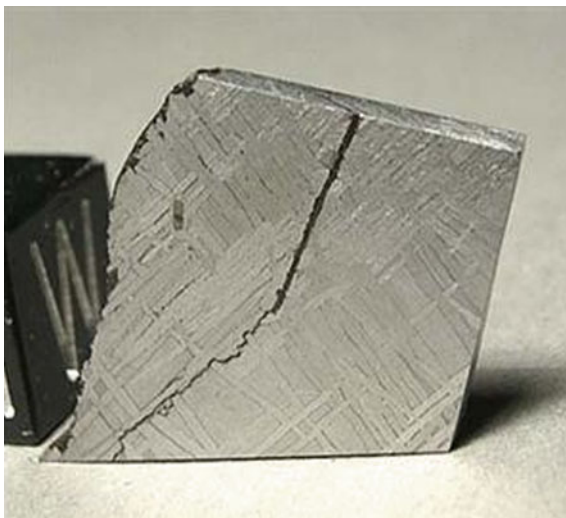


Fig. 2.24 Garabato. *Credit:*
Martin Horejsi



Fig. 2.25 Hinojal. *Credit:*
Mike Bandli



Fig. 2.26 Huaytiquina.
Credit: Eduardo Jawerbaum



Fig. 2.27 Indio Rico. *Credit:*
 R. Kempton



Huaytiquina. $23^{\circ} 44' \text{ S}$, $67^{\circ} 14' \text{ W}$. Iron, hexaedrite IIAB. Find, 1998, 19.6 kg. Huaytiquina is a Chilean locality, next to the Argentine border (It has not been officially classified) (Fig. 2.26).

Indio Rico. $38^{\circ} 20' \text{ S}$, $60^{\circ} 53' \text{ W}$. Indio Rico, Coronel Dorrego, Buenos Aires Province. Stone, olivine-bronzite chondrite, (H_6), *C.f.* El Perdido chondrite. Find, 1887, 15 kg. Museo de La Plata, Smithsonian Institution collections. Fossa Mancini (1947b). Fig. 2.27.

Isthilart. $31^{\circ} 11' \text{ S}$, $57^{\circ} 57' \text{ W}$. Federación, Entre Ríos Stone, olivine-bronzite chondrite, (H_5). Seen to fall on November 12, 1928, 3.05 kg were recovered. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux y Pastore (1930).

Juárez. $37^{\circ} 33' \text{ S}$, $60^{\circ} 09' \text{ W}$. Buenos Aires Province. Stone, olivine-hypersthene chondrite, (L_6). Find, 1938, 6.1 kg. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. The



Fig. 2.28 La Colina. *Credit:* Woreczko Jan & Wadi

Fig. 2.29 La Criolla. *Credit:* R.D. Acevedo



Permanent Commission on Meteorites of the International Geological Congress (1962a), Giacomelli (1969).

La Colina. $37^{\circ} 20' \text{ S}$, $61^{\circ} 32' \text{ W}$. General Lamadrid, Buenos Aires Province. Stone, olivine-bronzite chondrite, (H₅). Seen falling on March 19, 1924, 2 kg were recovered. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux (1925). Pastore (1925a). Fig. 2.28.

La Criolla. $31^{\circ} 16' \text{ S}$, $58^{\circ} 06' \text{ W}$. La Criolla, Entre Ríos Stone, olivine-hypersthene chondrite, (L₆). Fell on January 6, 1985. Meteoritic shower. 35 kg were recovered. Museo de Geología de la Universidad de Oviedo (España), Smithsonian Institution collections, Natural History Museum. SEAN Bulletin (1985), Graham (1986), Acevedo et al. (2005), Rocca (2005). Fig. 2.29.

Laguna Manantiales. $48^{\circ} 35' \text{ S}$, $67^{\circ} 25' \text{ W}$. Deseado, Santa Cruz. Iron, (II-IAB?). Find, 1945, 92 kg. Smithsonian Institution collections, Natural History Museum. The Permanent Commission on Meteorites of the International Geological Congress (1962a), Giacomelli (1969). Fig. 2.30.

Fig. 2.30 Laguna Manantiales. *Credit: Anne Black*

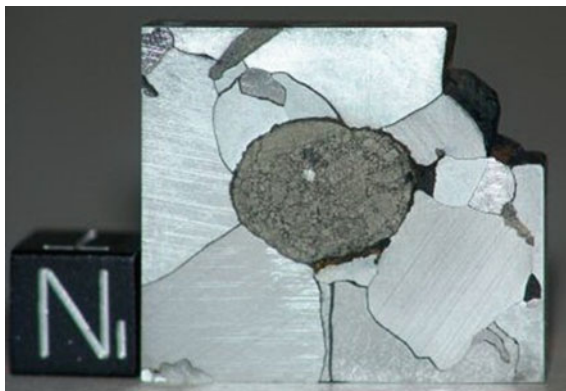
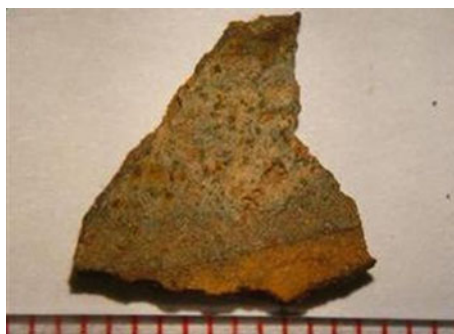


Fig. 2.31 Los Cerrillos.
Credit: Michael S. Scherman



Los Cerrillos. $28^{\circ} 58' S$, $63^{\circ} 20' W$. Santiago del Estero. Stone, ordinary chondrite, (H₄), S₂ W₂. Fa_{17.3}, Fs_{15.1} Wo_{0.9}. Find, 2006, 1 kg. Weisberg et al. (2009). Fig. 2.31.

Luján. $34^{\circ} 40' S$, $59^{\circ} 22' W$. Luján, Buenos Aires Province. Iron, octahedrite? weighing 50 g was found before 1878 by the paleontologist Florentino Ameghino at the depth of 6 meters in a ravine of Río Luján, 8 km southwest of Luján city, near Jáuregui town. This meteorite fell in prehistoric times (20.000 to 50.000 years ago, Late Pleistocene). Main mass is deposited in the Museo de La Plata. Ameghino (1914).

Malotas. $28^{\circ} 56' S$, $63^{\circ} 14' W$. Salavina, Santiago del Estero. Stone, olivine-bronzite chondrite, (H₅). Seen falling on June 22, 1931. Meteoritic shower. Hundreds of fragments recovered. Unknown mass. Smithsonian Institution collections, Natural History Museum. Olsacher (1931). Fig. 2.32.

Fig. 2.32 Malotas. *Credit:*
Woreczko Jan & Wadi



Medanitos. 27° 15' S, 67° 30' W. Tinogasta, Catamarca. Achondrite, eucrite (brecciated). Seen falling on July 14, 1953, 31 g were rescued. Specola Vaticana (Vaticano City State), Natural History Museum. Salpeter (1957), The Permanent Commission on Meteorites of the International Geological Congress (1958b), Giacomelli (1969).

Mercedes. 34° 40' S, 59° 20' W. Mercedes, Buenos Aires. Stone, olivine-bronzite chondrite, (H₅), W₃, Fa_{18.9}, Fs_{17.6} Wo_{1.2}. Find, 1994, 3.3 kg (26 pieces). Connolly Jr. et al. (2006). Fig. 2.33.

Muelle Viejo. 41° 11' S, 71° 23' W. Lago Nahuel Huapi, San Carlos de Bariloche, Río Negro. Iron, octaedrite?. Found at the depth of 8.5 meters in an excavation at the shores of Lake Nahuel Huapi in 1961, 130 g were recovered. Sección Geología, Museo de la Patagonia “Francisco P. Moreno”, Bariloche (Argentina). Rivas et al. (1976). (It has not been officially classified).

Nahuel Niyeu. 40° 32' S, 66° 38' W. Río Negro. Stone, ordinary chondrite, (H₅), S₂ W_{2/3}. Find, 2005, 10.54 kg. (Weisberg et al., 2010).

Nicolás Levalle. 38° 51' 01" S 62° 52' 44" W. Nicolás Levalle, Buenos Aires Province. Stone, ordinary chondrite, (L₅), S₂ W₅. Find, 1956, 60 kg. Main mass, Sociedad Meteorítica Argentina, IGPP-UCLA. Rönick et al. (2011), Garvie (2012).

Nogoyá. 32° 22' S, 59° 50' W. Entre Ríos. Stone, carbonaceous chondrite, (CM₂). Fell on June 30, 1879, 4 kg. Main mass in Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux (1914), Nazarov et al. (1998). Fig. 2.34.

Norquín-Có. 337° 43' S, 70° 37' W. Neuquén. Iron, octahedrite, (IIIAB). Found in 1945, 19.25 kg. Museo de La Plata. Herrero Ducloux (1945a). Fig. 2.35.

Palca de Aparzo. 23° 07' S, 65° 06' W. Jujuy. Stone, ordinary chondrite, (L₅). Fa₂₅, Fs₂₁. Seen falling on September 14, 1988, 1,439 kg were rescued. Wlotzka (1994).

Fig. 2.33 Mercedes. *Credit:*
Woreczko Jan & Wadi



Fig. 2.34 Nogoyá. *Credit:*
www.meteorite.fr



Fig. 2.35 Ñorquin-Có.
Credit: Mike Bandli



Pampa del Infierno. 26° 41' S, 61° 05' W. Avia Terai, Chaco. Stone, olivine-hypersthene chondrite, (L₆). Find, 1895, 896 g. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux (1928b).

Pitino. 27° 28' S, 60° 35' W. Chaco. Stone, olivine-bronzite chondrite, (H₅), S₄ W₂. Fa_{15.8}, Fs_{14.9} Wo_{1.4}. Found in 2002, 1,667 g. (Russell et al., 2003). Fig. 2.36.

Puerta de Arauco. 28° 53' S, 66° 40' W. La Rioja. Iron, octahedrite, (IVA?). Find, 1904, 1.5 kg. Museo de La Plata (Herrero Ducloux, 1908) (Fig. 2.37).

Fig. 2.36 Pitino. SEM image. *Credit:* Mariluz Valín-Alberdi

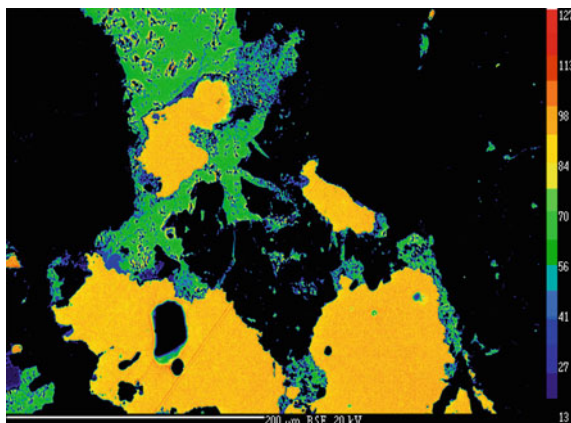


Fig. 2.37 Puerta de Arauco. *Credit:* Museo de La Plata



Raco. $26^{\circ} 40' \text{ S}$, $65^{\circ} 27' \text{ W}$. Taí del Valle, Tucumán. Stone, olivine-bronzite chondrite, (H_5). Fell on November 17, 1957, 5 kg. Instituto Miguel Lillo, Universidad Nacional de Tucumán (Argentina), Smithsonian Institution collections, Natural History Museum. The Permanent Commission on Meteorites of the International Geological Congress (1961), Giacomelli (1969). Fig. 2.38.

Renca. $32^{\circ} 45' \text{ S}$, $65^{\circ} 17' \text{ W}$. San Luis. Stone, olivine-hypersthene chondrite, (L_5). Seen falling on June 20, 1925, 300 g were saved. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux and Pastore (1929).

Rincón. $23^{\circ} 52' 15' \text{ S}$, $67^{\circ} 10' 35' \text{ W}$. Salta. Stone, ordinary chondrite, (L_6), $S_4 W_2$. $Fa_{25.7}$, $Fs_{22.5}$. Ringwoodite-bearing. Collected in 1995, 294.4 g were recovered. Wlotzka (1995), Stelzner et al. (1997). Fig. 2.39.

Río Cuarto 001. $32^{\circ} 52' \text{ S}$, $64^{\circ} 13' \text{ W}$. Córdoba. Achondrite, eucrite. Plagioclase $An_{89.7-96.6}$, orthopyroxene $Fs_{37.2-77.1}$ $Wo_{0.3-4.8}$, pigeonite $Fs_{62.6-85.8}$ $Wo_{5.3-16.6}$, and augite $Fs_{35.4-72.6}$ $Wo_{21.3-43.5}$. Found 62.7 g within an oblong

Fig. 2.38 Raco. *Credit:*
Eduardo Jawerbaum



Fig. 2.39 Rincón. *Credit:*
Klaus Heide



depression of 4 x 0.6 km. University of Río Cuarto (Argentina), University of Chicago (USA), Imperial College London (UK). Connolly et al. (2007), Levine et al. (2007).

Río Limay. 39° 51' S, 69° 29' W. Quíñihua, Río Negro. Stone, ordinary chondrite, (L₅). Fa₂₃ Fs₁₉, plagioclase An₁₅. Find, 1995, 280 kg. Smithsonian Institution collections. Grossman (1996). Fig. 2.40.

San Borjita. 27° 33' 31' S, 56° 08' W. Corrientes. Stone, ordinary chondrite, (L₄). Fa_{24.4}, En_{19.8} Wo_{0.8}. S₃ W₂. Found in 1983, 12.3 kg. Smithsonian Institution collections. Grossman (1998).

San Carlos. 35° 32' S, 58° 46' W. San Miguel del Monte, Buenos Aires Province. Stone, olivine-bronzite chondrite, (H₄). Find, 1942, 3.6 kg. Disappeared from the Asociación Amigos de la Astronomía de Ciudad de Buenos Aires (Argentina). Herrero Ducloux (1942). Smithsonian Institution collections, Natural History Museum. Fig. 2.41.

San Luis. 33° 20' S, 66° 23' W. San Luis. Stone, olivine-bronzite chondrite, (H). Find, 1964, mass unknown. Smithsonian Institution collections.

Fig. 2.40 Río Limay.
Credit: Woreczko Jan &
 Wadi



Fig. 2.41 San Carlos.
Credit: Collection Jean
 Michel Masson



Santa Isabel. $33^{\circ} 54' \text{ S}$, $61^{\circ} 42' \text{ W}$. Santa Fe. Stone, olivine-hypersthene chondrite, (L_6). Seen falling on November, 1924, 5.5 kg were collected. Museo Argentino de Ciencias Naturales, Buenos Aires, Natural History Museum. Herrero Ducloux (1926), Pastore (1925b).

Santa Lucía. $31^{\circ} 32' \text{ S}$, $68^{\circ} 29' \text{ W}$. Derqui and Edison streets, Villa Manuelita, Departamento de Santa Lucía, San Juan Province. Stone, ordinary chondrite, (L_6), W_0 . Olivine $Fa_{24.4}$ and pyroxenes $Fs_{20.7} Wo_{1.5}$ (Varela et al. 2010). Seen falling on January 23, 2008, 1.9 kg were rescued. Monomictic breccia. CASLEO, San Juan (Argentina) (354 g) and Museo de La Plata (1,526 g). (Weisberg et al., 2010). Fig. 2.42.

Sierra Colorada. $40^{\circ} 48' \text{ S}$, $67^{\circ} 29' \text{ W}$. Río Negro. Stone, ordinary chondrite, (L_5). Fa_{24-26} , Fs_{26} . Find, 1995, 71.3 kg. Smithsonian Institution collections. Grossman (1997). Fig. 2.43.

Talampaya. $29^{\circ} 55' \text{ S}$, $68^{\circ} 05' \text{ W}$. La Rioja. Achondrite, eucrite. $En_{58.6-60.0} Wo_{1.2-1.6} En_{40.5} Wo_{45.7}$, plagioclase $An_{89.95}$, chromite with 1.26 % MgO, very low concentration of incompatible trace elements, and Cr 3,400 ppm, typical of cumulate eucrites. Fall, 1995, 1,421 kg. Natural History Museum. Grossman (1999) Fig. 2.44.

Fig. 2.42 Santa Lucía.
Credit: Diario de Cuyo



Fig. 2.43 Sierra Colorada.
Credit: Woreczko Jan & Wadi



Fig. 2.44 Talampaya.
Credit: courtesy of Heritage Auctions, www.HA.com



Fig. 2.45 Vera. *Credit:*
Eduardo Jawerbaum

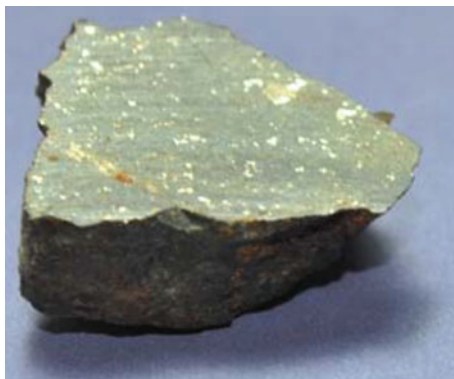


Fig. 2.46 Viedma. *Credit:*
Woreczko Jan & Wadi



Tostado. 29° 14' S, 61° 46' W. Santa Fe. Stone, olivine-bronzite chondrite, (H). Find, 1945, 22 kg. Museo Argentino de Ciencias Naturales, Buenos Aires, Smithsonian Institution collections, Natural History Museum. Herrero Ducloux (1945b).

Tres Estacas. 25° 09' S, 60° 40' W. Río Teuco, Chaco. Stone, ordinary chondrite. Find, 1968, 160 kg. Villar (1968).

Uzcuclún. 44° 07' S, 66° 09' W. Ameghino, Chubut. Stone, olivine-hypersthene chondrite, (L). Fell on April 16, 1948, 20 kg. Museo Histórico Municipal de Bahía Blanca (Argentina). De Serralonga (1969), Wlotzka (1992).

Vera. 29° 55' S, 60° 17' W. Vera, Santa Fe. Stone, olivine-hypersthene chondrite, (L or LL4). Find, 1941, 80 kg. Smithsonian Institution collections, Natural History Museum. The Permanent Commission on meteorites of the International Geological Congress (1961), Carnevali (1953). Fig. 2.45.

Viedma. 41° 04' S, 62° 51' W. Río Negro. Stone, olivine-hypersthene chondrite, (L₅). Fa_{24.9} Fs_{21.1}. Found in 2003, 6.9 kg. Russell et al. (2004). Fig. 2.46.

Fig. 2.47 Villa Regina.
Credit: Woreczko Jan &
Wadi



Villa Regina. 39° 06' S, 67° 04' W. Río Negro. Iron, (IIIAB). Ni = 79.3 mg/g. Find, 2005, 5.03 kg. Published in Meteoritical Bulletin, N° 100, MAPS 46, in preparation (2013). Fig. 2.47.

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