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Abstract–Meteoritical Bulletin No. 86 lists information for 1154 newly classified meteorites, comprising 661 from Antarctica, 218 from Africa, 207 from Asia (203 of which are from Oman), 62 from North America, 3 from South America, and 3 from Europe. Information is provided for 5 falls (El Idrissia, Undulung, Dashoguz, El Tigre, and Yafa). Noteworthy specimens include 7 martian meteorites (Dhofar 378, Grove Mountains 99027, Northwest Africa 856, 1068, and 1110, and Sayh al Uhaymir 060 and 090); 4 lunar meteorites (Dhofar 301, 302, 303, and 489); 9 new iron meteorites; a mesosiderite (Northwest Africa 1242); an ungrouped stony-iron meteorite (Dar al Gani 962); and a wide variety of other interesting stony meteorites, including CH, CK, CM, CR, CV, R, enstatite, unequilibrated ordinary, and ungrouped chondrites, primitive achondrites, howardite–eucrite–diogenite (HED) achondrites, and ureilites.

INTRODUCTION

The Meteoritical Bulletin is a compilation of announcements by the Meteoritical Society's Meteorite Nomenclature Committee of newly described and classified meteorites. For supplemental maps and photographs, visit the Meteoritical Bulletin web site at: http://www.uark.edu/studorg/metsoc/metbull.htm.

Several conventions are followed in this document. Shock classifications conform to the scheme of Stöffler *et al.* (1991). The scale of Wlotzka (1993) is used to describe weathering grades, except as noted. For chondrite groups, petrologic types, shock stages, and weathering grades, slashes (*e.g.*, H5/6) indicate transitional assignments. Hyphens in petrologic type assignments for chondrites (*e.g.*, H5–6) indicate the range of types observed in breccias. Group names such as "L(LL)" indicate uncertain assignments, with the less probable group in parentheses. The word "ungrouped" indicates that a meteorite can not be fit into existing classification schemes. The word "anomalous" is used if a meteorite can be assigned to an established class, but differs from other members of that class in a significant way. All italicized abbreviations refer to addresses tabulated at the end of this document.

NEWLY DESCRIBED METEORITES

ANSMET meteorites
(594 meteorites)
Antarctica
Found 1999–2000

Appendix 1 brings up-to-date the list of officially announced meteorites from the U.S. Antarctic Meteorite (ANSMET) program. 9598 meteorites were previously listed in the *Meteoritical Bulletin*, nos. 76, 79, and 82–85; these meteorites bring the total to 10 192. The meteorites in Appendix 1 were published in the *Antarctic Meteorite Newsletter* (AMN), issues 24(2) (2001) and 25(1) (2002). Listed are the classifications, masses, degrees of weathering, olivine and pyroxene compositions, pairing information, ice fields upon which the meteorites were found, and bibliographic information, all sorted by sample name. Note that meteorite pairings may be tentative.

Barbianello 45°03'28" N, 9°11'44" E
Pavia, Italy
Found October 1960 or 1961
Iron ungrouped (ataxite)

A single mass of 860 g was found by farmer Clemente Allini while he was ploughing a cornfield. In 1972, young Carla Allini showed it at school to her teacher, who submitted it to Professor G. Giuseppetti at the University of Pavia. In 1974, he inspected the meteorite macroscopically and obtained bulk data by atomic absorption spectroscopy and traditional wet chemistry, and identified it as an unusually Ni-rich iron meteorite. Classification and mineralogy (A. Fioretti, *UPad*; V. de Michele, *Milano*): ataxitic texture, lacking Widmannstätten pattern; consists almost entirely of taenite (Ni_{27}) with minor plates of kamacite and accessory troilite and schreibersite; severely altered surface, but fresh interior. Bulk metal composition (B. Spettel, W. Huisl and J. Zipfel, *MPI*): Ni = 27.1 wt%; Ge = 73 μg/g; Ga = 28 μg/g; As = 16.6 μg/g; composition falls at the Ni-rich end of the IAB-IIICD trends, with Ga and Ge concentrations comparable to those of the Ni-rich IAB's San Cristobal and Yamato 791694 and to the ungrouped iron Elephant Moraine (EET) 87506, but with lower As than any of these meteorites; based on mineralogical and chemical data the meteorite is classified as an ungrouped iron. See also Fioretti *et al.* (2001). Specimens: main mass and type specimen, 479 g, *Milano*.

Bates Nunatak (BTN), see ANSMET meteorites

Danby Dry Lake 34°13' N, 115°3' W
Erratum: The coordinates listed in *Meteoritical Bulletin, No.* 85 were incorrect; the correct ones are given above.

Dar al Gani 659–964, see Saharan meteorites from Libya

Dar al Gani 962 27°11.88' N, 16°24.51' E
Libya
Found 1998
Stony-iron (ungrouped)
A single stone of 130 g was found on the Dar al Gani plateau during a systematic search by *Pelisson*. The cut surface reveals a metallic matrix (55 vol%) containing numerous, large, angular silicate clasts (45 vol%). Silicate clasts are cut by small metal veinlets. Mineralogy and classification (P. Sipiera, *Harper*): metal, kamacite and taenite in equal proportions, minor troilite (contains minor V and Cr); silicate clasts are mostly enstatite, $Fs_{0.11–2.28}Wo_{0.64–1.84}$, and olivine, $Fa_{0.15–1.92}$, accessory clinopyroxene and albite-rich plagioclase. Mineralogy and petrology indicate that this meteorite is an ungrouped stony-iron. Specimens: type specimen, 19 g, and one polished section, *PSF*; main mass, *Pelisson*.

Dashoguz 41°59'4" N, 59°41'6" E
Turkmenistan
Fell 1998 September 5
Ordinary chondrite (H5)
A meteor trail was witnessed near the city of Dashoguz, Turkmenistan. After a search of several weeks, a very small crater (depression) with ~7 kg of meteorite fragments was found. Kakabay Annaniyazov recovered fresh, grey fragments from the rim of the crater and weathered, brown fragments from within the water-filled crater. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): olivine, $Fa_{17.5}$; pyroxene, $Fs_{15.3}$; plagioclase, An_{14}. Shock stage, S3; weathering grade, W0/1 for the gray fragments, W4 for the brown fragments. Specimens: type specimen, 21.2 g and one thin section, *NAU*; main mass with anonymous purchaser.

David Glacier (DAV), see PNRA meteorites

Delaware 35°17' N, 93°30' W
Logan County, Arkansas, USA
Found 1972
Ordinary chondrite (L4)
A single 8.346 kg stone was found by Daniel Michaelson, a 12-year-old boy, while hunting for arrowheads with his father. Classification (K. Kaneda, *UTok*): $Fa_{22.3–27.3}$; $Fs_{17.5–28.5}$ (mainly $Fs_{20.0–23.5}$). The meteorite is brecciated. Weathering grade: W0. Specimens: type specimen, 28 g *UTok*; main mass, *AShaw*.

Derrick Peak (DRP), see ANSMET meteorites

Dhofar 204–489, see Oman meteorites

Dhofar 225 18°21.6' N, 54°11.3' E
Oman
Found 2001 January 15
Carbonaceous chondrite (CM, anomalous)
A black stone weighing 90 g was found in the Dhofar region in Oman. Mineralogy and classification (M. A. Ivanova and M. A. Nazarov, *Vernad*; L. Taylor and A. Patchen, *UTenn*): fusion crust is distinct and black. Texturally the sample is similar to CM chondrites, consisting of fine-grained matrix, calcium-aluminum-rich inclusions (CAIs), irregularly shaped olivine aggregates, and rare type I and II chondrules. Coarse-grained objects are surrounded by accretionary dust mantles. CAIs are mainly spinel-rich with perovskite, Al-diopside and forsterite surrounded by phyllosilicates; chondrules consist of olivine, very rare orthopyroxene embedded in completely altered mesostasis; type I chondrules and olivine aggregates contain kamacite blebs in forsterite; groundmass consists of phyllosilicates, isolated olivine grains (forsterite is dominant). Contains Ni-rich metal grains (up to 60 wt% of Ni), schreibersite, Ca-phosphates, sulfides (mostly pentlandite and pyrrhotite), chromite and escolaite; bulk chemistry: Fe/Si = 1.24, Mg/Si = 0.91, Al/Si = 0.093, low H_2O contents. Oxygen isotopic composition (R. N. Clayton, *UChi*): $\delta^{18}O = +21.85‰$, $\delta^{17}O = +9.22‰$. The oxygen isotopic composition, low Fe/Si ratio and low H_2O content are atypical for CM chondrites. Specimens: type specimen, 19.7 g and two thin sections, *Vernad*; main mass is with the anonymous finder.

Dhofar 285 18°26.0' N, 54°10.2' E
Oman
Found 2001 January 14
Achondrite (polymict eucrite)
One 216 g stone with black glassy fusion crust was found in the Dhofar region of Oman. Classification and description (C. Lorenz, *Vernad*): a polymict breccia; contains basalts, melts, melt breccias and mineral clasts. Basalts contain pyroxene ($En_{40.5}Wo_{1.85}$) and feldspar ($An_{60.4–93.8}$). Pyroxenes have lamellae of clinopyroxene ($En_{34.4}Wo_{35.5}$). Silica is minor phase. Ilmenite, troilite, Ca-phosphate and metal iron are rare. Composition of pyroxene clasts is $En_{28.73–65.8}Wo_{1.5–44.05}$. Rare magnesian pyroxenes are zoned from $En_{72.2}Wo_{1.8}$ to $En_{43.9–48}Wo_{1.8}$. Weathering stage is W0/1. Specimens: type specimen, 39 g, *Vernad*; main mass with anonymous finder.

Dhofar 301 18°24.1' N, 54°08.9' E
Oman
Found 2001 April 13
Lunar meteorite (anorthositic impact melt breccia)
A brownish grey stone weighing 9 g was found in the Dhofar region, Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; meteorite is a clast-rich impact melt breccia containing numerous mineral fragments and lithic clasts embedded in a very fine-grained impact melt matrix. The lithic clast population is dominated by impact melt breccias; primary igneous rocks and granulites of mostly anorthositic and gabbro-noritic compositions are rare; mare basalt material is possibly present; feldspar, $An_{90–98}$; orthopyroxene, $Wo_{1–4}En_{70–99}$; clinopyroxene, $Wo_{6–43}En_{1–74}$; olivine, $Fo_{58–86}$ (Fe/Mn ≈ 90 atom%); accessory minerals are Ti-rich chromite, ilmenite (7 wt% MgO), troilite, and FeNi metal (7–48 wt% Ni; 0.4–1.4 wt% Co); composition of the impact melt matrix is SiO_2 = 44.1, TiO_2 = 0.36, Al_2O_3 = 28.6, Cr_2O_3 = 0.10, FeO = 4.27, MnO = 0.07, MgO = 4.83, CaO = 16.5, Na_2O = 0.39, K_2O = 0.04, P_2O_5 = 0.07 (wt%); the meteorite is moderately weathered; gypsum, calcite, celestite, barite, and Fe hydroxides occur in cracks and holes. Dhofar 025 and Dhofar 301 are possibly paired because the stones were found nearby, and they are similar in texture and mineral chemistry. Specimens: type specimen, 1.8 g plus a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 302 19°19.6' N, 54°47.1' E

Oman

Found 2001 June 28

Lunar meteorite (anorthositic impact melt breccia)

A dark grey stone weighing 3.83 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; meteorite is a clast-rich impact melt breccia; mineral fragments and lithic clasts are set within a poorly crystallized impact melt glassy matrix; impact melt breccias are most abundant in the lithic clast population; fragments of primary igneous rocks and granulites of anorthositic, gabbro-noritic, and troctolitic compositions are common; rare glass fragments of KREEP composition were found; mare basalt material is probably present; feldspar, $An_{90–99}$; orthopyroxene, $Wo_{1–4}En_{45–88}$; clinopyroxene, $Wo_{6–46}En_{2–83}$, olivine, $Fo_{8–94}$ (Fe/Mn ≈ 86 atom%); accessory minerals are Ti-rich chromite, Mg-Al-spinel, ilmenite (0.4–6 wt% MgO), baddeleyite, silica, tranquilityite (?), troilite, and FeNi metal (0.7–44 wt% Ni; 0.2–1.4 wt% Co); composition of the impact-melt glassy matrix is SiO_2 = 44.5, TiO_2 = 0.27, Al_2O_3 = 28.1, Cr_2O_3 = 0.09, FeO = 4.02, MnO = 0.06, MgO = 4.84, CaO = 16.5, Na_2O = 0.41, K_2O = 0.09, P_2O_5 = 0.12 (wt%); terrestrial weathering is not significant. Dhofar 302 and Dhofar 081/280 were found nearby and are possibly paired. However, Dhofar 302 seems to be poorer in glass and richer in igneous and granulitic lithologies. Specimens: type specimen, 0.8 g plus a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 303 19°19.8' N, 54°47.0' E

Oman

Found 2001 June 28

Lunar meteorite (anorthositic impact melt conglomerate)

A light grey stone weighting 4.15 g was found in the Dhofar region of Oman. Mineralogy and classification (M. Nazarov, *Vernad*; L. Taylor, *UTenn*): fusion crust is absent; meteorite has a typical conglomerate texture; rounded lithic clasts are cemented by a very fine-grained impact melt matrix; clasts of impact melt breccias are most abundant and show commonly breccia-in-breccia textures; primary igneous rocks and granulites are rare and have mainly anorthositic and troctolitic compositions; feldspar, $An_{94–99}$; orthopyroxene, $Wo_{1–5}En_{19–89}$; clinopyroxene, $Wo_{6–46}En_{29–70}$; olivine, $Fo_{48–88}$ (Fe/Mn ≈ 87 atom%); accessory minerals are Ti-rich chromite, ilmenite (3–6 wt% MgO), Al-Cr-Zr-rich armalcolite, rutile, troilite, and FeNi metal (1–37 wt% Ni; 0.2–2.3 wt% Co); composition of the impact melt matrix is SiO_2 = 44.0, TiO_2 = 0.15, Al_2O_3 = 29.8, Cr_2O_3 = 0.06, FeO = 3.17, MnO = 0.06, MgO = 4.91, CaO = 17.0, Na_2O = 0.34, K_2O = 0.01, P_2O_5 = 0.03 (wt%); the stone is moderately weathered; celestite, barite, gypsum, calcite and Fe hydroxides are present. The conglomerate texture and degree of weathering distinguish Dhofar 303 from Dhofar 302 and Dhofar 081/280, which were found nearby. However the meteorites may be paired. Specimens: type specimen, 0.85 g plus a thin section, *Vernad*; main mass with anonymous finder.

Dhofar 378 18°9.5' N, 54°6.8' E

Oman

Found 2000 June 17

Martian meteorite (basaltic shergottite)

A single stone of 15 g, covered with fresh black fusion crust, was recovered by an anonymous finder within the province of the other Dhofar meteorites. Classification and description: (Y. Ikeda and M. Kimura, *Ibaraki*; H. Takeda, *Chiba*): it has a doleritic or microgabbroic texture, and the grain sizes of the main minerals (pyroxenes and plagioclase glass) are ~1 mm across. It consists mainly of ferroan pyroxenes (augite and pigeonite), and plagioclase glass with quenched plagioclase rims. Minor minerals are hedenbergite, pyroxferroite, fayalite, silica, Ti-rich magnetite, ilmenite, sulfide, phosphate, and rhyolitic glass. The Fe/(Mg + Fe) ratios of pyroxenes (augite and pigeonite) range from 0.40 to more than 0.90, those of hedenbergite from 0.97 to 0.99, and olivine from 0.90 to 0.98. The original plagioclase grains were transformed to plagioclase glass (An_{35} to An_{55}) by an intense impact shock, then quenched plagioclase of the same composition a few tens of micrometers up to 100 μm in width at the boundaries between the plagioclase glass and other minerals. Oxygen isotopic composition (T. K. Mayeda and R. N. Clayton, *UChi*): $\delta^{18}O$ = +4.46‰, $\delta^{17}O$ = +2.52‰. This meteorite was recovered from an area near the Dhofar 019 basaltic shergottite, but the two meteorites are probably not paired. Dhofar 019 is doleritic and contains olivine grains with Fe/(Mg + Fe) ratios of 0.4–0.75, while these seem to be absent from Dhofar 378. Pyroxenes in Dhofar 019 are more magnesian than in Dhofar 378. Specimens: type specimens, 0.445 and 0.054 g, *Ibaraki*; 2.74 g *MPI*; main mass is with the anonymous finder.

Dhofar 489 19°25' N, 54°35' E

Oman

Found 2001 August 11

Lunar meteorite (feldspathic crystalline matrix breccia)

One 34.4 g stone was found in the Dhofar region of Oman. Mineralogy and classification (H. Takeda, *Chiba*; T. Ishii and M. Ohtsuki, *UTok*): A feldspathic fragmental breccia consisting of clasts of various lithologies embedded into a fine-grained crystalline matrix (crystals up to 0.04 mm in length). Clasts include cataclastic feldspars up to 1.8 × 0.6 mm in size, plus dark fine-grained impact melt breccia 3.3 × 2.3 mm in size with feldspar fragments. Plagioclase compositions of $An_{95–97}$ are within the range of lunar anorthites. Pyroxene crystals in plagioclase and crystalline matrix range from $En_{75}Fs_{21}Wo_4$ to $En_{85}Fs_{10}Wo_5$ with FeO/MnO (wt%) = 57. Olivine: Fa_{15} to Fa_{24} with FeO/MnO (wt%) = 78. Fine Ca carbonate veins penetrate into the specimen. Unlike known lunar meteorites, this lunar rock is a feldspathic crystalline matrix breccia. The most Mg-rich pyroxene is more Mg-rich than those of common lunar regolith breccias and similar to those of 60019, an Apollo 16 breccia containing poikilitic clasts. This lunar meteorite differs from other known lunar meteorites from the Dhofar region, which are either feldspathic regolith breccias or fragmental breccias. Specimens: type specimen, 6 g, *NSMT*; 0.42 g plus two polished thin sections, *Chiba*; main mass with anonymous finder.

El Idrissia 34°25' N, 2°75' E

Djelfa, Algeria

Fell 1989 March 10

Ordinary chondrite (L6)

After a sonic boom was heard, three pieces of a meteorite were recovered by the police and Bounatiro Lout (an astrophysicist at *CRAAG*). The total known mass is ~10 kg with each of the pieces weighing between 2 and 4 kg. The meteorite fell near the village of El Idrissia on the desert platform with the nearest town being Ain Lahdjar. Classification and mineralogy (Mounia Messaoudi, *IST-*

USTHB; M. Bourot-Denise, *MNHNP*, B. Devouard, *OPGC*): olivine, $Fa_{25.3}$, and pyroxene, $Fs_{18.8}$, S2 and W1. Specimens: type specimen, 150 g, *IST-USTHB* and 2 kg, *CRAAG*; main mass, unknown.

El Tigre 19°58'2" N, 103°3'6" W
Jalisco, Mexico
Fell 1993 December 23
Ordinary chondrite (L6)

Three stones, weighing ~5 kg, fell near the village of El Tigre. A fireball was witnessed in Puerto Vallarta and along a line in an east-southeast direction. Three stones were recovered several days later in a farmer's field. One stone (328 g) was purchased by a collector in 1994, location of the other two stones is unknown. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): olivine, $Fa_{24.6}$; plagioclase, An_{12}. Shock stage, S2; weathering grade, W0. Specimens: type specimen, 19.2 g and one thin section at *NAU*; remainder of this stone with anonymous collector.

Frontier Mountain, see PNRA meteorites

Frontier Mountain (FRO) 01030 72°59'27" S, 160°24'09" E
Antarctica
Found January 2002
Achondrite (ureilite)

This 6 g stone is a rounded, partially crusted, stony fragment. Classification (L. Folco, *MNA-SI*): it has a typical texture for ureilites and an average grain size of 1.5 mm. It is composed of olivine and pigeonite with homogeneous core compositions (Fa_{10} and Fs_{10}). It is devoid of evidence for shock metamorphism (S1). The degree of terrestrial weathering is low. The meteorite is petrographically distinct from previously classified Frontier Mountain ureilites. Main mass, type specimen and thin section at *MNA-SI*.

Grove Mountains (GRV) 73°05' S, 75°12' E
(28 meteorites)
Antarctica
Found 2000 February

Twenty-eight meteorites (Table 1) were collected on blue ice in the Grove Mountains main icefield by the 16th Chinese Antarctic Research Expedition (CARE) in 2000 February, updating the total number of meteorites found in this region to 32. Of the newly found meteorites, there is a martian lherzolite (GRV 99027, see separate entry), a eucrite (GRV 99018, see separate entry), and the remaining 26 are ordinary chondrites. Classification: Y. Lin and B. Miao (*GIG*), K. Tao, Y. Jun and X. Liu (*IGG*), H. Wang and C. Lin (*NU*), and J. Liu and Y. Zhou (*NAOC*). Specimens: all masses and sections of the meteorites at *PRIC*.

Grove Mountains (GRV) 99018 73°05'56" S, 75°11'53" E
Antarctica
Found 2000 February 9
Achondrite (eucrite)

TABLE 1. Meteorites from Grove Mountains, Antarctica.

Name	Type	Mass (g)	Found (yyyy.mm.dd)	Fa (mol%)	Fs (mol%)	Shock stage	WG	Comments
Grove Mountains								
GRV 99001	L3	428.9	2000.02.05	24.9 ± 12.5 (3–39)	11.1 ± 7.6 (3–28)	S1	W1	–
GRV 99002	LL4–6	17.50	2000.02.05	28.8	23.7	S2	W1	LL6 clasts in LL4 host
GRV 99003	L4	7.86	2000.02.05	25.5	19.7	S1	W1	–
GRV 99004	LL5	2.91	2000.02.06	26.5	21.6	S1	W1	–
GRV 99005	LL5	19.66	2000.02.06	27.0	21.9	S1	W1	–
GRV 99006	H4	2.55	2000.02.06	17.3	15.3	S1	W1	–
GRV 99007	L6	2.11	2000.02.06	22.6	19.2	S1	W1	–
GRV 99008	L4	1.94	2000.02.06	21.5	18.1	S1	W1	–
GRV 99009	H6	20.91	2000.02.07	18.0	16.0	S1	W1	–
GRV 99010	H6	0.93	2000.02.07	18.3	16.0	S1	W1	–
GRV 99011	H4	1.39	2000.02.08	17.0	15.0	S1	W1	–
GRV 99012	L4	5.36	2000.02.08	25.2	17.7	S1	W1	–
GRV 99013	LL5	3.13	2000.02.08	26.5	21.1	S2	W1	–
GRV 99014	L6	6.15	2000.02.08	23.5	20.2	S1	W1	–
GRV 99015	LL4	2.85	2000.02.08	28.4	21.8	S1	W1	–
GRV 99016	L6	38.80	2000.02.08	22.6	19.0	S1	W1	–
GRV 99017	L6	5.51	2000.02.08	23.4	19.7	S1	W1	–
GRV 99018	Eucrite	0.23	2000.02.09	–	–	*See separate entry*		
GRV 99019	L3	4.55	2000.02.08	26.3 ± 9.2 (9–39)	8.7 ± 5.2 (1–21)	S1	W1	–
GRV 99020	L3	0.25	2000.02.08	22.3 ± 10.1 (5–40)	9.8 ± 7.0 (1–20)	S1	W1	–
GRV 99021	L3	1.70	2000.02.08	27.2 ± 10.9 (10–47)	12.9 ± 7.6 (2–26)	S1	W1	–
GRV 99022	L3	1.05	2000.02.08	21.9 ± 11.7 (3–39)	7.6 ± 6.8 (2–30)	S1	W1	–
GRV 99023	L6	3.08	2000.02.08	22.6	19.1	S1	W1	–
GRV 99024	L5	0.85	2000.02.08	25.9	19.5	S2	W1	–
GRV 99025	H5	4.17	2000.02.08	15.6	13.9	S1	W1	–
GRV 99026	L3	11.29	2000.02.08	23.8 ± 10.6 (0–40)	11.4 ± 9.2 (1–25)	S1	W1	–
GRV 99027	Martian	9.97	2000.02.08	–	–	*See separate entry*		
GRV 99028	H4	3.56	2000.02.09	17.9	15.6	S1	W1	–

The smallest stone (0.23 g) collected from blue ice in the Grove Mountains, Antarctica. It is a fragment. The broken surface is fresh, with most of other surface covered by fusion crust. Classification and mineralogy (Lin and B. Miao, *GIG*; K. Tao, Y. Jun and X. Liu, *IGG*): it is a mono-breccia, consisting of converted pigeonite (50.5 vol%) and plagioclase (37.2 vol%) with minor SiO_2 (7.0 vol%) and opaque minerals (5.2 vol%). All grains of the pigeonite have exsolved lamellae of augite ($En_{29–32}Fs_{25–31}Wo_{37–45}$) and hypersthene ($En_{36–38}Fs_{55–62}Wo_{1–3}$). The FeO/MnO (wt%) ratio of the pyroxenes is (28 ± 2). Plagioclase is anorthitic ($An_{88–91}$). Fracturing and undulose extinction in silicates is common, and plagioclase is deformed. Shock stage S3, weathering grade W1. The meteorite is curated at *PRIC*.

Grove Mountains (GRV) 99027 73°06'01" S, 75°14'13" E
Antarctica
Found 2000 February 8
Martian meteorite (lherzolitic shergottite)

This meteorite weighs 9.97 g, and most of the surface is covered by fusion crust. Classification and mineralogy (Lin and B. Miao, *GIG*; H. Wang and C. Lin, *NU*): it is composed mainly of coarse-grained orthopyroxene, olivine, clinopyroxene and plagioclase, with minor opaque minerals. There are two textures. In the larger part of the sections, olivine occurs as rounded euhedral grains, poikilitically enclosed in a megacryst of orthopyroxene; in the other side of the sections, it shows a cumulate texture, consisting of euhedral orthopyroxene, clinopyroxene, olivine and interstitial plagioclase. Chromite, the most common opaque phase, is euhedral and enclosed in pyroxenes. The mineral assemblage and textures are similar to the Allan Hills (ALHA) 77005 lherzolite. The FeO/MnO (wt%) ratio of orthopyroxene is 34 ± 5. Compositions of orthopyroxene ($En_{66–78}Fs_{20–26}Wo_{2–8}$), clinopyroxene ($En_{48–52}Fs_{13–15}Wo_{34–39}$), olivine ($Fa_{22–30}$) and plagioclase ($An_{49–55}Ab_{44–50}Or_{<1}$) overlap with the ranges in ALHA77005. Fracturing and undulose extinction in silicates are strong. Plagioclase is commonly deformed, and partially turns into maskelynite along the boundaries of grains. The shock stage is S4; weathering grade, W1. The meteorite is curated at *PRIC*.

Hagersville 42°58' N, 80°09' W
Ontario, Canada
Found 1999 April
Iron (IAB)

This 30 kg iron meteorite was found by Mr. Joseph Mahé while clearing stones from a seeded field on his family farm. Classification (S. Kissin, *Lake*; Richard Herd, *GSC*): Ni = 6.89 wt%, Cr = 10 ppm, Co = 4.83 mg/g, Cu = 125 ppm, Ga = 75.1 ppm, Ge = 318 ppm, As = 16.9 ppm, Sb = 327 ppb, W = 1090 ppb, Re = 260 ppb, Ir = 2.36 ppm, Pt = 5.9 ppm, Au = 1.5 ppm. It is statistically indistinguishable from Odessa and differs from Canyon Diablo only in Cu and As. It has a low sulphide content, no graphite and low shock stage. Specimens: type specimen, 48 g, *GSC*; main mass, Joseph and Marcelle Mahé.

Hammadah al Hamra 293–313, see Saharan meteorites from Libya

Jiddat al Harasis 021–031, see Oman meteorites

Johannessen Nunataks (JOH), see PNRA meteorites

Lost Creek 39°07'27" N, 98°10'04" W
Lincoln County, Kansas, USA
Find 1916
Ordinary chondrite (H3.8)

A single 4.018 kg stone was found by a man walking along a fence line surrounding a farm pasture. The stone was passed to the finder's son where it remained until purchased in 2001 December. Classification (A. Rubin, *UCLA*): $Fa_{19.2±0.3}$. Shock stage, S2; weathering grade, W3. Specimens: type specimen, 46 g, *UCLA*; main mass, Brad Sampson.

Meteorite Hills (MET), see ANSMET meteorites

Miller Butte (MIB), see PNRA meteorites

Mount Walton (WAL), see PNRA meteorites

Muenatauray 4°54' N, 61°12' W
Bolivar, Venezuela
Found 1960 March 5
Iron (IIAB)

The owner found an iron meteorite on the ground, approximately 27 × 23 × 12 cm (exact weight unknown but estimated at ~30 kg). Mineralogy and classification (D. H. Hill, *UAz*): the specimen appears to have a complete fusion crust with some regmaglypts. The meteorite has two textural regions—one structureless and one with recrystallised, 1 mm-sized domains, suggestive of pre-atmospheric heating and subsequent annealing. Bulk composition (D. H. Hill, *UAz*): Fe = 91.35%, Ni = 5.339%, Ga = 59.1 ppm, Ir = 12.75 ppm, Co = 4227 ppm, Au = 0.54 ppm, As = 3.66 ppm, Sb = 0.051 ppm. Specimens: type specimen, 134 g, *UAz*; main mass with finder (J. Coronel, c/o Ms. Adriana Munoz, 6725 Clyde Street, Apt. 1-G, Forest Hills, New York 11375, USA).

Northwest Africa 139–1242, see Saharan meteorites from Morocco and surrounding countries

Northwest Africa 482, correction

From the day the meteorite was purchased it belonged to Adam and Greg Hupe (*Hupe*) and they still hold the main mass. The holder of the main mass listed in *The Meteoritical Bulletin, No.* 85 was incorrect.

Northwest Africa 595
Morocco
Purchased 2001 January
Primitive achondrite (brachinite)

One complete stone of a total weight of 196 g was purchased by *Cott* in Tucson, Arizona, in 2001 January. Mineralogy and classification (P. Warren, *UCLA*): mineral mode, 80 vol% olivine, 10–15 vol% orthopyroxene, 5–10 vol% augite and minor chromite, traces include kamacite and Ni-rich metal, no plagioclase was found. Mineral composition, olivine, $Fo_{71–72}$ and FeO/MnO = 52 ± 6, orthopyroxene, $En_{72–73}Fs_{25–26}Wo_{2.2}$ and FeO/MnO = 40 ± 7, augite, $En_{45}Fs_{10–11}Wo_{44–45}$ and FeO/MnO = 32 ± 9, chromite, Cr/(Cr + Al) = 0.77, Mg/(Mg + Fe) = 0.25 and TiO_2 = 1.1–1.4 wt%. Typical polygonal-granular texture with a notable alignment of more elongated grains; grain sizes of 0.5 to 1 mm, one exceptionally large grain of 3 mm was observed. Highly weathered, W3/4. Texture, mineral mode and mineral composition of mafic silicates and bulk chemical data are consistent with its classification as brachinite. Specimens: type specimen, 23 g, and thin section, *UCLA*; main mass, *Cott*.

Northwest Africa 739
Morocco
Purchased 2000 January
Carbonaceous chondrite (CH)

Two stones that fit together, with a total mass of 60 g, were purchased by D. Gregory from a Moroccan dealer at the Tucson mineral show at the end of 2000 January. The fusion crust is black. Mineralogy and classification (R. Jones, *UNM*): metal-rich chondrite with small chondrules, average chondrule size 87 μm. Cryptocrystalline chondrules are common in smaller size range. Most olivine and pyroxene have Fe/(Fe + Mg) < 6 mol%, with peaks at Fa_{2-3} and Fs_3 in histograms of random analyses. Olivine and pyroxene compositions range up to Fa_{23} and Fs_{24}. CAIs are small (mostly <60 μm) and a variety of types including grossite-rich. Metal constitutes ~10 vol% of the chondrite and is mostly kamacite, mean Ni = 6.5 wt%, with solar Ni/Co ratio. Oxygen isotopes (Z. Sharp and T. Larson, *UNM*): $\delta^{18}O$ = +4.32‰, $\delta^{17}O$ = +1.75‰. Chondrite has affinities to the CH group, in particular Acfer 182. Specimens: type specimen, 12 g, and thin section, *UNM*; main mass, *ROM*.

Northwest Africa 856
Unknown
Found 2001 March
Martian meteorite (basaltic shergottite)

A single stone of 320 g was found in Morocco in 2001 March. The exact location of find is unknown and the meteorite was referred to under the pseudonym "Djel Ibone". The meteorite has a fine-grained basaltic texture consisting mainly of pyroxene (70 vol%) and maskelynite (23 vol%). Accessory minerals include merrillite, apatite, pyrrhotite, chromite, Fe-Ti oxides, silica (stishovite) and baddeleyite. Melt pockets with phenocrysts and submicrometer-sized needles of stishovite are present. Pyroxenes are highly fractured. Calcite veins formed by terrestrial weathering crosscut the specimens. Classification and mineralogy (A. Jambon, *UPVI*; V. Sautter, *MNHNP*; Ph. Gillet, *ENSL*): pyroxenes are pigeonite, $En_{48}Fs_{39}Wo_{13}$, and augite, $En_{36}Fs_{32}Wo_{32}$; maskelynite composition is $An_{41-47}Ab_{57-51}Or_2$. Geochemistry (J-A. Barrat, *UAng* and Ch. Göpel, *IPGP*): bulk composition in wt% is 0.81 TiO_2, 6.83 Al_2O_3, 17.8 FeO*, 0.49 MnO, 9.51 MgO, 10.2 CaO, 1.28 Na_2O, 0.13 K_2O. Trace elements, 77 ppm Ni and a REE pattern similar to that of Shergotty and Zagami. Key element weight-ratios are FeO*/MnO ≈ 30, Na/Al ≈ 0.40, K/La of 500 and Ga/Al of 4.1×10^{-4}. Abundances of Ba and Sr and the Th/U ratio indicate that terrestrial weathering is minor. Specimens: type specimen, 16 g, *ENSL*; main mass, *Fectay*.

Northwest Africa 974
Remlia, Morroco
Found 2001 April
Enstatite chondrite (E6)

A single stone was found by villagers within 25 km of Remlia, Morocco, and was sold to a meteorite dealer in 2001 April. The original mass was 2250 g, but most of the rusty crust fell off and, therefore, only 1784 g are preseved. Classification and mineralogy (A. Jambon, *UPVI*): no visible chondrules and no evidence for melting; consists of anhedral enstatite ($En_{>99}$) and kamacite ($Fe_{93}Ni_6Si_1$); minor phases include, plagioclase (Ab_{82}), oldhamite, daubreelite, alabandite, schreibersite, troilite, graphite and silica. Sulfides are oxidized to various degrees. Shock stage, S4. Based on the abundance of kamacite, classification as EH is suggested; yet, compositions of phases are not typical for EH chondrites and are possibly related to the high petrologic grade. Specimens: type specimen, 25 g, *UPVI*; main mass, *Fectay*.

Northwest Africa 1000
Morocco
Purchased 2001
Achondrite (eucrite)

One stone, which was probably recovered in Morocco, was purchased by D. Gregory. The stone has a reported total weight of 1200 g. Mineralogy and classification (P. Warren, *UCLA*): subophitic and slightly variolitic (fan-spherulitic) texture with laths of plagioclase (up to 4 mm long) and pyroxene (up to 5 mm). Pyroxenes are zoned from $En_{68}Wo_4$ to $En_{16}Wo_{26}$ with an offshoot from the main trend toward $En_{40}Wo_3$ resulting from a reaction of early pigeonite with intruded veins of fayalitic olivine (Fo_{16-25}). About half of the plagioclase has been shock-altered to isotropic glass (maskelynite), average An_{83} (range An_{75-86}, n = 29). Bulk composition and ratios of Ga/Al = 0.020 and Fe/Mn = 38 support its classification as eucrite (Warren, 2002). Moderately weathered as shown by carbonate veining. Specimens: type specimen, 22 g, and one thin section, *UCLA*; main mass, *Gregory*.

Northwest Africa 1068
Morocco
Found 2001 April
Martian meteorite (basaltic shergottite)

In 2001 April, meteorite hunters of the local team of "La Mémoire de la Terre" recovered 23 stones (one large mass, 522 g, and 22 small fragments, <20 g; total known mass, 576.77 g) in the Moroccan Sahara. Rocks are greenish-brown and partially coated by desert varnish; no fusion crust; cracks filled with terrestrial calcium carbonate. Thin shock veins and small melt pockets are abundant. Classification, mineralogy and bulk chemistry (J-A. Barrat, *UAng*; A. Jambon, *UPVI*; M. Bohn, *I-CB*; Ph. Gillet, *ENSL*; V. Sautter, *MNHNP*; Ch. Göpel, *IPGP*; M. Lesourd, *SCIAM)*: consists of olivine (50 μm to 2 mm) in a fine-grained groundmass (average grain size ~100 μm) of euhedral to subhedral pyroxene crystals and interstitial maskelynite; minor phases are chromite, Ti-chromite, ilmenite, ulvöspinel, sulfides, merrillite, apatite, and a K-rich mesostasis; impact melt pockets (up to 1.5 mm long) contain pyrrhotite spherules. Modal abundances of impact melt pockets and calcite free areas: 52 vol% pyroxenes, 22% maskelynite, 21% olivine, 2% phosphates, 2% opaque oxides and sulfides, and 1% K-rich mesostasis. Mineralogy: olivine (Fa_{28} to Fa_{58}); pyroxenes: pigeonite ($En_{57}Wo_5Fs_{28}$ to $En_{40}Wo_{13}Fs_{47}$; *fe*# (100 Fe/(Fe + Mg) = 29–54 atom%) and augite ($En_{55}Wo_{21}Fs_{24}$ to $En_{35}Wo_{28}Fs_{36}$; *fe*# = 29–51 atom%) are present as separate crystals in roughly equal volume proportions; maskelynite is zoned ($An_{53}Ab_{45}Or_2$ to $An_{49}Ab_{48}Or_3$) but is locally An-poor ($An_{35}Ab_{57}Or_8$); FeO-rich merrillite (FeO 1.3 to 2.8 wt%); apatites, Cl 0.5–2.5 wt% and F 1.1–6.4 wt%; chromite have Ti-rich rims; ulvöspinels contain fine ilmenite lamellae (<1 μm thick). An interstitial K-rich component, probably a shock-produced glass of alkali feldspar and silica, is generally associated with Fe-Ti oxides. Bulk chemistry: Al-poor ferroan basaltic rock, rich in MgO with major element abundances similar to those reported for EETA79001 lithology A. Key element weight ratios are Fe/Mn = 45, Al/Ti = 6.6, Na/Ti = 1.83, and Na/Al = 0.28. REE pattern is similar to Shergotty, Zagami, and Los Angeles. Specimens: type specimen, 20 g and 2 polished sections, *ENSL*; main mass, *Fectay*.

Northwest Africa 1110
Morocco
Purchased 2001 November
Martian meteorite (basaltic shergottite)

G. and A. Hupe (*Hupe*) received a small sample of this meteorite in 2001 September and bought the rest from a dealer in Erfoud, Morocco in 2001 November. The weight of the total material purchased is 118 g. The place of recovery is believed to be in Morocco. Classification and mineralogy (A. Irving and S. Kuehner, *UWS*): consists of olivine phenocrysts in a fine-grained groundmass of complexly zoned pigeonite and homogenous maskelynite, $Ab_{46}Or_2$, with minor ilmenite, Ti-magnetite and pyrrhotite. Euhedral to subhedral olivine has Mg-rich cores (Fa_{28}, FeO/MnO = 50) and narrow Fe-rich rims (Fa_{51}, FeO/MnO = 53) and contains inclusions of chromite and glass; augite ($Fs_{33}Wo_{21}$) occurs as rare inclusions in olivine; pigeonite is zoned, $Fs_{28}Wo_9$ to $Fs_{40}Wo_{15}$ and FeO/MnO = 30; presence of rare chlorapatite in mesostasis. Secondary features include minor barite, commonly associated with chromite inclusions in olivine; calcite, in a crosscutting glass veinlet; and narrow zones of K-Al-bearing glass or clay minerals along grain boundaries between pyoxene and maskelynite. Mineral composition indicates that this rock is possibly paired with NWA 1068. Specimens: type specimen, 20 g and several thin sections, *UWS*; main mass, *Hupe*.

Northwest Africa 1150
Morocco
Purchased 2000
Achondrite (howardite)

A 67.1 g stone was purchased in Tagounite, Morocco, by a meteorite collector. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): modal analyses on 24 cm^2 show that 93 vol% of the clasts are diogenites, 7 vol% are basaltic eucrites. Diogenitic pyroxenes range from $Fs_{28.1}Wo_{2.5}$ to $Fs_{7.8}Wo_{11.3}$; plagioclase, $An_{85–95}$ with ilmenite, chromite and sulfides. Eucrite pyroxenes range from $Fs_{38}Wo_6$ to $Fs_{47.4}Wo_{16.7}$; plagioclase, $An_{88–92}$, with chromite (TiO_2 = 0.68–3.48 wt%), troilite, and silica. Low weathering grade, W1. Specimens: type specimen, 21.1 g, and one thin section, *NAU*; main mass is with the purchaser.

Northwest Africa 1180
Morocco
Found 2000
Carbonaceous chondrite (CR2)

Eight fully to mostly crusted stones, weighing a total of 1705 g, were purchased in Rissani (2001). The local finders say that these stones defined a strewnfield ~1.5 km long and within a few kilometers of Zagora. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): chondrules account for 63 vol%; small chondrules (<1.5 mm) tend to be round and metal-poor, large chondrules (<4.0 mm) are mostly irregularly shaped with abundant metal (kamacite = 5.2–6.0 wt% Ni). Olivine, $Fa_{1.3–2.1}$; orthopyroxene, $Fs_{2.2–3.2}Wo_{0.8}$; plagioclase, $An_{95–97}$; pyrrhotite (Ni = 1.4 wt%); phyllosilicates, serpentine-greenalite series (Mg > Fe); chondrule and matrix glasses are Mg, Al-rich, Na, K-poor; fine-grained (<0.05 mm) refractory inclusions contain diopside ($Wo_{49–52}$, Fs_1), spinel (FeO = 0.25 wt%), and gehlenite. Shock stage, S1; weathering grade, W2. Specimens: type specimen, 19.7 g and one thin section, *NAU*; main mass is with the purchaser.

Northwest Africa 1181
Morocco
Found 2001
Achondrite (polymict eucrite)

A 3279 g, crusted stone was purchased in Rissani, in 2001. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): modal analyses (area of 34 cm^2), eucritic basalts, 94 vol%; shock melt clasts, 4 vol%, diogenites, 2 vol%. At least 34 different eucrite clasts were observed that range from micro-ophitic/subophitic (<0.1 mm) to cumulate to very coarse-grained gabbroic (3–7 mm). Gabbro pyroxenes are predominantly 2–5 mm in size, subcalcic ferroaugites (TiO_2, 0.9 to 2.1 wt%) with 3–6 mm plagioclase, An_{92}; ilmenite, chromite (Al_2O_3 = 9.2 wt%), and acicular crystals of tridymite up to 7 mm in length. Shock stage, S2; weathering grade, variable, W1 to W2. Specimens: type specimen, 18.4 g and three thin sections, *NAU*; main mass is with the purchaser.

Northwest Africa 1182
Morocco
Found 1999
Achondrite (howardite)

A 780 g, mostly crusted specimen, was purchased in Morocco in 2000. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): medium clast size (<1.5 cm); clast modal analyses of 22 cm^2 yield: diogenites, 82 vol%; ophitic to subophitic basalts, 12%; shock melt, 4%; others, 2%. Diogenite clasts, orthopyroxene ($Fs_{24}Wo_{1.5}$) predominant over pigeonite ($Fs_{30}Wo_8$), plagioclase, An_{96}, ilmenite, chromite and pyrrhotite. Shock stage, S2; weathering grade, W1. Specimens: type specimen, 20.3 g and one thin section, *NAU*; main mass is with the purchaser.

Northwest Africa 1235
Northwest Africa
Found 2000
Enstatite achondrite (possibly anomalous aubrite)

The 80 g individual has a dark brown fusion crust. Mineralogy and description (C. A. Lorenz, *Vernad*): medium-grained subophitic rock consisting of Fe-poor enstatite, $En_{99}Wo_1$ (76 vol%), feldspar $An_{74.8–95.6}Or_{0.6–6.8}$ (8 vol%), minor silica (1 vol%) and 15 vol% of Si-bearing Fe metal, schreibersite, Cr-bearing troilite and rust. Accessory minerals are oldhamite, ferromagnesian alabandite, sphalerite, Fe-Ni metal, taenite, carbon phase, Fe-Ni-Cr alloy, Sb- and Ag-sulfides. The meteorite bears some similarities with Itqiy. Shock stage is S2/3, weathering stage is W3/4. Specimens: type specimen, 16.6 g and two polished thin sections, *Vernad*; main mass is with the anonymous finder.

Northwest Africa 1239
Northwest Africa
Found 2001
Achondrite (diogenite)

A single stone of 237 g was bought in Zagora in 2001 May. The meteorite is a polymict breccia that contains more than 90 vol% orthopyroxene fragments. Classification and mineralogy (J-A. Barrat, *UAng*; M. Bohn, *I-CB*; V. Sautter, *MNHNP*; Ph. Gillet, *ENSL*): typical orthopyoxene, $En_{70–72}Wo_2$ (FeO/MnO molar = 32), but many more ferroan grains exist, contains inverted pyroxenes of eucritic origin, $Fs_{27}Wo_{45}$ to $Fs_{64}Wo_2$ and $Fs_{22}Wo_{44}$ to $Fs_{51}Wo_1$ (two grains), calcic plagioclase, An_{94}-An_{81}, olivine, Fa_{40}–Fa_{55}, metal, pure Fe and FeNi, and troilite. Specimens: type specimen, 22 g and one polished thin section, *ENSL*; main mass is with the anonymous purchaser.

Northwest Africa 1240
Northwest Africa
Found 2001
Achondrite (eucrite, anomalous)

A single stone of 98 g was bought in Zagora in 2001 November. Classification and mineralogy (J-A. Barrat, *UAng*; A. Jambon, *UPVI*; M. Bohn, *I-CB*; V. Sautter, *MNHNP*; Ph. Gillet, *ENSL*; Ch. Göpel, *IPGP*; F. Keller, *LGCA*): the meteorite has the texture of an unbrecciated achondrite consisting of skeletal low-Ca pyroxene phenocrysts in a variolitic (fan-spherulitic) mesostasis of pyroxenes, plagioclase, and accessory skeletal chromite, iron, silica, fayalite, troilite and phosphate. The rock resembles some Apollo 15 pigeonite basalts but mineral and bulk rock compositions indicate a relationship to eucrites. Pyroxenes (FeO/MnO molar = 31, n = 540) are unequilibrated and comprise a compositional range wider than in any other HED meteorite with phenocryst cores, $En_{76}Fs_{22.1}Wo_{1.9}$, and mesostasis pyroxenes (pyroxferroite?), $En_{0.3}Fs_{83.4}Wo_{16.3}$; plagioclase, $An_{90.9}$ (n = 122), range, An_{88} to An_{92}. Bulk composition: Mg-rich Kapoeta-like clasts; slightly depleted in light REEs similar to the cumulate eucrite Moore County; possibly an impact-melted cumulate eucrite. Specimens: type specimen, 17 g and one polished thin section, *ENSL*; main mass is with the anonymous purchaser.

Northwest Africa 1241 ~27°N, ~16°E
Libya
Found 2001 August 11
Achondrite (ureilite)

A single stone of 282 g was found by an anonymous finder in the Libyan desert. Classification and mineralogy (F. Wlotzka, *MPI*, and M. Kurz, *Kurz*): coarse olivine and pigeonite grains (up to 1 mm) are set in a pavement texture of smaller olivines containing finely dispersed metal grains. Coarser white reflecting grains are suessite, $(Fe,Ni)_3Si$, with 13 wt% Si, 2.5 wt% Ni (range 1–4 wt%), and 1.1 wt% Cr. This mineral is abundant and occurs in blocky grains or interstial vein-like forms. No kamacite and no troilite were found. Olivine cores, $Fa_{17–20}$ (0.7–1.7 wt% Cr_2O_3, 0.2–0.6 wt% CaO), rims are reduced to $Fa_{1–10}$; pigeonite, $Fs_{4–22}Wo_{4–15}En_{74–87}$, and 0.6–1.2 wt% Cr_2O_3. Carbonaceous matrix is rare, graphite occurs in fine-grained patches. The stone is, in contrast to North Haig, not brecciated. Weathering is minor, except for carbonate and oxide veins. Specimens: type specimen, 20.5 g, *MPI*; main mass is with the anonymous finder.

Northwest Africa 1242
Gillio, Libya
Found 1985
Mesosiderite

Two fully ablated pieces of a mesosiderite (total known weight ~7 kg) were found near the village of Gillio by unknown oil exploration workers and put into service as bookends for 13 years. Purchased in 1998 by an anonymous dealer. Reports of a strewn field are presently unconfirmed. Classification and mineralogy (T. Bunch and J. Wittke, *NAU*): type 2A; contains scarce, metal nodules up to 19 mm in diameter; Mg-rich pyroxene overgrowths on Ca-pyroxene clasts; moderate resorption of plagioclase. Orthopyroxene ($Fs_{33}Wo_3$) replaces pigeonite ($Fs_{34}Wo_8$) and exsolved augite ($Fs_{43}Wo_{42}$); plagioclase (An_{92}); pyrrhotite, chromite (Al_2O_3 = 8.4 wt%); kamacite, 5.8 wt% Ni; rare taenite (42 wt% Ni), silica and phosphate. Shock stage, S1; weathering grade, W0. Specimens: type specimen, 20.2 g thin section, *NAU*; main mass is with the anonymous purchaser.

Oman Meteorites
(203 meteorites)
Oman
Found 1999–2002

Two hundred and three meteorites (Table 2) were found during fieldwork in the desert of Oman by people searching for meteorites. See separate entries for Dhofar 225 (anomalous CM chondrite), Dhofar 285 (polymict eucrite), Dhofar 301, 302, 303 and 489 (lunar meteorites), Dhofar 378 and SaU 060 (martian meteorites) and Shi• r 007 (ureilite).

Ordinary chondrite finds
USA
Found 1999–2001
(57 meteorites)

The meteorites listed in Table 3 are ordinary chondrites found in the southwest USA, and reported in the last year.

Palmersville 36°27.99' N, 88°36.17' W
Weakley County, Tennessee, USA
Found 1908 summer
Ordinary chondrite (H5)

A single 9.979 kg stone was found by John T. Fagan in 1908 on his tobacco patch near Palmersville. The crop had been cultivated the previous day with a mule and harrow, and the meteorite was not believed to be there then. It was given to Mr. Fagan's grandson, Dr. Hugh Berryman around 1967. Classification (A. Rubin, *UCLA*): Ordinary chondrite, $Fa_{18.3\pm0.1}$, S3; W3. Specimens: type specimen, 40.82 g, *UCLA*; main mass, Hugh Berryman.

PNRA meteorites
(30 meteorites)
Antarctica
Found 2001–2002

Table 4 reports classification of some of the meteorites recovered from northern Victoria Land by the Italian Antarctic Research Programme (PNRA) in 2001 December. A total of 171 meteorites was found in the Frontier Mountains; classification of the first 26 of these is included in the table. One meteorite was also found at each of the following locations: David Glacier (DAV), Johannessen Nunataks (JOH), Miller Butte (MIB) and Mount Walton (WAL). Mineralogy and classification by A. Burroni, C. Ferraris and L. Folco (*MNA-SI*). Main masses, type specimens and thin sections at *MNA-SI*.

Queen Alexandra Range (QUE), see ANSMET meteorites

Sahara 99042, see Saharan meteorites from unknown locations

TABLE 2. Meteorites from Oman.

Name	Latitude (N)	Longitude (E)	Wt (g)	Found (mm/dd/yyyy)	Pieces	Class	Shock stage	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type spec (g)	Info*
Dhofar (Dho)														
Dho 204	19°25.1'	54°45.8'	41.4	1/26/2000	1	L6	S4	W2	24.5	21.4	–	–	8.5	Vr1
Dho 206	18°14.3'	54°08.1'	190	3/6/2000	2	L3.7	S1	W3	7.04–28.6	16.8–41.6	–	PMD 22.7, Fe0 6.2 wt%	68.4	Vr5
Dho 207	18°15.8'	54°04.1'	499.5	12/4/1999	1	H3.4/3.5	S2	W1	7.34–34.0	10.7–31.5	–	PMD 27.29, Fe0 13.96 wt%	80	Vr5
Dho 209	18°29.6'	54°15.1'	111	1/14/2001	1	H4	S4	W0/1	18	16.9	–	–	22	Vr1
Dho 210	18°45.5'	54°25.6'	272	3/5/2000	1	L4	S1	W3	24.5	20.9	–	–	134	Vr1
Dho 211	18°15.4'	54°10.9'	255	1/14/2001	1	H4	S1	W4	17.1	16,4	–	–	75.6	Vr1
Dho 212	18°51.6'	54°49.9'	1456	4/27/2000	17	H3.9	S2	W3	17.0 (11.4–18.3)	16.7 (14.9–19.1)	–	PMD 6.33	150	Vr1
Dho 213	18°31.5'	54°07.0'	256	3/5/2000	1	H5	S3	W2	18.3	17.3	–	–	63.5	Vr1
Dho 214	19°02.6'	54°33.3'	11	1/11/2001	1	H6	S2	W3	17.9	17.1	–	Probably paired with Dhofar 020	1.4	Vr1
Dho 215	18°32.1'	54°19.3'	86	1/14/2001	1	H4	S1	W2	18.1	15.3	–	–	24.7	Vr1
Dho 216	18°35.9'	54°19.3'	70	1/15/2001	1	L6	S2	W3	23.4	21.2	–	–	14.9	Vr1
Dho 217	18°44.8'	54°33.9'	602	4/25/2000	4	L6	S4	W3	23.5	21,2	–	–	105	Vr1
Dho 218	18°41.1'	54°24.4'	570	1/15/2001	1	H4	S1	W3	18.7	17.2	–	–	132	Vr1
Dho 219	18°08.4'	54°09.7'	99	1/14/2001	1	H5	S2	W3	17	15.7	–	–	32.5	Vr1
Dho 220	18°29.1'	54°18.9'	132	1/15/2001	1	H4	S3	W3	18.2	17.2	–	–	24.8	Vr1
Dho 221	18°15.1'	54°11.9'	3536	3/7/2000	>100	L5	S3	W3	24.3	21	–	–	700	Vr1
Dho 222	18°41.6'	54°22.2'	5680	3/1/2000	9	L5	S4	W4	24.8	21.6	–	–	1120	Vr1
Dho 223	18°16.0'	54°05.8'	1708	1/22/2000	1	H4	S3	W3	19.1	16.8	–	–	500	Vr1
Dho 224	19°09.5'	54°34.4'	14974	6/25/2001	16	H4	S1	W3	17.1	16.6	–	–	2950	Vr1
Dho 225	18°21.6'	54°11.3'	90	1/15/2001	1	CM anom	–	–	–	–	–	*See separate entry*	19.65	Vr6
Dho 226	19°06.7'	54°49.7'	62	1/16/2001	1	H6	S2	W2	18.1	17.7	–	–	28	Vr1
Dho 227	18°59.4'	54°36.0'	50	6/26/2001	1	L6	S4	W2	23.8	21.6	–	–	24.8	Vr1
Dho 228	19°09.0'	54°35.0'	3452	6/29/2001	58	L6	S4	W3	24.3	23.1	–	–	723	Vr1
Dho 229	19°03.4'	54°34.5'	716	3/14/2000	1	H6	S3	W3	20.1	17.7	–	–	197	Vr1
Dho 230	18°59.9'	54°35.1'	144	1/11/2001	1	H4	S2	W2	18.3	17.5	–	–	25.5	Vr1
Dho 231	18°47.5'	54°34.6'	1780	1/15/2001	74	H4	S2	W3	17.9	17.1	–	–	350	Vr1
Dho 232	18°26.1'	54°06.3'	128	1/25/2000	1	LL6	S4	W1	30.1	25.9	–	–	22.5	Vr1
Dho 233	18°27.0'	54°06.2'	93	1/25/2000	1	L6	S4	W4	24.5	21.2	–	–	20	Vr1
Dho 234	19°04.2'	54°27.4'	98	1/25/2000	1	H6	S4	W2	18.6	17.2	–	–	20	Vr1
Dho 235	19°00.3'	54°33.0'	394	3/14/2000	5	LL5	S3	W3	26.4	21.4	1.5	Ca–Px: $Fs_{7.5}$, $Wo_{43.5}$	79	Vr4
Dho 236	19°01.7'	54°32.9'	320	3/14/2000	26	L4	S4	W4	22.8	17.7	4.8	Ca–Px: Fs_{7-13}, Wo_{29-43}	256	Vr4
Dho 237	19°10.6'	54°37.5'	206	3/14/2000	4	H5	S2	W4	17.5	15.9	1.2	–	90	Vr4
Dho 241	18°39.11'	54°46.43'	451.8	2/6/2001	4	H5/6	S3	W3/4	19	16.5	–	–	25	Mün1
Dho 244	18°37.83'	54°43.97'	178.3	2/6/2001	2	H5	S4	W4	15	14	–	–	21	Mün1
Dho 250	19°07.35'	54°40.40'	585.7	2/7/2001	3	L6	S6	W3	25.5	22	–	sv, rw	27	Mün1
Dho 251	19°18.09'	54°44.10'	12.7	2/7/2001	1	L6	S2	W3	25.5	21	–	–	2.3	Mün1
Dho 253	18°37.48'	54°05.80'	413	2/11/2001	1	H4/5	S2	W3	19	17.5	–	br	29	Mün1
Dho 254	18°42.19'	54°17.20'	191.8	2/11/2001	1	L6	S3	W3/4	23.5	20	–	–	21	Mün1
Dho 255	18°44.70'	54°23.11'	11.3	2/11/2001	1	H6	S2	W4	20	18	–	–	1.9	Mün1
Dho 256	18°44.75'	54°23.06'	1465.4	2/11/2001	73	H6	S2	W4	19	16.5	–	–	24	Mün1
Dho 257	18°44.80'	54°23.00'	2520.1	2/12/2001	80	H6	S3	W4	18.5	17	–	–	25	Mün1
Dho 258	18°42.56'	54°18.18'	110.2	2/12/2001	1	H5	S3	W4	19	17.5	–	sv	24	Mün1
Dho 260	18°47.19'	54°15.03'	6574.4	2/12/2001	many	L6	S2	W4	25	21	–	–	30	Mün1
Dho 261	19°09.23'	54°43.16'	787.5	2/12/2001	1	H4/5	S2	W3/4	18.5	16	–	–	20	Mün1
Dho 262	18°16.64'	54°15.32'	291.8	2/21/01	16	H6	S3	W2	19	17	–	sv	23	Mün1
Dho 264	18°20.82'	54°24.93'	474.4	2/21/01	1	L6	S3	W3/4	25	21.5	–	–	23	Mün1
Dho 265	18°36.17'	54°27.31'	324.3	2/22/01	4	L4	S2	W4	21.5	19.5	–	–	25	Mün1
Dho 267	18°19.6'	54°13.1'	1910	3/6/2000	>100	H5	S3	W4	18.5	15.9	1.2	–	870	Vr4
Dho 268	18°54.1'	54°33.7'	124	4/27/2000	1	H4	S4	W3	19.2	16.9	–	–	43	Vr1
Dho 269	19°02.3'	54°30.9'	2006	1/26/2000	32	H5	S4	W3	17.8	17	0.8	–	306	Vr7
Dho 270	18°19.7'	54°09.1'	50	4/11/2001	1	LL5–6	S4	W2	29.4	23.4	–	br	10.5	Vr8
Dho 271	18°15.9'	54°02.7'	1335	3/8/2000	1	H4	S2	W4	18.2	16.9	1.2	–	197	Vr7
Dho 272	18°26.3'	54°07.1'	2073	4/5/2001	3	L5	S1	W4	24.5	21.7	1.4	–	122	Vr7
Dho 273	18°22.5'	54°08.9'	2085	4/4/2001	1	L5	S4	W3	23.1	20.5	1.5	–	260	Vr7

TABLE 2. *Continued.*

Name	Latitude (N)	Longitude (E)	Wt (g)	Found (mm/dd/yyyy)	Pieces	Class	Shock stage	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type spec (g)	Info*
Dho 274	18°03.8'	54°03.0'	2475	4/7/2001	1	L6	S3	W0/1	24.1	21.7	1.5	–	365	Vr7
Dho 275	19°09.1'	54°46.5'	353	12/12/2001	8	Eucrite	–	–	–	40.8	12.2	$En_{47.0}$; Plag: $An_{86.9}$, $Or_{1.6}$; probably paired with 055	63.6	Vr8
Dho 276	18°39.0'	54°08.1'	7285	4/14/2001	342	H5	S2	W3/4	18.6	17.6	1.5	–	946	Vr7
Dho 277	18°20.9'	54°20.2'	1930	4/3/2001	2	L6	S2	W3	25.2	22.2	1.5	–	132	Vr7
Dho 278	18°40.1'	54°40.0'	1666	4/7/2001	86	L6	S2	W4	24.9	22.2	1.5	–	366	Vr7
Dho 279	18°15.9'	54°20.3'	1932	4/8/2001	1	L6	S2	W3	24.2	21.3	1.5	–	184	Vr7
Dho 281	18°34.5'	54°17.9'	4936	4/14/2001	1	L3.8	S1	W3	23.9 (7.6–29.2)	16.9 (9.1–27.0)	1.2	PMD 11.7	398	Vr7
Dho 282	19°02.0'	54°37.7'	928	4/5/2001	1	L6	S3	W3	24.9	21.8	1.4	–	125	Vr7
Dho 283	18°26.4'	54°01.1'	1788	4/10/2001	5	H6	S3	W3/4	18.9	18.6	1.7	–	187	Vr7
Dho 284	18°27.8'	54°01.8'	1337	4/10/2001	2	L6	S2	W4	24.5	22.2	1.4	–	142	Vr7
Dho 285	18°26.0'	54°10.2'	216	1/14/2001	1	Eucrite (polymict)	W0/1	–	–	–		*See separate entry*	39	Vr8
Dho 286	18°07.6'	54°06.9'	1453	4/12/2001	6	L6	S2	W4	25.1	21.8	1.5	–	205	Vr7
Dho 288	18°29.6'	54°08.0'	996	1/18/2001	1	L6	S4	W4	25.2	22	1.5	–	97	Vr7
Dho 289	18°20.0'	54°11.6'	1180	1/16/2001	1	H6	S3	W2	19.2	17.6	1.3	–	100	Vr7
Dho 290	19°18.9'	54°50.6'	62	12/11/2001	1	Acapulcoite	–	–	11	10.5	1.85	Plag: $An_{18.46}$, $Or_{2.84}$	14.1	Vr8
Dho 291	18°14.9'	54°06.2'	1164	3/5/2000	1	L5	S3	W3	23.6	22.2	1.2	–	123	Vr7
Dho 292	19°22.1'	54°40.8'	804	3/10/2000	1	H6	S4	W3	19.8	17.8	1.2	–	75	Vr7
Dho 293	19°06.4'	54°51.5'	2366	1/16/2001	22	L5	S2	W3	24.7	21.9	1.6	–	240	Vr7
Dho 295	19°12.5'	54°38.4'	48	1/15/2002	1	Ureilite	–	–	13.7	13.8	6.13	–	9.2	Vr8
Dho 301	18°24.1'	54°08.9'	9	4/13/2001	1	Lunar	–	–	–	–	–	*See separate entry*	1.8	Vr9
Dho 302	19°19.6'	54°47.1'	3.83	6/28/2001	1	Lunar	–	–	–	–	–	*See separate entry*	0.8	Vr9
Dho 303	19°19.8'	54°47.0'	4.15	6/28/2001	1	Lunar	–	–	–	–	–	*See separate entry*	0.85	Vr9
Dho 351	19°14.341'	54°49.538'	258	2000	1	L6	S4	W3	24.3	22.1	–	–	31.6	Be2
Dho 352	18°40.462'	54°32.508'	207	2000	2	L6	S4	W3	25.9	22.1	–	–	32.1	Be2
Dho 353	18°40.056'	54°36.295'	666	2000	1	H5/6	S3	W3	19.7	18	–	–	29.1	Be2
Dho 354	18°39.550'	54°43.776'	810	2000	many	H6	S4	W4	15.8	15.2	–	–	35.9	Be2
Dho 355	18°38.265'	54°43.803'	641	2000	several	H6	S4	W4	15.5	14.5	–	–	30	Be2
Dho 356	18°38.261'	54°43.879'	1372	2000	many	H6	S4	W4	15	13.6	–	–	32	Be2
Dho 357	18°38.123'	54°43.863'	308	2000	5	H6	S4	W3	17.6	16.3	–	–	41.2	Be2
Dho 358	18°36.694'	54°44.052'	185	2000	1	H6	S4	W3/4	18.3	17.1	–	–	28.5	Be2
Dho 359	18°25.851'	54°27.383'	569	2000	1	H5–6	S2	W2	19	16.7	–	br	33.6	Be2
Dho 360	19°02.401'	54°47.030'	15300	2000	1	LL3–6	S2	W2/3	28.0 (8.3–34.6)	20.3 (2.7–32.3)	–	br	40.1	Be2
Dho 361	19°01.963'	54°51.449'	1715	2000	1	H3	S3	W3/4	14.7 (1.6–29.8)	8.3 (1.9–21.6)	–	–	29.3	Be2
Dho 362	19°02.071'	54°50.761'	615	2000	1	H5	S4	W2/3	18.7	16.9	–	–	32.5	Be2
Dho 364	19°05.479'	54°47.679'	307	2000	1	H3	S2	W2/3	18.2 (0.9–30.8)	14.5 (3.8–27.5)	–	–	29.6	Be2
Dho 365	19°05.483'	54°47.690'	4623	2000	1	H5	S3	W3	18.8	17.4	–	–	52.2	Be2
Dho 366	18°59.981'	54°54.689'	450	2000	1	H4	S2	W3	18.6	16.9	–	–	29.1	Be2
Dho 367	19°03.464'	54°49.508'	147	2000	2	L6	S3	W3	25.5	22.1	–	–	23.9	Be2
Dho 368	19°04.409'	54°48.320'	105.3	2000	3	H6	S3	W4	19.4	17	–	–	21.5	Be2
Dho 369	19°04.743'	54°47.637'	269	2000	1	L4	S2	W2	25.5	21.3	–	–	30.9	Be2
Dho 370	19°04.697'	54°47.227'	336	2000	2	L6	S4	W2/3	24.8	21.2	–	–	35.7	Be2
Dho 371	18°32.879'	54°40.615'	852	2000	1	H4	S2	W3	18.5	16.4	–	–	30.6	Be2
Dho 372	18°39.140'	54°44.077'	246	2000	1	H5	S5	W4	15.9	15.6	–	–	30.9	Be2
Dho 373	18°39.127'	54°44.735'	383	2000	1	H6	S4	W3/4	15.9	13.8	–	–	30.4	Be2
Dho 374	18°42.109'	54°47.537'	424	2000	4	H6	S4	W4	18.7	16.9	–	–	33.8	Be2
Dho 375	19°02.293'	54°47.654'	6933	2000	4	LL4–6	S2/3	W1/2	29.1	20	–	br, sv	35	Be2
Dho 376	19°05.512'	54°47.757'	370	2000	1	L6	S4	W3	26	22.1	–	–	37.8	Be2
Dho 377	19°07.238'	54°49.406'	92.6	2000	5	H6	S3	W4	19.4	17.1	–	–	18.3	Be2
Dho 378	18°09.5’	54°06.8’	15	6/17/2000	1	Martian	–	–	–	–	–	*See separate entry*	2.74	Chi1
Dho 380	19°06.447'	54°48.580'	111	3/19/2001	5	H5	S3	W3/4	18	16.5	–	sv	22	Mün1
Dho 381	19°06.380'	54°49.041'	680	3/19/2001	2	H5	S2	W3	18.5	16	–	sv	37	Mün1
Dho 384	19°06.406'	54°49.251'	49	3/19/2001	2	H5	S2	W3/4	19	17	–	–	10	Mün1
Dho 387	19°06.356'	54°48.617'	491	3/20/2001	1	L6	S3	W3	25	21	–	sv	33	Mün1
Dho 388	19°06.537'	54°48.871'	126	3/20/2001	1	H5	S3	W4	19	17	–	–	18	Mün1

TABLE 2. *Continued.*

Name	Latitude (N)	Longitude (E)	Wt (g)	Found (mm/dd/yyyy)	Pieces	Class	Shock stage	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type spec (g)	Info*
Dho 390	19°08.012'	54°48.597'	54	3/20/2001	1	L5/6	S4	W3	25.5	21.5	–	sv	15	Mün1
Dho 391	19°06.445'	54°49.170'	284	3/21/2001	1	H5/6	S3	W3/4	18	16	–	–	18	Mün1
Dho 392	19°08.000'	54°49.096'	131	3/21/2001	2	H5/6	S3	W4	19.5	17	–	sv	17	Mün1
Dho 393	19°08.353'	54°49.987'	5000	3/21/2001	~80	H5	S2	W4	19	17	–	–	83	Mün1
Dho 394	19°02.167'	54°53.283'	1057	3/22/2001	4	H5	S2	W2	18	16	–	sv	26	Mün1
Dho 395	19°02.185'	54°53.121'	1168	3/22/2001	1	H6	S3	W3	18	16.5	–	sv	22	Mün1
Dho 396	19°02.151'	54°53.114'	1033	3/22/2001	1	H5	S3	W4	18	16	–	sv	17	Mün1
Dho 397	19°02.328'	54°52.918'	1176	3/22/2001	4	H5	S2	W3	18	16	–	sv	35	Mün1
Dho 398	19°05.694'	54°48.152'	574	3/22/2001	1	H5/6	S3	W3/4	19	17	–	–	25	Mün1
Dho 399	18°13.254'	54°42.071'	283	3/22/2001	1	L6	S4	W4	24.5	21.5	–	partly S5	25	Mün1
Dho 400	19°17.291'	54°32.346'	492	3/22/2001	1	L5	S4	W4	25	21	–	–	80	Mün1
Dho 401	19°18.011'	54°31.992'	1304	3/22/2001	3	L5/6	S4	W3	24.5	20.5	–	–	45	Mün1
Dho 403	19°17.618'	54°32.282'	409	3/22/2001	1	L5/6	S4	W4	25	22	–	sv	17	Mün1
Dho 404	19°18.025'	54°31.852'	594	3/22/2001	1	H5	S2	W2	18	16.5	–	sv	23	Mün1
Dho 405	19°18.138'	54°31.852'	8000	3/22/2001	~80	H5	S2	W3/4	19	16.5	–	–	18	Mün1
Dho 407	19°17.102'	54°32.048'	403	3/23/2001	1	L5	S4	W3/4	24	20	–	sv	40	Mün1
Dho 408	18°41.244'	54°07.589'	2355	3/24/2001	8	L6	S4	W4	25.5	21.5	–	partly S5	56	Mün1
Dho 410	18°44.485'	54°11.598'	620	3/25/2001	1	H5/6	S2	W3	18.4	16.5	–	–	26	Mün1
Dho 412	18°49.278'	54°20.848'	478	3/25/2001	2	H6	S4	W3/4	19	17	–	–	34	Mün1
Dho 414	18°46.292'	54°14.573'	5156	3/26/2001	15	L6	S2	W4	25.5	22	–	–	25	Mün1
Dho 416	18°45.856'	54°13.995'	281	3/26/2001	1	L(LL)3	S2	W3/4	13.5 ± 7.5	10.2 ± 5.7	–	–	25	Mün1
								range:	1–31	1–21				Mün1
Dho 418	18°48.891'	54°25.692'	958	3/26/2001	~20	H6	S3	W3/4	19	17	–	sv	52	Mün1
Dho 419	18°45.763'	54°16.703'	68	3/27/2001	–	H6	S2	W4	18.5	16.5	–	–	12	Mün1
Dho 420	18°45.763'	54°16.703'	966	3/27/2001	–	L5/6	S2	W4	24.5	21	–	–	32	Mün1
Dho 421	18°46.307'	54°13.641'	337	3/27/2001	1	LL5	S5	W2	28.5	24.5	–	sv, br	20	Mün1
Dho 422	18°36.975'	54°44.114'	90	3/28/2001	2	H6	S3	W4	19.5	17	–	–	21	Mün1
Dho 423	18°37.014'	54°43.810'	362	3/28/2001	3	H4/5	S4	W4	15.5	15 ± 2	–	calc. v.	30	Mün1
Dho 424	18°37.080'	54°43.615'	67	3/28/2001	3	L6	S4	W3/4	25	20.5	–	–	40	Mün1
Dho 428	18°47.394'	54°29.311'	526	3/28/2001	2	H(L)5	S2	W4	21.5	18.5	–	–	40	Mün1
Dho 431	18°46.857'	54°46.812'	446	3/28/2001	1	H5	S3	W3	17.5	15.5	–	–	18	Mün1
Dho 432	18°37.218'	54°38.570'	986	3/29/2001	~20	L5/6	S2	W4	24.5	21	–	–	48	Mün1
Dho 433	18°38.171'	54°31.761'	615	3/29/2001	2	H5/6	S2	W4	20.5	17.5	–	sv, br	20	Mün1
Dho 435	18°53.226'	54°31.503'	6800	3/29/2001	1	H6	S2	W2–3	19.5	17.5	–	br	35	Mün1
Dho 436	18°55.037'	54°42.686'	209	3/29/2001	3	H5	S3	W4	18	16	–	–	25	Mün1
Dho 437	18°48.408'	54°26.360'	446	3/30/2001	1	H5/6	S2	W3/4	18.5	16.5	–	–	34	Mün1
Dho 438	18°47.727'	54°34.914'	566	3/31/2001	2	L6	S3	W4	25	21.5	–	–	31	Mün1
Dho 439	18°45.101'	54°21.812'	536	3/31/2001	7	H5/6	S2	W3	19	16.5	–	–	25	Mün1
Dho 442	18°51.749'	54°25.800'	395	3/31/2001	1	H5	S3	W4	18.5	17	–	sv	38	Mün1
Dho 446	18°56.283'	54°41.195'	12400	3/31/2001	~120	L5	S1	W4	25.5	22	–	–	35	Mün1
Dho 448	18°53.965'	54°32.374'	391	4/1/2001	3	L6	S3	W4	26	22.5	–	–	26	Mün1
Dho 449	18°54.344'	54°30.531'	74	4/1/2001	2	L6	S4	W4	24.5	21	–	partly S5	18	Mün1
Dho 451	18°54.648'	54°28.496'	745	4/1/2001	3	L6	S4	W4	23.5	20.5	–	–	57	Mün1
Dho 453	18°45.297'	54°24.867'	482	4/1/2001	1	H6	S3	W3/4	20	18.5	–	sv, calc. v.	31	Mün1
Dho 454	18°56.156'	54°37.863'	80	4/2/2001	2	H5	S3	W4	19	16.5	–	–	21	Mün1
Dho 455	19°01.096'	54°23.926'	63	7/10/2001	1	Howardite	–	–	–	–	–	*See separate entry*	10	Mün1
Dho 470	19°03'3"	54°42'6"	1280	1/2001	1	H4	S2	W2	18.3	14.2	0.4	–	22	Frei2
Dho 472	19°09'2"	54°44'8"	57.1	1/2001	1	LL3	S1	W2	18.9 (peak 29)	13.5 (2.8–25.0)	1.8	kam: 2.7 wt% Co	5	Frei2
Dho 474	19°10'4"	54°46'5"	747	1/2001	1	H3	S3	W4	18.2 (peak 19)	11.5(3.3–22.1)	1	–	20	Frei2
Dho 475	19°06'9"	54°48'4"	550	1/2001	1	L6	S4	W3	24.3	21.3	1.6	–	21	Frei2
Dho 477	19°11'8"	54°53'3"	3796	1/2001	1	L6	S5	W2	24.2	21.3	1.4	–	23	Frei2
Dho 478	19°10'7"	54°37'0"	2683	1/2001	1	H5/6	S3	W2	17.9	16.6	1.5	–	21	Frei2
Dho 479	19°12'4"	54°39'7"	2512	1/2001	1	H6	S3	W2	18.8	17.4	1.5	–	21	Frei2
Dho 482	19°09'3"	54°41'0"	380	1/2001	1	LL5	S2	W3	30.1	25.7	1.7	–	20	Frei2
Dho 483	19°06'6"	54°49'5"	817	1/2001	1	H3	S2/3	W1	15.5 (peak 19)	15 (peak 17)	1	–	21	Frei2

TABLE 2. *Continued.*

Name	Latitude (N)	Longitude (E)	Wt (g)	Found (mm/dd/yyyy)	Pieces	Class	Shock stage	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Comments	Type spec (g)	Info*
Dho 485	19°06'3"	54°47'1"	1558	1/2001	4	Howardite	S4	W2	–	40.4	3.6	Plag: $An_{85–95}$, br	19	Frei2
Dho 487	19°09'7"	54°46'0"	3549	1/2001	1	H4	S2	W3	18.4	16.9	1.6	–	29	Frei2
Dho 489	19°25'	54°35'	34.4	8/11/2001	–	Lunar	–	–	–	–	–	*See separate entry*	6	Chi2
Jiddat al Harasis (JaH)														
JaH 021	19°16.2'	56°05.6'	1400	1/15/2000	46	H5	S3	W3	19.4	17.3	1.3	–	215	Vr7
JaH 026	19°13.7'	55°10.8'	565	4/26/2000	17	L3	S3	W3	1.14–39.2	2.23–30.1	–	PMD 41.5; FeO 9.95 wt%; petrologic type <3.4	132	Vr7
JaH 027	19°15.0'	56°09.5'	810	4/2000	1	L6	S3	W3	25.1	23.1	–	–	56	Vr1
JaH 031	19°49'55"	56°05'05"	83.27	2/20–25/2000	1	LL5	–	–	–	–	–	br	83.27	Az2
Sayh al Uhaymir (SaU)														
SaU 057	21°03.7'	57°19.6'	88	1/6/2001	1	H6	S3	W3	18.5	16.4	–	–	34.8	Vr1
SaU 058	20°27.4'	56°39.4'	35	1/9/2001	1	L5	S4	W2	23.9	21.8	–	–	10.6	Vr1
SaU 059	20°32.5'	56°40.7'	62	1/9/2001	1	H4	S1	W3	18.1	16.9	–	–	20	Vr1
SaU 060	20°58.8'	57°19.1'	42.28	6/27/2001	1	Martian	S5	–	–	–	–	*See separate entry*	9.5	Vr1
SaU 061	20°30.4'	56°39.3'	900	3/18/2000	1	L6	S4	W3	25	20	–	–	180	Vr1
SaU 062	21°03.6'	57°17.4'	14	6/27/2001	1	L4	S2	W3	23.6	18.7 (8.9–22.0)	–	–	13	Vr1
SaU 063	20°34.9'	56°47.9'	262	4/24/2000	1	H5	S3	W3	19.1	16.2	–	–	50	Vr1
SaU 064	21°00.0'	57°18.6'	216	1/17/2001	1	H5	S3	W3	17.6	15.4	–	–	43	Vr1
SaU 065	21°02.1'	57°16'5'	58	1/17/2001	1	H5	S3	W3	17.4	15.6	1.1	–	16.2	Vr4
SaU 066	20°31.9'	56°40.6'	4670	4/30/2000	6	LL5	S2	W3	30.8	26.5	2.1	–	560	Vr7
SaU 068	21°19.6'	57°10.7'	1165	4/1/2001	1	H5	S2	W3	17.2	16.4	1	–	182	Vr7
SaU 069	20°49.14'	57°20.38'	311.9	2/4/2001	2	H6	S3	W4	18	16	–	–	20	Mün1
SaU 070	20°46.51'	57°16.90'	760.1	2/4/2001	3	L5/6	S3	W3/4	24	20	–	–	22	Mün1
SaU 071	20°49.14'	57°15.82'	931.9	2/4/2001	1	H5/6	S2	W4	19	16	–	–	21	Mün1
SaU 072	20°38.29'	57°10.14'	6750	2/5/2001	1	H5	S2	W2	18	16	–	–	22	Mün1
SaU 073	20°39.09'	57°10.14'	1899.1	2/5/2001	1	H5	S2	W3/4	18	16	–	–	22	Mün1
SaU 074	20°37.65'	57°09.86'	410.5	2/5/2001	1	H5	S2	W3/4	18	16	–	–	22	Mün1
SaU 075	20°41.07'	57°08.44'	4261.2	2/5/2001	10	H3–5	S3	W4	16–22	12–21	–	br with impact melt clasts	27	Mün1
SaU 076	20°43.95'	57°07.32'	1024.9	2/5/2001	13	L6	S2	W4	24.5	20.5	–	–	24	Mün1
SaU 078	21°00.24'	57°19.12'	598.6	2/14/2001	2	L6	S3	W2	24	20	–	–	19	Mün1
SaU 090	21°00.0'	57°19.2'	94.84	1/19/2002	2	Martian	–	–	–	–	–	Probably paired with SaU 005/008/051/060/094	25.9	Vr1
SaU 095	21°07.384'	56°58.943'	230	2000	1	H6	S2	W1/2	18.7	16.6	–	–	32.1	Be2
SaU 096	21°06.547'	56°56.010'	158	2000	2	H4/5	S2	W4	18.3	16.2	–	–	24.4	Be2
SaU 097	21°08.724'	56°47.250'	234	2000	1	H6	S3	W4	19	17.5	–	–	35.3	Be2
SaU 098	21°08.696'	56°48.352'	2342	2000	1	H5	S2	W2	18.8	16.9	–	–	37.8	Be2
SaU 099	20°36.942'	57°09.791'	50.7	2000	1	H5	S2	W4	18.9	17.2	–	–	13	Be2
SaU 100	20°49.651'	57°18.331'	154	2000	1	H4/5	S3	W4	18.6	16.3	–	–	27.1	Be2
SaU 101	21°03.182'	57°15.763'	1704	2000	1	L6	S5	W2	25.9	21.8	–	–	29	Be2
Shalim														
Shalim 001	18°11.1'	55°06.6'	286	3/3/2000	1	LL6	S3	W1	26.7	23.1	–	–	62.8	Vr1
Shisr														
Shisr 001	18°30.48'	53°59.24'	936.8	2/8/2001	1	L6	S5	W3	24	20	–	sv	23	Mün1
Shisr 004	18°35.06'	53°54.82'	325.7	2/8/2001		H5	S2	W3	19.5	17.5	–	–	22	Mün1
Shisr 005	18°27.97'	53°50.05'	445.6	2/11/2001	1	H6	S3	W3/4	18.5	16.5	–	sv	26	Mün1
Shisr 007	18°17.55'	53°34.05'	9024	4/9/2001	14	Ureilite	–	–	–	–	–	*See separate entry*	557	MP5
Umm as Samim (UaS)														
UaS 001	21°19.1'	56°25.0'	1847	4/2/2001	1	H5	S2	W3	18.2	17.2	1.5	–	295	Vr7

*See "Abbreviations for Analysts and Specimen Locations" after References.
Abbreviations: br = brecciated; calc. v. = strong calcite veining; kam = kamacite; plag = plagioclase; PMD = percent mean deviation of FeO content of olivine; rw = ringwoodite; sv = shock veins.

TABLE 3. Meteorites from southwestern USA.

Name	Find site	County, State	Latitude (N)	Longitude (W)	Mass (g)	Found (mm/dd/yyyy)	Pcs	Class	Shock stage	WG	Fa (mol%)	Comments	Finder	Type spec (g)	Info*
Bluewing 002	Dry Lake	Pershing, Nevada	40°14.489'	118°56.858'	23	10/28/1999	1	H5	S1	W4	19.5 ± 0.6	–	Paul Gessler	5	LA12
Bluewing 003	Dry Lake	Pershing, Nevada	40°16.051'	118°56.585'	95	10/28/1999	1	L6	S3	W3	24.8 ± 0.4	–	Paul Gessler	17	LA12
Bluewing 004	Dry Lake	Pershing, Nevada	40°16.522'	118°56.766'	113	10/28/1999	1	L5	S3	W3	25.1 ± 0.2	–	Paul Gessler	22	LA12
Bluewing 005	Dry Lake	Pershing, Nevada	40°17.138'	118°56.794'	7200	11/4/1999	6	L5	S1	W2	25.3 ± 0.2	–	Paul Gessler	25	LA12
Bluewing 006	Dry Lake	Pershing, Nevada	40°17.003'	118°56.885'	355	11/7/1999	1	L6	S3	W3	25.4 ± 0.2	–	Paul Gessler	25	LA12
Bluewing 007	Dry Lake	Pershing, Nevada	40°16.948'	118°56.923'	324	11/7/1999	1	L4	S2	W3	25.1 ± 0.3	–	Paul Gessler	25	LA12
Borrego	–	San Diego, CA	33°16'	116°23'	2126	1930s	1	L6	S4	W1	25.1 ± 0.7	Plag–chromite assemblages	Anonymous	51	LA11
Cuddeback Dry Lake 001	Dry lake	San Bernardino, CA	35°17.745'	117°28.008'	32.50	10/16/1999	1	L6	S4	W2	25.4 ± .3	–	Verish	6.5	LA13
Cuddeback Dry Lake 002	Dry lake	San Bernardino, CA	35°16.53'	117°28.7'	95.00	3/18/2000	1	L6	S2	W4	25.1 ± 0.4	–	Randy Duncan	20	LA13
Cuddeback Dry Lake 003	Dry lake	San Bernardino, CA	35°17.51'	117°28.24'	7.50	3/18/2000	1	L6	S3	W3	25.2	–	Verish	1.5	LA13
Cuddeback Dry Lake 004	Dry lake	San Bernardino, CA	35°18.14'	117°27.61'	40.00	3/18/2000	1	H6	S2	W3	19.2	–	Verish	8	LA13
Cuddeback Dry Lake 005	Dry lake	San Bernardino, CA	35°18.739'	117°27.189'	35.00	3/25/2000	1	H5	S2	W4	18.7 ± 0.6	–	Verish	7	LA13
Cuddeback Dry Lake 006	Dry lake	San Bernardino, CA	35°18.736'	117°27.18'	0.50	3/25/2000	1	H6	S3	W4	18.9 ± 0.4	–	Verish	0.3	LA13
Cuddeback Dry Lake 007	Dry lake	San Bernardino, CA	35°18.684'	117°27.205'	96.70	3/25/2000	1	L4	S2	W5	25.3	–	Verish	19.4	LA13
Cuddeback Dry Lake 008	Dry lake	San Bernardino, CA	35°17'	117°29'	18.02	4/9/2000	1	L6	S2	W3	24.9 ± 0.1	–	Nick Gessler	7.15	LA12
Cuddeback Dry Lake 009	Dry lake	San Bernardino, CA	35°19.1'	117°28'	19.00	5/5/2000	1	H5	S2	W5	18.6 ± 0.2	–	Verish	3.8	LA13
Cuddeback Dry Lake 010	Dry lake	San Bernardino, CA	35°18.672'	117°27.279'	10.50	10/29/2000	1	L5	S2	W4	25.1 ± 0.4	–	Rob Matson	1.57	LA7
Cuddeback Dry Lake 011	Dry lake	San Bernardino, CA	35°16.548'	117°28.726'	10.69	10/29/2000	1	L6	S3	W3	25.3	–	Rob Matson	3.12	LA7
Diamond Valley	Dry lake	Eureka, Nevada	40°4.904'	115°56.204'	440	8/17/2001	1	H5	S2	W3	19.4 ± 0.3	–	Nick Gessler	25	LA12
El Mirage Dry Lake 001	Dry lake	San Bernardino, CA	34°39.26'	117°35.783'	1.5	10/14/2000	–	H5	S3	W2	18.6 ± 0.3	–	Paul Harris	0.3	LA15
El Mirage Dry Lake 002	Dry lake	San Bernardino, CA	34°38.8'	117°34.865'	13.0	3/17/2001	–	H4	S1	W4	18.4 ± 0.4	–	Anonymous	3	LA13
Golden Mile	Pebble pavemt.	Mohave, AZ	35°53.4'	114°10.0'	378.8	10/31/2000	1	H4	S1	W1	18 ± 3	Fs: 15 ± 52	Ingrid Monrad	30	Az1
Goldstone Dry Lake	Dry lake	San Bernardino, CA	35°22.4'	116°54.5'	1.1	11/11/1999	1	H6	S3	W4	19.2 ± 0.3	–	Verish	0.5	LA13
KumivaValley	Dry lake	Pershing, Nevada	40°22'47"	119°05'11"	30.15	3/19/2001	1	H5	S2	W3	18.7 ± 0.3	–	Nick Gessler	8.03	LA16
Old Dominion Mine	Mining site	San Bernardino, CA	34°51.575'	116°13.268'	42	10/13/2000	1	H4	S2	W3	19.8 ± 1.8	–	James Tobin	9.1	LA14
Payson	–	Gila, Arizona	34°14'	111°24'	1728	10/21/2001	1	L6	S2	W1	25.1	–	Killgore	21	Kg1
Red Dry Lake 002	Dry lake	Mohave, AZ	35°39.1834'	114°1.462'	21.5	12/28/2001	1	H6	S1	W5	19.2 ± 0.2	–	Verish	4.3	LA13
Red Dry Lake 003	Dry lake	Mohave, AZ	35°38.7312'	114°1.8411'	94	12/28/2001	1	H6	S2	W5	19.2 ± 0.3	–	Jim LaBarbera	18.8	LA13
Red Dry Lake 004	Dry lake	Mohave, AZ	35°38.7842'	114°1.7091'	13.5	12/28/2001	1	H6	S2	W5	19.0 ± 0.3	–	Verish	2.7	LA13
Red Dry Lake 005	Dry lake	Mohave, AZ	35°38.7871'	114°1.7118'	12	12/28/2001	1	H6	S1	W6	19.6 ± 0.5	–	Verish	3.2	LA13
Red Dry Lake 006	Dry lake	Mohave, AZ	35°37.6231'	114°2.6013'	40	12/28/2001	1	H4	S2	W3	19.2 ± 0.2	–	Verish	8	LA13
Red Dry Lake 009	Dry lake	Mohave, AZ	35°37.634'	114°2.594'	13	12/28/2001	1	H3.6	S2	W4	16.1 ± 3.0	–	Jim LaBarbera	3	LA13
Sheephole Valley 002	Dry lake	San Bernardino, CA	34°7.5'	115°33.8'	4.4	10/23/1999	1	L4	S4	W2	25.5 ± 0.5	–	Verish	1	LA13
Silurian Dry Lake	Dry lake	San Bernardino, CA	35°31.051'	116°10.564'	43.8	2/5/2000	1	LL6	S2	W3	29.0 ± 0.4	–	Verish	9	LA13
Silver Dry Lake 002	Dry lake	San Bernardino, CA	35°20.666'	116°06.891'	16.5	12/10/2000	1	H6	S2	W4	18.9 ± 0.2	Breccia	Nick Gessler	4.2	LA12
Superior Valley 001	Dry lake	San Bernardino, CA	35°15.269'	117°6.583'	3.4	9/30/2000	1	H5	S3	W2	18.4 ± 0.2	–	Verish	0.9	LA13
Superior Valley 002	Dry lake	San Bernardino, CA	35°13.415'	117°6.816'	145	10/7/2000	1	L6	S3	W3	25.5 ± 0.4	–	Verish	20	LA13
Superior Valley 003	Dry lake	San Bernardino, CA	35°14.845'	117°5.994'	65.6	1/7/2001	1	H6	S2	W4	19.5 ± 0.4	–	Rob Matson	15.2	LA7
Superior Valley 004	Dry lake	San Bernardino, CA	35°14.12'	117°6.03'	15.3	1/19/2001	1	L6	S3	W2	25.2 ± 0.2	–	Jim LaBarbera	3.9	LA13
Superior Valley 005	Dry lake	San Bernardino, CA	35°14.28'	117°02.19'	32.92	2/16/2001	1	H6	S1	W4	19.4 ± 0.1	–	Rob Matson	9.57	LA7
Superior Valley 006	Dry lake	San Bernardino, CA	35°14.33'	117°01.60'	78.5	3/8/2001	1	H6	S2	W6	19.0 ± 0.3	–	Rob Matson	18.03	LA7
Superior Valley 007	Dry lake	San Bernardino, CA	35°14.30'	117°01.97'	67.21	3/8/2001	1	L6	S4	W3	25.1 ± 0.3	–	Rob Matson	13.45	LA7
Superior Valley 008	Dry lake	San Bernardino, CA	35°14.16'	117°02.64'	77.44	3/8/2001	1	L6	S3	W5	25.0 ± 0.5	–	Rob Matson	17.13	LA7
Superior Valley 009	Dry lake	San Bernardino, CA	35°14.15'	117°02.64'	116.42	3/8/2001	3	L6	S3	W6	25.4 ± 0.2	–	Rob Matson	20.95	LA7
Superior Valley 010	Dry lake	San Bernardino, CA	35°14.18'	117°02.59'	26.26	6/14/2001	1	L4	S2	W2	24.3 ± 0.2	–	Rob Matson	4.9	LA7
Superior Valley 011	Dry lake	San Bernardino, CA	35°14.17'	117°02.58'	2.52	7/6/2001	1	H6	S3	W2	18.5 ± 0.7	–	Rob Matson	0.62	LA7
Superstition Mountain	Open desert	Imperial, California	32°52'15"	115°46'57"	333	8/15/2000	2	H5	S2	W4	18.9 ± 0.4	–	Nick Gessler	44	LA16
Tungsten Mountain 001	Dry lake	Churchill, Nevada	39°38'10"	117°39'17"	31.73	2/28/2000	1	H4	S2	W3	19.3 ± 0.5	–	Paul Gessler	5.28	LA16
Tungsten Mountain 002	Dry lake	Churchill, Nevada	39°40.4141'	117°36.259'	11.3	5/28/2001	1	H6	S2	W5	19.2 ± 0.2	–	Verish	4.1	LA13
Tungsten Mountain 003	Dry lake	Churchill, Nevada	39°41.0691'	117°37.243'	7.8	5/28/2001	1	H4	S2	W3	17.5 ± 0.1	–	Verish	2.6	LA13
Tungsten Mountain 004	Dry lake	Churchill, Nevada	39°41.0665'	117°37.213'	8.1	5/28/2001	1	H6	S2	W5	18.6 ± 0.1	–	Verish	2	LA13
Tungsten Mountain 005	Dry lake	Churchill, Nevada	39°41.064'	117°37.204'	4.7	8/4/2001	1	L6	S2	W3	25.5 ± 0.2	–	Jerry LaBarbera	0.8	LA13
Tungsten Mountain 006	Dry lake	Churchill, Nevada	39°41.0617'	117°37.211'	8.8	8/4/2001	1	L6	S4	W3	25.0 ± 0.2	–	Jerry LaBarbera	1.8	LA13
Tungsten Mountain 007	Dry lake	Churchill, Nevada	39°41.1106'	117°37.263'	44	8/4/2001	1	H5	S3	W3	18.5 ± 0.2	–	Jim LaBarbera	9.2	LA13
Tungsten Mountain 008	Dry lake	Churchill, Nevada	39°40.8432'	117°37.667'	7	8/4/2001	1	H5	S3	W2	20.3 ± 0.3	–	Jim LaBarbera	1.6	LA13
Tungsten Mountain 009	Dry lake	Churchill, Nevada	39°40.8211'	117°37.751'	31	8/4/2001	1	H4	S2	W3	17.9 ± 0.1	–	Jim LaBarbera	9.5	LA13
Tungsten Mountain 010	Dry lake	Churchill, Nevada	39°41.059'	117°37.231'	13.4	8/4/2001	1	H5	S2	W3	18.2 ± 0.2	–	Jim LaBarbera	2.7	LA13

*See "Abbreviations for Analysts and Specimen Locations" after References.

TABLE 4. Meteorites collected by PNRA.

Name	Latitude (S)	Longitude (E)	Mass (g)	Pieces	Class	Shock stage	WG	Fa (mol%)	Fs (mol%)	Comments	Info*
David Glacier											
DAV 01001	75°40'53"	155°27'11"	134.1	1	L6	S5	W1	25	23	–	Sn1
Frontier Mountain											
FRO 01001	72°57'07"	160°30'02"	3.2	1	H5/6	S3	W1	19	17	–	Sn1
FRO 01002	72°57'09"	160°30'19"	13.6	1	H3	S2	W2	0–32	1–25	–	Sn1
FRO 01003	72°57'07"	160°30'29"	14.3	1	H6	S2	W1	18	16	–	Sn1
FRO 01004	72°57'06"	160°30'32"	7.4	1	H5	S3	W1	19	17	–	Sn1
FRO 01005	72°57'06"	160°30'32"	6.6	1	L3	S4	W2	2–43	5–19	–	Sn1
FRO 01022	72°59'12"	160°24'09"	3.5	1	H5	S2	W2	19	17	–	Sn1
FRO 01023	72°59'15"	160°24'02"	3.3	1	H6	S2	W2	19	17	–	Sn1
FRO 01024	72°57'09"	160°31'06"	14.8	1	L4	S2	W1	26	21	–	Sn1
FRO 01025	72°59'20"	160°24'22"	8	1	L3	S4	W2	26	22	–	Sn1
FRO 01026	72°59'20"	160°24'20"	2.7	1	H4	S2	W3	21	19	–	Sn1
FRO 01027	72°59'25"	160°24'14"	7.3	1	H4	S3	W1/2	19	18	–	Sn1
FRO 01028	72°59'25"	160°24'16"	3.9	1	H6	S1	W2	21	19	–	Sn1
FRO 01029	72°59'26"	160°24'10"	8.4	1	L4/5	S4	W1	22	19	br	Sn1
FRO 01030	72°59'27"	160°24'09"	6	1	Ureilite	S1	low	10	10	*See separate entry*	Sn1
FRO 01043	72°59'18"	160°24'25"	0.7	1	H3–5	S2/3	W2	7–23	5–19	br	Sn1
FRO 01052	72°59'22"	160°24'25"	14.6	8	H3	S2	W2	2–21	3–34	–	Sn1
FRO 01062	72°59'16"	160°24'34"	13.3	5	H5	S2	W2	19	16	–	Sn1
FRO 01084	72°59'27"	160°24'15"	11.5	6	H3	S2	W2	1–27	1–21	–	Sn1
FRO 01094	72°57'13"	160°27'11"	3.7	1	LL(L)3	S2	W1	1–17	3–20	–	Sn1
FRO 01101	72°57'07"	160°27'38"	2.2	1	LL4	S2	W1	27	23	–	Sn1
FRO 01136	72°59'37"	160°24'50"	2.4	2	H3	S2	W2	0–29	0–19	–	Sn1
FRO 01148	72°56'03"	160°38'55"	3.3	1	L4	S3	W2	24	20	–	Sn1
FRO 01149	72°59'18"	160°20'48"	1.5	1	H4	S1	W4	18	17	–	Sn1
FRO 01170	72°57'09"	160°31'26"	4.9	1	H4–5	S2	W2	18	16	br	Sn1
FRO 01171	72°57'09"	160°28'10"	3.8	1	H6	S2	W2	19	16	–	Sn1
FRO 01172	72°58'20"	160°20'18"	150.2	1	L3	S3	W2	1–27	9–22	–	Sn1
Johannssens Nunataks											
JOH 01001	72°51'30"	161°08'10"	1058.7	1	H5	S1	W1	21	19	–	Sn1
Miller Butte											
MIB 01001	72°41'03"	161°18'57"	6260	1	L5	S3	W1	26	22	–	Sn1
Mount Walton											
WAL 01001	72°27'00"	160°20'06"	271.6	1	H4/5	S2	W2	20	18	–	Sn1

*See "Abbreviations for Analysts and Specimen Locations" after References.

Saharan meteorites from Libya

Libya
Found 1997–2001
(58 meteorites)

A number of different anonymous finders and SaharaMet (*Pelisson*) recovered these meteorites from several regions of the Libyan Sahara (Table 5). See separate entry for DaG 962 (an ungrouped stony-iron meteorite).

Saharan meteorites from Morocco and surrounding countries

Northwest Africa
Purchased or found 1985–2001
(157 meteorites)

Many meteorites lacking first-hand documentation of the find location are being sold by Moroccan rock and mineral dealers, and by people from other countries who have collected material in Morocco. These meteorites are all sold as Moroccan finds, but there are plausible reports that some were actually collected in Algeria or Western Sahara. Other meteorites have been reported from this region with what appear to be precise find locations. The reliability of locality information associated with these meteorites is difficult to assess due to the anonymity of all of the finders and most of the original sellers, and because the Nomenclature Committee lacks the resources to investigate. All meteorites found in this region are numbered in a "Northwest Africa" (NWA) series. The Nomenclature Committee considers it possible that differently numbered specimens are paired with each other or with other named meteorites, and some may even be derived from the same individual object. Table 6 lists 157 specimens of this type. See separate entries for NWA 595 (brachinite), NWA 739 (CH chondrite), NWA 1180 (CR chondrite), NWA 974 and 1235 (enstatite meteorites), NWA 1000, 1150, 1181, 1182, 1239 and 1240 (HED achondrites), NWA 773 (lunar), NWA 856, 1068 and 1110 (martian), NWA 1242 (mesosiderite) and NWA 1241 (suessite-bearing ureilite).

Saharan meteorites from unknown locations

Sahara, country unknown
Found 1999

This meteorite (Table 7) has been collected by Marc, Luc and Jim Labenne (*Labenne*) in the Sahara. The Labennes will not disclose the exact locations of these meteorites at the present time. The secret origin (*w, z*) in Table 7 is identical to the origin reported in *The Meteoritical Bulletin, Nos*. 84 and 85, and is several hundred kilometers distant from the origin (*x, y*) given in *The Meteoritical Bulletin, No.* 82.

Sayh al Uhaymir 057–101, see Oman meteorites

Sayh al Uhaymir 060 20°58.8' N, 57°19.1' E

Oman
Found 2001 June 27
Martian meteorite (basaltic shergottite)

TABLE 5. Meteorites from the Libyan Sahara.

Name	Found (mm/dd/yyyy)	Latitude (N)	Longitude (E)	Wt (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Comments	Type spec (g)	Info*
Dar al Gani (DaG)													
DaG 659	11/2000	27°36'	16°12'	15	1	H5	S4	W2	19	18	–	3.0	Sn1
DaG 678	11/2000	26°45'	16°26'	162	1	H5/6	S4	W4	21	19	–	24.8	Sn1
DaG 692	11/1999	27°05'	16°22'	734	1	Ureilite	S4	heavy	8	9	br	48.7	Sn1
DaG 693	11/1999	27°05'	16°22'	8	1	Ureilite	S4	heavy	7	10	br, paired with 692	8	Sn1
DaG 872†	10/2000	27°13.15'	16°13.58'	885	1	Eucrite	heavy	W2	–	60–63	monomict basalt	30.4	Ha1
DaG 877	11/2000	27°05'	16°07'	211	1	H5	S2	W2	16	14	–	210	Sn2
DaG 883	11/2000	27°05'	16°07'	100	1	H5–6	S4	W2	17	16	br	15.9	Sn1
DaG 884	11/2000	27°06'	16°06'	100	1	H4	S2	W5	16	14	–	26.9	Sn1
DaG 885	11/2000	26°06'	16°04'	102	1	H6	S1	W4	19	18	–	15.8	Sn1
DaG 886	11/2000	26°06'	16°05'	74	1	H5	S3	W3	18	16	–	13.4	Sn1
DaG 887	11/2000	27°09'	16°06'	156	6	H5/6	S2	W2	19	18	–	27.4	Sn1
DaG 888	11/2000	27°10'	16°08'	44	2	H5/6	S2	W2	19	16	–	10.8	Sn1
DaG 889	11/2000	27°11'	16°07'	58	1	H6	S3	W2	18	16	br	11.4	Sn1
DaG 890	11/2000	27°11'	16°08'	68	2	H5	S2/3	W1	17	15	–	17.9	Sn1
DaG 891	11/2000	27°15'	16°11'	58	1	L5	S3	W2	23	20	–	11.3	Sn1
DaG 892	11/2000	27°07'	16°06'	48	1	H6	S2	W3	16	14	–	8.1	Sn1
DaG 893	11/2000	27°07'	16°04'	132	2	H6	S2/3	W3	17	14	br	18.8	Sn1
DaG 895	11/2000	27°08'	16°07'	286	3	H4	S3	W3	20	17	–	43.8	Sn1
DaG 897	11/2000	27°40'	16°21'	73	1	Ureilite	S5	heavy	22	20	mos	15.3	Sn1
DaG 943	3/24/2000	27°13.04'	16°05.56'	15.25	1	L5	S2/3	W2	24.3	21.0	–	3.14	OU1
DaG 944	3/25/2000	27°11.80'	16°11.83'	119.27	1	LL6	S2	W3	32.0	25.6	–	20.05	OU1
DaG 945‡	3/25/2000	27°11.32'	16°22.55'	300	1	Eucrite	S1	W1	–	–	$An_{84.2–90.2}$	22.72	OU2
DaG 946	3/25/2000	27°11.24'	16°22.69'	54.03	1	LL4	S2	W3/4	26.4	21.9	–	2.57	OU1
DaG 947	3/26/2000	27°26.81'	16°19.16'	436	1	LL6	S2	W3/4	29.9	23.9	–	20.19	OU1
DaG 948	3/26/2000	27°41.23'	15°58.63'	1032	1	L6	S3	W2/W3	25.6	20.7	–	19.85	OU1
DaG 949	3/27/2000	27°53.91'	15°51.82'	204.01	1	L6	S2	W3	25.8	21.6	–	21.66	OU1
DaG 950	3/27/2000	27°53.94'	15°51.87'	42.83	1	L6	S2/S3	W1/W2	25.2	22.0	–	8.64	OU1
DaG 951	3/27/2000	27°54.10'	15°51.81'	1080	3+	L5	S2	W2	25.2	21.5	–	21.22	OU1
DaG 952	1998	27°19.87'	16°12.21'	56	1	L6	–	W5	23.5	19.9	–	11	MP2
DaG 953	1999	27°07.50'	16°20.72'	50.5	1	H4	–	W4	17.4	15.5	–	12	MP2
DaG 954	1998	27°07.06'	16°01.59'	65	4	H6	–	W4	19.3	16.5	–	13	MP2
DaG 955	1999	27°07.91'	16°12.46'	18500	many	H6	–	W3	18.8	16.6	–	25	MP2
DaG 956	1997	27°07.96'	15°59.55'	15000	several	L6	–	W3	24.4	20.8	–	125	MP2
DaG 961	1998	26°52.95'	16°39.72'	481	3	L5	S3	W3	24.3	21.3	–	18	Ha2
DaG 962	10/1999	27°11.88'	16°24.51'	130	1	Stony-iron (ungrouped)		–	–	–	*See special entry*		
DaG 963	12/1997	27°06.65'	16°02.65'	484	several	H6	–	W3	19.3	17.5	–	22	MP2
DaG 964	4/2000	27°02.07'	16°08.57'	158.1	3	H3.9	S2	W3	16.7 (13–19)	16.1 (10–30)	–	19.5	Mün2
Hammadah al Hamra (HaH)													
HaH 293	11/2000	28°47'	12°32'	382	1	L6	S5	W3	24	20	–	380	Sn2
HaH 294	11/2000	26°06'	12°19'	3710	1	L6	S2	W6	23	19	–	3707	Sn2
HaH 295	11/2000	29°01'	12°22'	466	1	H5	S1	W5	16	15	–	44.1	Sn1
HaH 296	11/2000	29°06'	12°19'	27064	1	H5/6	S4	W4	20	16	–	268.2	Sn1
HaH 297	11/2000	29°10'	12°19'	786	1	H4	S2	W4	17	14	–	16.3	Sn1
HaH 298	11/2000	25°05'	12°28'	100	1	L6	S5	W3	24	20	–	14.1	Sn1
HaH 299	3/31/2000	29°53.49'	12°11.17'	656	1	H6	S2	W2	18.9	16.7	–	20.13	OU1
HaH 300	4/1/2000	30°07.19'	12°06.81'	893	1	L6	S2	W3	25.8	21.8	–	20.03	OU1
HaH 301	8/15/2000	28°23.28'	13°12.49'	972	1	H5	S2	W3	18.5	16.5	–	19.3	Mün1
HaH 302	8/15/2000	28°32.21'	13°18.72'	1514	1	L6	S4	W2	25	21	–	19.5	Mün1
HaH 303	8/15/2000	28°32.45'	13°23.95'	1016	1	H5	S2	W4	17.5	15.5	–	27.4	Mün1
HaH 304	8/17/2000	28°40.96'	13°06.13'	615	1	H5	S2	W3	18.5	16.5	–	16.0	Mün1
HaH 305	8/17/2000	28°38.71'	13°06.13'	45	1	H4/5	S2	W4	18.5	16.5	–	10.0	Mün1
HaH 306	8/18/2000	28°41.91'	13°02.47'	378	1	H4/5	S2	W3	19	17	–	20.3	Mün1
HaH 307	8/18/2000	28°59.72'	12°58.99'	533	1	H5	S2	W3	18	16.5	–	26.9	Mün1
HaH 308	8/18/2000	29°02.63'	13°01.77'	73	1	L6	S4	W1	25	21.5	sv	15.1	Mün1
HaH 309	8/19/2000	29°08.64'	13°05.19'	716	3	H6	S3	W3	19	16.5	sv	22.7	Mün1
HaH 310	8/20/2000	29°26.78'	13°12.24'	1265	2	H6	S4	W3	19.5	17.5	sv	27.9	Mün1
HaH 311	8/21/2000	29°14.13'	13°26.71'	168	1	H5/6	S2	W3	19	17.5	–	21.9	Mün1
HaH 312	8/22/2000	29°17.32'	13°29.91'	882	1	L6	S4	W1–2	24.5	21.5	–	21.3	Mün1
HaH 313	8/24/2000	29°19.44'	13°33.92'	64	1	L6	S3	W3	25	21	sv	14.1	Mün1

Abbreviations: br = breccia; mos = mosaicized; sv = shock veins.
*See "Abbreviations for Analysts and Specimen Locations" after References.
†See description in Patzer *et al.* (2002).
‡Oxygen isotope data (I. Franchi and A. Sexton, *OU*): $\delta^{17}O = +1.568‰$, $\delta^{18}O = +3.494‰$, $\Delta^{17}O = –0.249$; mineral analysis (A. Sexton and C.Smith, *OU*).

TABLE 6. Meteorites from Morocco and surrounding countries.

Name	Possible origin or pseudonym*	Latitude† (N)	Longitude† (W)	Date‡ (mm/dd/yyyy)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Notes§	Place purchased	Type Spec (g)	Info#
Northwest Africa (NWA)															
NWA 139	–	–	–	9/17/2000	21.4	1	H6	S3	W1	19.1	–	–	Erfoud	21.4	LA1
NWA 172	Anbdur	–	–	1999?	24.2	1	H5	S3	W2	18.1	15.6	–	–	14	Vr1
NWA 266	–	30°20'	5°50'	1999	940	1	H5	S2	W3	18.95	14.34	–	Zagora	33	Ha3
NWA 280	Algeria	–	–	P 11/2000	1490	1	L6	S3	W2	24.4	21.2	–	Erfoud	166.9	Vr2
NWA 281	Algeria	–	–	P 11/2000	2082	1	L6	S3	W1	23.8	19.9	–	Erfoud	168.1	Vr2
NWA 284	Algeria	–	–	P 11/2000	762	1	L6	S3	W1	24.4	21.7	–	Erfoud	200.1	Vr2
NWA 301	Ben Abbes	–	–	P 12/2000	2150	1	H6	S1	W1	19	18	plag: $Ab_{82}An_7Or_{11}$	Erfoud	126	JSC1
NWA 302	Algeria	–	–	P 12/2000	210.9	1	L5	S3	W0	23.5	21.2	–	Erfoud	45.9	Vr2
NWA 303	Algeria	–	–	P 12/2000	158	1	LL4	S3	W0	27.2	22.7	–	Erfoud	39.2	Vr2
NWA 305	Algeria	–	–	P 12/2000	210	1	E3	S2	W3	–	1.11	plag: $An_{10.8}$	Erfoud	34.7	Vr2
NWA 306	Algeria	–	–	P 12/2000	182	1	L4	S2	W2	25.7	23.41	–	Erfoud	33.4	Vr2
NWA 309	–	–	–	P 4/2001	308	1	L5	S2	W3	24.8	–	–	Erfoud	67	LA2
NWA 310	Algeria	–	–	P 01/2001	103.72	1	H4	S2	W5	18.3 ± 0.2	–	–	Erfoud	26.89	LA3
NWA 311	Algeria	–	–	P 11/2000	19.2	1	H4	S5	W1	18.2 ± 0.6	–	–	Erfoud	5.02	LA3
NWA 312	Algeria	–	–	P 01/2001	107.22	1	L6	S4	W2	26.1	–	–	Erfoud	18.16	LA3
NWA 313	Algeria	–	–	P 01/2001	108.22	1	H5	S2	W3	18.6 ± 0.2	–	–	Erfoud	18.08	LA3
NWA 314	Algeria	–	–	P 01/2001	70.5	1	H3.8	S2	W3	17.5 ± 0.7	–	–	Erfoud	15.5	LA3
NWA 315	Algeria	–	–	P 01/2001	64	1	H4	S2	W1	19.1 ± 1.8	–	–	Erfoud	15.56	LA3
NWA 471	Er Rachidia 002	31°58.5'	4°10.0'	1999?	868	1	L5	S3	W2	24.7	22.0	–	–	170	Vr3
NWA 474	Er Rachidia 005	32°01.3'	4°08.3'	1999?	28.8	1	H6	S2	W1	19.3	18.0	–	–	9.66	Vr3
NWA 475	Er Rachidia 006	32°02.6'	4°08.2'	1999?	111.7	1	H4	S2	W3	18.6	16.5	–	–	22	Vr3
NWA 476	Er Rachidia 007	32°01.7'	4°09.5'	1999?	344	1	H6	S3	W1	18.8	16.8	–	–	71.53	Vr3
NWA 595	–	–	–	1/1/2001	196	1	Brachinite	–	*See special entry*						
NWA 739	Lahmada	–	–	P 11/1/1999	60	2	CH	–	*See special entry*						
NWA 742	–	–	–	8/2000	17.0	1	H3.8	S1	W2	19.0	–	–	Erfoud	3.5	LA4
NWA 743	–	–	–	P 11/2000	175	1	L5	S2	W2	24.9	–	–	E. Morocco	31	LA5
NWA 744	–	–	–	P 9/2000	24	1	H4	S2	W4	18.3 ± 0.8	–	–	Erfoud	7	LA6
NWA 750	Lahmada	–	–	P 2000	964	2	H6	S1	W0/1	19	16.5	–	Rissani	27	Mü1
NWA 751	Lahmada	–	–	P 2000	385.5	1	L6	S4	W1	25.5	22.5	–	Rissani	23	Mü1
NWA 752	Kem Kem	–	–	P 2000	3450	3	LL4/5	S2	W1–2	29	24	–	Rissani	21	Mü1
NWA 754	Lahmada	–	–	P 2000	30000	many	L6	S4	W3	25	21	partly S5	Rissani	42	Mü1
NWA 756	Lahmada	–	–	P 2000	20000	many	L6	S4	W1	25.5	21.5	sv	Rissani	23	Mü1
NWA 757	Boudnib	–	–	P 2000	714	1	LL6	S4	W2	28	23.5	(1) sv, rw, partly S6	Rissani	22	Mü1
NWA 758	Lahmada	–	–	P 2000	394.9	1	H6	S1	W0/1	18.5	16.5	–	Rissani	24	Mü1
NWA 767	Mahbes–Luban	30°38.15'	5°05.30'	12/12/2000	5146	9	L4	–	W1	26.5	21.7	–	–	20	MP2
NWA 768	Zag	28°00.05'	9°16.20'	11/30/2000	1708	16	H4	–	W0	18.3	16.4	–	–	20	MP2
NWA 769	Gulmima	31°42.15'	4°58.10'	11/10/2000	712	many	Eucrite	–	–	–	–	(2); unbrecciated	–	20	MP2
NWA 827	–	–	–	P 12/2000–3/2001	48.7	1	H3.9	S2	W1	19.2 ± 0.4	–	–	E. Morocco	13.5	LA7
NWA 828	Zagora	30°18'	5°55'	2000	738	1	H3	S1	W2	16.2 ± 2.8 (n = 84)	15.3 ± 2.8 (n = 49)	(3); petrol. type 3.0–3.4	–	36	UHd1
NWA 830	–	–	–	P 2000	55	1	R5	S3	W3	40.2 ± 2.2	–	br	–	13	LA1
NWA 832	–	–	–	P 02/2001	3450	1	L4	S2	W1	23.58 (n = 49)	19.96 (n = 41)	regolith breccia	Erfoud	360	Ha4
NWA 833	–	–	–	P 1/2001–3/2001	412	1	H4	S2	W3	19.1 ± 0.6	–	–	E. Morocco	31.86	LA7
NWA 835	Zag	28°00.05'	9°16.20'	11/30/2000	1104	9	H6	S4	W1	19.5	17.3	br	–	29.9	Be1
NWA 836	Mahbes	27°23.30'	9°01.04'	11/27/2000	3660	41	L5	S3	W3	24.6	21.0	–	–	25.2	Be1
NWA 837	Mahbes	27°23.30'	9°01.04'	11/27/2000	382	2	H4	S2	W4	18.3	16.6	–	–	22.7	Be1
NWA 838	Mahbes	27°23.30'	9°01.04'	11/30/2000	660	2	L6	S3	W2	25.4	21.2	–	–	24	Be1
NWA 839	Morocco	–	–	2/22/2001	230	1	LL6	S2	W3	29.9	25.0	–	–	24.8	Be1
NWA 840	Mahbes	30°11.56'	9°02.20'	2/28/2001	2875	1	H5	S1	W3	18.3	16.2	–	–	22.6	Be1
NWA 841	–	30°11.56'	9°02.20'	3/5/2001	8012	1	L6	S4	W2	25.9	21.4	–	–	22.6	Be1
NWA 842	Hamada du Draa	–	–	3/5/2001	1227	1	L5	S2	W2	25.4	21.2	–	–	25.6	Be1
NWA 843	Hamada du Draa	–	–	3/5/2001	4850	1	H4	S2	W2/3	18.3	18.0	–	–	20	Be1

TABLE 6. *Continued*.

Name	Possible origin or pseudonym*	Latitude† (N)	Longitude† (W)	Date‡ (mm/dd/yyyy)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Notes§	Place purchased	Type Spec (g)	Info#
NWA 844	Faiga	30°48.48'	5°51.35'	3/5/2001	629	32	H3	S2	W3	17.6 (1.5–40.1)	8.2 (3.5–19.3)	–	–	21.3	Be1
NWA 845	Faiga	30°48.48'	5°51.35'	3/5/2001	36	1	R4	–	W1	39.2	14–19	–	–	7	MP2
NWA 846	Er Rachidia	–	–	3/6/2001	12	1	LL6	S4	W2	30.5	25.0	sv	–	1.5	Be1
NWA 847	Algeria	–	–	3/5/2001	1851	1	H3	S2	W2	21.6 (1.6–47.5)	16.6 (1.3–22.8)	–	–	21.5	Be1
NWA 848	Zag	28°00.05'	9°16.20'	11/16/2000	4508	36	L6	–	W1	25.4	21.3	–	–	28	MP2
NWA 850	Malal	30°24.40'	5°53.54'	2/24/2001	5300	12	H5	–	W3	19.0	16.8	–	–	20	MP2
NWA 851	Safsaf	–	–	3/5/2001	695	1	R4	–	W4	41.1	30.5	–	–	20	MP2
NWA 852	Faiga	30°48.48	5°51.35	3/5/2001	174	4	CR2	–	W1	1.3	4.3	(4)	–	20	MP2
NWA 853	Er Rachidia	–	–	3/6/2001	720	1	Ureilite	–	–	22.2	–	(5)	–	22	MP2
NWA 854	Ziz	–	–	P 1/2000	45 kg	2	IAB	–	–	–	–	(6)	–	150	LA1
NWA 855	Bouafra	–	–	P 2000	14.6 kg	1	H3.8	S2	W3	18.0 ± 0.3	–	–	–	123	LA1
NWA 856	Djel Ibone	–	–	3/2001	320	1	Martian	–	*See special entry*						
NWA 857	–	–	–	P 2000	345	1	H6	S2	W3	19.4	–	–	–	20	LA1
NWA 858	–	–	–	P 2000	238	1	LL6	S3	W5	32.2	–	–	–	20	LA1
NWA 859	Taza, Morocco	–	–	2001	75.3 kg	several	Iron ung.	–	–	–	–	(7)	–	110	LA8
NWA 860	Tafrawet, Algeria	–	–	2000	32 kg	1	IIIAB	–	–	–	–	(8)	–	100	LA8
NWA 861	–	–	–	2000	209	1	H5	–	–	18	15.8 ± 1.1	–	–	19	CU1
NWA 862	–	–	–	2000	279	1	H5	–	–	16.2	15.2	–	–	56	CU1
NWA 864	–	–	–	2000	972	1	L3	–	–	0.3–42.5	–	(9) Highly unequilibrated(<3.3)	–	89	CU1
NWA 865	–	–	–	2000	263	7	L4	–	–	26.2 ± 0.6	4.8–21.1	breccia	–	38	CU1
NWA 866	–	–	–	2000	247	1	L3	–	–	4.4–39.1	2.2–15.1	(10) Highly unequilibrated (<3.3)	–	31	CU1
NWA 906	–	–	–	P 6/2001	1031	6	H3.8	S2	W3	17.6 ± 0.4	–	–	Zagora	21	LA9
NWA 916	–	–	–	P 6/2001	1714	10	L6	S2	W3	24.9	–	–	Zagora	30	LA9
NWA 926	–	–	–	P 6/2001	201	3	H4	S3	W2	18.7	–	–	M'hamid	21.2	LA9
NWA 946	–	–	–	P 6/2001	424	7	H3.8	S2	W4	18.6	–	–	Rissani	21.9	LA9
NWA 949	–	–	–	P 6/2001	197	2	L5	S4	W1	23.9	–	–	Rissani	20	LA9
NWA 964	–	–	–	P 6/2001	179	1	LL4	S4	W3	31.4	–	–	Erfoud	20	LA9
NWA 965	–	–	–	P 6/2001	19.2	1	LL4	S2	W3	27.7	–	–	Erfoud	4	LA9
NWA 974	Remlia	–	–	P 4/2001	2250	1	E6	–	*See special entry*						
NWA 978	–	–	–	P 8/1/2001	722	3	R3.8	S3	W2	41.9 ± 0.2	–	–	Erfoud	29	LA10
NWA 979	–	–	–	P 8/1/2001	187	1	LL6	S4	W1	28.7 ± 1.2	–	–	Erfoud	20	LA10
NWA 980	–	–	–	P 8/1/2001	2164	1	LL3.7	S2	W3	27.7 ± 7.0	–	–	Erfoud	30	LA10
NWA 981	–	–	–	P 8/1/2001	110	2	H6	S3	W4	20	–	–	Erfoud	26.1	LA10
NWA 983	–	–	–	P 8/1/2001	83	1	LL4	S3	W2	26.6 ± 1	–	–	Erfoud	13.3	LA10
NWA 984	–	–	–	P 8/1/2001	89	1	LL4	S2	W3	28.9	–	–	Erfoud	14.8	LA10
NWA 985	–	–	–	P 8/1/2001	69.8	1	H6	S2	W4	19	–	–	Erfoud	11.02	LA10
NWA 986	–	–	–	P 8/1/2001	90	1	L6	S3	W3	25.3	–	–	Erfoud	17.11	LA10
NWA 987	–	–	–	P 8/1/2001	975	1	L3.8	S5	W1	24.8 ± 1.6	–	–	Erfoud	23.22	LA10
NWA 988	–	–	–	P 8/1/2001	453	3	L6	S3	W1	24.5	–	–	Erfoud	44.09	LA10
NWA 989	–	–	–	P 8/1/2001	146	1	CV3	S2	W4	5.1 ± 4.5	–	–	Erfoud	20.34	LA10
NWA 990	–	–	–	P 8/1/2001	611	1	L6	S4	W2	24.8	–	–	Erfoud	56.1	LA10
NWA 991	–	–	–	P 8/1/2001	292	1	LL4	S2	W3	28.1 ± 0.3	–	–	Erfoud	27.6	LA10
NWA 992	–	–	–	P 8/1/2001	560	1	H4	S2	W1	19.8 ± 1.8	–	–	Erfoud	62.2	LA10
NWA 1000	–	–	–	P 11/2001	1200	1	Eucrite	–	*See special entry*						
NWA 1044	–	–	–	P 12/17/2000	80.4	1	L6	S4	W1	23.9	21.3	Wo: 1.6	E. Morocco	16	Frei1
NWA 1045	–	–	–	P 12/17/2000	102	2	H4/5	S3	W1	18.1	16.6	Wo: 1.3	E. Morocco	19	Frei1
NWA 1046	–	–	–	P 12/17/2000	809	18	H5	S2	W3	18.3	16.9	Wo: 1.6	E. Morocco	20	Frei1
NWA 1047	–	–	–	P 12/17/2000	593	2	L6	S4	W3	23.9	21.2	Wo: 1.7	E. Morocco	18	Frei1
NWA 1048	–	–	–	P 12/17/2000	35.8	1	L3	S4	W1	22.7 range 22.1–24.1	16.4 peak 19	Wo: 0.8	E. Morocco	6	Frei1
NWA 1049	–	–	–	P 12/17/2000	626	1	L6	S4	W1	23.9	21.3	Wo: 1.4	E. Morocco	20	Frei1

TABLE 6. *Continued.*

Name	Possible origin or pseudonym*	Latitude† (N)	Longitude† (W)	Date‡ (mm/dd/yyyy)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Notes§	Place purchased	Type Spec (g)	Info#
NWA 1050	–	–	–	P 12/17/2000	214	2	L6	S4	W1	23.9	21.0	Wo: 1.6; possibly paired with NWA 1049	E. Morocco	15	Frei1
NWA 1068	Louise Michel	–	–	4/2001	576.77	23	Martian	–	*See special entry*						
NWA 1110	–	–	–	P 11/2001	118	2	Martian	–	*See special entry*						
NWA 1150	–	–	–	P 2000	67.05	1	Howardite	–	*See special entry*						
NWA 1151	–	–	–	P 2000	126	1	LL5	S2	W2	26.4	–	–	Tagounite	21.3	NAU1
NWA 1152	–	–	–	P 2000	98	1	CV3	S2	W2/3	23	–	Fa in chondrules	Tagounite	19.2	NAU1
										56	–	Fa in matrix			
NWA 1172	Tabelbala, Algeria	–	–	2000	>120 kg	many	H5	–	W0	18.1	–	dia. Plag <50 μm	Er Rachidia	2 kg	Vn1
NWA 1173	Mhamid	–	–	1999	182	1	H6	–	W2	18.6	–	dia Plag >50 μm	Er Rachidia	83	Vn1
NWA 1174	Mhamid	–	–	1998	884	1	H5	–	W1	16.6	–	dia. Plag <50 μm	Er Rachidia	21	Vn1
NWA 1180	Zagora	–	–	2000	1705	8	CR2	–	*See special entry*						
NWA 1181	–	–	–	P 2001	3279	1	Howardite	–	*See special entry*						
NWA 1182	–	–	–	P 2000	780	1	Howardite	–	*See special entry*						
NWA 1197	Zagora	–	–	2001	345	1	L6	S4	W1	25.3	21.1	–	–	20.7	Be1
NWA 1199	Er Rachidia	–	–	6/2000	78	1	H5	–	W1	18.5	16.6	–	–	16	MP3
NWA 1200	Er Rachidia	–	–	6/2000	1077	1	H5	–	W1	18.1	15.7	–	–	20	MP3
NWA 1201	Zag	28°00.05'	9°16.20'	11/2000	206	2	H4	–	W0	19.0	16.4	–	–	20	MP3
NWA 1202	Zagora	–	–	1999	1638	–	L6	S1	W3	25.3	21.3	–	–	240	UTok1
NWA 1203	Zagora	–	–	1999	716	–	H5	S2	W3	17.6	16.5	well-defined chondrules	–	150	UTok1
NWA 1204	Zagora	–	–	1999	393	–	H4	S2	W3	18.5	15.7	–	–	83	UTok1
NWA 1205	Zagora	–	–	1999	749	–	H4	S2	W3	17.7	15	–	–	79	UTok1
NWA 1206	Zagora	–	–	1999	999	–	H5	S3	W3	17.9	16.2	–	–	152	UTok1
NWA 1207	Zagora	–	–	1999	905	–	H3	S2	W3	18.4	14.6	–	–	163	UTok1
NWA 1208	Zagora	–	–	1999	368	–	H5	S2	W3	17.7	16.2	well-defined chondrules	–	63	UTok1
NWA 1209	Zagora	–	–	1999	295	–	H4	S2	W3	18.4	15.1	well-defined chondrules	–	57	UTok1
NWA 1210	Zagora	–	–	1999	280	–	H5	S2	W3	17.5	16.0	–	–	76	UTok1
NWA 1211	Zagora	–	–	1999	280	–	H4	S2	W3	18.0	16.9	br, type 3 clast	–	53	UTok1
NWA 1212	Zagora	–	–	1999	803	–	H3	S2	W3	17.7	15.9	br, H6 clast; (PMD: Fa 0.28%, Fs 0.25%)	–	149	UTok1
NWA 1213	Zagora	–	–	1999	267	–	H4	S1	W3	17.8	16.5	br, H5 clast; (PMD: Fa 0.37%, Fs 0.47%)	–	94	UTok1
NWA 1214	Zagora	–	–	1999	492	–	H4	S2	W3	19.3	16.3	–	–	87	UTok1
NWA 1215	Zagora	–	–	1999	217	–	L5	S2	W3	25.1	21.4	–	–	36	UTok1
NWA 1216	Zagora	–	–	1999	198	–	H5	S2	W3	17.9	16.6	–	–	44	UTok1
NWA 1217	Zagora	–	–	1999	307	–	H4	S1	W3	17.8	16.8	–	–	60	UTok1
NWA 1218	Zagora	–	–	1999	167	–	H5	S2	W3	17.2	15.7	–	–	23	UTok1
NWA 1219	Zagora	–	–	1999	274	–	H5	S2	W3	17.7	15.4	–	–	68	UTok1
NWA 1220	Zagora	–	–	1999	164	–	H5	S2	W3	18.2	16.6	–	–	45	UTok1
NWA 1221	Zagora	–	–	1999	131	–	H6	S2	W3	18.1	15.8	–	–	41	UTok1
NWA 1222	Morocco	–	–	1999	2800	–	EL5	S3	W3	–	0.6	PMD: Fs 0.27%	–	250	UTok1
NWA 1223	Morocco	–	–	1999	2328	–	L6	S2	W3	24.6	20.6	–	–	246	UTok1
NWA 1224	Morocco	–	–	1999	93	–	L5	S3	W3	24.6	20.8	sv	–	41	UTok1
NWA 1225	Morocco	–	–	1999	357	–	L5	S3	W3	24.5	20.7	sv	–	79	UTok1
NWA 1226	Morocco	–	–	1999	83	–	L4	S3	W3	24.0	21.5	sv	–	39	UTok1
NWA 1227	Morocco	–	–	1999	1050	–	LL3	S3	W3	23.1	17.3	sv	–	124	UTok1
NWA 1228	Morocco	–	–	1999	609	–	H5	S3	W3	18.1	15.9	PMD: Fa 9.87%, Fs 8.57%	–	91	UTok1
NWA 1229	Morocco	–	–	1999	66	–	L5	S3	W3	24.8	22.1	–	–	15	UTok1
NWA 1230	Morocco	–	–	1999	118	–	H4	S3	W3	20.7	19.4	–	–	55	UTok1
NWA 1231	Morocco	–	–	1999	59	–	H4	S2	W3	20.9	17.1	–	–	24	UTok1
NWA 1233	–	–	–	2000	146	1	L3.7	S2	W1	24.8 (10.9–36.9)	2.75–26.9	PMD 23.6%	–	20	Vr4
NWA 1234	–	–	–	2000	102	1	LL6	S2	W3	28.3	24.2	–	–	20	Vr4
NWA 1235	–	–	–	2000	80	1	Enstatite achondrite	–	*See special entry*						

TABLE 6. *Continued.*

Name	Possible origin or pseudonym*	Latitude† (N)	Longitude† (W)	Date‡ (mm/dd/yyyy)	Mass (g)	Pieces	Class	Shock	WG	Fa (mol%)	Fs (mol%)	Notes§	Place purchased	Type Spec (g)	Info#
NWA 1236	–	–	–	2000	171	1	H4	S1	W3	17.4	15.8	–	–	20	Vr4
NWA 1237	Libya	–	–	2000	153	1	L6	S2	W0	24.1	20.7	–	–	20	Vr4
NWA 1238	–	–	–	2000	53	1	LL6	S2	W1	27.6	25.4	–	–	20	Vr4
NWA 1239	–	–	–	P unknown	237	1	Diogenite	–	*See special entry*						
NWA 1240	–	–	–	P 11/2001	98	1	Eucrite	–	*See special entry*						
NWA 1241	Libya	–	–	8/11/2001	282	1	Ureilite	–	*See special entry*						
NWA 1242	Libya	–	–	1985	~7000	2	Mesosiderite	–	*See special entry*						

Most of these were purchased from Moroccan dealers. If information was supplied by a dealer about where the specimen may have been collected, this is noted instead of the latitude and longitude Most of the collection locations cannot be verified.

*Meteorites may have been sold under some of these names or numbers. These are NOT recognized by the Nomenclature Committee, and some are not uniquely associated with the meteorite classified in this table. Only the NWA number should be used.

†Coordinates of place of supposed origin; not all reports may be trustworthy, and the Nomenclature Committee lacks the resources to investigate.

‡"P" indicates a date of purchase, others are reported dates of find.

§Notes: sv = shock veins; br = brecciated; Wo = Wo content of low-Ca pyroxene (mol%); CPX = Ca-rich pyroxene; Ol = olivine. (1) For details, see A. Bischoff (2002). (2) Unbrecciated eucrite, Opx ($En_{34}Wo_3$) and Cpx ($En_{30}Wo_{43}$) of constant composition in lamellar intergrowth, plagioclase, An_{90}. (3) High modal abundance of kamacite, taenite and troilite (14 vol%), all chondrules contain fresh glass. (4) Low chondrule/matrix ratio, Fe-rich olivines with Fa up to 53. (5) Olivine with $Fa_{22.2}$ (0.26 wt% CaO, 0.47 wt% Cr_2O_3) in the cores, rims reduced to Fa_{10}. (6) Co = 4.68 mg/g, Ni = 69.1 mg/g, Ga = 90.9 μg/g, As = 11.1 μg/g, Ir = 2.10 μg/g, Pt = 6.8 μg/g, Au = 1.499 μg/g. (7) Plessitic octahedrite, Co = 13.1 mg/g, Ni = 159.3 mg/g, Cu = 296 μg/g, Ga = 87.0 μg/g, Ge = 2200 μg/g, As = 54 μg/g, W = 6.8 μg/g, Ir = 2.45 μg/g, Pt = 37.7 μg/g, Au = 6.52 μg/g. (8) Med. oct., Co = 5.22 mg/g, Ni = 83.6 mg/g, Cu = 151 μg/g, Ga = 20.5 μg/g, As = 7.88 μg/g, W = 0.63 μg/g, Ir = 0.404 μg/g, Pt = 6.3 μg/g, Au = 1.064 μg/g. (9) Highly unequilibrated chondrite with well-defined chondrules and some contain zoned olivine. Its matrix contains fine blades and laths of Fe-rich olivine and is very similar to Krymka (L3.1) matrix. These characterisitics suggest that it is L ≤ 3.3. (10) A highly unequilibrated chondrite of petrological type L ≤ 3.3 and with shock-darkened silicates.

#See "Abbreviations for Analysts and Specimen Locations" after References.

A small 42.28 g partially crusted grey-greenish stone was found near to the area of previous finds of Sayh al Uhaymir 005/008/051/094. All five meteorites seem to be paired. Mineralogy and classification (S. Afanasiev, *Vernad*): has a porphyritic texture with large olivine phenocrysts ($Fo_{63.1–70.8}$) set in a groundmass consisting of maskelynite ($An_{61.4–68.3}$ $Or_{0.5–1.6}$) and pigeonite ($En_{60–69.6}$ $Wo_{7.1–8.6}$), augite (En_{47} Wo_{35}) is rare; shock stage, S5; slight weathering. Analyzed by Dr. N. N. Kononkova (*Vernad*). Specimens: type specimen, 9.5 g, *Vernad*; main mass with anonymous finder.

Sevaruyo 19°22.065' S, 66°58.072' W

Bolivia

Found 2001 June 11

Ordinary chondrite (H5)

A single 12.37 g stone was found on a dry river-bed (elevation, 3749 m) by Blaine Reed, Kevin Kichinka, Rubber Munoz and Martin Choquetuanca. Classification (P. Sipiera, *Harper*; G. Jerman, *MSFC*): $Fa_{18.3}$ (*n* = 29); $Fs_{16.4}$ (*n* = 24); shock stage, S2; weathering grade, W4. Specimens: type specimen, 1.24 g and probe section, *PSF*; main mass, 7.24 g, Bolivian National Museum, La Paz; 2 g, *Reed*; 1.3 g, K. Kichinka.

Shalim 001, see Oman meteorites

Shi• r 001–007, see Oman meteorites

Shi• r 007 18°17'34.4" N, 53°34'1.4" E

Dhofar, Oman

Found 2001 April 9

Achondrite (ureilite)

A single stone of 4.258 kg, partly covered in fusion crust, was recovered during a natural science expedition on a gravel plateau west of Wadi Ghadun. A further individual of 3.099 kg plus 12 fragments of between 2 and 530 g (total: 1.667 kg) have been recovered within a 27 m radius. Classification (F. Wlotzka, *MPI*; Rainer Bartoschewitz, *Bart*): composed of coarse (1–3 mm), equigranular olivine (cores $Fa_{19.4}$, Cr_2O_3 0.55%) and pigeonite ($Fs_{17.4}$, $Wo_{9.0}$, Cr_2O_3 1.2%). Olivine grain rims reduced to Fa_{11}, they contain finely disseminated metal grains. Carbonaceous matter occurs as narrow, intergranular veins. Moderately shocked, with mosaicism in olivine. Specimens: type specimens, 18 g, *MPI*; 557 g *Vernad*; main mass, 4217 g, *Bart*; nearly 4 kg with anonymous finder.

Tafassasset undisclosed location until 2005 February 14

Tenere desert, Niger

Found 2000 February 14

Carbonaceous chondrite (equilibrated CR-like meteorite) or primitive achondrite

Twenty-six pieces with a total weight of ~110 kg were found by Bernard Dejonghe on an ancient alluvial plain. The two largest weigh ~30 kg each. Twenty stones were found on a trip in early 2000, and six more in 2001 March. The geographic coordinates of these meteorites are being withheld by the finder for three years. Classification (M. Bourot-Denise, *MNHNP*): $Fa_{29.3}$, pyroxene $Fs_{24.3}$; ~30 vol% millimeter-sized relic chondrules are clearly visible in backscattered electron images. Textures and relative abundances of the phases vary considerably. The dominant lithology has a coarse grain size. It consists of olivine (poikilitically enclosed within

TABLE 7. Meteorites from the Sahara, locations unknown.

Name	Found	Latitude*	Longitude*	Mass (g)	Pieces	Class	WG	Fa	Fs	Type spec (g)	Info†
Sahara 99042	1999	*z* + 0°13'34"	*w* + 0°22'55"	345	1	L5	W1	26.3	22.0	20	MP4

*The geographic coordinates of these meteorites have not been disclosed by the finder. Listed are the offsets relative to a secret origin at (*w* °W longitude, *z* °N latitude, where *w* and *z* are integers that are *not* the same as *x* and *y* in Table 7 of *The Meteoritical Bulletin, No.* 82).
†See "Abbreviations for Analysts and Specimen Locations" after References.

pyroxenes in the relic chondrules), a small amount of plagioclase, 10% metal in rounded or oval-shaped grains often edged by chromite, and minor sulphides in small grains. The interchondrule matrix consists of subhedral crystals of olivine embedded in plagioclase and within anhedral crystals of chromite and phosphate that are up to 1 mm in size. Two distinct plagioclase compositions are present: $An_{46.4}Or_{2.2}$ in the matrix and $An_{26.6}Or_{5.2}$ in chondrule relics. A second lithology is finer grained and porous, without large metal grains but with fairly abundant sulphide grains. The large metal grains are composed of kamacite (6% Ni, 0.6% Co) and martensite (12% Ni, 0.4% Co). Some smaller metal grains associated with sulphides are made up of taenite (up to 36% Ni, 0.2% Co) with martensite cores. The sulphide is troilite (Cr 0.02–0.08%), with some grains containing inclusions of Cu-bearing pentlandite. See also Bourot-Denise *et al.* (2002). Bulk chemistry (J. Zipfel and B. Spettel, *MPI*; H. Palme, *Köln*): refractory lithophiles fractionated compared to a typical CR composition, leading to possible classification as a primitive achondrite (Zipfel *et al.*, 2002). Oxygen isotopes (M. Javoy, *IPGP*): $\delta^{17}O$ = +0.18 ± 0.08‰, $\delta^{18}O$ = +2.94 ± 0.2‰. Weathering grade, W0/1; shock stage, unknown. Specimens: type specimen, 396 g plus five polished sections, *MNHNP*; main mass partly left in Niger, partly with the finder.

A 3.61 kg stone, labeled "Te-1", was found in 2000 March, probably on the same expedition noted above, and is reported by J. Otto (*Frei*) to have been found in the Tenere Desert at 20°45.8' N, 10°26.5' E, and is probably paired with Tafassasset. Classification (J. Otto and A. Ruh, *Frei*): a primitive achondrite; partly covered with black fusion crust; shows a recrystallization texture with abundant 120° triple junctions dominated by olivine (56 vol%, 100–700 μm, $Fa_{28.7}$, 0.06 wt% CaO) and poikilitic orthopyroxene (23 vol%, up to 3 mm, $Fs_{25.4}Wo_{3.6}$) with exsolved clinopyroxene ($Fs_{12.7}Wo_{39.7}$); Fe-Ni metal is irregularly distributed (~10 vol%, up to 5 mm); poikilitic plagioclase occurs in interstices (6.5 vol%, $An_{38.5}Or_{3.7}$); troilite (~3.5 vol%, 0.01 wt% Ni); chromite (~1 vol%, Fe/(Fe + Mg) = 0.817, Cr/(Cr + Al) = 0.818). Oxygen isotopes (R. Clayton and T. Mayeda, *UChi*): $\delta^{17}O$ = –0.85‰, $\delta^{18}O$ = +1.70‰, different from other achondrites. Noble gases (L. Schultz, *MPI*): data compatible with those of brachinites; exposure age is ~45 Ma. Shock stage, S1/2; weathering grade, W0. Specimens: main mass with Christian Stehlin, Basel; type specimen, 30.2 g and thin section, *Frei*.

Thiel Mountains (TIL) 85° S, 94° W
(Nine meteorites)
Antarctica
Found January 2000

Table 8 reports nine meteorite specimens found in blue ice regions of Moulton Escarpment in the Thiel Mountains region of Antarctica. Specimens were collected by various members of the Planetary Studies Foundation's Antarctica 2000 expedition, 2000 January 12–15. Analyses were by Gregory A. Jerman, *MSFC*; classification by Paul Sipiera, *Harper*. The entire masses, reference specimens and probe sections reside at *PSF*.

Thiel Mountains (TIL) 99002 85º9.630' S, 94º34.207' W
Antarctica
Found 2000 January 12
Primitive achondrite (acapulcoite)

A fresh 44.3 g black stone completely covered by fusion crust was recovered on blue ice at the Moulton Escarpment by Owen K. Garriott during a systematic search for meteorites conducted by *PSF*. Classification and mineralogy (P. Sipiera, *Harper*; G. Jerman, *MSFC*; A. Patzer, *UAz*): has a cumulate texture; metal is interstitial to coarse silicates; olivine, $Fa_{9.2}$ (range $Fa_{4.8–10.6}$); augite ($Fs_4Wo_{41–46}$); low Ca-pyroxene ($Fs_{9–11}En_{89–91}$); plagioclase ($An_{15–18}Ab_{78–82}$), Fe-Ni metal, troilite, chromite, and apatite; with abundant 120° triple point junctions. shock stage, S1; weathering grade, W1. The meteorite is mineralogically similar to Graves Nunataks (GRA) 98028 but larger grain size (300–400 μm) than GRA 98028 (50–100 μm). Specimens: all at *PSF*.

Towada 40°33' N, 141°14' E
Aomori, Japan
Found 1997 late April
Ordinary chondrite (H6)

A stone of 53.5 g was found outside a barn, beneath a hole in the eaves, by Mr. K. Ishikura. The meteorite probably fell between 1985, when the barn was built, and 1992, based on ^{22}Na abundance being below detection (S. Yoneda, *NSMT*). Mineralogy (A. Okada, *RIKEN*; S. Yoneda, *NSMT*): olivine, $Fa_{19–20}$; pyroxene, $Fs_{17–19}$; CaO, 0.6–0.9%; slightly weathered. Chemistry (Y. Oura and M. Ebihara, *TMU*): CI- and Si-normalised, Al = 1.03, Sc = 0.97, Ca = 0.88, Na = 0.79, As = 0.62, S = 0.21, Ir = 0.94, Co = 1.10, Au = 0.94. Oxygen isotopes (M. Kusakabe, *OkaU*): $\delta^{17}O$ = +2.64 to +2.94‰, $\delta^{18}O$ = +3.85 to +4.22‰. Cosmogenic nuclides (J. Park, R. Okazaki and K. Nagao, *UTok*): ^{21}Ne exposure age = 31 Ma. Specimens: type specimen, 9 g (8.5 g remaining), *NSMT*; main mass property of the finder and on long-term loan to Towada City Cultural Center.

Umm as Samim 001, see Oman meteorites

Undulung 66°8'20" N, 124°46'00" E
Yakutiya, Russia.
Fell 1986 September 11
Ordinary chondrite (L4)

The crew of a helicopter, while in flight, saw an object falling nearby. The object landed on a bar in the Undulung River, a right-hand tributary of the Lena River 80 km south of Zhigansk, Yakutiya, Russia. The crew immediately landed on the bar and found a small black stone, which was warm. The stone was broken into two parts of 97.7

TABLE 8. Meteorites from Thiel Mountains.

Name	Latitude (S)	Longitude (W)	Mass (g)	Pieces	Class	Shock stage	WG*	Fa (mol%)	Fs (mol%)	Comments	Info†
Thiel Mountains											
TIL 99001	85°09.910'	94°34.401'	288	1	L4	S2	A	23.86	21.16	–	Ha5
TIL 99002	85°09.630'	94°34.207'	44.3	1	Acapulcoite	–	A	9.23	9.36	*See separate entry*	Ha5
TIL 99003	85°09.824'	94°35.684'	113.8	1	H5	S2	A/B	19.32	17.06	–	Ha5
TIL 99004	85°09.807'	94°35.453'	313.4	1	L4	S3	A/B	24.13	20.74	–	Ha5
TIL 99005	85°09.775'	94°35.548'	47.7	1	LL5	S3	A/B	28.98	23.9	–	Ha5
TIL 99006	85°09.794'	94°34.792'	31	1	H6	S3	B	18.04	15.87	–	Ha5
TIL 99007	85°09.649'	94°36.942'	51.9	1	L4	S2/3	B	24.16	20.44	–	Ha5
TIL 99008	85°09.662'	94°35.847'	147.5	1	H6	S2	B	18.49	17.06	–	Ha5
TIL 99009	85°09.329'	94°32.812'	302.9	1	L5	S4	A/B	24.11	20.85	–	Ha5

*See *Meteorite Bulletin No.* 79 (Grossman and Score, 1996) for explanation.
†See "Abbreviations for Analysts and Specimen Locations" after References.

and 15.7 g. Mineralogy and classification (A. Kopylova, *YIGS*; M. A. Nazarov, S. Afanasiev, *Vernad*): fusion crust is well developed; olivine, $Fa_{26.3}$; pyroxene, $Fs_{18.1}$; shock stage, S1; weathering grade, W0. Specimens: type specimens, 15.7 g, *Vernad*; 97.7 g *YIGS*.

Uruaçu 14°32' S, 48°46' W

Goiás, Brazil
Found 1992
Iron (IAB)

Four masses have been recovered: (1) 29 kg, (2) 25.2 kg, (3) 300 g, and (4) 18 kg, on the property of Mr. Wilson Rezende. Mass (1) was found by a cattleman in 1992, masses (2) and (3) were found in 1994 and 1999 respectively by Célio Rezende, and mass (4) by miners prospecting for gold in 2000. Classification (M. E. Zucolotto, *MNRJ*; J. Wasson *UCLA*): cohenite-schreibersite-rich iron. Bulk composition: Co = 0.46%, Ni = 6.43%, Ga = 89.6 ppm, As = 11.6 ppm, Ir = 3.36 ppm, Au = 1.46 ppm. The composition is indistinguishable from Campo del Cielo. Specimens: type specimen, mass (2), *MNRJ*, Brazil; main mass: Mr. Carvalho, mass (1) and (4).

Viksdalen 61°02' N, 06°03' E

Norway
Found 1992 July 4
Achondrite (eucrite)

Fragments of a single 470 g stone were found by Steffan Hatlestad, a 12-year-old boy, while walking in the mountains. Mineralogy and classification (G. Raade, *UOslo*): the meteorite is a breccia with relic primary gabbroic textures. The main minerals are plagioclase (with undulatory extinction) and pyroxene (low-Ca pigeonite). They occur as angular clasts (0.05 to 0.7 mm) in a fine-grained groundmass; subrounded pyroxene grains may be up to 1.2 mm. Rounded clasts 2–3 mm in size show coarse ophitic to subophitic (gabbroic) textures. Accessory minerals are silica, ilmenite, titanian chromite, and troilite. Isolated plagioclase clasts and plagioclase laths from the larger, gabbroic clasts have similar composition, An_{86} (mean of three analyses). Low Ca-pyroxene has a composition of $Fs_{59}Wo_2$. Exsolved augite lamellae vary in composition from $Fs_{26}Wo_{44}$ to $Fs_{31}Wo_{36}$. Scanning an exsolved pyroxene grain gave a bulk composition of $Fs_{44}Wo_{21}$. The host pyroxene has small inclusions of troilite, ilmenite, or plagioclase. Weathering grade: W0. Chemical composition (G. Raade, *UOslo*): SiO_2 = 49.03%, Al_2O_3 = 11.58%, Fe_2O_3 = 0.82%, FeO = 17.85%, MnO = 0.53%, MgO = 7.12%, CaO = 9.85%, Na_2O = 0.58%, K_2O = 0.05%, TiO_2 = 0.92%, P_2O_5 = 0.07%. Specimens: main mass and type specimen, 459 g plus thin section, *UOslo*.

Wernigerode 51°51' N, 10°47' E

Sachsen-Anhalt, Germany
Found 1970
Ordinary chondrite (H5)

An individual stone of 24.3 g with complete fusion crust was found in the attic of a house below a roof damaged in the Second World War. It probably fell between 1945 and 1970 after the roof damage occurred. Mineralogy and classification (F. Wlotzka, *MPI*; M. Kurz, *Kurz*): olivine $Fa_{17.0}$, pyroxene $Fs_{14.6}Wo_1$. Contains solar rare gases, cosmic-ray exposure age ~7 Ma (L. Schultz, *MPI*). Weathering grade, W0, consistent with fresh fall. Shock stage, S2. Specimens: type specimen, 3 g and thin section, *MPI*; main mass is property of anonymous finder, on loan to the Gothenburg Observatory, 01445 Radebeul, Germany.

Yafa 13°42'40" N, 45°10'12" E

Yafa province, Yemen
Fell 2000 July 15, 14:45 h GMT
Ordinary chondrite (H5)

A main mass of ~5 kg and a second mass of ~700 g are known. Many witnesses reported a fireball over a wide area from Ma'raban to Aden (some 95 km to the south-southwest) to Ad Dhala (70 km west-southwest of Ma'raban) and many in the region reported associated sound effects. The larger stone was collected on the day of the fall, probably within 2–3 h of the event. The smaller stone was collected the following day. Classification and analysis (G. C. Wilson, *UToron*): Macroscopically, the fall is a breccia, with well-developed fusion crust and a pale interior. Olivine, $Fa_{19.4}$; orthopyroxene, $En_{81.3}Fs_{17.3}Wo_{1.4}$; kamacite, 0.56 wt% Co and 6.78 wt% Ni. Tetrataenite, averaging 50.3 wt% Ni, is an accessory mineral. Shock stage, S2; negligible degree of weathering, consistent with recent fall. See also Wilson and Rucklidge (2001). Specimens: type specimen, 600 g, *Yemen*; 93 g and polished thin section, *GSC*; main mass believed to reside with the finders (as of 2001 September 28).

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ADDRESSES OF METEORITE COLLECTIONS AND RESEARCH FACILITIES

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AShaw: Allen Shaw, P.O. Box 13166, Edwardsville, KS 66113, USA.
Bart: Bartoschewitz Meteorite Laboratory, Lehmweg 53, D-38518 Gifhorn, Germany.
Bessey: Dean Bessey, Box 6306, Stn A, Toronto, Ontario M5W 1P7, Canada.
Chiba: Chiba Institute of Technology, Tsudanuma, Narashino, Chiba 275-0016, Japan.
Cott: M. Cottingham Meteorite Collection, P.O. Box 727, Silver City, NM 88062, USA.
CRAAG: Astronomy and Astrophysics and Geophysics Research Center, Algiers, Algeria.
ENSL: Ecole Normale Supérieure de Lyon, Laboratoire de Sciences de la Terre, 46 allée d'Italie, F-69364 Lyon Cedex, France.
Farmer: Mike Farmer, 1001 W. St Mary, Tucson, AZ 85745, USA.
Fectay: Bruno Fectay and Carine Bidaut, La Memoire de la Terre SARL, Rue de la Mairie, F-39240 La Boissiere, France.
Fernlea: Mr. Rob Elliott, Fernlea Meteorites, Milton of Balgonie, Fife. KY7 6PY, Scotland, UK.
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GSC: National Meteorite Collection, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada.
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IGG: Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100101, China.
IPGP: Institute de Physique du Globe, Place Jussieu, F-75252 Paris Cedex 05, France.
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Milano: Museo Civico di Storia Naturale di Milano, Corso Venezia, 55, I-20121 Milano, Italy.
MNA-SI: Museo Nazionale dell'Antartide, Università di Siena, Via Laterina 8, I-53100 Siena, Italy.
MNB: Museum für Naturkunde, Invalidenstrasse 43, D-10115 Berlin, Germany.
MNHNP: Museum National d'Histoire Naturelle, Paris, France.
MNRJ: Museu Nacional, Quinta da Boa Vista, Rio de Janeiro, CEP 20940-040 Brazil.
MPI: Max Planck Institut für Chemie, Mainz, Germany.
MSFC: NASA/George C. Marshall Space Flight Center, Huntsville, AL 35812, USA.
MSUR: Department of Geology, Moscow State University, Vorobjovy Gory, Moscow, 119899, Russia.
Mün: Institut für Planetologie, Wilhelm-Klemm-Str. 10, D-48149 Münster, Germany.
NAOC: National Astronomical Observatories, Chinese Academy of Sciences, Beijing 100012, China.
NAU: Northern Arizona University, Flagstaff, AZ 86011, USA.
NHM: The Natural History Museum, London, UK.
NHMV: Naturhistorisches Museum, Postfach 417, A-1014 Wien, Austria.
NSMT: National Science Museum, 3-23-1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan.
NU: Department of Earth Sciences, Nanjing University, Nanjing 210008, China.
OAM: Osservatorio Astronomico e Museo "Giorgio Abetti" in San Giovanni in Persiceto, Bologna, Italy.
OkaU: Institute for Study of the Earth's Interior, Okayama University, Misasa Tottori 682-0193, Japan.
OPGC: Observatoire de Physique du Globe de Clermont-Ferrand, 5 rue Kessler, F-63000 Clermont Ferrand, France.
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SCIAM: Service Commun d'Imageries et d'Analyses Microscopiques, 2 Rue Haute de Reculée, F-49045 Angers Cedex, France.
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Yemen: Geological Survey of Yemen, c/o Dr. M. A. Mattash, Geological Museum of the Mineral Resources and Geological Survey Corporation, Maalla-Aden, P.O. Box 5877, Yemen.
YIGS: Yakutsk Institute of Geological Sciences, Russian Academy of Sciences, Siberian Division, 677891, GSP, Yakutsk, prospect Lenina, 39, Russia.

ABBREVIATIONS FOR ANALYSTS AND SPECIMEN LOCATIONS

These abbreviations are used in the "Info" columns of tables in the *Meteoritical Bulletin*. Unless specifically noted, all type specimens are at the home institution of the first listed analyst and main masses are with anonymous finders.

Az1 = classified by *UAz*.
Az2 = D. H. Hill, A. Patzer and W. V. Boynton (*UAz*).
Be1 = classified by A. Greshake (*MNB*) and M. Kurz (*Kurz*); type specimen, *MNB*.
Be2 = classified by A. Greshake (*MNB*).
Chi1 = classified by Yukio Ikeda and M. Kimura, *Ibaraki* and H.Takeda, *Chiba*.
Chi2 = classified by H. Takeda, *Chiba* and T. Ishii and M. Ohtsuki, *UTok*.
CU1 = classified by Michael Weisberg (*KCCU*). Specimens: type specimen, *AMNH*; main mass, anonymous dealer.
Frei1 = classified by J. Otto and A. Ruh (*Frei*); purchased by S. Haberer; type specimens and thin sections, *Frei*; main mass, S. Haberer.
Frei2 = classified by J. Otto and A. Ruh (*Frei*).
Ha1 = classified by A. Patzer, D. Hill, W. Boyton (*UAz*) and P. Sipiera (*Harper*); found by *Pelisson*. Specimens: type specimen, *PSF*; analytical samples, *UAz*, *UChi, MPI*; main mass, *Pelisson*.
Ha2 = classified by P. Sipiera (*Harper*); found by *Pelisson;* type specimen, *PSF*; main mass, *Pelisson*.
Ha3 = classified by P. Sipiera (*Harper*); purchased by *Radomsky*. Specimens: type specimen, *PSF*; main mass, *Radomsky.*
Ha4 = classified by P. Sipiera (*Harper*); type specimens, 120 g, *PSF,* and 240 g, *NHM*; main mass, *Fernlea*.
Ha5 = classified by P. Sipiera (*Harper*), G. Jerman (*MSFC)* and A. Patzer (*UAz)*. Specimens, *PSF*.
JSC1 = classified by M. Zolensky (*JSC*); puchased by *Bessey*. Specimens: type specimen, *SI*, main mass, *Bessey*.
Kg1 = classified by M. Killgore; specimens: types specimen: *UAz*; main mass *SWML*.
LA1 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, anonymous dealers.
LA2 = classified by A. Rubin (*UCLA*); puchased by *Bessey*. Specimens: type specimen, *UCLA*, main mass, *Bessey*.
LA3 = classified by A. Rubin and H. Imai (*UCLA*); purchased by *Bessey*. Specimens: type specimen, *UCLA*; main mass, *Gessler*.
LA4 = classified by A. Rubin (*UCLA*); purchased by M. Farmer (*Farmer*) and M. Cottingham (*Cott*) in 8/2000. Specimens: type specimen, *UCLA*; main mass, *Hartman*.
LA5 = classified by A. Rubin (*UCLA*); type specimen, *UCLA*; purchased by *Bessey* in 11/2000; main mass, *Verish*.
LA6 = classified by A. Rubin (*UCLA*); type specimen, *UCLA*; purchased by *Farmer* and *Cott* in 9/2000; main mass, *Verish*.
LA7 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, R. Matson.
LA8 = classified by J. Wasson (*UCLA*). Specimens: type specimen, *UCLA*; main mass, anonymous dealers.
LA9 = classified by A. Rubin *(UCLA)*; purchased by G. and A. Hupe (*Hupe*). Specimens: type specimen, *UCLA*; main mass, *Hupe.*
LA10 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, purchaser.
LA11 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, Duane Penshorn.
LA12 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, *Gessler*.
LA13 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, *Verish*.
LA14 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, *Tobin*.
LA15 = classified by A. Rubin (*UCLA*). Specimens: type specimen, *UCLA*; main mass, *Harris*.
LA16 = classified by A. Rubin and Imai (*UCLA*). Specimens: type specimen, *UCLA*; main mass, *Gessler*.
MP1 = classified by F. Wlotzka (*MPI*); type specimens, *MPI*.
MP2 = classified by F. Wlotzka (*MPI*) and M. Kurz (*Kurz*); type specimens, *MPI*.
MP3 = classified by F. Wlotzka (*MPI*) and M. Kurz (*Kurz*); type specimen, MPI; main mass, *Kurz*.
MP4 = classified by F. Wlotzka (*MPI*); type specimen, *Mün*, and 3.6 g *MPI*; main mass, *Bart*.
MP5 = classified by F. Wlotzka (*MPI*) and Rainer Bartoschewitz (*Bart*); type specimen, *MPI*; main mass *Bart*.
Mün1 = classified by A. Sokol and A. Bischoff (*Mün*); type specimens, *Mün*.
Mün2 = classified by A. Bischoff (*Mün*) and R. Bartoschewitz (*Bart*); type specimens, *Mün*; main mass, *Bart*.
NAU1 = classified by T. Bunch and J. Wittke (*NAU*); type specimen, *NAU*; main mass, buyer.
OU1-2 = classified by A. Sexton, R. Greenwood and P. Bland (*OU*); type specimens, 1 = *OU*; 2 = *OU and ENSL*.
Sn1-2 = classified by A. Burroni and L. Folco (*MNA-SI*); type specimen, 1 = *MNA-SI*, 2 = *OAM*; main mass with finder except DaG 877, HaH 293 and HaH 294.
UHd1 = classified by R. Altherr (*Heidel*); type specimen, 36 g, *Heidel*, main mass, anonymous dealer.
UTok1 = classified by T. Mikouchi and K. Kaneda (*UTok*); type specimens, *UTok*, main mass, unknown.
Vn1 = classified by F. Brandstätter (*NHMV*); purchased by A. Pani (*Pani*). Specimens: type specimen, *NHMV*; main mass, *Pani.*
Vr1 = classified by S. V. Afanasiev and N. Kononkova (*Vernad*); type specimen, *Vernad*; main mass, unknown.
Vr2 = classified by S. V. Afanasiev (*Vernad*); purchased by *Bessey*. Specimens: type specimen, *Vernad*; main mass, *Bessey*.
Vr3 = classified by S. V. Afanasiev (*Vernad*); type specimen, *Vernad*; main mass, S. V. Afanasiev.
Vr4 = classified by D. Badyukuv (*Vernad*); type specimen, *Vernad*; main mass, unknown.
Vr5 = classified by S. Afanasiev, N. Kononkova and A. I. Ivliev (*Vernad*).
Vr6 = classified by M. A. Ivanova, M. A. Nazarov (*Vernad*) and L. Taylor, A. Patchen (*UTenn*).
Vr7 = classified by S. Afanasiev (*Vernad*) and A. Ulianov (*MSUR*); similar sized specimens also at *MSUR*.
Vr8 = classified by C. Lorenz (*Vernad*).
Vr9 = classified by M. Nazarov (*Vernad*) and L. Taylor (*UTenn*).

APPENDIX 1. Recently described meteorites from ANSMET.†

Name‡	Class§	Mass	Weath	%Fa	%Fs	Pairing	Ice¶	Ref
BTN 00300	Eu "ub"	124.6	A	–	28–49	–	25	24(2)
DRP 00200	IIAB	10000.0	B	–	–	78001	–	24(2)
DRP 00201	IIAB	2689.4	B	–	–	78001	–	24(2)
MET 00400	IIIAB	4583.8	B	–	–	(23)	–	24(2)
MET 00401	IIIAB	205.1	B	–	–	00400	–	24(2)
MET 00402	IIIAB	82.6	B	–	–	00400	–	24(2)
MET 00403	IIIAB	58.5	B	–	–	00400	–	24(2)
MET 00404	IIIAB	20.7	B	–	–	00400	–	24(2)
MET 00405	IIIAB	17.0	B	–	–	00400	–	24(2)
MET 00406	IIIAB	16.1	B	–	–	00400	–	24(2)
MET 00407	IIIAB	5.4	B	–	–	00400	–	24(2)
MET 00408	IIIAB	18.1	B	–	–	00400	–	24(2)
MET 00409	IIIAB	14.0	B	–	–	00400	–	24(2)
MET 00410	IIIAB	3.0	B	–	–	00400	–	24(2)
MET 00411	IIIAB	3.2	B	–	–	00400	–	24(2)
MET 00412	IIIAB	8.7	B	–	–	00400	–	24(2)
MET 00413	IIIAB	3.8	B	–	–	00400	–	24(2)
MET 00414	IIIAB	4.8	B	–	–	00400	–	24(2)
MET 00415	IIIAB	5.2	B	–	–	00400	–	24(2)
MET 00416	IIIAB	4.4	B	–	–	00400	–	24(2)
MET 00417	IIIAB	7.8	B	–	–	00400	–	24(2)
MET 00418	IIIAB	4.8	B	–	–	00400	–	24(2)
MET 00419	IIIAB	9.0	B	–	–	00400	–	24(2)
MET 00420	IIIAB	6.3	B	–	–	00400	–	24(2)
MET 00421	IIIAB	6.7	B	–	–	00400	–	24(2)
MET 00422	Diog	201.5	A/B	–	22	–	–	24(2)
MET 00423	How	79.4	A/B	–	20–53	–	–	24(2)
MET 00424	Diog	98.9	B	29	27	–	–	24(2)
MET 00425	Diog	118.3	B/C	–	15	–	–	24(2)
MET 00426	CR2	31.3	B	1–32	1–4	–	–	24(2)
MET 00427	How	18.6	B	–	14–41	–	–	24(2)
MET 00428	Iron ung	45.8	B	–	–	–	–	24(2)
MET 00431	CM2	23.4	BE	0–31	7	(4)	–	24(2)
MET 00432	CM2	38.9	B	0–1	–	–	26	24(2)
MET 00433	CM2	10.9	BE	0–8	–	00431	–	24(2)
MET 00434	CM2	6.1	BE	0–6	3	00431	–	24(2)
MET 00435	CM2	2.4	BE	1–21	0–2	00431	–	24(2)
MET 00436	Diog	1765.6	B/C	–	26	–	–	24(2)
MET 00437	L6	2685.3	B/C	25	21	–	–	24(2)
MET 00438	L6	3747.4	B	24	19	–	–	24(2)
MET 00439	LL5	2601.9	A	–	–	–	–	24(2)
MET 00440	L5	1624.7	B/C	–	–	–	26	24(2)
MET 00441	L5	1299.6	A/B	24	19	–	–	24(2)
MET 00442	H4	1149.2	C	20	11–19	–	–	24(2)
MET 00443	L5	872.0	B/C	–	–	–	–	24(2)
MET 00444	LL6	1469.6	C	–	–	–	–	24(2)
MET 00445	L5	1631.5	C	24	20	–	–	24(2)
MET 00446	L5	1181.3	B/C	–	–	–	–	24(2)
MET 00447	L5	1231.6	C	–	–	–	–	24(2)
MET 00448	L5	1148.7	A/B	–	–	–	–	24(2)
MET 00859	IIIAB	33.9	B	–	–	00400	–	24(2)
QUE 99013	L5	814.2	C	–	–	–	24	24(2)
QUE 99016	LL5	2166.4	B	–	–	–	F	24(2)
QUE 99017	LL5	4999.0	B	–	–	–	F	24(2)
QUE 99023	H5	1933.0	C	–	–	–	Y	24(2)
QUE 99024	H6	2074.0	B	18	15	–	F	24(2)
QUE 99025	LL5	747.2	B/C	–	–	–	F	24(2)
QUE 99031	H5	189.1	C	–	–	–	20	24(2)
QUE 99032	L5	214.1	B/C	–	–	–	20	24(2)
QUE 99034	L6	198.3	B/C	–	–	–	Y	24(2)
QUE 99035	LL5	57.8	B	–	–	–	20	24(2)
QUE 99036	LL5	45.5	B	–	–	–	S	24(2)
QUE 99037	L5	101.9	B	–	–	–	20	24(2)
QUE 99039	L5	244.1	B/C	–	–	–	F	24(2)
QUE 99089	L4	584.6	B	25	21	–	F	24(2)
QUE 99090	L5	235.9	B	–	–	–	F	24(2)
QUE 99091	LL5	356.8	B	–	–	–	F	24(2)
QUE 99092	L5	230.0	B	–	–	–	F	24(2)
QUE 99093	LL5	336.1	B	–	–	–	F	24(2)
QUE 99094	H5	329.3	B	20	17	–	F	24(2)
QUE 99095	L5	525.9	B	–	–	–	F	24(2)
QUE 99096	H6	1029.2	C	–	–	–	F	24(2)
QUE 99097	LL6	463.0	A/B	–	–	–	F	24(2)
QUE 99098	H4	755.5	B	18	8–15	–	F	24(2)
QUE 99099	H5	173.6	B	18	15	–	F	24(2)
QUE 99110	LL5	7.5	A	–	–	–	F	24(2)
QUE 99111	LL5	1.85	A	–	–	–	F	24(2)
QUE 99112	LL5	23.2	A	–	–	–	F	24(2)
QUE 99113	CM2	0.58	A	2–13	2–12	–	F	24(2)
QUE 99114	LL5	29.9	C	–	–	–	F	24(2)
QUE 99115	LL5	1.25	B	–	–	–	F	24(2)
QUE 99116	LL5	30.8	B	–	–	–	F	24(2)
QUE 99117	LL5	21.3	B	–	–	–	F	24(2)
QUE 99118	L5	93.9	C	–	–	–	F	24(2)
QUE 99119	H5	56.9	C	–	–	–	F	24(2)
QUE 99120	LL5	7.8	B/C	–	–	–	F	24(2)
QUE 99121	L5	22.6	B/C	–	–	–	20	24(2)
QUE 99122	E-ung	19.9	C	–	0–1	94204	20	24(2)
QUE 99123	LL5	5.4	B	–	–	–	F	24(2)
QUE 99124	L4	23.0	B/C	–	–	–	20	24(2)
QUE 99125	L5	54.6	C	25	21	–	F	24(2)
QUE 99126	LL5	14.7	B	–	–	–	F	24(2)
QUE 99127	LL5	8.4	B	–	–	–	F	24(2)
QUE 99128	L5	20.5	C	–	–	–	20	24(2)
QUE 99129	LL5	0.50	B	–	–	–	F	24(2)
QUE 99130	LL5	13.9	A/B	–	–	–	F	24(2)
QUE 99131	LL5	4.7	B	–	–	–	F	24(2)
QUE 99132	LL5	1.45	B	–	–	–	F	24(2)
QUE 99133	LL5	5.0	B	–	–	–	F	24(2)
QUE 99134	Metal	0.39	A/B	25	23	–	F	24(2)
QUE 99135	LL5	2.7	C	–	–	–	F	24(2)
QUE 99136	LL5	3.5	B	–	–	–	F	24(2)
QUE 99137	LL5	5.9	B/C	–	–	–	F	24(2)
QUE 99138	LL5	1.05	B	–	–	–	F	24(2)
QUE 99139	LL5	4.2	B/C	–	–	–	F	24(2)
QUE 99140	LL5	1.05	B	–	–	–	F	24(2)
QUE 99141	LL5	3.1	B	–	–	–	F	24(2)
QUE 99142	LL5	0.31	A/B	–	–	–	F	24(2)
QUE 99143	LL5	1.57	B	–	–	–	F	24(2)
QUE 99144	LL5	20.0	A/B	–	–	–	F	24(2)
QUE 99145	L5	2.0	C	24	20	–	F	24(2)
QUE 99146	LL5	7.5	A/B	–	–	–	F	24(2)
QUE 99147	LL5	5.5	A/B	–	–	–	F	24(2)
QUE 99148	H6	21.8	C	19	17	–	F	24(2)
QUE 99149	LL5	1.30	B	–	–	–	F	24(2)
QUE 99150	LL5	0.44	B	–	–	–	F	24(2)
QUE 99151	LL5	2.8	B/C	27	22	–	S	24(2)
QUE 99152	LL5	15.7	B	–	–	–	F	24(2)
QUE 99153	LL5	6.0	B	–	–	–	F	24(2)
QUE 99154	LL5	3.4	B	–	–	–	F	24(2)
QUE 99155	LL5	2.2	B	–	–	–	F	24(2)
QUE 99156	LL5	3.0	B	–	–	–	F	24(2)
QUE 99157	E-ung	10.7	C	–	0–1	94204	20	24(2)
QUE 99158	E-ung	31.0	C	–	0–1	94204	20	24(2)
QUE 99159	L5	2.4	C	–	–	–	Q	24(2)
QUE 99160	LL5	16.4	B/C	–	–	–	F	24(2)
QUE 99161	L5	3.8	B	–	–	–	F	24(2)
QUE 99162	H5	1.01	C	19	16	–	F	24(2)
QUE 99163	LL5	4.4	B	–	–	–	F	24(2)
QUE 99164	LL5	0.74	B	–	–	–	F	24(2)
QUE 99165	LL5	25.9	B	–	–	–	F	24(2)
QUE 99166	LL5	20.0	B	–	–	–	F	24(2)
QUE 99167	LL5	1.94	B	–	–	–	F	24(2)
QUE 99168	LL5	6.1	B	–	–	–	F	24(2)
QUE 99169	LL5	2.5	B	–	–	–	F	24(2)
QUE 99170	LL5	23.6	B	–	–	–	F	24(2)
QUE 99171	LL5	19.3	B	–	–	–	F	24(2)
QUE 99172	LL5	24.7	A/B	–	–	–	F	24(2)
QUE 99174	L5	39.3	B/C	–	–	–	F	24(2)
QUE 99175	L5	63.3	B/C	–	–	–	F	24(2)
QUE 99176	LL5	27.4	B	–	–	–	F	24(2)
QUE 99177	CR2	43.6	BE	1–31	1–7	–	20	24(2)
QUE 99178	LL5	19.4	B	–	–	–	F	24(2)
QUE 99179	L5	41.0	C	–	–	–	F	24(2)
QUE 99180	LL5	6.0	B	–	–	–	F	24(2)
QUE 99181	LL5	1.69	B	–	–	–	F	24(2)
QUE 99182	LL5	10.7	B	–	–	–	F	24(2)
QUE 99183	LL5	10.2	B	–	–	–	F	24(2)

APPENDIX 1. *Continued*.

Name‡	Class§	Mass	Weath	%Fa	%Fs	Pairing	Ice¶	Ref
QUE 99184	LL5	5.1	B	–	–	–	F	24(2)
QUE 99185	LL5	0.52	B	–	–	–	F	24(2)
QUE 99186	L5	3.7	C	–	–	–	F	24(2)
QUE 99187	LL6	1.97	C	–	–	–	F	24(2)
QUE 99188	LL5	0.48	B/C	–	–	–	F	24(2)
QUE 99189	LL5	1.68	B	–	–	–	F	24(2)
QUE 99190	L5	123.3	B/C	–	–	–	F	24(2)
QUE 99191	L6	100.0	B/C	–	–	–	F	24(2)
QUE 99192	H5	139.3	C	19	17	–	F	24(2)
QUE 99193	H5	181.6	B/C	19	17	–	F	24(2)
QUE 99194	L5	205.8	C	–	–	–	F	24(2)
QUE 99195	H6	234.7	C	20	17	–	F	24(2)
QUE 99196	LL5	77.6	B	–	–	–	F	24(2)
QUE 99197	H6	24.8	C	–	–	–	22	24(2)
QUE 99198	H5	36.9	C	19	16	–	22	24(2)
QUE 99199	LL5	30.2	B	–	–	–	F	24(2)
QUE 99200	LL5	1.10	B	–	–	–	F	24(2)
QUE 99201	LL5	0.17	B	–	–	–	F	24(2)
QUE 99202	L5	1.89	C	–	–	–	22	24(2)
QUE 99203	H5	2.0	C	20	17	–	22	24(2)
QUE 99204	LL5	26.7	B	–	–	–	F	24(2)
QUE 99205	LL5	1.15	B/C	–	–	–	F	24(2)
QUE 99206	LL5	1.69	C	–	–	–	22	24(2)
QUE 99207	LL5	0.71	B	–	–	–	F	24(2)
QUE 99208	LL5	3.8	B	–	–	–	F	24(2)
QUE 99209	LL5	1.22	C	–	–	–	22	24(2)
QUE 99210	LL5	8.6	B	–	–	–	F	24(2)
QUE 99211	LL5	0.47	B	–	–	–	F	24(2)
QUE 99212	LL5	8.7	B	–	–	–	F	24(2)
QUE 99213	LL5	1.16	B	–	–	–	F	24(2)
QUE 99214	LL5	1.18	B	–	–	–	F	24(2)
QUE 99215	LL5	0.19	B/C	–	–	–	F	24(2)
QUE 99216	LL5	1.93	B/C	–	–	–	F	24(2)
QUE 99217	LL5	3.4	B	–	–	–	F	24(2)
QUE 99218	LL5	0.26	B	–	–	–	F	24(2)
QUE 99219	LL5	0.38	B	–	–	–	F	24(2)
QUE 99220	LL5	16.1	A/B	–	–	–	F	24(2)
QUE 99221	LL5	8.9	B	–	–	–	F	24(2)
QUE 99222	LL5	9.6	B	–	–	–	F	24(2)
QUE 99223	LL5	0.64	B/C	–	–	–	F	24(2)
QUE 99224	LL5	2.2	B/C	–	–	–	F	24(2)
QUE 99225	LL5	0.34	B/C	–	–	–	F	24(2)
QUE 99226	LL5	0.62	B	–	–	–	F	24(2)
QUE 99227	LL5	0.48	B	–	–	–	F	24(2)
QUE 99228	LL5	0.48	B	–	–	–	F	24(2)
QUE 99229	LL5	0.80	B	–	–	–	F	24(2)
QUE 99230	H6	8.1	C	19	16	–	22	24(2)
QUE 99231	Diog	1.50	A	–	20	–	S	24(2)
QUE 99232	LL5	1.50	B	–	–	–	F	24(2)
QUE 99233	LL5	0.81	B	–	–	–	F	24(2)
QUE 99234	LL5	2.4	B	–	–	–	F	24(2)
QUE 99235	H5	6.1	C	–	–	–	22	24(2)
QUE 99236	H5	0.86	C	–	–	–	S	24(2)
QUE 99237	LL6	2.3	B	–	–	–	F	24(2)
QUE 99238	LL5	2.4	B/C	–	–	–	S	24(2)
QUE 99239	L5	18.4	B	–	–	–	F	24(2)
QUE 99240	LL5	13.0	B/C	–	–	–	F	24(2)
QUE 99241	LL5	3.2	A	–	–	–	F	24(2)
QUE 99242	LL5	1.54	B	–	–	–	F	24(2)
QUE 99243	LL5	6.8	B	–	–	–	F	24(2)
QUE 99244	LL5	21.2	A/B	–	–	–	F	24(2)
QUE 99245	LL5	32.6	B/C	–	–	–	F	24(2)
QUE 99246	H6	36.0	C	–	–	–	F	24(2)
QUE 99247	H6	42.0	C	–	–	–	F	24(2)
QUE 99248	LL5	14.4	A/B	–	–	–	F	24(2)
QUE 99249	LL5	1.77	B	–	–	–	F	24(2)
QUE 99250	LL5	6.2	B	–	–	–	F	24(2)
QUE 99251	LL5	17.5	A/B	–	–	–	F	24(2)
QUE 99252	LL5	0.35	B/C	–	–	–	F	24(2)
QUE 99253	LL5	0.28	B/C	–	–	–	F	24(2)
QUE 99254	H5	0.33	C	–	–	–	F	24(2)
QUE 99255	LL5	1.04	B	–	–	–	F	24(2)
QUE 99256	LL5	0.83	B	–	–	–	F	24(2)
QUE 99257	LL5	4.1	B	–	–	–	F	24(2)
QUE 99258	LL5	1.56	A/B	–	–	–	F	24(2)
QUE 99259	LL6	1.19	B/C	–	–	–	F	24(2)
QUE 99260	LL5	4.6	B	–	–	–	F	24(2)
QUE 99261	LL5	2.8	B	–	–	–	F	24(2)
QUE 99262	LL5	4.1	B	–	–	–	F	24(2)
QUE 99263	LL5	3.8	B/C	–	–	–	F	24(2)
QUE 99264	L5	10.9	C	–	–	–	F	24(2)
QUE 99265	LL5	7.0	B	–	–	–	F	24(2)
QUE 99266	LL5	0.74	B	–	–	–	F	24(2)
QUE 99267	LL5	4.6	B	–	–	–	F	24(2)
QUE 99268	LL5	1.44	B	–	–	–	F	24(2)
QUE 99269	LL5	1.64	B/C	–	–	–	F	24(2)
QUE 99270	LL5	1.52	B	–	–	–	F	24(2)
QUE 99271	LL5	1.79	B	–	–	–	F	24(2)
QUE 99272	LL5	2.7	B	–	–	–	F	24(2)
QUE 99273	LL5	5.6	B	–	–	–	F	24(2)
QUE 99274	LL5	1.69	B	–	–	–	F	24(2)
QUE 99275	LL5	9.8	B	–	–	–	F	24(2)
QUE 99276	LL5	6.4	C	–	–	–	F	24(2)
QUE 99277	LL5	1.85	B	–	–	–	F	24(2)
QUE 99278	LL5	7.9	C	–	–	–	F	24(2)
QUE 99279	LL5	7.1	B/C	–	–	–	F	24(2)
QUE 99280	LL5	0.64	B	–	–	–	F	24(2)
QUE 99281	LL5	1.48	B/C	–	–	–	F	24(2)
QUE 99282	LL5	18.5	B/C	–	–	–	F	24(2)
QUE 99283	LL5	2.2	B/C	–	–	–	F	24(2)
QUE 99284	LL5	2.8	B	–	–	–	F	24(2)
QUE 99285	LL5	11.5	A/B	–	–	–	F	24(2)
QUE 99286	LL5	1.86	B	–	–	–	F	24(2)
QUE 99287	LL5	9.3	A/B	–	–	–	F	24(2)
QUE 99288	LL5	3.0	B/C	–	–	–	F	24(2)
QUE 99290	LL5	2.9	B	–	–	–	F	24(2)
QUE 99291	LL5	5.2	B	–	–	–	F	24(2)
QUE 99292	LL5	3.8	B	–	–	–	F	24(2)
QUE 99293	LL5	1.76	B	–	–	–	F	24(2)
QUE 99294	L5	0.34	C	–	–	–	F	24(2)
QUE 99295	LL5	0.33	B	–	–	–	F	24(2)
QUE 99296	LL5	2.7	B	–	–	–	F	24(2)
QUE 99297	LL5	1.96	C	–	–	–	F	24(2)
QUE 99298	LL5	0.66	C	–	–	–	F	24(2)
QUE 99299	LL5	1.76	B	–	–	–	F	24(2)
QUE 99300	LL5	0.60	B	–	–	–	F	24(2)
QUE 99301	H6	10.0	C	–	–	–	V	24(2)
QUE 99302	LL5	0.57	B/C	–	–	–	V	24(2)
QUE 99303	LL5	3.7	B/C	–	–	–	F	24(2)
QUE 99304	H6	0.47	C	–	–	–	V	24(2)
QUE 99305	LL5	17.4	B/C	–	–	–	F	24(2)
QUE 99306	LL5	1.81	B/C	–	–	–	F	24(2)
QUE 99307	H6	13.8	C	–	–	–	V	24(2)
QUE 99308	H6	7.5	C	–	–	–	V	24(2)
QUE 99309	Ch ung	1.75	C	3–4	1	94411	V	24(2)
QUE 99310	H6	25.3	C	–	–	–	V	24(2)
QUE 99311	H5	98.3	C	–	–	–	V	24(2)
QUE 99312	L5	101.7	C	–	–	–	F	24(2)
QUE 99313	LL5	103.9	C	–	–	–	F	24(2)
QUE 99314	L5	101.2	B	–	–	–	F	24(2)
QUE 99315	LL5	142.3	A/B	–	–	–	F	24(2)
QUE 99316	LL5	104.0	B	–	–	–	V	24(2)
QUE 99317	LL5	145.0	B	–	–	–	W	24(2)
QUE 99318	H5	90.0	C	–	–	–	V	24(2)
QUE 99319	H5	77.9	C	–	–	–	V	24(2)
QUE 99320	LL5	17.8	B	–	–	–	F	24(2)
QUE 99321	LL5	23.7	A/B	–	–	–	F	24(2)
QUE 99322	H6	35.7	C	–	–	–	V	24(2)
QUE 99323	LL5	47.5	A/B	–	–	–	V	24(2)
QUE 99324	H6	16.3	C	–	–	–	V	24(2)
QUE 99325	LL5	52.4	A/B	–	–	–	V	24(2)
QUE 99326	H6	21.6	C	–	–	–	V	24(2)
QUE 99327	L4	29.7	C	23	19	–	V	24(2)
QUE 99328	LL5	25.7	C	–	–	–	V	24(2)
QUE 99329	H6	19.6	C	–	–	–	V	24(2)
QUE 99330	LL6	11.7	B	–	–	–	F	24(2)
QUE 99331	L4	7.0	C	22	10–18	–	F	24(2)
QUE 99332	LL5	8.7	B	–	–	–	F	24(2)

APPENDIX 1. *Continued*.

Name‡	Class§	Mass	Weath	%Fa	%Fs	Pairing	Ice¶	Ref
QUE 99333	LL5	6.2	B	–	–	–	F	24(2)
QUE 99334	LL5	1.45	B	–	–	–	F	24(2)
QUE 99335	LL5	1.12	B/C	–	–	–	F	24(2)
QUE 99336	LL5	6.7	B	–	–	–	F	24(2)
QUE 99337	LL5	1.78	B	–	–	–	F	24(2)
QUE 99338	LL5	1.40	B/C	–	–	–	F	24(2)
QUE 99339	LL5	17.1	B	–	–	–	F	24(2)
QUE 99790	LL5	8.9	B	–	–	–	F	24(2)
QUE 99791	LL5	9.6	B	–	–	–	F	24(2)
QUE 99792	LL5	9.2	B/C	–	–	–	F	24(2)
QUE 99793	LL5	1.78	B/C	–	–	–	F	24(2)
QUE 99794	LL5	1.13	B/C	–	–	–	F	24(2)
QUE 99795	LL5	2.8	B	–	–	–	F	24(2)
QUE 99796	LL5	3.8	B/C	–	–	–	F	24(2)
QUE 99797	L5	1.12	C	–	–	–	F	24(2)
QUE 99798	LL5	2.7	B	–	–	–	F	24(2)
QUE 99799	Eu "br"	8.3	B	–	23–54	–	F	24(2)
QUE 99340	LL5	2.1	B/C	–	–	–	F	25(1)
QUE 99341	LL5	3.6	B/C	–	–	–	F	25(1)
QUE 99342	CM2	1.7	Be	2–37	–	(2)	F	25(1)
QUE 99343	LL5	2.7	B/C	–	–	–	F	25(1)
QUE 99344	LL5	1.4	B/C	–	–	–	F	25(1)
QUE 99345	LL5	9.5	B/C	–	–	–	F	25(1)
QUE 99347	LL5	5.9	B/C	–	–	–	F	25(1)
QUE 99348	LL5	3.1	B/C	–	–	–	F	25(1)
QUE 99349	LL5	4.4	B/C	–	–	–	F	25(1)
QUE 99350	L5	37.7	B	–	–	–	F	25(1)
QUE 99351	LL5	24.5	A/B	–	–	–	F	25(1)
QUE 99352	H4	92.6	C	19	17	–	F	25(1)
QUE 99353	LL5	22.0	B	–	–	–	F	25(1)
QUE 99354	LL5	28.1	B	–	–	–	F	25(1)
QUE 99355	CM2	32.4	B	1–42	–	99342	F	25(1)
QUE 99356	LL5	14.5	A/B	–	–	–	F	25(1)
QUE 99357	LL5	23.7	B	–	–	–	F	25(1)
QUE 99358	LL5	36.4	B	–	–	–	F	25(1)
QUE 99359	H6	34.3	C	19	16	–	F	25(1)
QUE 99360	LL5	6.9	B	–	–	–	F	25(1)
QUE 99361	LL5	1.0	B	–	–	–	F	25(1)
QUE 99362	LL5	11.7	B	–	–	–	F	25(1)
QUE 99363	LL5	2.4	B	–	–	–	F	25(1)
QUE 99364	LL5	3.7	B	–	–	–	F	25(1)
QUE 99365	LL5	12.4	B	–	–	–	F	25(1)
QUE 99366	LL5	0.9	B	–	–	–	F	25(1)
QUE 99367	LL5	0.11	B	–	–	–	F	25(1)
QUE 99368	LL5	2.4	B	–	–	–	F	25(1)
QUE 99369	LL5	0.5	B	–	–	–	F	25(1)
QUE 99370	LL5	4.7	B	–	–	–	F	25(1)
QUE 99371	H5	3.6	C	–	–	–	F	25(1)
QUE 99372	LL5	3.2	B/C	–	–	–	F	25(1)
QUE 99373	LL5	4.6	B	–	–	–	F	25(1)
QUE 99374	LL5	0.6	B	–	–	–	F	25(1)
QUE 99375	H5	0.3	C	–	–	–	F	25(1)
QUE 99376	LL5	1.1	C	–	–	–	F	25(1)
QUE 99377	LL5	0.5	B	–	–	–	F	25(1)
QUE 99378	LL5	1.5	B	–	–	–	F	25(1)
QUE 99379	LL5	3.5	B	–	–	–	F	25(1)
QUE 99380	LL5	8.5	A/B	–	–	–	F	25(1)
QUE 99381	LL5	22.2	B	–	–	–	F	25(1)
QUE 99382	LL5	0.9	A/B	–	–	–	F	25(1)
QUE 99383	LL5	1.0	A/B	–	–	–	F	25(1)
QUE 99384	LL5	4.4	A/B	–	–	–	F	25(1)
QUE 99385	LL5	1.4	B	–	–	–	F	25(1)
QUE 99386	LL6	15.8	A/B	30	24	–	F	25(1)
QUE 99387	E (ung)	10.6	B/C	–	0–1	94204	20	25(1)
QUE 99388	LL5	19.4	B	–	–	–	S	25(1)
QUE 99389	LL5	3.3	B	–	–	–	S	25(1)
QUE 99390	LL5	0.11	B	–	–	–	F	25(1)
QUE 99391	LL5	0.7	B	–	–	–	F	25(1)
QUE 99392	LL5	1.3	B	–	–	–	F	25(1)
QUE 99393	LL5	4.5	B	–	–	–	F	25(1)
QUE 99394	LL5	1.1	B	–	–	–	F	25(1)
QUE 99395	LL5	3.2	B	–	–	–	F	25(1)
QUE 99396	H imp. melt	1.7	C	18	16	–	F	25(1)
QUE 99397	LL5	4.5	B	–	–	–	F	25(1)
QUE 99398	LL5	9.2	B	–	–	–	F	25(1)
QUE 99399	LL5	3.7	A/B	–	–	–	F	25(1)
QUE 99400	LL6	2.4	A/B	–	–	–	F	25(1)
QUE 99401	LL5	1.4	A/B	–	–	–	F	25(1)
QUE 99402	LL5	0.7	B	–	–	–	F	25(1)
QUE 99403	LL5	0.8	B	–	–	–	F	25(1)
QUE 99404	LL5	1.0	A/B	–	–	–	F	25(1)
QUE 99405	LL5	0.3	B/C	–	–	–	F	25(1)
QUE 99406	LL5	2.2	A/B	–	–	–	F	25(1)
QUE 99407	LL5	2.3	A/B	–	–	–	F	25(1)
QUE 99408	LL5	3.1	A/B	–	–	–	F	25(1)
QUE 99410	LL5	0.3	B	–	–	–	F	25(1)
QUE 99411	LL5	3.1	B	–	–	–	F	25(1)
QUE 99412	LL5	2.3	B/C	–	–	–	F	25(1)
QUE 99413	L5	2.5	B/C	–	–	–	F	25(1)
QUE 99414	L5	0.4	B/C	–	–	–	F	25(1)
QUE 99415	LL5	2.2	B	–	–	–	F	25(1)
QUE 99416	LL5	7.9	B	–	–	–	F	25(1)
QUE 99417	LL5	8.8	B	–	–	–	F	25(1)
QUE 99418	LL5	1.8	B	–	–	–	F	25(1)
QUE 99419	L6	6.7	B/C	–	–	–	F	25(1)
QUE 99430	H5	7.3	B/C	–	–	–	22	25(1)
QUE 99431	H5	3.3	B/C	–	–	–	22	25(1)
QUE 99432	LL5	10.1	A/B	–	–	–	F	25(1)
QUE 99433	H5	3.0	B/C	–	–	–	27	25(1)
QUE 99434	H5	1.3	B/C	–	–	–	27	25(1)
QUE 99435	H5	0.4	B/C	–	–	–	27	25(1)
QUE 99436	H5	3.0	B/C	–	–	–	27	25(1)
QUE 99437	L6	9.4	A/B	–	–	–	22	25(1)
QUE 99438	EH3	5.1	B/C	0–1	0–1	–	27	25(1)
QUE 99439	LL5	4.7	A/B	–	–	–	F	25(1)
QUE 99440	LL6	30.5	A/B	–	–	–	F	25(1)
QUE 99443	CM2	8.7	A/B	1–34	–	–	22	25(1)
QUE 99444	H6	33.6	B/C	–	–	–	27	25(1)
QUE 99445	L6	86.1	B/C	–	–	–	22	25(1)
QUE 99446	H6	55.5	B/C	–	–	–	27	25(1)
QUE 99447	LL5	48.5	A/B	–	–	–	F	25(1)
QUE 99448	H6	91.3	B/C	–	–	–	22	25(1)
QUE 99449	LL5	13.6	B/C	–	–	–	F	25(1)
QUE 99450	H5	112.8	C	–	–	–	F	25(1)
QUE 99451	L6	195.5	B/C	–	–	–	Y	25(1)
QUE 99452	L5	284.0	B/C	–	–	–	F	25(1)
QUE 99453	L5	282.1	B/C	–	–	–	F	25(1)
QUE 99454	L5	372.4	B/C	–	–	–	F	25(1)
QUE 99455	L5	336.6	B/C	–	–	–	F	25(1)
QUE 99456	L5	256.3	C	–	–	–	F	25(1)
QUE 99457	L6	211.7	C	–	–	–	F	25(1)
QUE 99458	LL6	87.2	B	–	–	–	F	25(1)
QUE 99459	H5	65.2	C	–	–	–	F	25(1)
QUE 99460	L6	29.1	B/C	–	–	–	F	25(1)
QUE 99461	H5	26.2	B/C	–	–	–	F	25(1)
QUE 99462	LL6	62.6	A/B	–	–	–	24	25(1)
QUE 99463	LL5	31.4	A/B	–	–	–	24	25(1)
QUE 99464	L5	92.8	A/B	–	–	–	24	25(1)
QUE 99465	L4	18.4	B	25	21	–	F	25(1)
QUE 99466	H5	81.9	B/C	–	–	–	F	25(1)
QUE 99467	LL5	14.6	A/B	–	–	–	F	25(1)
QUE 99468	LL5	10.8	A/B	–	–	–	F	25(1)
QUE 99469	H5	64.3	A/B	–	–	–	F	25(1)
QUE 99470	LL5	2.0	A/B	–	–	–	F	25(1)
QUE 99471	LL5	3.8	A/B	–	–	–	F	25(1)
QUE 99472	LL5	0.6	B	–	–	–	F	25(1)
QUE 99474	LL5	0.8	B/C	–	–	–	F	25(1)
QUE 99475	LL5	3.4	A/B	–	–	–	F	25(1)
QUE 99476	L5	3.6	A/B	–	–	–	F	25(1)
QUE 99477	LL5	0.9	A/B	–	–	–	F	25(1)
QUE 99478	LL5	0.5	A/B	–	–	–	F	25(1)
QUE 99479	LL5	1.9	A/B	–	–	–	F	25(1)
QUE 99480	LL5	2.2	B/C	–	–	–	F	25(1)
QUE 99481	L5	1.7	C	–	–	–	F	25(1)
QUE 99482	LL5	0.8	C	–	–	–	F	25(1)
QUE 99483	H6	2.6	B	–	–	–	F	25(1)
QUE 99484	L5	0.7	C	–	–	–	F	25(1)
QUE 99485	LL5	0.4	B	–	–	–	F	25(1)

APPENDIX 1. *Continued*.

Name‡	Class§	Mass	Weath	%Fa	%Fs	Pairing	Ice¶	Ref
QUE 99486	LL5	4.8	B	–	–	–	F	25(1)
QUE 99487	LL5	1.3	B	–	–	–	F	25(1)
QUE 99488	LL5	3.3	B/C	–	–	–	F	25(1)
QUE 99489	LL5	1.3	B/C	–	–	–	F	25(1)
QUE 99490	LL5	1.5	B	–	–	–	F	25(1)
QUE 99491	LL5	0.9	B	–	–	–	F	25(1)
QUE 99492	LL5	1.3	B	–	–	–	F	25(1)
QUE 99493	LL5	1.0	B/C	–	–	–	F	25(1)
QUE 99494	LL6	1.1	B/C	–	–	–	F	25(1)
QUE 99495	LL5	3.9	B/C	–	–	–	F	25(1)
QUE 99496	L6	2.0	B/C	–	–	–	F	25(1)
QUE 99497	LL5	3.2	B	–	–	–	F	25(1)
QUE 99498	LL5	4.1	B/C	–	–	–	F	25(1)
QUE 99499	LL5	2.7	C	–	–	–	F	25(1)
QUE 99500	LL6	6.3	B	–	–	–	F	25(1)
QUE 99501	LL5	3.0	B/C	–	–	–	F	25(1)
QUE 99502	LL5	21.8	A/B	–	–	–	F	25(1)
QUE 99503	L5	1.3	C	–	–	–	F	25(1)
QUE 99504	LL5	9.5	B	–	–	–	F	25(1)
QUE 99505	H6	0.9	C	–	–	–	F	25(1)
QUE 99506	LL5	1.8	B/C	–	–	–	F	25(1)
QUE 99507	LL5	1.4	B	–	–	–	F	25(1)
QUE 99508	LL5	6.1	B	–	–	–	F	25(1)
QUE 99509	LL5	3.5	B/C	–	–	–	F	25(1)
QUE 99510	LL5	27.1	A/B	–	–	–	F	25(1)
QUE 99511	H6	15.8	B/C	–	–	–	27	25(1)
QUE 99512	H5	5.8	B/C	–	–	–	22	25(1)
QUE 99513	LL5	2.0	A/B	–	–	–	F	25(1)
QUE 99514	H5	13.1	B/C	–	–	–	27	25(1)
QUE 99515	LL5	2.6	A/B	–	–	–	F	25(1)
QUE 99516	LL5	8.9	A/B	–	–	–	F	25(1)
QUE 99517	L3.4	1.4	B	9–28	4–21	–	27	25(1)
QUE 99518	L6	17.7	B/C	24	20	–	S	25(1)
QUE 99519	LL5	2.1	A/B	–	–	–	F	25(1)
QUE 99520	L5	2.8	C	–	–	–	S	25(1)
QUE 99521	L6	3.0	Ce	24	20	–	27	25(1)
QUE 99522	LL5	2.5	A/B	–	–	–	S	25(1)
QUE 99523	L5	1.8	C	–	–	–	S	25(1)
QUE 99524	H5	1.0	C	–	–	–	22	25(1)
QUE 99525	LL5	2.1	B	–	–	–	S	25(1)
QUE 99526	LL5	6.8	B	–	–	–	F	25(1)
QUE 99527	LL5	7.9	B/C	–	–	–	F	25(1)
QUE 99528	LL5	2.2	B/C	–	–	–	F	25(1)
QUE 99529	H4	4.4	C	19	–	–	22	25(1)
QUE 99530	LL5	6.2	B	–	–	–	F	25(1)
QUE 99531	LL5	1.6	B	–	–	–	F	25(1)
QUE 99532	LL5	0.7	B	–	–	–	F	25(1)
QUE 99533	LL5	6.2	B	–	–	–	F	25(1)
QUE 99534	LL5	0.9	B	–	–	–	F	25(1)
QUE 99535	LL5	0.2	B	–	–	–	F	25(1)
QUE 99536	L5	0.6	B/C	–	–	–	F	25(1)
QUE 99537	LL5	1.2	B	–	–	–	F	25(1)
QUE 99538	H5	2.3	C	–	–	–	F	25(1)
QUE 99539	LL5	3.1	B	–	–	–	F	25(1)
QUE 99540	LL5	5.8	B	–	–	–	F	25(1)
QUE 99541	LL5	3.4	B	–	–	–	V	25(1)
QUE 99542	H6	0.8	C	–	–	–	V	25(1)
QUE 99543	LL6	1.1	B	–	–	–	F	25(1)
QUE 99544	LL5	2.1	B	–	–	–	F	25(1)
QUE 99545	LL5	2.4	B/C	–	–	–	F	25(1)
QUE 99546	LL6	4.7	B	–	–	–	V	25(1)
QUE 99547	LL5	0.3	B	–	–	–	F	25(1)
QUE 99548	H5	3.2	C	–	–	–	V	25(1)
QUE 99549	LL5	6.4	B	–	–	–	F	25(1)
QUE 99550	LL5	0.8	B	–	–	–	F	25(1)
QUE 99551	LL5	0.9	A/B	–	–	–	F	25(1)
QUE 99552	LL5	8.9	B	–	–	–	F	25(1)
QUE 99553	H5	2.5	C	–	–	–	V	25(1)
QUE 99554	LL5	5.2	A/B	–	–	–	F	25(1)
QUE 99555	LL5	13.4	B	–	–	–	F	25(1)
QUE 99556	H5	11.2	C	–	–	–	V	25(1)
QUE 99557	LL5	0.8	A/B	–	–	–	F	25(1)
QUE 99558	LL5	2.5	B	–	–	–	F	25(1)
QUE 99559	LL5	0.4	A/B	–	–	–	F	25(1)
QUE 99560	LL5	3.1	B	–	–	–	F	25(1)
QUE 99561	LL5	4.2	B	–	–	–	F	25(1)
QUE 99562	LL5	0.7	A/B	–	–	–	F	25(1)
QUE 99563	LL5	1.1	B/C	–	–	–	F	25(1)
QUE 99564	LL5	0.5	B/C	–	–	–	F	25(1)
QUE 99565	LL5	0.5	B/C	–	–	–	F	25(1)
QUE 99566	LL5	0.8	A/B	–	–	–	F	25(1)
QUE 99567	LL5	2.1	A/B	–	–	–	F	25(1)
QUE 99568	LL5	3.8	A/B	–	–	–	F	25(1)
QUE 99569	LL5	0.5	A/B	–	–	–	F	25(1)
QUE 99570	H5	13.1	B/C	–	–	–	F	25(1)
QUE 99571	LL6	33.5	A/B	–	–	–	F	25(1)
QUE 99572	LL5	25.1	A/B	–	–	–	F	25(1)
QUE 99573	LL5	26.8	A/B	–	–	–	F	25(1)
QUE 99574	LL5	10.4	A/B	–	–	–	F	25(1)
QUE 99575	LL5	13.3	A/B	–	–	–	F	25(1)
QUE 99576	LL5	55.0	A/B	–	–	–	F	25(1)
QUE 99577	L5	37.8	A/B	–	–	–	F	25(1)
QUE 99578	LL5	31.9	A/B	–	–	–	F	25(1)
QUE 99579	LL5	27.0	A/B	–	–	–	F	25(1)
QUE 99580	LL5	23.0	B/C	–	–	–	F	25(1)
QUE 99581	LL5	13.0	B/C	–	–	–	F	25(1)
QUE 99582	LL5	9.4	B/C	–	–	–	F	25(1)
QUE 99583	LL5	28.9	B/C	–	–	–	F	25(1)
QUE 99584	LL5	16.1	B	–	–	–	F	25(1)
QUE 99585	LL5	11.7	B/C	–	–	–	F	25(1)
QUE 99586	LL5	11.6	A/B	–	–	–	F	25(1)
QUE 99587	LL5	6.4	B/C	–	–	–	F	25(1)
QUE 99588	LL5	26.1	A/B	–	–	–	F	25(1)
QUE 99589	H6	38.8	B/C	–	–	–	F	25(1)
QUE 99590	LL5	1.3	C	–	–	–	F	25(1)
QUE 99591	LL5	1.1	A/B	–	–	–	F	25(1)
QUE 99592	LL5	2.8	C	–	–	–	F	25(1)
QUE 99593	LL5	1.8	B	–	–	–	F	25(1)
QUE 99594	L6	5.9	B	–	–	–	F	25(1)
QUE 99595	LL5	0.4	A/B	–	–	–	F	25(1)
QUE 99596	H6	7.4	C	19	17	–	F	25(1)
QUE 99597	LL5	1.0	B	–	–	–	F	25(1)
QUE 99598	H5	3.7	C	–	–	–	F	25(1)
QUE 99599	LL5	4.4	B	–	–	–	F	25(1)
QUE 99600	H5	119.6	C	18	16	–	F	25(1)
QUE 99601	H5	166.4	B/C	–	–	–	F	25(1)
QUE 99602	L5	250.1	B	–	–	–	F	25(1)
QUE 99603	H5	156.8	B/C	–	–	–	F	25(1)
QUE 99604	H5	136.4	C	–	–	–	F	25(1)
QUE 99605	L5	315.5	B/C	–	–	–	F	25(1)
QUE 99606	L6	132.1	C	–	–	–	24	25(1)
QUE 99607	H5	164.9	C	18	15	–	24	25(1)
QUE 99608	L5	189.6	C	–	–	–	F	25(1)
QUE 99609	Eu "br"	24.5	B	–	59	–	F	25(1)
QUE 99630	LL5	2.5	B	–	–	–	F	25(1)
QUE 99631	L5	1.1	C	–	–	–	F	25(1)
QUE 99632	LL5	0.5	B	–	–	–	F	25(1)
QUE 99633	LL5	1.4	B	–	–	–	F	25(1)
QUE 99634	H5	1.3	B	–	–	–	F	25(1)
QUE 99635	LL5	0.9	B	–	–	–	F	25(1)
QUE 99636	LL5	1.2	B/C	–	–	–	F	25(1)
QUE 99637	LL5	3.9	B/C	–	–	–	F	25(1)
QUE 99638	L5	5.1	C	–	–	–	F	25(1)
QUE 99639	LL5	3.8	B	–	–	–	F	25(1)
QUE 99640	L5	3.0	C	–	–	–	F	25(1)
QUE 99641	LL5	4.6	B	–	–	–	F	25(1)
QUE 99642	LL5	20.6	A/B	–	–	–	F	25(1)
QUE 99643	LL5	4.6	A/B	–	–	–	F	25(1)
QUE 99644	LL5	2.3	A/B	–	–	–	F	25(1)
QUE 99645	L6	2.8	B	–	–	–	F	25(1)
QUE 99646	LL5	6.2	B	–	–	–	F	25(1)
QUE 99647	L5	18.3	B	–	–	–	F	25(1)
QUE 99648	LL5	0.6	B	–	–	–	F	25(1)
QUE 99649	LL5	1.6	A/B	–	–	–	F	25(1)
QUE 99658	Eu "ub"	8.8	A	–	59	–	F	25(1)
QUE 99675	CK4	1.7	Ce	28	–	(5)	F	25(1)
QUE 99676	CK4	0.9	Ce	28	–	99675	F	25(1)
QUE 99677	CK4	1.3	Ce	28	24	99675	F	25(1)

APPENDIX 1. *Continued*.

Name‡	Class§	Mass	Weath	%Fa	%Fs	Pairing	Ice¶	Ref
QUE 99678	CK4	1.6	Ce	28	–	99675	F	25(1)
QUE 99679	CK4	3.7	Ce	28	25	99675	F	25(1)

†See "Notes to Table 2" in *The Meteoritical Bulletin No.* 79 (Grossman and Score, 1996) for explanation of columns.

‡Abbreviations for meteorite names: QUE = Queen Alexandra Range.

§Abbreviations for meteorite classes: br = brecciated; Ch ung = ungrouped chondrite; Diog = diogenite; E-ung = ungrouped enstatite-rich meteorite; Eu = eucrite; How = howardite; Imp melt = impact melt; ub = unbrecciated.

¶Ice field names: 20 = W. Tail's End Icefield; 22 = W. Foggy Bottom Moraine; 24 = North Tail's End Icefield; 25 = Bates North; 26 = Lower Vee; 27 = E. Foggy Bottom Moraine; F = Goodwin Nunataks Icefields; Q = Foggy Bottom Moraine; S = Mare Meteoriticas; V = Scoraine Moraine; W = Scoraine Moraine Icefield; Y = Tail's End Icefield.