Antarctic Meteorite Newsletter

Volume 21, Number 1 February 1998

A periodical issued by the Meteorite Working Group to inform scientists of the basic characteristics of specimens recovered in the Antarctic.

Edited by Cecilia Satterwhite and Marilyn Lindstrom, Code SN2, NASA Johnson Space Center, Houston, Texas 77058

Curator's Comments

by Marilyn Lindstrom

New Meteorites

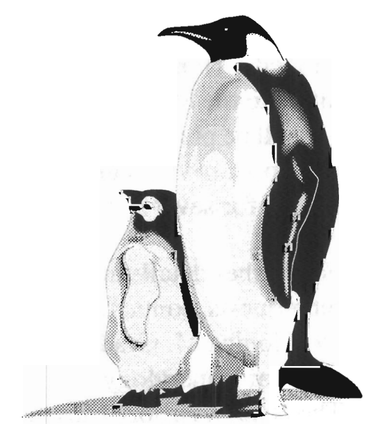
This newsletter contains classifications of numerous meteorites from the 1995-1996 collections. We've got another good batch of 31 special samples which are described herein. Most notable is lunar meteorite EET96008, but there are also 4 new ureilites, 2 CV3 carbonaceous chondrites, and an R chondrite, in addition to the more usual howardites, C2s, EC, and type 3 ordinary chondrites. Photographs of the bulk samples appear in the newsletter, but thin section photos, provided by Tim McCoy of SI, are only available on the web version of the newsletter at www-curator.jsc.nasa.gov/curator/antmet/amn/amn.htm. Check them out!

Another Change in MWG Secretary

After spending a very busy year as MWG secretary, Judy Allton has resigned that job to work on curation planning for the newly approved Genesis mission. It is a new Discovery mission to collect and return solar wind particles to JSC. Judy will continue to help with organic contamination control and monitoring for martian meteorites. Judy has done a terrific job as secretary, stepping in when correspondence was behind and the workload was super heavy due to the ALH84001 mania. Not only was she careful and efficient, but friendly and helpful. Working with her was a pleasure. Thanks so much, Judy!

Don Morrison has agreed to take over as MWG Secretary. He's just been appointed to the job and is still figuring out what he's got himself into. Go easy on him this March. Thanks, Don, for "volunteering."

Inside this Issue



Sample Request Deadline
March 6, 1998

MWG Meets
March 20-21, 1998

Nakhla to be Distributed

by Dr. Monica Grady
Natural History Museum

Nakhla is a 1300 million year old martian meteorite, the first one in which carbonates were identified. Nakhla fell as a shower of stones in 1911; several of the stones are in the collection of the Natural History Museum in London.

One completely fusion-crusted stone has been kept unbroken since its acquisition in 1913.

The Natural History Museum is now prepared to offer samples of this stone to scientists for appropriate analyses. The Antarctic Meteorite Processing Group has kindly agreed to allow the stone to be broken and sub-divided at the Curatorial Facility at the Johnson Space Center in Houston, prior to the LPSC in March.

There is no formal deadline for sample requests, but the material available is limited. Co-ordinated approaches from groups of scientists undertaking complementary studies are encouraged. Those requests submitted to the Museum by April 3 will be processed in April. Those arriving later will be delayed for several months.

For further details and to submit requests, contact:

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The Natural History Museum
Cromwell Road
London SW7 5BD
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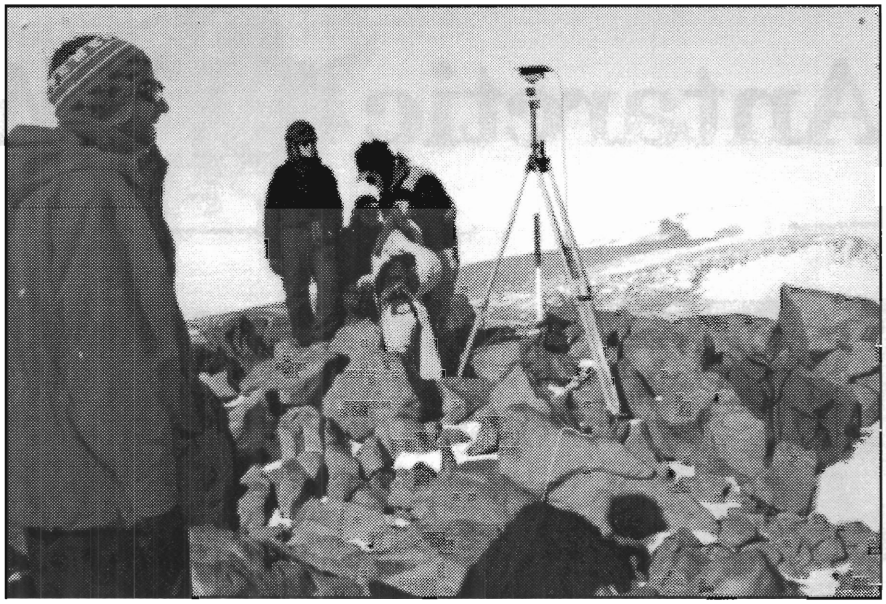
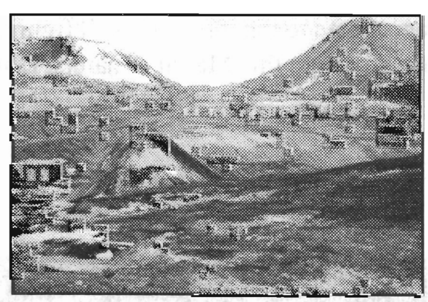


1997-98 ANSMET field team working at the Lewis Cliff region. Photo courtesy of Dave Mittlefehldt.

Report from the ANSMET Field Team

The 1997-1998 ANSMET field team has returned to civilization as we know it, and the rocks are on their way to JSC. A total of nine people spent part of the austral summer searching for meteorites. The original eight member team consisted of Ralph Harvey, John Schutt, Gretchen Benedix, Marta Corbin, Dave "duck" Mittlefehldt, Tim Swindle, Mark Wieczorek and Karl Wirth. Four weeks into the field work Luann Becker came and replaced Ralph, who left early ostensibly to prepare for spring teaching. But we all know he just wanted to see Tucker Harvey, then just over 2 months old. The team spent the entire time in the "Foggy Bottom" area harvesting the Queen Alexandra Range ice fields. A one day trip to the nearby Lewis Cliff area also netted a few meteorites. The total haul was about 1080 rocks, a few of which are probably terrestrial. Twenty additional pecimens were recovered from the Allan Hills Near Western icefield by a field party under the direction of Ian Whillans (Byrd Polar Research Center) where they were studying ice dynamics. That brings the season total to a nice round 1100 (some of which may actually NOT be ordinary chondrites). The weather was outstanding, and contributed to the near record number of meteorites collected.



Scenic view of McMurdo base. Photo courtesy of Dave Mittlefehldt.

New Meteorites

From 1995-1996 Collections

Pages 4-15 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 20(2), July 1997. Specimens of special petrologic type (carbonaceous chondrite, unequilibrated ordinary chondrite, achondrite, etc.) are represented by separate descriptions unless they are paired with previously described meteorites. However, some specimens of non-special petrologic type are listed only as single line entries in Table 1. For convenience, new specimens of special petrological type are also recast in Table 2.

Macroscopic descriptions of stony meteorites were performed at NASA/JSC. These descriptions summarize hand-specimen features observed during inital examination. Classification is based on microscopic petrography and reconnaissance-level electron microprobe analyses using polished sections prepared from a small chip of each meteorite. For each stony meteorite the sample number assigned to the preliminary examination section is included. In some cases, however, a single microscopic description was based on thin sections of several specimens believed to be members of a single fall.

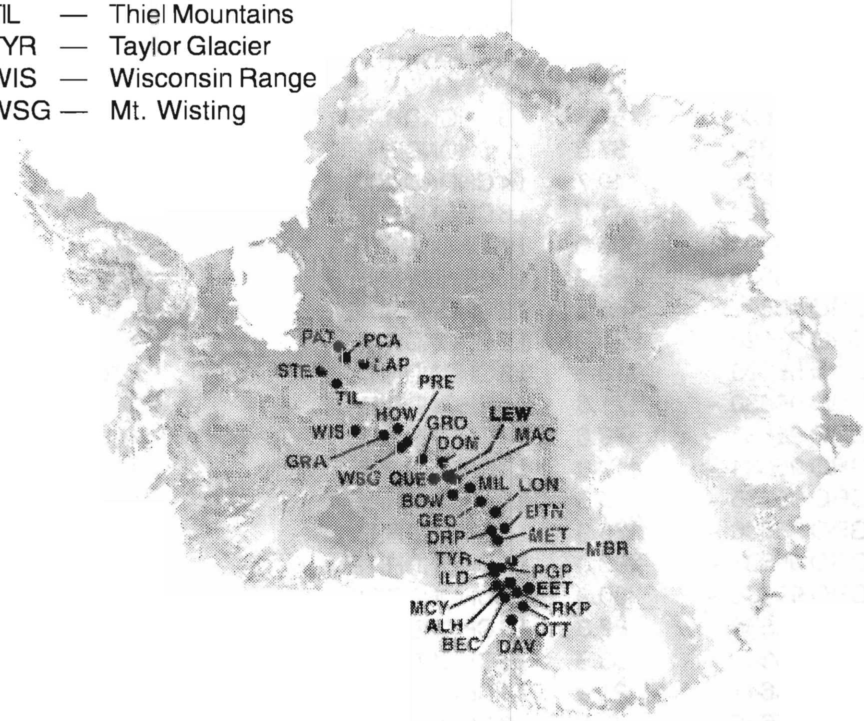
Meteorite descriptions contained in this issue were contributed by the following individuals:

Kathleen McBride, Carol Schwarz
Antarctic Meteorite Laboratory
NASA Johnson Space Center
Houston, Texas

Brian Mason and Tim McCoy
Department of Mineral Sciences
U.S. National Museum of Natural History
Smithsonian Institution
Washington, D.C.

Antarctic Meteorite Locations

ALH — Allan Hills
BEC — Beckett Nunatak
BOW — Bowden Neve
BTN — Bates Nunataks
DAV — David Glacier
DEW — Mt. DeWitt
DOM — Dominion Range
DRP — Derrick Peak
EET — Elephant Moraine
GEO — Geologists Range
GRA — Graves Nunataks
GRO — Grosvenor Mountains
HOW — Mt. Howe
ILD — Inland Forts
LAP — LaPaz Ice Field
LEW — Lewis Cliff
LON — Lonewolf Nunataks
MAC — MacAlpine Hills
MBR — Mount Baldr
MCY — MacKay Glacier
MET — Meteorite Hills
MIL — Miller Range
OTT — Outpost Nunatak
PAT — Patuxent Range
PCA — Pecora Escarpment
PGP — Purgatory Peak
PRE — Mt. Prestrud
QUE — Queen Alexandria Range
RKP — Reckling Peak
STE — Stewart Hills
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range
WSG — Mt. Wisting



Information on the U.S. Collection of Antarctic Meteorites

Number of meteorites:	8412
Number of meteorites classified:	7796

Table 1: List of Newly Classified Antarctic Meteorites**

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
GRO 95565	167.5	L5 CHONDRITE	A/B	A/B	24	20
GRO 95571	51.4	L5 CHONDRITE	A	B	23	19
GRO 95572	84.8	L5 CHONDRITE	B	A	24	21
GRO 95574	90.6	HOWARDITE	A	A		22-37
GRO 95575	137.8	UREILITE	A/B	A/B	16-21	18
GRO 95579	158.7	L5 CHONDRITE	A	A/B	23	19
GRO 95580	75.1	H5 CHONDRITE	B/Ce	B	19	17
GRO 95584	138.3	H5 CHONDRITE	A/B	A	19	17
GRO 95586	92.8	H5 CHONDRITE	B	A	18	16
GRO 95590	125.8	LL4 CHONDRITE	A	B	29	19-25
GRO 95596	12.7	LL3.8 CHONDRITE	A/B	A	9-29	3-20
GRO 95598	14.4	H5 CHONDRITE	A/B	A	18	16
GRO 95599	75.7	H5 CHONDRITE	B	A	19	17
GRO 95600	19.8	LL5 CHONDRITE	B	A	27	23
GRO 95608	6.1	UREILITE	B	A	22	18
GRO 95611	26.7	L4 CHONDRITE	B	A	24	20
GRO 95612 ~	43.6	L6 CHONDRITE	B	B		
GRO 95613	58.8	LL4 CHONDRITE	A/B	A/B	29	23-26
GRO 95614 ~	29.5	L6 CHONDRITE	A/B	A		
GRO 95615 ~	110.5	H6 CHONDRITE	B	A/B		
GRO 95616	122.6	L4 CHONDRITE	B	A	23	19-21
GRO 95617	40.3	H6 CHONDRITE	B	A/B		
GRO 95618 ~	26.7	L6 CHONDRITE	B/C	A		
GRO 95619	30.5	H5 CHONDRITE	B	A/B	19	17
GRO 95620	161.3	L5 CHONDRITE	B	A	25	21
GRO 95622 ~	57.6	L6 CHONDRITE	B	A		
GRO 95623	40.7	L4 CHONDRITE	B	A	24	17-20
GRO 95624 ~	11.9	L6 CHONDRITE	B	B		
GRO 95625	88.6	H5 CHONDRITE	B	A	18	16
GRO 95626	52.2	EL6 CHONDRITE	B/Ce	B/C		0.1-0.5
GRO 95627 ~	186.5	L6 CHONDRITE	B/Ce	A		
GRO 95628 ~	21.2	L6 CHONDRITE	B/C	A		
GRO 95629 ~	113.3	L6 CHONDRITE	A/B	A		
GRO 95630 ~	71.5	L6 CHONDRITE	B/C	A/B		
GRO 95631 ~	79.6	L6 CHONDRITE	A/B	A		
GRO 95634 ~	119.8	L6 CHONDRITE	B/C	A/B		
GRO 95635 ~	75.5	L6 CHONDRITE	A/B	A/B		
GRO 95636 ~	125.9	L6 CHONDRITE	A/B	A		
GRO 95637 ~	293.0	L6 CHONDRITE	Be	B		
GRO 95638 ~	90.9	L6 CHONDRITE	B/C	A		
GRO 95639 ~	82.3	L6 CHONDRITE	A/B	A/B		
GRO 95640 ~	33.3	L6 CHONDRITE	B	A		
GRO 95641	21.9	L4 CHONDRITE	B	A	24	18-22
GRO 95642 ~	9.5	L6 CHONDRITE	A/B	A		
GRO 95643 ~	12.2	L6 CHONDRITE	A	A		
GRO 95644 ~	10.2	L6 CHONDRITE	B	A		
GRO 95645 ~	2.4	C2 CHONDRITE	B/Ce	B		
GRO 95646 ~	8.6	L6 CHONDRITE	A/B	A		
GRO 95647	57.1	LL6 CHONDRITE	A/B	B	29	25

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
GRO 95648 ~	93.8	L6 CHONDRITE	B	A/B		
GRO 95649 ~	89.1	L6 CHONDRITE	B	A/B		
GRO 95650 ~	84.3	L6 CHONDRITE	B/C	A		
GRO 95651 ~	93.5	H6 CHONDRITE	B/C	A		
GRO 95652	93.3	CV3 CHONDRITE	B/Ce	B/C	0.3-16	4-13
GRO 95653 ~	59.0	L6 CHONDRITE	B	B		
GRO 95654 ~	67.1	H6 CHONDRITE	B/C	B		
GRO 95655	11.6	LL6 CHONDRITE	Be	A	30	25
GRO 95656 ~	27.4	L6 CHONDRITE	B	B		
GRO 95657 ~	20.7	L6 CHONDRITE	A	A		
GRO 95658	57.6	LL3.3 CHONDRITE	A/B	A	6-28	2-21
GRO 95660 ~	131.6	L6 CHONDRITE	B	A		
GRO 95661 ~	17.2	L6 CHONDRITE	B	A		
GRO 95662 ~	112.0	L6 CHONDRITE	B	A/B		
GRO 95663 ~	43.4	L6 CHONDRITE	B	A		
GRO 95664	89.7	H5 CHONDRITE	B	A/B	19	17
GRO 95665 ~	127.3	L6 CHONDRITE	B	A		
GRO 95666 ~	66.5	L6 CHONDRITE	B	A		
GRO 95668	72.3	H5 CHONDRITE	B	B	18	16
PRE 95413	106.3	H5 CHONDRITE	B/C	A	19	17
PRE 95414	93.2	H4 CHONDRITE	B/C	A/B	19	17-21
WSG 95303	113.2	H5 CHONDRITE	B/C	A	18	16
WSG 95304	40.4	L4 CHONDRITE	B/Ce	A/B	25	16-21
WSG 95307	34.1	L3.8 CHONDRITE	B	A	18-26	11-22
WSG 95308	123.2	LL6 CHONDRITE	B	A	29	25
EET 96001	5.8	UREILITE	B	A	16-25	
EET 96002	10.1	HOWARDITE	B	B		26-52
EET 96003	15.6	HOWARDITE	A	A		21-45
EET 96004	13.4	HOWARDITE	A	A		29-38
EET 96005	1.3	C2 CHONDRITE	B	A	0.2-30	1-4
EET 96006	42.2	C2 CHONDRITE	Be	B	1-39	1-4
EET 96007 ~	5.1	C2 CHONDRITE	Be	B		
EET 96008	53.0	LUNAR-BASALTIC BRECCIA	A	A	41-64	18-53
EET 96010	16.3	CV3 CHONDRITE	B	A	2-33	1-3
EET 96011	5.3	C2 CHONDRITE	A	B	0.5-31	
EET 96012 ~	9.4	C2 CHONDRITE	Be	B		
EET 96013	2.1	C2 CHONDRITE	Be	B	0.5-36	
EET 96014	2.3	C2 CHONDRITE	B	A	0.6-27	1-4
EET 96015	.5	L3.4 CHONDRITE	B	A	2-33	2-6
EET 96016 ~	132.1	C2 CHONDRITE	Be	B		
EET 96017 ~	19.9	C2 CHONDRITE	Be	B		
EET 96018 ~	5.9	C2 CHONDRITE	Be	B		
EET 96019 ~	18.9	C2 CHONDRITE	Be	B		
EET 96020	1307.5	L6 CHONDRITE	A/B	A/B	24	21
EET 96022	687.0	L6 CHONDRITE	A/B	A/B	23	20
EET 96023	897.0	H6 CHONDRITE	B	B	18	16
EET 96024	421.3	L6 CHONDRITE	B/C	B	24	21
EET 96025	385.3	H6 CHONDRITE	B/C	A	18	16
EET 96026	226.0	R CHON(CARLISLE LAKES)	B	A	3-39	5-19

~Classified by using refractive indices.

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
EET 96027		2038.3	H6 CHONDRITE	C	C	18	16
EET 96028		636.4	L6 CHONDRITE	B/C	A/B	24	21
EET 96029		843.3	C2 CHONDRITE	A/B	B	0-39	2-5
EET 96030		234.1	H6 CHONDRITE	Ce	B	18	16
EET 96031		414.0	H4 CHONDRITE	B/C	A	16	15
EET 96032		435.7	L4 CHONDRITE	A/B	B	26	7-21
EET 96033		237.0	H6 CHONDRITE	B	B	19	17
EET 96034	~	311.4	L6 CHONDRITE	Be	A/B		
EET 96035		223.5	L4 CHONDRITE	A/B	A	24	21
EET 96036	~	313.9	L6 CHONDRITE	B	B/C		
EET 96037		325.7	H4 CHONDRITE	B/C	B/C	15	13
EET 96038	~	284.9	L6 CHONDRITE	B	B		
EET 96039	~	259.5	L6 CHONDRITE	B/C	B/C		
EET 96040		276.2	H4 CHONDRITE	B/C	B	16	14
EET 96041		280.1	H6 CHONDRITE	C	B	19	17
EET 96042		249.8	UREILITE	A/B	A	14-18	
EET 96043		392.9	H5 CHONDRITE	C	C	19	17
EET 96044	~	179.5	L6 CHONDRITE	C	C		
EET 96045	~	111.4	L5 CHONDRITE	A/B	A/B		
EET 96046	~	117.5	L6 CHONDRITE	B	B/C		
EET 96047		139.4	H4 CHONDRITE	C	A	15	13
EET 96048	~	342.0	L6 CHONDRITE	B	A/B		
EET 96049		188.3	LL6 CHONDRITE	B	C	29	24
EET 96050		195.1	H5 CHONDRITE	B/C	B	18	16
EET 96051	~	154.7	L6 CHONDRITE	B	B		
EET 96052	~	164.9	L6 CHONDRITE	C	A/B		
EET 96053	~	187.7	L6 CHONDRITE	B	A/B		
EET 96054	~	156.2	L6 CHONDRITE	A/B	A/B		
EET 96056	~	140.1	L6 CHONDRITE	B	A		
EET 96057	~	199.7	L6 CHONDRITE	A/B	A		
EET 96060	~	84.8	L6 CHONDRITE	A/B	A		
EET 96061	~	98.4	L6 CHONDRITE	A/B	A/B		
EET 96062	~	122.8	H6 CHONDRITE	B/C	B		
EET 96063	~	83.1	H6 CHONDRITE	B/C	B		
EET 96064	~	24.5	L6 CHONDRITE	A/B	A/B		
EET 96066	~	16.9	L6 CHONDRITE	B	A/B		
EET 96070	~	2.4	H6 CHONDRITE	B	B		
EET 96071	~	.7	H6 CHONDRITE	B	B		
EET 96072	~	1.4	H6 CHONDRITE	C	B		
EET 96073	~	9.7	H6 CHONDRITE	B/C	B		
EET 96075	~	11.7	H5 CHONDRITE	C	C		
EET 96076	~	3.2	L6 CHONDRITE	B/C	B		
EET 96078	~	2.6	L6 CHONDRITE	B/C	B		
EET 96079	~	.9	H6 CHONDRITE	B/C	B		
EET 96082	~	4.6	H6 CHONDRITE	B	A		
EET 96083	~	43.2	L6 CHONDRITE	B/C	B		
MET 96500		592.9	HOWARDITE	B	B		20-30

~Classified by using refractive indices.

Table 2: Newly Classified Specimens Listed By Type **

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
		Achondrites				
GRO 95574	90.6	HOWARDITE	A	A		22-37
EET 96002	10.1	HOWARDITE	B	B		26-52
EET 96003	15.6	HOWARDITE	A	A		21-45
EET 96004	13.4	HOWARDITE	A	A		29-38
MET 96500	592.9	HOWARDITE	B	B		20-30
EET 96008	53.0	LUNAR-BASALTIC BRECCIA	A	A	41-64	18-53
GRO 95575	137.8	UREILITE	A/B	A/B	16-21	18
GRO 95608	6.1	UREILITE	B	A	22	18
EET 96001	5.8	UREILITE	B	A	16-25	
EET 96042	249.8	UREILITE	A/B	A	14-18	
		Carbonaceous Chondrites				
GRO 95645 ~	2.4	C2 CHONDRITE	B/Ce	B		
EET 96005	1.3	C2 CHONDRITE	B	A	0.2-30	1-4
EET 96006	42.2	C2 CHONDRITE	Be	B	1-39	1-4
EET 96007 ~	5.1	C2 CHONDRITE	Be	B		
EET 96011	5.3	C2 CHONDRITE	A	B	0.5-31	
EET 96012 ~	9.4	C2 CHONDRITE	Be	B		
EET 96013	2.1	C2 CHONDRITE	Be	B	0.5-36	
EET 96014	2.3	C2 CHONDRITE	B	A	0.6-27	1-4
EET 96016 ~	132.1	C2 CHONDRITE	Be	B		
EET 96017 ~	19.9	C2 CHONDRITE	Be	B		
EET 96018 ~	5.9	C2 CHONDRITE	Be	B		
EET 96019 ~	18.9	C2 CHONDRITE	Be	B		
EET 96029	843.3	C2 CHONDRITE	A/B	B	0-39	2-5
GRO 95652	93.3	CV3 CHONDRITE	B/Ce	B/C	0.3-16	4-13
EET 96010	16.3	CV3 CHONDRITE	B	A	2-33	1-3
		Chondrites - Type 3				
EET 96015	.5	L3.4 CHONDRITE	B	A	2-33	2-6
WSG 95307	34.1	L3.8 CHONDRITE	B	A	18-26	11-22
GRO 95658	57.6	LL3.3 CHONDRITE	A/B	A	6-28	2-21
GRO 95596	12.7	LL3.8 CHONDRITE	A/B	A	9-29	3-20
EET 96026	226.0	R CHON(CARLISLE LAKES)	B	A	3-39	5-19
		E Chondrites				
GRO 95626	52.2	EL6 CHONDRITE	B/Ce	B/C		0.1-0.5

~Classified by using refractive indices.

Table 3: Tentative Pairings for New Specimens

Table 3 summarizes possible pairings of the new specimens with each other and with previously classified specimens, based on descriptive data in this newsletter issue. Readers who desire a more comprehensive review of the meteorite pairings in the U.S. Antarctic collection should refer to the compilation provided by Dr. E.R. D. Scott, as published in issue 9(2) (June 1986). Possible pairings were updated in Meteoritical Bulletin No. 76 (Meteoritics 29, 100-143) and Meteoritical Bulletin No. 79 (Meteoritics and Planetary Science 31, A161-174).

HOWARDITES

GRO 95574 with GRO 95534
EET 96004 with EET 96003

C2 CHONDRITES

EET 96006, EET 96007, EET 96011, EET 96012, EET 96013, EET 96014, EET 96016, EET 96017, EET 96019, EET 96029 with EET 96005

**Notes to Tables 1 and 2:

"Weathering" Categories:

A: Minor rustiness; rust haloes on metal particles and rust stains along fractures are minor.
B: Moderate rustiness; large rust haloes occur on metal particles and rust stains on internal fractures are extensive.
C: Severe rustiness; metal particles have been mostly stained by rust throughout.
e: Evaporite minerals visible to the naked eye.

"Fracturing" Categories:

A: Minor cracks; few or no cracks are conspicuous to the naked eye and no cracks penetrate the entire specimen.
B: Moderate cracks; several cracks extend across exterior surfaces and the specimen can be readily broken along the cracks.
C: Severe cracks; specimen readily crumbles along cracks that are both extensive and abundant.

Petrographic Descriptions

Sample No.: GRO95574
Location: Grosvenor Mountains
Dimensions (cm): 5.5x3.5x 3.0
Weight (g): 90.62
Meteorite Type: Howardite

Macroscopic Description: Kathleen McBride

Ninety five percent of the exterior of this achondrite has smooth, black fusion crust, that appears shiny in some small patches. The interior is gray in color and resembles concrete. Almost no rust is present. There are light colored clasts approximately 1-2 mm in size and a few dark clasts < 1mm in size.

Thin Section (,2) Description: Brian Mason

The section shows a groundmass of comminuted pyroxene and plagioclase grains (up to 0.3 mm) with a few larger plagioclase clasts (up to 1 mm). Microprobe analyses show that most of the pyroxene is hypersthene (Wo_{1-5}, Fs_{22-34}); one grain of augite, $Wo_{36}Fs_{37}$, was analyzed, and several grains of intermediate composition. Plagioclase composition is An_{91-96}. The meteorite is a howardite, very similar in texture and mineral compositions to GRO95534, 95535, 95581, and 95602, with which it is probably paired.

Sample No.: GRO95575
Location: Grosvenor Mountains
Dimensions (cm): 5.5x5.5x 3.0
Weight (g): 137.77
Meteorite Type: Ureilite

Macroscopic Description: Kathleen McBride

The exterior of this achondrite has smooth black fusion crust with polygonal fractures and oxidation haloes. The interior is a steel gray in color with numerous dark clasts approximately 1 mm in size. This meteorite is very soft and friable with some rust present.

Thin Section (,2) Description: Brian Mason

The section shows an aggregate of anhedral olivine and pyroxene grains, up to 2 mm across, in a black carbonaceous matrix which contains trace amounts of nickel-iron and troilite. The meteorite appears to be relatively unshocked. Olivine composition is somewhat variable, Fa_{16-21} pyroxene composition is $Wo_{10}Fs_{18}$. The meteorite is a ureilite.

Sample No.. GRO95596
Location: Grosvenor Mountains
Dimensions (cm): 2.5x2.0x1.5
Weight (g): 12.69
Meteorite Type: LL3 Chondrite (estimated LL3.8)

Macroscopic Description: Kathleen McBride

This ordinary chondrite has shiny brown/black fusion crust, with a rough texture. The interior has a white matrix with an oxidation rind. Metal grains and dark gray crystalline clasts are visible. Chondrules are dark gray in color.

Thin Section (,2) Description: Brian Mason

The section shows a closed-packed aggregate of chondrules and chondrule fragments (up to 2.4 mm across) in a dark matrix containing a small amount of nickel-iron and troilite. Weathering is minor, with some brown limonitic staining throughout the section. Microprobe analyses show olivine and pyroxene of variable composition; olivine, Fa_{9-29}, mean Fa_{24}; pyroxene, Fs_{3-20}. The meteorite is classified as an LL3 chondrite (estimated LL3.8).

Sample No.: GRO95608
Location: Grosvenor Mountains
Dimensions (cm): 2.5x1.5x0.5
Weight (g): 6.08
Meteorite Type: Ureilite

Macroscopic Description: Carol Schwarz

Eighty percent of this ureilite is covered with fusion crust which is smooth and black on the top and frothy on the bottom. The interior is black with areas of oxidation. Metal and white to yellowish colored mineral grains are visible on the interior and many larger interior grains have obvious cleavage planes. The specimen was very coherent.

Thin Section (,2) Description: Brian Mason

The section shows an aggregate of anhedral grains of olivine and pyroxene, up to 3 mm across. Individual grains are rimmed with carbonaceous material which contains trace amounts of nickel-iron and troilite. The meteorite appears to be relatively unshocked. Microprobe analyses show the following compositions: olivine, Fa_{22} pyroxene, $Wo_{11}Fs_{18}$ The meteorite is a ureilite.

Sample No.: GRO95626
Location: Grosvenor Mountains
Dimensions (cm): 5.5x3.0x2.0
Weight (g): 52.2
Meteorite Type: EL6 Chondrite

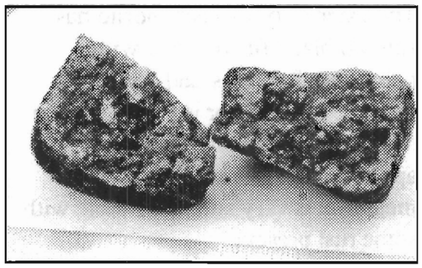
Macroscopic Description: Carol Schwarz
This chondrite has thin, remnant, iridescent fusion crust on about 50% of the exterior surface. The interior is dark red brown and contains some evaporate deposits. The specimen is very coherent because of its high metal content. Several deep fractures penetrate this meteorite. There are no clasts or chondrules visible on the interior.

Thin Section (,2) Description: Brian Mason
Only vague traces of chondritic structure are visible in the thin section, which shows the meteorite to consist largely of prismatic or granular enstatite (grain size 0.1-0.2 mm), a considerable amount of nickel-iron, and minor amounts of sulfides and plagioclase. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Microprobe analyses show that the enstatite is almost pure $MgSiO_3$ (FeO 0.2-0.5%); one grain of plagioclase, An_{17} was analyzed; the nickel-iron contains 0.9-1.0% Si. The meteorite is an EL6 chondrite.

Sample No.: GRO95645
Location: Grosvenor Mountains
Dimensions (cm): 1.0x1.0x1.5
Weight (g): 2.42
Meteorite Type: C2 Chondrite

Macroscopic Description: Kathleen McBride
This carbonaceous chondrite has gray-black, fractured fusion crust. The fusion crust has a slight greenish cast under fluorescent lighting. Some areas are weathered and rusty. The interior reveals a black, fine-grained matrix with very little rust, but weathered evaporites.

Thin Section (,2) Description: Brian Mason
The section shows a close-packed aggregate of small chondrules (up to 0.2 mm across), chondrule fragments, and mineral grains with interstitial black matrix. The chondrules and mineral grains are made up of a fine-grained weakly birefringent material; microprobe analyses indicate that this material is probably an iron-rich serpentine. The meteorite is tentatively identified as a C2 chondrite.



Sample No.: GRO95652
Location: Grosvenor Mountains
Dimensions (cm): 5.0x3.5x3.0
Weight (g): 93.33
Meteorite Type: CV3 Chondrite

Macroscopic Description: Kathleen McBride
Ninety percent of the exterior of this carbonaceous chondrite is covered by a dull brown/black fusion crust, rough in texture. The matrix is black, soft and friable. Evaporites are present and inclusions are rusty to light colored.

Thin Section (,2) Description: Brian Mason
The section shows numerous chondrules and irregular aggregates, up to 3 mm across, in a black matrix. Trace amounts of metal and sulfide are present as minute grains, mostly within the chondrules. Chondrule types are mainly porphyritic or granular olivine. Microprobe analyses show olivine and pyroxene of variable composition: olivine, $Fa_{0.3-16}$, mean Fa_3; pyroxene, Fs_{4-13}. The meteorite is classified as a C3 chondrite of the Vigarano subtype.

Sample No.: GRO95658
Location: Grosvenor Mountain
Dimensions (cm): 3.0x3.0x5.0
Weight (g): 57.62
Meteorite Type: LL3 Chondrite (estimated LL3.3)

Macroscopic Description: Kathleen McBride
The exterior of this ordinary chondrite has dull black fusion crust over 60% of its surface. This fusion crust is striated and rough, with visible bubbles. The interior has a black matrix. Numerous, large (largest ~0.5 cm in diameter) tan and rust colored chondrules and metal grains are present.

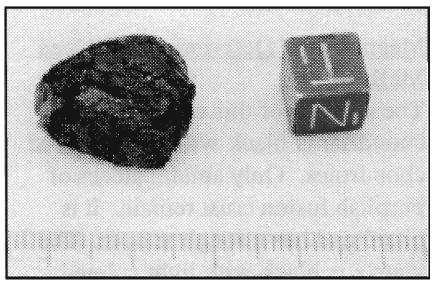
Thin Section (,2) Description: Brian Mason
The section shows a close-packed aggregate of chondrules, chondrule fragments and irregular aggregates up to 1.8 mm across, in a small amount of black matrix which contains accessory nickel-iron and sulfide in minute grains. A variety of chondrules are present, including barred olivine, granular and porphyritic olivine and olivine-pyroxene, and radiating and cryptocrystalline pyroxene. Microprobe analyses show olivine and pyroxene of variable compositions; olivine, Fa_{6-28}, mean Fa_{18}; pyroxene, Fs_{2-21}. The meteorite is tentatively classified as an LL3 chondrite (estimated LL3.3).

Sample No.: WSG96307
Location: Mount Wisting
Dimensions (cm): 4.0x3.5x 1
Weight (g): 34.1
Meteorite Type: L3.8 Chondrite

Macroscopic Description: Carol Schwarz
Fifty percent of the exterior of this meteorite has black fusion crust, the other 50% is dark brown with light clasts/chondrules on the surface. The interior is medium gray with some dark and light inclusions/chondrules. Chondrules are abundant. A thin vein of metal runs through the interior.

Thin Section (,2) Description: Brian Mason

The section shows a close-packed aggregate of chondrules and chondrule fragments (up to 2.5 mm across) in a dark matrix containing a small amount of nickel-iron and troilite. The meteorite is considerably weathered, with brown limonitic staining throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{18-26},, mean Fa_{22}; pyroxene, Fs_{11-22}. The meteorite is classified as an L3 chondrite (estimated L3.8).



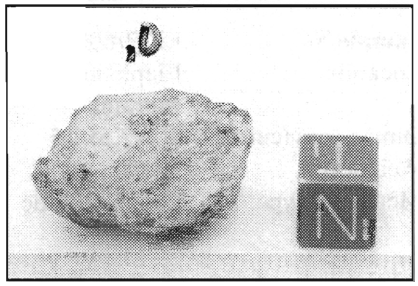
Sample No.:	EET96001
Location:	Elephant Moraine
Dimensions (cm):	2.0x1.5x1.0
Weight (g):	5.79
Meteorite Type:	Ureilite

Macroscopic Description: Kathleen McBride

This meteorite has a smooth black fusion crust which covers ~50% of the exterior surface area. The material underlying the fusion crust that is exposed reveals a greenish colored matrix and is very fine grained. It also contains very small white-cream colored inclusions. These inclusions are <1 mm in diameter. The interior of this achondrite is rather non-descript. It is black in color and very fine grained with very few inclusions that are < 1 mm in diameter.

Thin Section (,3) Description: Brian Mason

The section shows a microbreccia of olivine clasts (up to 1.2 mm across) with a little plagioclase and polysynthetically twinned pyroxene in a black matrix. Traces of nickel-iron and troilite are present along grain boundaries. The meteorite appears to be unweathered. Microprobe analyses show olivine of variable compositions: Fa_{16-25},, mean Fa_{20}. One grain of plagioclase, An_{36}, was analyzed. The meteorite is classified as a ureilite.



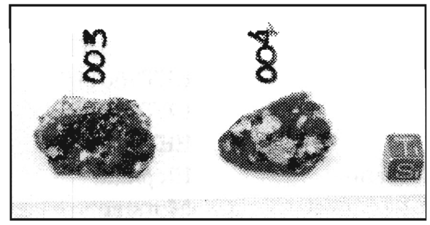
Sample No.:	EET96002
Location	Elephant Moraine
Dimensions (cm):	3.0x2.0x1.5
Weight (g):	10.12
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride

The exterior of this meteorite has brown, bubbly fusion crust. Patches of black, glassy material are visible in certain areas on the fusion crust. The interior is a fine grained, tan matrix with numerous inclusions. These include one perfectly round, black glass bead, numerous green crystalline fragments, some as large as 5 mm across, basalt fragments and light gray and white fragments. Clear crystals and reddish mineral grains are found near the fusion crust. This meteorite was brecciated and very friable.

Thin Section (,4) Description: Brian Mason

The section shows a microbreccia of comminuted pyroxene and plagioclase (grains up to 0.3 mm) with a few larger plagioclase clasts (up to 2.4 mm). Microprobe analyses show that most of the pyroxene is hypersthene (compositions clustered around Wo_3Fs_{26}) with some pigeonite ($Wo_{5-14}Fs_{35-52}$). Plagioclase composition is An_{91-95}. The meteorite is a howardite.



Sample No.:	EET96003; EET96004
Location:	Elephant Moraine
Dimensions (cm):	3.5x2.0x1.5; 3.0x2.0x1.5
Weight (g):	15.64; 13.35
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride

These achondrites are covered with a black patchy fusion crust with a shiny luster and some glassy appearing areas. Fusion crust covers 50% of the exterior surfaces. The interior is a dull, powdery gray matrix with numerous tan and white angular to sub-angular inclusions, mm size in diameter.

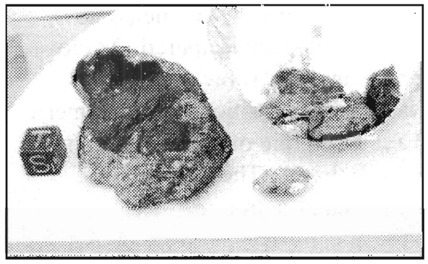
Thin Section (EET96003,4; 96004,4)Description: Brian Mason

The sections are so similar that a single description will suffice; the meteorites are probably paired. The sections show a groundmass of comminuted pyroxene and plagioclase (average grain size 0.1 mm), with a few larger clasts (up to 2 mm) of these minerals. Section 96003,4 has a coarse-grained gabbroic clast 6 mm across. Microprobe analyses show that most of the pyroxene is hypersthene (Wo_{1-5} Fs_{31-45}); one grain of augite, $Wo_{38}Fs_{21}$, was analyzed, and a few grains of intermediate composition. Plagioclase composition is An_{82-95}. The meteorites are howardites.

Sample No.: EET96005; EET96006; EET96011; EET96013; EET96014
Location: Elephant Moraine
Dimensions (cm): 1.0x1.0x0.5; 4.5x3.5x2.5; 2.0x2.5x1.0; 1.7x1.5x0.7; 1.5x1.5x 0.7
Weight (g): 1.36; 42.2; 5.34; 2.13; 2.34
Meteorite Type: C2 Chondrites

Macroscopic Description: Kathleen McBride
These carbonaceous chondrites a have black, rough fusion crust with a dull luster. The surface is pitted and bubbles are present on some of the exterior. The interior is a dull black color with some gray, splotchy inclusions and minor rust. Most of the inclusions are <1 mm in size.

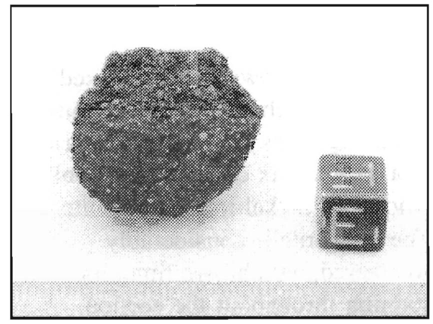
Thin Section (EET 96005,2; 96006,2; 96011,2; 96013,2; 96014,2) Description: Brian Mason
The sections are so similar that a single description will suffice; the meteorites are probably paired. The sections show a few small chondrules (up to 0.6 mm) and numerous mineral grains in a black matrix; trace amounts of nickel-iron and sulfide are present as small scattered grains. Microprobe analyses show most of the olivine grains near $Mg_2 SiO_4$ but with a few iron-rich grains; pyroxene compositions are Fs_{1-4} The matrix consists mainly of iron-rich serpentine. The meteorites are C2 chondrites.



Sample No.: EET96008
Location: Elephant Moraine
Dimensions (cm): 4.5x3.5x1.5
Weight (g): 52.97
Meteorite Type: Lunar Basaltic Breccia

Macroscopic Description: Kathleen McBride
50% of this meteorite is covered by a black glassy fusion crust. Areas that lack fusion crust appear virtually unweathered. The fusion crust is very thinly distributed over the surface of the rock. The matrix is fine grained, medium gray with numerous inclusions. These inclusions are white, light gray and tan and are angular and subangular in shape. Metal and rust are not visible. This is a brecciated basalt, possibly lunar in origin.

Thin Section (,4) Description: Brian Mason
The section shows a microbreccia of pyroxene and plagioclase clasts, up to 1.2 mm across; traces of nickel-iron and sulfide are present, as small scattered grains. Microprobe analyses show that most of the pyroxene ranges from $Wo_{11}Fs_{31}$ to $Wo_{40}Fs_{18}$, with a few more iron-rich grains; plagioclase composition is An_{93-96}. A few olivine grains of variable composition, Fa_{41-64}, were analyzed. Fe/Mn in pyroxene is about 70. The meteorite is a lunar basaltic breccia.



Sample No.: EET96010
Location: Elephant Moraine
Dimensions (cm): 2.5x2.5x2.0
Weight (g): 16.3
Meteorite Type: CV3 Chondrite

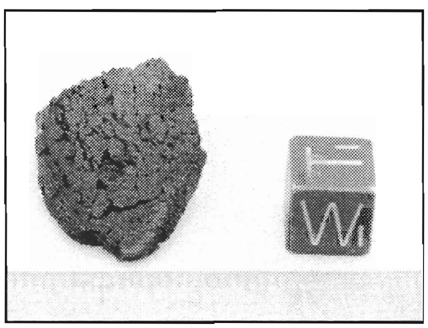
Macroscopic Description: Kathleen McBride
The exterior of this carbonaceous chondrite is black with light colored chondrules. Only small patches of purplish fusion crust remain. It is pitted and has a rough texture. The matrix is black with light colored chondrules, mm in size. It is very soft and chondrules fall out easily or break. There are some areas of rust but the amount of metal seems minor.

Thin Section (,5) Description: Brian Mason
The section shows numerous chondrules and chondrule fragments, up to 3 mm across, in a black matrix. Trace amounts of nickel-iron and sulfide are present as minute grains dispersed through the matrix. Microprobe analyses show that most of the chondritic olivine is close to Mg_2SiO_4 in composition, with some more iron-rich grains; pyroxene composition is Fs_{1-3}. The matrix appears to consist largely of iron-rich olivine, around Fa_{45}.. The meteorite is a C3 chondrite of the Vigarano subtype.

Sample No.: EET96015
Location: Elephant Moraine
Dimensions (cm): 0.75x0.75x0.5
Weight (g): 0.52
Meteorite Type: L3.4 Chondrite

Macroscopic Description: Kathleen McBride
The exterior of this ordinary chondrite has black patches of fusion crust with some brown rusty areas visible. The interior is a gray matrix with irregularly shaped euhedral/subhedral inclusions. The inclusions have dark rims and have an almost "interlocking" appearance. These inclusions are various colors and sizes.

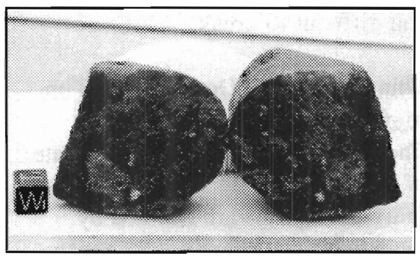
Thin Section (,3) Description: Brian Mason
The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 1.2 mm across, in a small amount of black matrix which contains accessory nickel-iron and troilite. Microprobe analyses show olivine of variable composition, Fa_{2-33}, with a mean of Fa_{12}. Pyroxene composition is Fs_{2-6}. The meteorite is an L3 chondrite (estimated L3.4).



Sample No.: EET96018
Location: Elephant Morraine
Dimensions (cm): 2.5x1.5x0.5
Weight (g): 5.89
Meteorite Type: C2 Chondrite

Macroscopic Description: Katlheen McBride
Thin purplish fusion crust covers 90% of the exterior surface. Polygonal fractures are present on the surface and the fusion crust has a very fine bubbly texture, almost iridescent in nature. The interior is dull black with a white evaporite ring between the fusion crust and matrix. A few visible chondrules are present.

Thin Section (,2) Description: Brian Mason
The section shows numerous chondrules, chondrule fragments, and small mineral grains in a black matrix; fusion crust is present along one edge. The chondrules and many of the mineral grains consist of an isotropic to weakly birefringent serpentine; a few of the mineral grains consist of calcite. The meteorite is a C2 chondrite, but differs in mineral composition and texture from the EET96005 C2 group.



Sample No.: EET 96026
Location: Elephant Morraine
Dimensions (cm): 5.0x4.0x5.5
Weight (g): 225.997
Meteorite Type: R3 Chondrite

Macroscopic Description: Kathleen McBride
The exterior is smooth and greenish-black in color with small, light colored inclusions visible. Only a thin, black fusion crust remains in a small area. The interior of this meteorite is dark gray with dark, angular, black clasts. Some lighter colored inclusions are present. The matrix is dull and very fine grained.

Thin Section (,2) Description: Tim McCoy
The meteorite consists of chondrules (0.5-1 mm diameter), mineral grains and fragments, and a chondritic clast (3 mm across) in a fine-grained silicate matrix. Minor, fine-grained Fe,Ti-oxides and sulfides occur scattered throughout the meteorite. Weathering is minor. Olivine compositions exhibit a broad range (Fa_{3-39}), with most grains Fa_{30-39}. Low-Ca pyroxene ranges from Fs_{5-19}. The meteorite is an R3 chondrite (estimated subtype 3.6) and is similar to PCA 91002 (1994, Meteoritics 29, 255).

Sample No.: EET 96029
Location: Elephant Morraine
Dimensions (cm): 15.0x11.0x8.5
Weight (g): 848.28
Meteorite Type: C2 Chondrite

Macroscopic Description: Kathleen McBride
The exterior of this carbonaceous chondrite is black with small white inclusions. There is very little fusion crust, which is purplish in color. Numerous circular pits or vugs and some evaporites are present. The interior is black with small white inclusions. The matrix is powdery, but coherent. Small inclusions are visible.

Thin Section (,7) Description: Tim McCoy
The section exhibits numerous small chondrules (most less than 0.5 mm), larger CAIs and mineral fragments in a black matrix. A 7 mm diameter clast is apparent in reflected light. Trace amounts of metal and troilite are present. The matrix appears to consist of serpentine. Olivines exhibit a range from Fa_{0-39}, with most Fa_{0-2}. Pyroxenes range from Fs_{2-5}. The meteorite is a C2 chondrite. The meteorite may be paired with the EET96005 group.

Sample No.:	EET 96031, EET 96037, EET 96040, EET 96047
Location:	Elephant Morraine
Dimensions (cm):	7.5x5.0x4.0; 8.5x6.5x3.0; 7.5x3.0x5.5; 6.0x4.0x4.0
Weight (g):	414; 325.7; 276.2; 139.41
Meteorite Type:	H4 Chondrites

Macroscopic Description: Kathleen McBride

The exteriors of these chondrites are covered with thin, patchy black fusion crust. They all have iridescent oxidation haloes and a few fractures. The interior is fine grained with some dark gray matrix visible. Some rust colored grains and metal are present. These meteorites are hard and coherent.

Thin Section (EET96031,2; 96037,2; 96042,2; 96047,2) Description: Tim McCoy

These four meteorites are likely paired and a common description is given. The sections show a close-packed aggregate of chondrules (usually less than 1 mm across), chondrule fragments and mineral grains in a dark matrix with abundant metal and troilite. The meteorite is moderately weathered and shocked. Polysynthetically twinned pyroxene is common. All four meteorites have olivine (Fa_{15-16}) and pyroxene compositions (Fs_{13-14}) which are below the range typical for H chondrites and similar to a small group of chondrites such as Willaroy (1993, GCA 57, 1867). The meteorites are unusual H4 chondrites.

Sample No.:	EET 96042
Location:	Elephant Morraine
Dimensions (cm):	5 5x5.5x3.5
Weight (g):	249.8
Meteorite Type:	Ureilite

Macroscopic Description: Kathleen McBride

The exterior of this meteorite is dark gray to black. Fusion crust covers ~80% of the surface area. Exposed interior is dark gray in color. The interior is dark, blackish-green crystalline texture. Some transparent, clear and light yellow crystals are present. It has a coarse grained texture with some dull rusty areas. Overall it has a dull metallic appearance. This achondrite is very coherent and difficult to break.

Thin Section (,7) Description: Tim McCoy

The section consists of an aggregate of olivine grains up to 3 mm across. Individual grains are rimmed by moderately-weathered carbon-rich material containing traces of metal and troilite. Olivine grains exhibit undulatory extinction. Olivine grains have core compositions of Fa_{18}, with rims reduced to Fa_{14}. The meteorite is a ureilite.

Sample No.:	MET96500
Location:	Meteorite Hills
Dimensions (cm):	11.0x8.0x6.0
Weight (g):	592.9
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride

The dull fusion crust on this achondrite is dark brown and thin and covers approximately 25% of the exterior. The exposed interior has weathered to a cement gray-yellow-orange color. It is pitted and friable. The fresh interior surface is off white to yellow and fine grained, with a sugary/crystalline texture. There are numerous inclusions of various sizes - rounded/subrounded to angular clasts and grains. Some metal and rusting is visible.

Thin Section (,6) Description: Brian Mason

The section shows a groundmass of comminuted pyroxene and plagioclase (grains up to 0.2 mm) with a few larger plagioclase clasts (up to 2 mm). Microprobe analyses show that most of the pyroxene is hypersthene (Wo_{1-4} Fs_{20-30}); one grain of augite, $Wo_{41}Fs_{20}$, was analyzed, and several grains of intermediate composition. Plagioclase composition is An_{89-92} One grain of a SiO_2 polymorph was analyzed. The meteorite is classified as a howardite.

Table 4: Natural Thermoluminescence (NTL) Data for Antarctic Meteorites

Paul Benoit and Derek Sears
Cosmochemistry Group, Dept. Chemistry and Biochemistry
University of Arkansas, Fayetteville, AR 72701 USA

The measurement and data reduction methods were described by Hasan et al. (1987, Proc. 17th LPSC E703-E709); 1989, LPSC XX, 383-384). For meteorites whose TL lies between 5 and 100 krad the natural TL is related primarily to terrestrial history. Samples with NTL <5 krad have TL below that which can be reasonably ascribed to long terrestrial ages. Such meteorites have had their TL lowered by heating within the last million years or so by close solar passage, shock heating, or atmospheric entry, exacerbated in the case of certain mildly metamorphosed meteorites by anomalous fading. We suggest meteorites with NTL >100 krad are candidates for unusual orbital/thermal histories (Benoit and Sears, 1993, EPSL 120, 463-471).

Samples	Class	NTL [krad at 250 deg. C]		
GRO95517	EH3	8	+-	2
GRA95215	H4	48.5	+-	0.4
GRO95527	H4	0.4	+-	0.1
GRO95541	H4	1.4	+-	0.1
GRA95213	H5	27.2	+-	0.1
GRA95214	H5	83.5	+-	0.1
GRO95519	H5	3.4	+-	0.1
GRO95521	H5	47.6	+-	0.8
GRO95524	L5	0.1	+-	0.1
GRO95537	H5	3.9	+-	0.1
GRO95538	H5	73	+-	3
GRO95507	H6	32.6	+-	0.3
GRO95525	H6	95.2	+-	0.2
GRO95536	L3	132	+-	6

Samples	Class	NTL [krad at 250 deg. C]		
GRO95539	L3		<	1
GRO95502	L3		<	1
GRO95504	L3		<	1
GRO95512	L3		<	1
GRO95546	L3.8	3.8	+-	0.1
GRO95515	L4	139.8	+-	0.5
GRA95200	L5	39.6	+-	0.1
GRO95529	L5	78.9	+-	0.2
GRO95530	L5	37.2	+-	0.1
GRO95540	L5	0.5	+-	0.1
GRO95500	L6	19.5	+-	0.1
GRO95501	L6	12.0	+-	0.1
GRO95514	L6	15.0	+-	0.3
GRO95523	L6	0.1	+-	0.1

The quoted uncertainties are the standard deviations shown by replicate measurements on a single aliquot.

Comments: The following comments are based on natural TL data, TL sensitivity, the shape of the induced TL glow curve, classifications, and JSC and Arkansas group sample descriptions.

GRO95502, GRO95504, and GRO95512 were classified petrographically as type 3.5 (AMN 20:2). TL sensitivities of these meteorites are very low (~0.001 relative to Dhajala H3.8) compared to type 3.5 meteorites. These meteorites may be of type 3.0-3.1, or they might be highly shocked. Extensive shock features were not reported in the initial description.

GRO95536 is type 3.3.

GRO95546 is confirmed as type 3.8 (AMN 20:2).

1. Pairings (Confirmations of pairings)
   L3: GRO95502, GRO95504, GRO95512 and GRO95539. (AMN 20:2).
2. TL data do not confirm pairing suggested in the Newsletter:
   L3: GRO95536 with the GRO95502 group (AMN 20:2)
3. Pairings suggested by TL data:
   H4: GRO95541 with GRO95527.
   H5: GRO95537 with GRO95519.
   H5: GRO95538 possibly with GRO95214.
   H6: GRO95525 possibly with GRO95516 (AMN 20:2).

Sample Request Guidelines

All sample requests should be made in writing to:

Meteorite Curator/SN2
NASA Johnson Space Center
Houston, TX 77058 USA

Requests that are received by the Curator before March 6, 1998, will be reviewed at the MWG meeting on March 20-21, 1998, to be held in Houston, Texas. Requests that are received after the March 6 deadline may possibly be delayed for review until the MWG meets again in the Fall of 1998. **PLEASE SUBMIT YOUR REQUESTS ON TIME.** Questions pertaining to sample requests can be directed in writing to the above address or can be directed to the curator by phone, FAX, or e-mail.

Requests for samples are welcomed from research scientists of all countries, regardless of their current state of funding for meteorite studies. Graduate student requests should be initialed or countersigned by a supervising scientist to confirm access to facilities for analysis. All sample requests will be reviewed in a timely manner. Those requests that do not meet the JSC Curatorial Guidelines will be reviewed by the Meteorite Working Group (MWG), a peer-review committee which meets twice a year to guide the collection, curation, allocation, and distribution of the U.S. collection of Antarctic meteorites. Issuance of samples does not imply a commitment by any agency to fund the proposed research. Requests for financial support must be submitted separately to the appropriate funding agencies. As a matter of policy, U.S. Antarctic meteorites are the property of the National Science Foundation and all allocations are subject to recall.

Each request should accurately refer to meteorite samples by their respective identification numbers. Specific requirements for sample types within individual specimens, or special handling or shipping procedures should be explained in each request. Each request should include a brief justification, which should contain: 1) what scientific problem will be addressed; 2) what analytical approach will be used; 3) what sample masses are required; 4) evidence that the proposed analyses can be performed by the requester or collaborators; and 5) why Antarctic meteorites are best suitable for the investigation. For new or innovative investigations, proposers are encouraged to supply additional detailed information in order to assist the MWG. Requests for thin sections which will be used in destructive procedures such as ion probing, etching, or even repolishing, must be stated explicitly. Consortium requests must be initialed or countersigned by a member of each group in the consortium. All necessary information, in most cases, should be condensable into a one-or two-page letter.

Samples can be requested from any meteorite that has been made available through announcement in any issue of the *Antarctic Meteorite Newsletter* (beginning with 1 (1) in June, 1978). Many of the meteorites have also been described in five *Smithsonian Contr. Earth Sci.:* Nos. 23, 24, 26, 28, and 30. A table containing all classifications as of December 1993 is published in *Meteoritics* 29, p. 100-142 and updated as of April 1996 in *Meteoritics and Planetary Science* 31, p. A161-A174.

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Meteorites On-Line

Several meteorite web site are available to provide information on meteorites from Antarctica and elsewhere in the world. Some specialize in information on martian meteorites and on possible life on Mars. Here is a general listing of ones we have found. We have not included sites focused on selling meteorites even though some of them have general information. Please contribute information on other sites so we can update the list.

JSC Curator, Antarctic meteorites	http://www-curator.jsc.nasa.gov/curator/antmet/antmet.htm
JSC Curator, martian meteorites	http://www-curator.jsc.nasa.gov/curator/antmet/marsmets/contents.htm
JSC Curator, Mars meteorite PIP	http://sn-charon.jsc.nasa.gov
Antarctic collection, martian meteorites	http://www.cwru.edu/CWRU/Dept/Artsci/geol/ANSMET/ANSMET.html
LPI martian meteorites	http://cass.jsc.nasa.gov/pub/lpi/meteorites/mars_meteorites.html
NIPR Antarctic meteorites	http://www.nipr.ac.jp/
BMNH general meteorites	http://www.nhm.ac.uk/mineral/project4/index.html
UHI planetary science discoveries	http://www.soest.hawaii.edu/PSRdiscoveries
Meteoritical Society	http://www.uark.edu/studorg/metsoc
Meteorite! Magazine	http://www.meteor.co.nz
Geochemical Society	http://www.ciw.edu/geochemical_society/BROCH.html

The curatorial databases may be accessed as follows:

Via INTERNET	1) Type **TELNET 139.169.126.35** or **TELNET CURATE.JSC.NASA.GOV**. 2) Type **PMPUBLIC** at the USERNAME: prompt.
Via WWW	1) Using a Web browser, such as Mosaic, open URL **http://www-sn.jsc.nasa.gov/curator/curator.htm**. 2) Activate the ***Curatorial Databases*** link.
Via modem	The modem may be between 1200 and 19200 baud; no parity; 8 data bits; and 1 stop bit. If you are calling long distance, the area code is 713. 1) Dial 483-2500 for 1200-9600 bps, V.32bis/V.42bis, or 483-9498 for 1200-19200 bps, V.32bis/V.42bis. 2) Once the connection is made, press <CR>. Type **INS** in response to the Enter Number: prompt. 3) Press <CR> twice quickly until the XYPLEX#> prompt displays. 4) Type **C CURATE.JSC.NASA.GOV** at the XYPLEX#> prompt. 5) Type **PMPUBLIC** at the USERNAME: prompt.

For problems or additional information, you may contact: Claire Dardano, Lockheed Martin Engineering & Sciences Company, (281) 483-5329, cdardano@ems.jsc.nasa.gov.