Antarctic Meteorite
NEWSLETTER

Volume 15
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A periodical issued by the Meteorite Working Group to inform scientists of the basic characteristics of specimens recovered in the Antarctic.

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Code SN2, NASA
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77058

INSIDE THIS ISSUE:

SAMPLE REQUEST DEADLINE: April 3, 1992 !!!!

MWG MEETS April 23-25, 1992

All sample requests should be made in writing to:

Secretary, MWG
SN2/Planetary Science Branch
NASA/Johnson Space Center
Houston, TX 77058 USA.

Requests that are received by the MWG Secretary before April 3, 1992 will be reviewed at the MWG meeting on April 23-25, 1992 to be held in Houston, Texas. Requests that are received after the April 3 deadline may possibly be delayed for review until the MWG meets again in the Fall of 1992. **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 at (713) 483-5135 or the secretary at (713) 483-5125.

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 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 and should provide detailed scientific justification for proposed research. Specific requirements for samples, such as sizes or weights, particular locations (if applicable) within individual specimens, or special handling or shipping procedures should be explained in each request. Requests for thin sections which will be used in destructive procedures such as ion probe, etch or even repolishing, must be stated explicitly. Consortium requests should be initialed or countersigned by a member of each group in the consortium. All necessary information should probably be condensable into a one- or two-page letter, although informative attachments (reprints of publication that explain rationale, flow diagrams for analyses, etc.) are welcome.

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 four Smithsonian Contr. Earth Sci.: Nos. 23, 24, 26, and 28.

New Meteorites

This newsletter presents classifications of 267 meteorites from the 1986-1990 collections. Descriptions are given for 27 meteorites of special petrologic type. These include 3 achondrites, 4 enstatite chondrites, numerous carbonaceous chondrites, 7 unequilibrated ordinary chondrites, and four unusual equilibrated chondrites. The most noteworthy of the whole group is achondrite LEW88663 which has chondritic mineral compositions.

1991-1992 Field Collection Season

The ANSMET collection team has returned from a successful Antarctic field season in the Thiel Mountains-Pecora Escarpment area. They traversed about 2000 km by snow mobile and visited 15 different ice fields. They also conducted reconnaisance via Twin Otter of the Pautexant and Wisconsin Ranges. This is the first year that our fearless leader Bill Cassidy waited in warmth and comfort for reports from the team. While Bill remains PI on the ANSMET grant and is in charge of organization, Ralph Harvey (U TN) is CoPI and field team leader. The 600 new meteorites, including many interesting specimens, will be sent to JSC in April. The first classifications of these meteorite will appear in the fall newsletter.

Staff Changes and Reorganization at JSC

Planetary Materials and Lunar Sample Curator John Dietrich retired at the end of 1991 after 25 years service at JSC, the last ten in lunar curation. We wish John many happy days in the Texas hill country. Jim Gooding has replaced John as head curator and promises to keep up the tradition of excellence in planetary materials curation and to look toward the future of curation of new samples from the Moon and Mars. Jim has previously been responsible for curation of cosmic dust and Antarctic meteorites and has worked in Mars mission planning. Other curatorial staff assignments remain unchanged. Marilyn Lindstrom continues as Antarctic meteorite curator and Robbie Score continues as Meteorite Working Group Secretary. The Office of the Curator (Jim Gooding, chief) is now separate from the Planetary Science Branch (Gordon McKay, chief). The curator's office retains the same mailing address, mail code SN2, while the science branch has mail code SN4. We're all still here in Building 31 and ready to help you with curation or debate planetary science.

From 1986-1990 Collections

Pages 5-18 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 14(2) (September 1991). All specimens of special petrologic type (carbonaceous chondrite, unequilibrated ordinary chondrite, achondrite, etc.) are represented by separate descriptions. However, some specimens of non-special petrologic type are listed only as single line entries in Table 1. For convenience, new specimens of special petrologic 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 initial 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:

Robbie Marlow, Cecilia Satterwhite, Roberta Score, and Carol Schwarz
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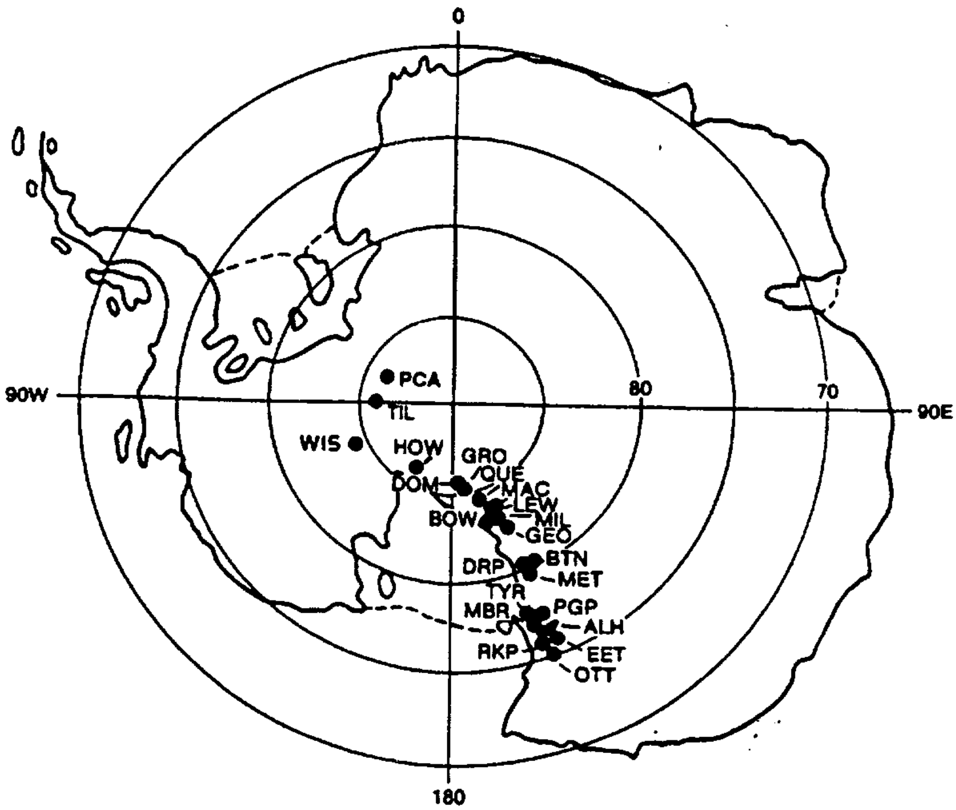
Antarctic Meteorite Locations

ALH — Allan Hills
BOW — Bowden Neve
BTN — Bates Nunataks
DOM — Dominion Range
DRP — Derrick Peak
EET — Elephant Moraine
GEO — Geologists Range
GRO — Grosvenor Mountains
HOW — Mt. Howe
ILD — Inland Forts
LEW — Lewis Cliff
MAC — MacAlpine Hills
MBR — Mount Baldr
MET — Meteorite Hills
MIL — Miller Range
OTT — Outpost Nunatak
QUE — Queen Alexandra Range
PCA — Pecora Escarpment
PGP — Purgatory Peak
RKP — Reckling Peak
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range



List of Newly Classified Antarctic Meteorites **

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 87115	30.4	H-6 CHONDRITE	C	B	17	15
LEW 86146	2.9	H-6 CHONDRITE	C	B/C	19	17
LEW 86277	25.4	H-5 CHONDRITE	C	A/B	18	16
LEW 86278	1.4	H-5 CHONDRITE	C	A	17	15
LEW 86279	12.8	H-5 CHONDRITE	Ce	B	19	17
LEW 86280	10.5	H-5 CHONDRITE	C	A	18	16
LEW 86283	13.6	H-5 CHONDRITE	C	A	18	16
LEW 86284	4.0	H-5 CHONDRITE	C	A	19	17
LEW 86285	4.2	H-5 CHONDRITE	C	A	19	17
LEW 86290	9.6	H-4 CHONDRITE	C	A	19	16-20
LEW 86291	14.9	H-6 CHONDRITE	C	B	18	16
LEW 86293	1.3	H-5 CHONDRITE	C	A	19	17
LEW 86294	2.0	H-5 CHONDRITE	C	A	19	17
LEW 86296	28.5	H-5 CHONDRITE	Ce	B	19	17
LEW 86297	3.0	L-6 CHONDRITE	C	A	26	21
LEW 86298	7.2	H-5 CHONDRITE	C	A	18	16
LEW 86299	25.1	H-5 CHONDRITE	C	A	19	17
LEW 86300	9.0	H-5 CHONDRITE	C	A	19	16
LEW 86301	5.1	H-5 CHONDRITE	C	A	19	16
LEW 86303	17.6	H-4 CHONDRITE	Ce	A	18	17-19
LEW 86304	4.2	H-5 CHONDRITE	C	A	18	16
LEW 86306	.6	H-5 CHONDRITE	C	A	18	16
LEW 86308	3.1	H-4 CHONDRITE	B/C	A	19	16
LEW 86310	7.6	H-5 CHONDRITE	C	A	19	16
LEW 86313	3.8	H-5 CHONDRITE	C	A	18	16
LEW 86315	22.7	H-5 CHONDRITE	C	B	18	16
LEW 86316	4.3	H-5 CHONDRITE	C	A	18	16
LEW 87054	5.8	H-5 CHONDRITE	C	A	18	16
LEW 87057	.4	E-3 CHONDRITE	C	A/B	0.3	0.1-18
LEW 87059	13.2	H-5 CHONDRITE	B/C	A	18	16
LEW 87064	6.7	H-3 CHONDRITE	B/C	A	2-20	3-21
LEW 87065	6.1	L-5 CHONDRITE	B	A	23	19
LEW 87068	30.1	H-6 CHONDRITE	B/C	B	17	15
LEW 87073	13.3	H-5 CHONDRITE	B/C	A	18	16
LEW 87074	12.8	H-5 CHONDRITE	C	A	17	15
LEW 87075	13.7	H-5 CHONDRITE	B/C	A	18	16
LEW 87077	8.4	H-5 CHONDRITE	B/C	A	17	15
LEW 87078	6.2	H-6 CHONDRITE	C	A	17	15
LEW 87079	5.2	H-5 CHONDRITE	B/C	A	17	15
LEW 87080	10.6	H-5 CHONDRITE	B/C	A	17	15
LEW 87081	24.3	H-5 CHONDRITE	B	A	17	15
LEW 87082	14.3	H-5 CHONDRITE	B/C	A	17	15
LEW 87084	8.5	H-5 CHONDRITE	B/C	A	19	17
LEW 87085	9.3	H-5 CHONDRITE	B/C	A	18	16
LEW 87086	8.0	H-5 CHONDRITE	B/C	A	18	16
LEW 87087	23.0	H-5 CHONDRITE	B/C	A	18	16
LEW 87088	12.7	H-4 CHONDRITE	B/C	A	19	7-18

~Classified by using refractive indices.
#Reclassified

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 87089	6.8	H-5 CHONDRITE	B/C	A	19	16
LEW 87093	7.0	L-3 CHONDRITE	C	A	11-21	4-30
LEW 87096	2.6	H-6 CHONDRITE	B/C	A	19	17
LEW 87097	4.3	H-5 CHONDRITE	C	A	19	17
LEW 87098	11.6	H-5 CHONDRITE	B/C	A	18	16
LEW 87099	2.4	H-5 CHONDRITE	B/C	A	17	15
LEW 87100	.6	H-6 CHONDRITE	B/C	A	19	17
LEW 87108	7.3	H-5 CHONDRITE	B/C	A	17	15
LEW 87110	12.3	H-5 CHONDRITE	B/C	A	18	16
LEW 87112	8.0	L-5 CHONDRITE	B	A	23	19
LEW 87116	6.6	H-5 CHONDRITE	C	A	18	16
LEW 87117	6.7	H-6 CHONDRITE	B/C	A	17	15
LEW 87121	3.8	H-5 CHONDRITE	B/C	A	17	15
LEW 87124	3.7	H-6 CHONDRITE	B/C	A	17	15
LEW 87133	2.4	L-4 CHONDRITE	B/C	A	23	15-23
LEW 87134	9.6	H-6 CHONDRITE	C	A	18	16
LEW 87138	4.9	H-6 CHONDRITE	C	A	18	16
LEW 87139	2.4	H-5 CHONDRITE	C	A	17	15
LEW 87141	7.9	H-6 CHONDRITE	B/C	A	17	15
LEW 87147	5.7	L-4 CHONDRITE	B	A	23	13-24
LEW 87156	.5	L-5 CHONDRITE	C	A	24	20
LEW 87160	.6	H-5 CHONDRITE	B/C	A	18	16
LEW 87163	.3	H-5 CHONDRITE	B/C	A	17	15
LEW 87164	.7	L-6 CHONDRITE	B	A	23	19
LEW 87212	7.7	H-6 CHONDRITE	B/C	A	18	16
LEW 87237	1.9	E-3 CHONDRITE	B/C	B	-	0-16
LEW 87251	.7	LL-6 CHONDRITE	B	A	29	23
LEW 87256	6.6	H-5 CHONDRITE	C	A	18	16
LEW 87265	9.4	H-6 CHONDRITE	Ce	B	19	16
LEW 87266	5.0	H-6 CHONDRITE	B/Ce	A	18	16
LEW 87272	3.6	H-5 CHONDRITE	C	A	18	16
LEW 87275	7.7	H-5 CHONDRITE	C	A	18	16
LEW 87278	31.4	H-5 CHONDRITE	C	A	18	16
LEW 87280	2.6	H-5 CHONDRITE	B/C	A	19	17
LEW 87285	.5	E-3 CHONDRITE	A	-	0-16	
LEW 87286	3.9	H-5 CHONDRITE	B/C	A	17	15
LEW 87288	8.8	H-5 CHONDRITE	B/C	A	18	16
LEW 87904	8.8	L-6 CHONDRITE		23	20	
LEW 88130	4.9	H-5 CHONDRITE	B/C	A	19	16
LEW 88132	7.1	H-5 CHONDRITE	B/C	A	17	15
LEW 88133	3.5	L-5 CHONDRITE	C	A	23	19
LEW 88138	6.2	H-5 CHONDRITE	B/C	A	19	17
LEW 88141	4.9	H-6 CHONDRITE	B/C	A	18	16
LEW 88142	6.6	H-6 CHONDRITE	B/C	A	18	16
LEW 88421	11.9	H-5 CHONDRITE	C	A	17	15
LEW 88440	19.0	H-5 CHONDRITE	C	A	19	16
LEW 88441	11.9	H-5 CHONDRITE	C	A	17	15
LEW 88443	10.7	H-5 CHONDRITE	C	A	17	15
LEW 88444	12.9	H-6 CHONDRITE	C	A	18	16
LEW 88461	11.2	H-6 CHONDRITE	C	A	19	17
LEW 88463	15.3	H-6 CHONDRITE	C	A	19	17
LEW 88478	14.5	H-5 CHONDRITE	Ce	A	19	16
LEW 88486	11.1	H-5 CHONDRITE	C	A	18	16
LEW 88490	19.4	H-5 CHONDRITE	C	A/B	18	16
LEW 88500	16.0	H-3 CHONDRITE	C	B	1-20	7-18

~Classified by using refractive indices.
#Reclassified

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 88504	13.5	H-5 CHONDRITE	C	A	18	16
LEW 88505	10.6	H-5 CHONDRITE	B/C	A	18	16
LEW 88506	26.2	H-6 CHONDRITE	C	C	18	16
LEW 88521	25.3	H-5 CHONDRITE	C	A	18	16
LEW 88529	14.4	L-6 CHONDRITE	C	A	25	21
LEW 88532	10.7	H-5 CHONDRITE	C	A	18	16
LEW 88535	9.2	H-5 CHONDRITE	B/C	A	17	15
LEW 88540	11.1	H-6 CHONDRITE	C	C	18	16
LEW 88547	15.1	H-5 CHONDRITE	C	A	18	16
LEW 88548	13.8	H-5 CHONDRITE	C	A	18	16
LEW 88564	6.5	LL-6 CHONDRITE	C	A	30	24
LEW 88571	2.7	H-5 CHONDRITE	C	A	17	15
LEW 88572	10.1	L-6 CHONDRITE	B/C	A	24	21
LEW 88574	13.7	H-5 CHONDRITE	C	A	18	16
LEW 88586	6.4	LL-6 CHONDRITE	B/C	C	30	24
LEW 88588	10.0	H-5 CHONDRITE		18	16	
LEW 88589	11.0	LL-6 CHONDRITE	C	A	28	23
LEW 88590	11.8	L-4 CHONDRITE	B/C	A	23	18-21
LEW 88593	4.3	L-6 CHONDRITE	C	A	25	21
LEW 88601	10.6	H-5 CHONDRITE	C	A	18	16
LEW 88606	2.7	LL-6 CHONDRITE	B/C	A	30	24
LEW 88616	14.7	H-5 CHONDRITE	C	C	19	17
LEW 88618	13.0	H-6 CHONDRITE	Ce	A	18	16
LEW 88621	7.5	L-3 CHONDRITE	C	A	7-20	3-25
LEW 88623	13.6	H-5 CHONDRITE	B/C	A	19	16
LEW 88624	11.7	H-5 CHONDRITE	C	A	17	15
LEW 88625	2.8	L-4 CHONDRITE	B/C	A	22	16-19
LEW 88635	18.7	H-5 CHONDRITE	C	A	19	16
LEW 88639	19.3	H-5 CHONDRITE	C	A	18	16
LEW 88642	6.9	H-5 CHONDRITE	C	A	17	15
LEW 88643	11.6	H-5 CHONDRITE	C	A	18	16
LEW 88646	16.9	H-5 CHONDRITE	C	A	18	16
LEW 88647	20.1	H-5 CHONDRITE	C	A	18	16
LEW 88662	12.9	H-6 CHONDRITE	C	A	17	15
LEW 88663	14.5	ACHONDRITE (?)	C	A	24	20
LEW 88670	18.8	L-6 CHONDRITE	C	A	24	21
LEW 88671	23.6	H-6 CHONDRITE	C	A	17	15
LEW 88678	27.2	H-6 CHONDRITE	C	B	17	15
LEW 88679	7.9	DIOGENITE	B/C	A	30	26
LEW 88682	10.9	H-4 CHONDRITE	C	A	18	16
LEW 88686	14.7	H-6 CHONDRITE	C	A/B	18	16
LEW 88689	20.4	H-5 CHONDRITE	C	A	18	16
LEW 88690	11.4	H-6 CHONDRITE	C	C	18	16
LEW 88691	15.0	H-4 CHONDRITE	C	A	18	8-15
LEW 88693	16.2	H-5 CHONDRITE	B/C	A	18	16
LEW 88694	11.2	H-4 CHONDRITE	C	A	18	9-14
LEW 88696	6.0	L-3 CHONDRITE	B/C	A	5-19	6-19
LEW 88700	13.4	LL-6 CHONDRITE	B/C	A	30	25
LEW 88703	9.9	L-5 CHONDRITE	B/C	A	23	20
LEW 88704	18.3	H-5 CHONDRITE	C	A	18	16
LEW 88706	10.2	L-5 CHONDRITE	C	A	23	19
LEW 88707	10.1	L-5 CHONDRITE	C	A	25	21
LEW 88708	12.4	H-5 CHONDRITE	B/C	A	18	16
LEW 88709	16.4	H-5 CHONDRITE	C	C	18	16
LEW 88712	22.9	H-6 CHONDRITE	C	A	17	15
LEW 88714	22.6	E-6 CHONDRITE	C	A		.1-.6

~Classified by using refractive indices.
#Reclassified

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 88719	10.9	H-5 CHONDRITE	C	A	19	17
LEW 88729	10.1	L-5 CHONDRITE	B/C	A	23	20
LEW 88737	10.2	L-6 CHONDRITE	C	A	24	21
LEW 88743	42.7	H-6 CHONDRITE	Ce	A	17	15
LEW 88745	18.3	H-6 CHONDRITE	C	A	19	17
LEW 88748	11.9	L-4 CHONDRITE	Ce	A	23	20
LEW 88752	18.7	H-4 CHONDRITE	A/B	C	19	13-18
LEW 88756	28.1	H-5 CHONDRITE	Ce	A	18	16
LEW 88758	5.0	LL-3 CHONDRITE	C	A	2-32	2-27
LEW 88762	18.8	H-5 CHONDRITE	C	A	18	16
LEW 88767	16.3	H-5 CHONDRITE	C	A	18	16
LEW 88768	11.6	H-6 CHONDRITE	C	A	19	16
LEW 88770	16.4	L-5 CHONDRITE	B/C	A	24	20
LEW 88773	14.1	L-6 CHONDRITE	C	A	24	20
LEW 88775	44.3	H-4 CHONDRITE	C	A	19	14-19
LEW 88777	10.7	H-4 CHONDRITE	B/C	A	18	9-16
LEW 88781	57.5	L-6 CHONDRITE	B/C	A	24	20
LEW 88783	9.8	LL-3 CHONDRITE	Ce	A	7-34	1-18
ALH 90407	.6	CARBONACEOUS C2	B	A	1-31	
EET 90001	53.2	CARBONACEOUS C4	Be	A	29	
EET 90002	28.0	CARBONACEOUS C4	Be	A	29	
EET 90003	30.8	CARBONACEOUS C4	Be	A	29	
EET 90005~	42.3	CARBONACEOUS C4	Be	A		
EET 90006~	23.9	CARBONACEOUS C4	Be	A		
EET 90008~	40.0	CARBONACEOUS C4	Be	A		
EET 90009~	30.1	CARBONACEOUS C4	Be	A		
EET 90010~	10.0	CARBONACEOUS C4	Be	A/B		
EET 90013~	36.3	CARBONACEOUS C4	Be	A		
EET 90014~	20.8	CARBONACEOUS C4	Be	A/B		
EET 90016~	45.1	CARBONACEOUS C4	Be	A		
EET 90017~	15.6	CARBONACEOUS C4	Be	A		
EET 90019	21.5	UREILITE	B/C	A	11	10
EET 90021	19.6	CARBONACEOUS C2	A/B	A	1-28	1-3
EET 90023~	31.5	CARBONACEOUS C4	Be	A		
EET 90025	45.8	CARBONACEOUS C4	Be	A	29	
EET 90026	61.5	CARBONACEOUS C4	Ae	A	29	
EET 90027~	6.2	CARBONACEOUS C4	Be	A		
EET 90028~	31.3	CARBONACEOUS C4	Be	A		
EET 90035~	1.3	CARBONACEOUS C4	Be	A		
EET 90036~	21.2	CARBONACEOUS C4	Be	A		
EET 90037~	6.0	L-6 CHONDRITE	B	A		
EET 90038~	5.5	CARBONACEOUS C4	B	A		
EET 90039~	5.8	CARBONACEOUS C4	B	A		
EET 90040	13.1	CARBONACEOUS C4	Be	A	31	
EET 90041	2.2	CARBONACEOUS C4	B	A	31	
EET 90042	14.2	CARBONACEOUS C4	B	A	28	
EET 90043	12.5	CARBONACEOUS C2	B	A	1-49	1-9
EET 90044	11.5	CARBONACEOUS C4	B	A	28	
EET 90045	6.6	CARBONACEOUS C4	B	A	29	
EET 90046	5.3	CARBONACEOUS C4	Be	A	30	
EET 90047	1.2	CARBONACEOUS C2	B	A	1-11	
EET 90048	12.4	CARBONACEOUS C4	Be	A	31	
EET 90049	18.0	CARBONACEOUS C4	B	A	30	
EET 90050	4.1	CARBONACEOUS C4	B	A	30	
EET 90052	10.7	CARBONACEOUS C4	Be	A	30	

~Classified by using refractive indices.
#Reclassified

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
QUE 90201#	1282.5	L-5 CHONDRITE	A/B	A	26	22
QUE 90202#	440.0	L-5 CHONDRITE	A	A	26	22
QUE 90203	1132.1	H-6 CHONDRITE	A	C	18	16
QUE 90204	334.6	H-6 CHONDRITE	B/C	C	18	16
QUE 90205	458.5	L-5 CHONDRITE	A/B	A	26	21
QUE 90206	548.9	L-5 CHONDRITE	A/B	B/C	26	21
QUE 90207	366.9	L-5 CHONDRITE	A/B	A	26	21
QUE 90208	811.6	L-5 CHONDRITE	A/B	A	26	21
QUE 90209	560.4	L-5 CHONDRITE	B	A	27	22
QUE 90210	316.1	L-5 CHONDRITE	A/B	A	26	21
QUE 90211	436.3	L-5 CHONDRITE	A/Be	A	26	22
QUE 90212	607.4	L-5 CHONDRITE	B	A	25	21
QUE 90213	389.0	L-5 CHONDRITE	A/B	A	26	21
QUE 90214	571.3	L-5 CHONDRITE	A/B	A	26	22
QUE 90215	358.9	L-5 CHONDRITE	A/B	A/B	27	23
QUE 90216	359.3	L-5 CHONDRITE	A/B	A	26	22
QUE 90217	327.7	L-5 CHONDRITE	A/B	A	26	22
QUE 90218	926.5	L-5 CHONDRITE	A/B	A	26	22
QUE 90219	316.0	L-5 CHONDRITE	A/B	A	26	22
QUE 90221	432.7	L-5 CHONDRITE	B/C	B/C	26	22
QUE 90222~	476.8	L-6 CHONDRITE	A/B	A		
QUE 90224	245.8	L-5 CHONDRITE	A/B	A/B	27	23
QUE 90225	325.5	L-5 CHONDRITE	A/B	A	27	22
QUE 90226	302.0	L-5 CHONDRITE	B/C	A	27	22
QUE 90227~	200.1	L-5 CHONDRITE	A/B	A		
QUE 90228~	244.7	H-6 CHONDRITE	B/C	A		
QUE 90229~	307.6	L-5 CHONDRITE	A/B	A		
QUE 90230~	236.3	L-5 CHONDRITE	B	B		
QUE 90231~	169.2	L-5 CHONDRITE	B	A		
QUE 90232~	181.9	L-5 CHONDRITE	B	A		
QUE 90233~	157.4	L-5 CHONDRITE	B	A		
QUE 90234~	333.2	L-5 CHONDRITE	B	B/C		
QUE 90235~	178.8	L-5 CHONDRITE	B	A		
QUE 90236~	187.1	L-5 CHONDRITE	B	A		
QUE 90237~	301.8	L-5 CHONDRITE	B	A		
QUE 90238~	205.1	L-5 CHONDRITE	B	A		
QUE 90239~	168.2	L-5 CHONDRITE	B/C	C		
QUE 90240~	115.8	L-5 CHONDRITE	B	A		
QUE 90241~	69.3	L-5 CHONDRITE	A/B	A		
QUE 90242~	212.5	L-5 CHONDRITE	B	A		
QUE 90243~	245.9	L-5 CHONDRITE	A/B	A		
QUE 90244~	152.4	L-5 CHONDRITE	B	A/B		
QUE 90245~	117.6	L-5 CHONDRITE	A/B	A		
QUE 90246~	103.1	L-5 CHONDRITE	A/B	A		
QUE 90247~	131.2	L-5 CHONDRITE	A/B	A		
QUE 90248~	153.9	L-5 CHONDRITE	A/B	B		
QUE 90249~	150.7	L-5 CHONDRITE	A/B	A		
WIS 90300	338.1	L-5 CHONDRITE	B/C	A	26	21
WIS 90301~	805.9	L-6 CHONDRITE	A/B	A		
WIS 90302	3864.6	H-5 CHONDRITE	B	B	18	16
WIS 90303	196.4	L-5 CHONDRITE	A	B/C	25	21

~Classified by using refractive indices.
#Reclassified

TABLE 2

Newly Classified Specimens Listed By Type **

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
		Achondrites				
LEW 88663	14.5	ACHONDRITE (?)	C	A	24	20
LEW 88679	7.9	DIOGENITE	B/C	A	30	26
EET 90019	21.5	UREILITE	B/C	A	11	10
		Carbonaceous Chondrites				
ALH 90407	.6	CARBONACEOUS C2	B	A	1-31	
EET 90021	19.6	CARBONACEOUS C2	A/B	A	1-28	1-3
EET 90043	12.5	CARBONACEOUS C2	B	A	1-49	1-9
EET 90047	1.2	CARBONACEOUS C2	B	A	1-11	
EET 90001	53.2	CARBONACEOUS C4	Be	A	29	
EET 90002	28.0	CARBONACEOUS C4	Be	A	29	
EET 90003	30.8	CARBONACEOUS C4	Be	A	29	
EET 90005~	42.3	CARBONACEOUS C4	Be	A		
EET 90006~	23.9	CARBONACEOUS C4	Be	A		
EET 90008~	40.0	CARBONACEOUS C4	Be	A		
EET 90009~	30.1	CARBONACEOUS C4	Be	A		
EET 90010~	10.0	CARBONACEOUS C4	Be	A/B		
EET 90013~	36.3	CARBONACEOUS C4	Be	A		
EET 90014~	20.8	CARBONACEOUS C4	Be	A/B		
EET 90016~	45.1	CARBONACEOUS C4	Be	A		
EET 90017~	15.6	CARBONACEOUS C4	Be	A		
EET 90023~	31.5	CARBONACEOUS C4	Be	A		
EET 90025	45.8	CARBONACEOUS C4	Be	A	29	
EET 90026	61.5	CARBONACEOUS C4	Ae	A	29	
EET 90027~	6.2	CARBONACEOUS C4	Be	A		
EET 90028~	31.3	CARBONACEOUS C4	Be	A		
EET 90035~	1.3	CARBONACEOUS C4	Be	A		
EET 90036~	21.2	CARBONACEOUS C4	Be	A		
EET 90038~	5.5	CARBONACEOUS C4	B	A		
EET 90039~	5.8	CARBONACEOUS C4	B	A		
EET 90040	13.1	CARBONACEOUS C4	Be	A	31	
EET 90041	2.2	CARBONACEOUS C4	B	A	31	
EET 90042	14.2	CARBONACEOUS C4	B	A	28	
EET 90044	11.5	CARBONACEOUS C4	B	A	28	
EET 90045	6.6	CARBONACEOUS C4	B	A	29	
EET 90046	5.3	CARBONACEOUS C4	Be	A	30	
EET 90048	12.4	CARBONACEOUS C4	Be	A	31	
EET 90049	18.0	CARBONACEOUS C4	B	A	30	
EET 90050	4.1	CARBONACEOUS C4	B	A	30	
EET 90052	10.7	CARBONACEOUS C4	Be	A	30	

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs

Chondrites - Type 3

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 87064	6.7	H-3 CHONDRITE	B/C	A	2-20	3-21
LEW 88500	16.0	H-3 CHONDRITE	C	B	1-20	7-18
LEW 87093	7.0	L-3 CHONDRITE	C	A	11-21	4-30
LEW 88621	7.5	L-3 CHONDRITE	C	A	7-20	3-25
LEW 88696	6.0	L-3 CHONDRITE	B/C	A	5-19	6-19
LEW 88758	5.0	LL-3 CHONDRITE	C	A	2-32	2-27
LEW 88783	9.8	LL-3 CHONDRITE	Ce	A	7-34	1-18

E Chondrites

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 87057	.4	E-3 CHONDRITE	C	A/B	0.3	0.1-18
LEW 87237	1.9	E-3 CHONDRITE	B/C	B	-	0-16
LEW 87285	.5	E-3 CHONDRITE	A	-	0-16	
LEW 88714	22.6	E-6 CHONDRITE	C	A	-	.1-.6

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.

~Classified by using refractive indices.

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).

CARBONACEOUS C4:

EET 90001, 90002, 90003, 90005, 90006, 90008, 90009, 90010, 90013, 90014, 90016, 90017, 90023, 90025, 90026, 90027, 90028, 90035, 90036, 90038, 90039, 90040, 90041, 90042,.90044, 90045, 90046, 90048, 90049, 90050, 90052 with EET 87507.

E-3 CHONDRITE

LEW 87057, 87237, 87285 with LEW 87223

E-6 CHONDRITE

LEW 88714 with LEW 87119.

L-5 CHONDRITE

QUE 90201, 90202, 90205, 90206, 90207, 90208, 90209, 90210, 90211, 90212, 90213, 90214, 90215, 90216, 90217, 90218, 90219, 90221, 90224, 90225, 90226, 90227, 90229, 90230, 90231, 90232, 90233, 90234, 90235, 90236, 90237, 90238, 90239, 90240, 90241, 90242, 90243, 90244, 90245, 90246, 90247, 90248, 90249, with QUE 90201.

LL6 CHONDRITE

LEW 88564, 88586, 88606

Sample No.: **ALH90407**
Location: Allan Hills
Field Number: 6619
Dimensions (cm): 1 x 0.9 x 0.6
Weight (g): 0.6
Meteorite Type: C2 chondrite

Macroscopic Description: Cecilia Satterwhite
The exterior of this pea-sized meteorite is dark gray to black and contains one small patch of fusion crust. The interior is medium gray. Abundant light colored inclusions and a few small dark inclusions are visible in the coarse grained matrix.

Thin Section (.2) Description: Brian Mason
The section consists almost entirely of black matrix, with sparse chondrules and small scattered grains of olivine. Microprobe analyses show that most of the olivine is near Mg_2SiO_4 in composition, but some iron-rich grains are present, the range being Fa_{1-31}, mean Fa_9 (CV FeO is 123). The meteorite is a C2 chondrite.

Sample No.: **EET90001; 90002; 90003; 90025; 90026**
Location: Elephant Moraine
Field Number: 6383; 6852; 6804; 6953; 6432
Dimensions (cm): 3.8 x 3.8 x 2.8; 3 x 2.8 x 1.5; 3.5 x 2.5 x 1.8; NA; 3.5 x 2.0 x 4.5
Weight (g): 53.2; 28.0; 30.8; 45.8; 61.5
Meteorite Type: C4 chondrite

Macroscopic Description: Robbie Marlow and Cecilia Satterwhite
Some fusion crust is present on all of these meteorites, the amount varying from 10% to 95%. The fusion crust is generally thin and black. Traces to abundant amounts of evaporite deposits are present. The deposit is white on most specimens except for 90003 where it has a greenish-blue color similar to that seen on EET90004 and 007. The interior of these Elephant Moraine C4's is medium gray. Cream-colored inclusions are present as is a small amount of metal.

Thin Section (EET90001,6; 90002,5; 90003,3; 90025,2; 90026,2) Description: Brian Mason
These sections are identical with the EET90004 group previously described (Antarctic Meteorite Newsletter, vol. 14, no. 2, 1991), and can confidently be paired with them. Additional specimens paired on optical examination are 90005, 006, 008, 009, 010, 013, 014, 016, 017, 023, 027, 028, 035, 036, 038, 039, 040, 041, 042, 043, 044, 045, 046, 047, 048, 049, 050, 052.

In the original description of the EET90004 group they were classed as C4 chondrites and tentatively paired with the EET 87507 group. Recently Kallemeyn et al. (Geochimica et Cosmochimica Acta, vol. 55, p. 883, 1991) reassigned EET87507 and its paired specimens from type 4 to type 5 "on the basis of their coarse silicate groundmass (50-200 µm) and highly recrystallized, barely discernable chondrules." However, well-defined chondrules are present in the following sections: EET87507,5; 87526,8; 90002,5; 90004,4; 90015,6; 90018,3; 90022,4. In fact, these sections are very similar to those of Karoonda, which is generally accepted as a C4 chondrite. Under these circumstances the original classification of these meteorites as C4 chondrites is retained.

Sample No.: **EET90019**
Location: Elephant Moraine
Field Number: 6872
Dimensions (cm): 4 x 2 x 1
Weight (g): 21.5
Meteorite Type: Ureilite

Macroscopic Description: Cecilia Satterwhite
Dull, black fusion crust covers most of this achondrite. The thickness of the fusion crust varies from thick to thin. Breaking EET90019 revealed a crystalline interior that is red-brown to black in color. Some rusty areas are present. Evaporite deposit is visible on the interior surfaces. Some troilite was noted.

Thin Section (.2) Description: Brian Mason
The section shows an aggregate of anhedral to subhedral olivine and pyroxene grains, up to 3 mm across, in a black carbonaceous matrix. The pyroxene shows coarse polysynthetic twinning. Microprobe analyses give the following compositions: olivine, Fa_{11} (CaO content is 0.3%); pyroxene, $Wo_{10}Fs_{10}$. The meteorite is a ureilite; it appears to be distinct from the other EET ureilites.

Sample No.: **EET90021**
Location: Elephant Moraine
Field Number: 6351
Dimensions (cm): 3.2 x 3 x 1
Weight (g): 19.6
Meteorite Type: C2 chondrite

Macroscopic Description: Cecilia Satterwhite
Seventy percent of the exterior of this carbonaceous chondrite is covered with fractured, black fusion crust. Cleaving this stone revealed an interior that is black in color and contains abundant light gray inclusions that are as large as 2 mm in diameter. A weathering rind is present.

Thin Section (,2) Description: Brian Mason
The section consists largely of black opaque matrix, with occasional chondrules up to 0.3 mm across and numerous small grains of olivine and a little pyroxene. Microprobe analyses show that most of the olivine is close to Mg_2SiO_4 in composition, with a few more iron-rich grains; mean composition is Fa_3, with range Fa_{1-28} (CV FeO is 241). Pyroxene composition is Fs_{1-3}. The meteorite is a C2 chondrite.

Sample No.: **EET90043**
Location: Elephant Moraine
Field Number: 7133
Dimensions (cm): 2.9 x 1.8 x 1.3
Weight (g): 12.5
Meteorite Type: C2 chondrite

Macroscopic Description: Cecilia Satterwhite
One patch of fusion crust remains on this meteorite. The interior is black with abundant chondrules/inclusions present.

Thin Section (,2) Description: Brian Mason
The section shows numerous small chondrules, up to 0.9 mm across, and abundant small grains, mainly olivine, in a black matrix. Microprobe analyses show olivine with a wide range in composition, Fa_{1-49}, mean Fa_{14} (CV FeO is 103); pyroxene, Fs_{1-9}. The meteorite is a C2 chondrite.

Sample No.: **EET90047**
Location: Elephant Moraine
Field Number: 6854
Dimensions (cm): 1.7 x 1 x 0.5
Weight (g): 1.2
Meteorite Type: C2 chondrite

Macroscopic Description: Cecilia Satterwhite
What little fusion crust remains on this carbonaceous chondrite is frothy and black. A few chondrules/inclusions are visible in the black interior.

Thin Section (,2) Description: Brian Mason
The section shows numerous chondrules, up to 0.8 mm across, and some scattered silicate grains, mainly olivine, in a black matrix. The chondrules appear to be completely serpentinized. The olivine grains in the matrix are close to Mg_2SiO_4 in composition, with a few more iron-rich grains; the composition range is Fa_{1-11}, mean Fa_2 (CV FeO is 172). The meteorite is a C2 chondrite.

Sample No.: **LEW87057; 87237; 87285**
Location: Lewis Cliff
Field Number: 4051; 4794; 4791
Dimensions (cm): 1 x 0.5 x 0.4; 1.8 x 1.2 x 0.4; 1 x 0.5 x 0.4
Weight (g): 0.4; 1.9; 0.5
Meteorite Type: E3 chondrite

Macroscopic Description: Cecilia Satterwhite and Carol Schwarz
Little fusion crust remains on these three chondrites. Weathering has taken its toll and left their interiors severely oxidized with no features recognizable. All the material from LEW87285 was made into thin sections; potted material is still available from 87057.

Thin Section (LEW87057,1; 87237,2; 87285,1) Description: Brian Mason
These three meteorites are identical and can be confidently paired with LEW87223. The sections show a closely packed aggregate of chondrules, up to 1.2 mm across, together with abundant metal grains and minor sulfide. Weathering is extensive, with limonitic staining and areas of brown limonite throughout the sections. The chondrules consist of granular or radiating pyroxene. Most of the pyroxene is close to $MgSiO_3$ in composition, but a few more Fe-rich grains were analysed. One grain of almost pure forsterite (FeO 0.3%) was found in 87057. The metal has a variable Si content, up to 0.6%. The meteorites are classified as E3 chondrites.

Sample No.: **LEW87064**
Location: Lewis Cliff
Field Number: 4148
Dimensions (cm): 2 x 1.5 x 1.5
Weight (g): 6.7
Meteorite Type: H3 chondrite

Macroscopic Description: Carol Schwarz
LEW87064 is a rounded stone with a smooth surface. Ninety five percent of the exterior is covered with fusion crust. Although the interior is extensively weathered, several millimeter-sized chondrules are visible.

Thin Section (.2) Description: Brian Mason
The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 1.8 mm across, in a granular matrix containing a moderate amount of nickel-iron and troilite. A variety of chondrule types is present, including granular and porphyritic olivine and olivine-pyroxene, and radiating and cryptocrystalline pyroxene. Weathering is extensive, with limonitic staining and areas of red-brown limonite throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{2-20}, mean Fa_{14} (CV FeO is 43); pyroxene, Fs_{3-21}. The amount of nickel-iron suggests H group, and the variability of olivine and pyroxene compositions type 3, hence the meteorite is classified as an H3 chondrite (estimated H3.5).

Sample No.: **LEW87093**
Location: Lewis Cliff
Field Number: 4206
Dimensions (cm): 2.5 x 1.5 x 1
Weight (g): 7.0
Meteorite Type: L3 chondrite

Macroscopic Description: Cecilia Satterwhite
LEW87093 is extremely weathered. Some reddish-brown crust remains and no features can be seen through the reddish brown oxidation.

Thin Section (.2) Description: Brian Mason
The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 2.1 mm across, in a matrix of fine-grained olivine and pyroxene and a little nickel-iron and troilite. Weathering is extensive, with limonitic staining and areas of brown limonite throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{11-21}, mean Fa_{17} (CV FeO is 19); pyroxene, Fs_{4-30}. The variability of olivine and pyroxene compositions suggests type 3, and the amount of nickel-iron indicates L group, hence the meteorite is classified as an L3 chondrite (estimated L3.8).

Sample No.: **LEW88500**
Location: Lewis Cliff
Field Number: 5224
Dimensions (cm): 4.1 x 1.4 x 1.6
Weight (g): 16.0
Meteorite Type: H3 chondrite

Macroscopic Description: Robbie Marlow
LEW88500 is mostly covered with shiny brown fusion crust. The interior is severely weathered masking any features that may be present.

Thin Section (.2) Description: Brian Mason
The section shows abundant chondrules and chondrule fragments, up to 1.9 mm across, in a finely granular matrix of olivine and pyroxene with a moderate amount of nickel-iron and a little troilite. Weathering is extensive, with limonitic staining and areas of brown limonite throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{1-20}, mean Fa_{16} (CV FeO is 29); pyroxene, Fs_{7-18}. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron H group, hence the meteorite is classified as an H3 chondrite (estimated H3.7).

Sample No.: **LEW88564; 88586; 88606**
Location: Lewis Cliff
Field Number: 4531; 5308; 5565
Dimensions (cm): 1.7 x 1.5 x 1; 1.9 x 1.4 x 1.0; 1.4 x 1.2 x 1.0
Weight (g): 6.5; 6.4; 2.7
Meteorite Type: LL6 chondrite

Macroscopic Description: Cecilia Satterwhite and Robbie Marlow
Thin black to brown fusion crust covers approximately half of each of these specimens. Each meteorite shows a brecciated interior with dark matrix surrounding areas of light matrix. Oxidation is moderate to heavy in areas.

Thin Section (LEW88564,1; 88586,2; 88606,2)
Description: Brian Mason
These meteorites are very similar in texture and mineral compositions and are probably paired. The sections show a cataclastic texture, with individual clasts up to 4 mm across. Olivine is the principal mineral, with a lesser amount of pyroxene and minor plagioclase. The sections are dark gray from finely disseminated troilite, much of it as coatings on silicate grain boundaries. Trace amounts of nickel-iron are present. The silicates are generally fine-grained, 0.02-0.05 mm, apparently by shock comminution of larger grains. Vague traces of chondritic structure were noted. The larger clasts, most abundant in 88586, are coarser-grained and lack the disseminated sulfide. Mineral compositions are slightly variable, the means being: olivine, Fa_{30}; pyroxene, Fs_{24}; plagioclase, An_{10}. The meteorites are tentatively identified as LL6 chondrites, but further research is indicated.

Sample No.:	**LEW88621**
Location:	Lewis Cliff
Field Number:	5519
Dimensions (cm):	2.0 x 1.8 x 1.1
Weight (g):	7.5
Meteorite Type:	L3 chondrite

Macroscopic Description: Robbie Marlow
Dull, frothy fusion crust covers 95% of this weathered meteorite. Any features present have been obliterated by oxidation.

Thin Section (,2) Description: Brian Mason
The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 1.8 mm across, in a fine-grained matrix of olivine and pyroxene with a small amount of nickel-iron and troilite. Extensive weathering is indicated by brown limonitic staining throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{7-20}, mean Fa_{16} (CV FeO is 24); pyroxene, Fs_{3-25}. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron L group, hence the meteorite is classified an an L3 chondrite (estimated L3.7).

Sample No.:	**LEW88663**
Location:	Lewis Cliff
Field Number:	6116
Dimensions (cm):	2.6 x 1.8 x 1.7
Weight (g):	14.5
Meteorite Type:	Achondrite (?)

Macroscopic Description: Robbie Marlow
Smooth, dull, dark brown fusion crust completely covers LEW88663. Cleaving this meteorite revealed an interior that is brown and black with a crystalline texture. A weathering rind that is about 1-2 mm thick is present. Oxidation is moderate to heavy in areas. No noteable interior features were visible.

Thin Section (,2) Description: Brian Mason
The section shows a granular aggregate of subequal amounts of olivine and pyroxene (average grain size 0.3 mm), with about 10% of plagioclase, 5% of troilite, and a trace of chromite. Brown limonitic staining pervades the section. Microprobe analyses give the following compositions: olivine, Fa_{24}; pyroxene, Wo_2Fs_{20}; plagioclase, somewhat variable, An_{17-23}. The olivine and pyroxene compositions match those of an L chondrite, but chondritic structure is absent and the meteorite has no nickel-iron. The meteorite is tenatively classified as an achondrite, but the composition does not seem to match that of any known achondrite.

Sample No: **LEW88679**
Location: Lewis Cliff
Field Number : 6187
Dimensions (cm): 1.8 x 1.5 x 1.2
Weight (g): 7.9
Meteorite Type: Diogenite

Macroscopic Description: Cecilia Satterwhite
Thin shiny fusion crust covers most of LEW88679. Areas of light brown oxidation scattered throughout the gray matrix give the interior a mottled appearance. Single crystals of pyroxene were noted.

Thin Section (.2) Description: Brian Mason
The section consists almost entirely of anhedral grains of pyroxene, up to 6 mm across; under crossed polars they show undulose extinction. Accessory amounts of isotropic plagioclase (maskelynite?) are present, as rounded grains 0.1-0.6 mm across; one grain of olivine was seen. Microprobe analyses show that the pyroxene has a fairly uniform composition, mean Wo_3Fs_{26}, with CaO 1.4-2.0%, Al_2O_3 0.9-1.1%. Plagioclase composition is An_{92}; olivine composition is Fa_{30}. The meteorite is a diogenite. It lacks the cataclastic texture of the other LEW digenites (88008 and 88011).

Sample No.: **LEW88696**
Location: Lewis Cliff
Field Number: 6144
Dimensions (cm): 2.1 x 1.8 x 1.0
Weight (g): 6.0
Meteorite Type: L3 chondrite

Macroscopic Description: Robbie Marlow
Ninety percent of LEW88696 is covered with smooth brown fusion crust. Abundant millimeter-sized inclusions are visible in the gray matrix. Oxidation appears as large patches scattered throughout the interior.

Thin Section (.2) Description: Brian Mason
The section shows numerous chondrules and chondrule fragments, up to 2.4 mm across, in a groundmass of fine-grained olivine and pyroxene with a minor amount of nickel-iron and troilite. Weathering is extensive, with limonitic staining and small areas of red-brown limonite throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{5-19}, mean Fa_{16} (CV FeO is 28); pyroxene, Fs_{6-19}. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron L group, hence the meteorite is classified as an L3 chondrite (estimated L3.7).

Sample No.: **LEW88714**
Location: Lewis Cliff
Field Number: 5654
Dimensions (cm): 3.5 x 3.5 x 1
Weight (g): 22.6
Meteorite Type: E6 chondrite

Macroscopic Description: Cecilia Satterwhite
Smooth, shiny, brown fusion crust covers one half of this meteorite. The interior matrix is fine-grained. Oxidation is heavy, giving the interior a brown color.

Thin Section (.2) Description: Brian Mason
Only vague traces of chondritic structure can be distinguished; the section consists largely of fine-grained pyroxene (grain size 0.06-0.3 mm), with a moderate amount of nickel-iron and minor troilite. Trace amounts of a colorless highly birefringent mineral, probably sinoite, were noted. Weathering is extensive, with brown limonitic staining throughout the section. Microprobe analyses show the pyroxene is almost pure $MgSiO_3$ (FeO 0.1-0.4%, CaO 0.5-0.6%); a little plagioclase, An_{13}, was found. The nickel-iron contains about 1.5% Si. The meteorite is an E6 chondrite; it is closely similar to LEW87119 and LEW88135, with which it may be paired. The other LEW E6 chondrite, 88180, is distinctly different, and almost unweathered.

Sample No.: **LEW88758**
Location: Lewis Cliff
Field Number: 5620
Dimensions (cm): 2.1 x 1.5 x 0.9
Weight (g): 5.0
Meteorite Type: LL3 chondrite

Macroscopic Description: Robbie Marlow
Shiny, dark brown fusion crust covers nearly half the exterior of this extremely weathered meteorite. The interior consists of dark brown matrix with some orangish colored inclusions/chondrules.

Thin Section (.2) Description: Brian Mason
The section shows abundant chondrules and chondrule fragments, up to 1.7 mm across, in a fine-grained dark matrix which contains trace amounts of nickel-iron and troilite. Weathering is extensive, with brown limonitic staining throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{2-32}, mean Fa_{16} (CV FeO is 57); pyroxene, Fs_{2-27}. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron LL group, hence the meteorite is classified as an LL3 chondrite (estimated LL 3.4).

Sample No.: **LEW88783**
Location: Lewis Cliff
Field Number: 5372
Dimensions (cm): 2.5 x 2.0 x 1.5
Weight (g): 9.8
Meteorite Type: LL3 chondrite

Macroscopic Description: Robbie Marlow
No fusion crust remains on this weathered stone. Evaporite deposit is present on the exterior surface. The interior is red brown with small areas of gray matrix scattered throughout. One millimeter sized orange inclusion was noted. Oxidation is heavy.

Thin Section (,2) Description: Brian Mason
The section shows a close-packed aggregate of chondrules and chondrule fragments, up to 2.9 mm across, in a minimum amount of black opaque matrix which contains accessory amounts of nickel-iron and troilite. Minor weathering is indicated by scattered areas of brown limonite. Microprobe analyses show olivine and pyroxene of variable composition: olivine, Fa_{7-34}, mean Fa_{18} (CV FeO is 38); pyroxene, Fs_{1-18}. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron LL group, hence the meteorite is classified as an LL chondrite (estimated LL3.6).

Sample No.: **WIS90302**
Location: Wisconsin Range
Field Number: 6117
Dimensions (cm): 19.8 x 14.5 x 12.5
Weight (g): 3864.6
Meteorite Type: H5 chondrite

Macroscopic Description: Roberta Score and Robbie Marlow
The exterior surface of WIS90302 is approximately 30% covered with dull brown and black fusion crust. Areas devoid of fusion crust are a dull brown rusty color. Abundant 2-3 mm sized chondrules and large rectangular (10 x 10 mm) clasts are scattered over the rough exterior surface. Minor fractures are present. In hand specimen WIS90302 appears to be brecciated. Many large (several cm in size) white areas are completely surrounded by dark areas. Metal is scattered throughout. Weathering is moderate to heavy. This meteorite plus the other three chondrites found in the Wisconsin Range were collected by a geologic field team working in the area.

Thin Section (,11,12,13) Description: Brian Mason
The sections show a few chondrules and chondrule fragments in a crystalline groundmass consisting largely of olivine and pyroxene with minor nickel-iron and troilite. Moderate weathering is indicated by limonitic staining around metal grains. The brecciated structure noted in the macroscopic description is not particularly evident in thin sections, being manifested in areas darkened by the presence of finely divided troilite, probably a shock effect. The texture and mineral compositions classify this meteorite as an H5 chondrite, although an area in 90302,11 had no chondrules and an H6 texture.

Natural Thermoluminescence (NTL) Data for Antarctic Meteorites

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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 NTL lies between 5 and 100 krad, the natural TL is related primarily to terrestrial age. Samples with NTL <5 krad have TL below that which can reasonably be ascribed to long terrestrial ages. Such meteorites have had their TL lowered by heating within the past million years or so (by close solar passage, shock heating, or atmospheric entry), exacerbated, in the case of certain achondrite classes, by "anomalous fading". We suggest that meteorites with NTL > 100 krad are candidates for an unusual history involving high radiation doses and/or low temperatures. NTL data for 40 Allan Hills meteorites collected by EUROMET in 1988 have been published in Meteorical Bulletin 71 (Meteoritics 26:3). (February 1992 data set).

Sample	Class	NTL [krad at 250 deg. C]	Sample	Class	NTL [krad at 250 deg. C]
EET90020	EUC	1.4 ± 0.1	EET90012	L 4	11.6 ± 0.1
			QUE90201	L 5	8.0 ± 0.1
LEW90500	C 1	< 1	QUE90202	L 5	8.2 ± 0.1
EET90007	C 4	2 ± 1.5	EET90030	L 6	12.6 ± 0.1
EET90015	C 4	< 1	EET90034	L 6	4 ± 1
EET90031	LL6	26.1 ± 0.1	QUE90200	H 4	88.5 ± 0.9
			QUE90203	H 6	42.9 ± 0.2
ALH90411	L 3	20.5 ± 0.1			

The quoted uncertainties are the standard deviations shown by replicate measurements of 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.

EET90034 appears to have been heavily shocked.
ALH90411 is type 3.7.
Pairings (confirmation of pairings suggested in AMN 14:2):
- C4: EET90007, EET90015 with EET87507
- L5: QUE90201 and QUE90202 (reclassified from L4 in this issue).

TABLE 5

^{26}Al Activity Data for Antarctic Meteorites

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SPECIMEN NUMBER	CLASS	^{26}Al Activity (dpm/kg)	SPECIMEN NUMBER	CLASS	^{26}Al Activity (dpm/kg)
ALHA 81096	H5	55 ±5	TIL 82406	L4	58 ±4
ALHA 81097	H4	60 ±5	TIL 82407	L4	48 ±3
ALHA 81304	L6	40 ±2	TIL 82408	LL3	49 ±4
ALHA 81307	L6	51 ±3	TIL 82409	H5	46 ±3
ALHA 82110	H3	53 ±3	TIL 82411	L4	49 ±3
ALHA 84099	H5	68 ±4	TYR 82700	L4	60 ±4

Uncertainties are calculated from counting statistics. All data have been corrected for background effects and counting geometry, and preliminary corrections have been made for sample geometry effects. For more information or to request a copy of the complete Battelle ^{26}Al dataset, please contact John Wacker [telephone: (509) 376-1076; FAX: (509) 376-5021].