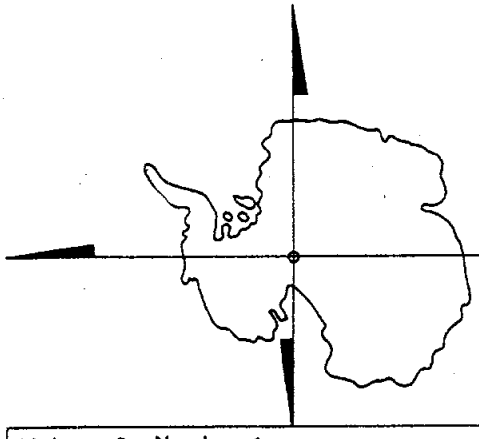


Antarctic Meteorite NEWSLETTER

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

Volume 2, Number 1 June 1979

Supported by the National Science Foundation, Division of Polar Programs, and compiled at Code SN2, Johnson Space Center, NASA, Houston, Texas 77058

The Meteorite Working Group will meet next in mid-September, 1979, to consider sample requests for specimens described in the news letters. Please submit requests before 1 September to:

John O. Annexstad
Secretary, Meteorite Working Group
Curators Branch, Code SN2
NASA/Johnson Space Center
Houston, Texas 77058

Detailed procedures and requirements for sample requests can be found on page 2.

- SPECIAL ANNOUNCEMENTS -

Mailing List

The Newsletter is sent to those people who have informed us they want to receive it. If you know anyone who does not receive the newsletter and would like to, have them send their name and address to the Secretary, Meteorite Working Group.

Newsletter frequency

During 1978 three issues of the Antarctic Newsletter were published. This year we plan to publish two issues unless the need for a third arises. The Meteorite Working Group will probably meet twice yearly around March/April and September/October. An issue of the newsletter will follow those meetings.

Newsletter mailing

Our foreign correspondents were sent Vol. 1, Number 3 by surface mail which resulted in unnecessary delays of delivery. Steps have been taken to insure the use of air mail for future issues.

Processing constraints

The Curator's Office, Johnson Space Center is involved with moving lunar samples to a new facility this summer. Since the meteorite processing group shares personnel and some resources with the lunar group, meteorite processing will be retarded for a few months. The affected areas will be processing samples for Newsletter information and processing samples for scientific study. Please bear with us during the move period because it is a temporary condition. The good news is that space vacated by lunar sample processing activities will eventually be dedicated to meteorite processing. This should allow us to expand the meteorite work in the future.

REQUIREMENTS AND PROCEDURES FOR ANTARCTIC METEORITE SAMPLE REQUESTS

Formal requests for Antarctic meteorite samples for scientific research should be submitted in writing to John O. Annexstad, Secretary, Meteorite Working Group, Code SN2, Johnson Space Center, NASA, Houston, Texas 77058. Requests are welcome from qualified U.S. and foreign scientists and will be considered twice yearly by the Meteorite Working Group of the National Science Foundation. In order for a request to be considered by the MWG, it must arrive in the Secretary's office prior to a deadline published in the newsletter. Some selected specimens can be allocated by the curator without a full scale committee review.

Sample requests will be reviewed independently of whether or not the requestor is presently funded for meteorite or lunar sample studies. It should be noted that sample allocation does not in any way commit funding agencies to the financing of the proposed research on Antarctic meteorites. Requests for financial support for research must be submitted separately to the appropriate funding agencies.

Requests for sample should provide detailed scientific justification of the proposed research and should include sample numbers, weight requirements, special handling and shipping requirements. Consortium type sample requests which are aimed at in-depth studies of specific samples by groups of scientists of different specialties are encouraged. Relevant sample information will be contained in the newsletters published by the Meteorite Working Group of the NSF through the Office of the Curator, Johnson Space Center, Houston, Texas.

Investigators wishing to study polished thin sections of Antarctic meteorites in support of their sample requests can do so at the thin section libraries which are located at the Johnson Space Center (contact Secretary, Meteorite Working Group) and at the National Museum of Natural History, Smithsonian Institution, Washington, DC (contact Brian Mason, Curator). These sections are for optical examination only and cannot be loaned out. Requests for polished thin sections or microprobe mounts will be entertained by the MWG, which will recommend the number and distribution of additional sections.

All allocated Antarctic meteorite samples remain the property of the National Science Foundation and are subject to recall to avoid any unnecessary duplication of effort. Any changes in the scope of research on allocated samples not detailed in the original sample request must be approved by the Meteorite Working Group.

1978-79 ANTARCTIC SEARCH FOR METEORITES

The third U.S. - Japan joint search for Antarctic meteorites was carried out during the 1978-79 austral summer. Participants from the U.S. were W. A. Cassidy and D. A. Clauter (University of Pittsburgh), J. O. Annexstad (Johnson Space Center) and U. B. Marvin (Smithsonian Astrophysical Observatory). Japanese participants were F. Nishio, M. Funaki and K. Shiraishi from the National Institute of Polar Research. The goals for this season were to search in the Darwin Glacier and Allan Hills areas for meteorites and to establish a glaciological network near the Allan Hills to investigate the mechanism of meteorite concentration.

Two parties searching at different times investigated the Darwin Glacier area which is located 300 km southwest of McMurdo Station. The area searched was between Boomerang Range to the north and Lonewolf Nunataks to the south where wide bare ice fields had been recognized from satellite photographs.

The parties collected 44 meteorites in four weeks. Twenty eight chondrites were found between the heads of the Darwin and Hartherton Glaciers near a low range of hills we have provisionally named Meteorite Hills. Six chondrites are from Bates Nanatak which is located 100 km southwest of the Darwin Glacier. A geological survey team from Waikato University of New Zealand, found six iron meteorites, of which the largest is around 25 cm in diameter, on the mountain side of Derrick Peak. Our party continued the search and located ten more irons, the largest of which weighs in excess of 130 kilograms.

In the Allan Hills area, three parties were dispatched at different times to find meteorites. Over the span of two months, the parties recovered 267 specimens in a 50 km^2 bare ice field. The search parties this season used snowmobiles which might account for such phenomenal success in a region that yielded 310 last year. Cassidy also noted that the Allan Hills area seemed to be more snow free than it was during the 1977-78 season.

A geological survey team, led by P. Kyle of Ohio State University found five chondrites near Reckling Peak which is located about 50 km north of the Allan Hills. This area will probably be investigated more thoroughly during the coming field season.

The glaciological party, (Annexstad and Nishio), established a triangular chain for measuring ice movement and ablation. This survey line extends over 15 km west from a control station at the Allan Hills. It is planned to resurvey this line in the coming season. The party also collected ice samples for dating experiments.

Preliminary Tabulation of Specimens found during
1978-79 Field Season

Meteorite Type	Darwin Glacier Area	Allan Hills Area	Total
Irons	10	1	11
Achondrites		6-8	4
Chondrites	34	∿254	291
Carbonaceous Chondrites		2	2
Possibles		3	3
TOTALS	44	267	311

Although most specimens collected have not yet been weighed and photographed, they have been assigned a name/number combination and have been placed in individual containers of various sizes according to the size of the specimen. This fact permits us to construct an approximate histogram of the number of specimens versus mass, as is shown in the accompanying figure. Each bar of the histogram shows the number of meteorite specimens in a given type of container. The weights shown below each bar are the approximate average weights of specimens in each category, as determined by the weights of those specimens already processed or by estimation. The weights in parentheses are the estimated total specimen mass in each container category as determined by multiplying the total number of specimens in each category with average weight. Compared to the 1977-78 collection, the 1978-79 collection contains fewer specimens in the ∿500 g range and more specimens in the ∿10 g range.

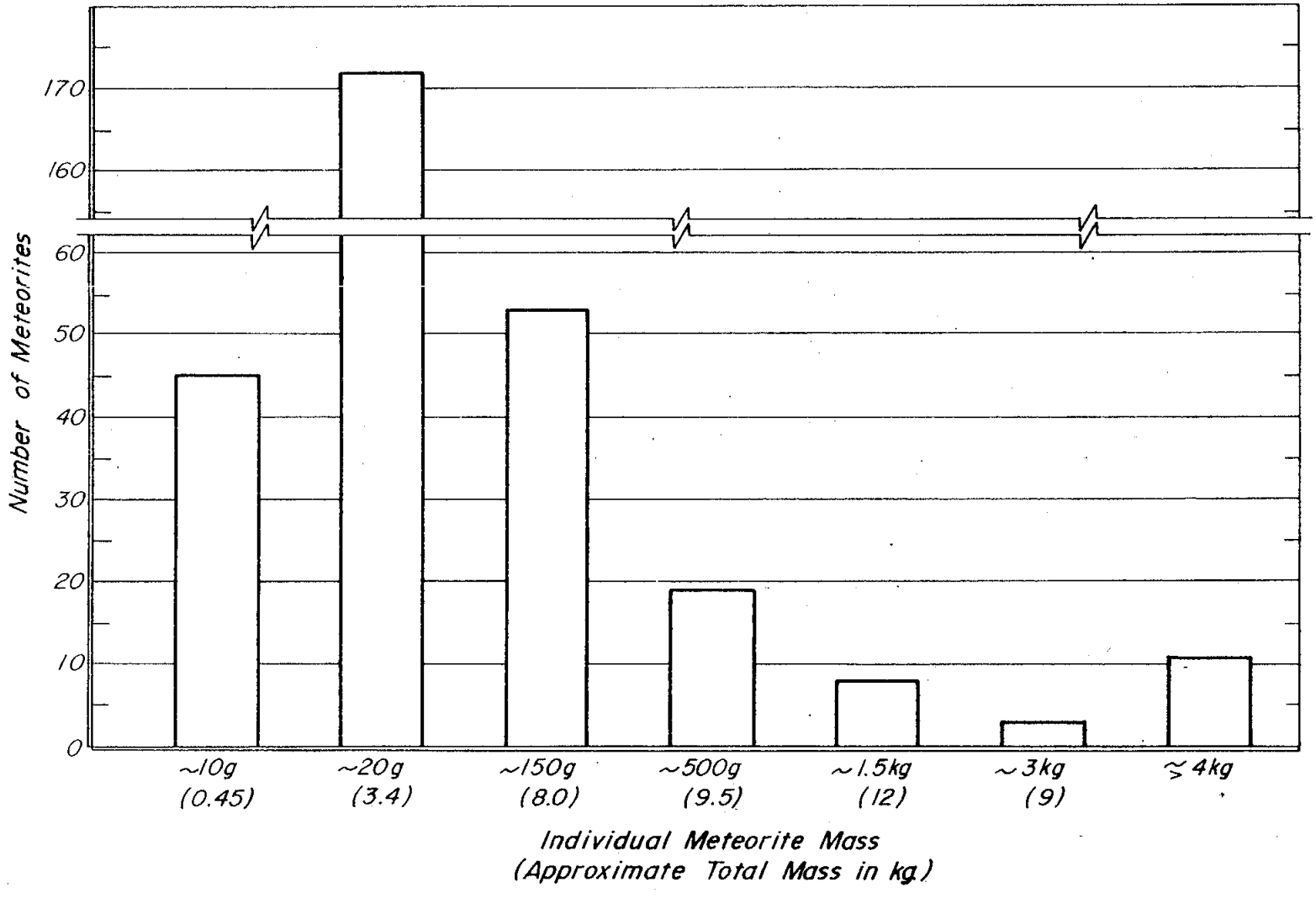
Japanese Representative

Mr. Kazuyuki Shiraishi, member of the joint U.S.-Japanese 1978-79 search for meteorites team assisted personnel of the curatorial facility in the staging of this years finds. He is a staff member of the National Institute of Polar Research in Tokyo and participated in the 1973 search for meteorites in the Yamato Mountains. During his visit to JSC, Mr. Shiraishi consented to macroscopically describe the iron meteorites from this seasons search. The described irons are listed in this newsletter and are reported in anticipation of investigator requests.

SAMPLE ALLOCATIONS

At the March, 1979, meeting of the Meteorite Working Group samples of 31 meteorites were allocated to more than 25 investigator groups. A matrix of these allocations is shown in an accompanying figure.

1978-79 Collection



SAMPLE/ INVESTIGATOR	ALHA 77003	ALHA 77208	ALHA 77214	ALHA 77219	ALHA 77224	ALHA 77230	ALHA 77250	ALHA 77256	ALHA 77257	ALHA 77271	ALHA 77278	ALHA 77283	ALHA 77299	ALHA 77302	ALHA 77306	ALHA 77307
D. Bogard; L. Nyquist														x		
W. Boynton				x												
T. Bunch; S. Chang; et. al																x
M. Drake				x												
S. Epstein	x	x						x	x							x
E. Gibson	x	x	x		x	x			x	x	x		x			x
S. Haggerty; M. Rhodes	x		x					x	x					x	x	
J. Hertogen				x				x						x		
R. Hewins				x												
E. Jarosewich				x												
T. King															x	
H. McSween																x
C. Moore																x
R. O'Nions; M. Prinz														x		
J. Papike				x										x		
C. Pillinger		x			x		x		x	x		x	x			
A. Reid				x				x								
F. Robert	x	x	x			x					x		x			
A. Schwartz																x
M. Tatsumoto											x		x			
F. Tera	x			x												
J. Wasson; et al.							x					x				x
C. Wolf																x

SAMPLE/ INVESTIGATOR	ALHA 77001	ALHA 77002	ALHA 77269	ALHA 77272	ALHA 77273	ALHA 77277	ALHA 77280	ALHA 77281	ALHA 77282	ALHA 77288	ALHA 77290	ALHA 77305	PGPA 77006	MBRA 76001	ALHA 76002
R. Clarke															x
S. Durrani	FIVE CHONDRITES TO BE SELECTED														
E. Gibson	x	x	x	x	x	x	x	x	x	x		x			
C. Pillinger														x	
J. Wasson											x		x		

TERRESTRIAL AGE FOR SOME ANTARCTIC METEORITES

Meteorite	Class	^{26}Al dpm/Kg (1)	^{26}Al terrestrial age (10^4 yrs) 1σ upper limit (1)	^{14}C dpm/Kg (2)	^{14}C terrestrial age (10^4 yrs) (2)	Thermoluminescence age (10^4 yrs) (3)
Adelie Land USNM 2318	L	50±2	<30			
Yamato 7301(J)	H4	26±3	<100			
Alan Hills						
ALHA76004	LL3	58±2	<20			
ALHA76005	EU	89±2	<10	<1.0	>3.2	
ALHA76006	H6	51±1	<20	<1.7	≥3.0	
ALHA76007	L6	45±1	<40	<1.2	>3.2	
ALHA76008	H6	11.2±.4	<180	<1.7	≥3.0	23
ALHA77002	L5	30±3	<100			14
ALHA77003	L3	45±5	<50			0
ALHA77025	H5	54±5	<20			
ALHA77062	H5	47±5	<40			
ALHA77071	H5	55±6	<20			
ALHA77081	H (?)	42±4	<60			
ALHA77086	H5	58±6	<20			
ALHA77118	H5	53±5	<20			
ALHA77124	H6	70±7	<10			
ALHA77140						6.9
ALHA77144	H6	56±6	<20			
ALHA77150	L6	43±4	<60			
ALHA77164	L3	44±5	<50			
ALHA77214	L	56±6	<30			5.6
ALHA77272	L6	35±4	<70			13
ALHA77278						8.8
ALHA77299	H3	43±4	<60			3.5

(1) Evans, J.C., and L.A. Rancitelli, 1979, Non-destructive ^{26}Al measurements on Antarctic meteorites, abstr., Lunar and Planetary Science X abstracts, pp 373-375.

(2) Fireman, E.L., 1979, Carbon-14 in lunar samples and in stony meteorites, abstr., Lunar and Planetary Science X abstracts, pp 385-387.

(3) Melcher, C.L., 1979, Thermoluminescence measurements of Antarctic meteorites, abstr., Lunar and Planetary Science X abstracts, pp 825-827.

1977 METEORITE COLLECTION

NUMBER	WT. (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77001	252.0	L-6 Chondrite	A	B	
ALHA77002	235.2	L-5 Chondrite	B	A	
ALHA77003	779.6	L-3 Chondrite	A	A	
ALHA77004	2230	H-4 Chondrite	C	C	12
ALHA77005	482.5	Achondrite (unique)	A	A	
PGPA77006	19,068	Iron			
ALHA77014	308.8	H-5 Chondrite	C	B/C	13
ALHA77015	411.1	L-3 Chondrite	B	B	14
ALHA77021	16.65	H-5 Chondrite	C	C	
ALHA77025	19.40	H-5 Chondrite	C	C	
ALHA77033	9.34	LL-3 Chondrite	C	C	
ALHA77061	12.61	H-5 Chondrite	B	A	
ALHA77062	16.72	H-5 Chondrite	B	B	
ALHA77064	6.47	H-5 Chondrite	B	B	
ALHA77071	10.87	H-5 Chondrite	B	B	
ALHA77074	12.07	H-5 Chondrite	B	B	
ALHA77081	8.59	H (?) Chondrite	B	B	
ALHA77086	19.44	H-5 Chondrite	C	C	
ALHA77088	51.15	H-5 Chondrite	C	C	
ALHA77102	12.25	H-5 Chondrite	B	C	
ALHA77118	7.84	H-5 Chondrite	C	B	
ALHA77119	6.36	H-5 Chondrite	C	C	
ALHA77124	4.41	H-5 Chondrite	C	C	
ALHA77140	78.62	L-3 Chondrite	C	B	
ALHA77144	7.88	H-6 Chondrite	B	A	
ALHA77148	13.10	H-6 Chondrite	C	C	
ALHA77150	58.30	L-6 Chondrite	C	C	
ALHA77155	305.3	L-6 Chondrite	A	A	15
ALHA77160	70.42	L-3 Chondrite	C	C	
ALHA77164	38.14	L-3 Chondrite	C	C	
ALHA77165	30.50	L-3 Chondrite	C	C	
ALHA77167	611.2	L-3 Chondrite	C	C	16
ALHA77177	368.2	H-5 Chondrite	B	A	17

NUMBER	WT. (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77182	1109.0	H-5 Chondrite	B	A	18
ALHA77190	387.1	H-4 Chondrite	C	C	19
ALHA77191	642.2	L-4 Chondrite	C	B/C	20
ALHA77192	845.3	H-4 Chondrite	C	C	21
ALHA77208	1733.0	H-4 Chondrite	C	C	
ALHA77214	2097.4	L or LL Chondrite	C	C	
ALHA77215	819.6	L-4 Chondrite	B	B	22
ALHA77216	1470.0	L-4 Chondrite	B	B	23
ALHA77217	413.2	L-4 Chondrite	A/B	B	24
ALHA77219	637.1	Diogenite	B	B	
ALHA77224	786.9	H-4 Chondrite	C	C	
ALHA77230	2473.0	L-4 Chondrite	B	B	
ALHA77231	9270.0	L-6 Chondrite	A/B	A/B	25
ALHA77233	4087.0	H-4 Chondrite	C	B	26
ALHA77234	563.8	Terrestrial			
ALHA77249	503.6	L-3 Chondrite	B/C	C	27
ALHA77250	10,555	Iron			
ALHA77252	343.1	L-4 Chondrite	B	C	28
ALHA77254	245.8	L-5 Chondrite	A/B	A	29
ALHA77255	765.1	Iron			30
ALHA77256	676.2	Achondrite (diogenite)	A	A	
ALHA77257	1995.7	Achondrite (ureilite)	A	B	
ALHA77258	597.3	H-6 Chondrite	B	A	31
ALHA77260	744.3	L-3 Chondrite	B	B	32
ALHA77261	411.7	L-6 Chondrite	B	B	33
ALHA77262	861.5	H-4 Chondrite	B	B	34
ALHA77263	1669	Iron			35
ALHA77264	10.97	H-5 Chondrite	A/B	A	
ALHA77269	1045.0	L-6 Chondrite	B	A	
ALHA77270	588.9	L-6 Chondrite	B	B	36
ALHA77271	609.5	H-6 Chondrite	A	A	
ALHA77272	674.1	L-6 Chondrite	B	B	
ALHA77273	492.0	L-6 Chondrite	B	B	

NUMBER	WT. (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77277	142.7	L-6 Chondrite	B	A/B	
ALHA77278	312.9	L-3 Chondrite	A	A	
ALHA77280	3226.0	L-6 Chondrite	A/B	B	
ALHA77281	1231.0	L-6 Chondrite	B	B	
ALHA77282	4127.0	L-6 Chondrite	B	B	
ALHA77283	10,510	Iron			
ALHA77284	376.2	L-6 Chondrite	A/B	B	37
ALHA77285	271.1	H-6 Chondrite	C	B	38
ALHA77288	1880.0	H-6 Chondrite	C	B	
ALHA77289	2186	Iron			39
ALHA77290	3784	Iron			
ALHA77294	1351.3	H-5 Chondrite	A	A	40
ALHA77296	963.3	L-6 Chondrite	A	A	41
ALHA77297	951.6	L-6 Chondrite	A/B	A	42
ALHA77299	260.7	H-3 Chondrite	A	A	
ALHA77300	234.5	H-5 Chondrite	C	B	43
ALHA77302	235.5	Achondrite (eucrite)	A	A	
ALHA77304	650.4	LL-3 Chondrite	B	B	44
ALHA77305	940.0	L-6 Chondrite	B	B	
ALHA77306	19.91	Carbonaceous Chondrite C2	A	A	
ALHA77307	181.30	Carbonaceous Chondrite C3	A	A	

Field relationships and physical and petrographic similarities suggest that the following specimens are pieces of a common fall:

1) ALHA77021, 025, 061, 062, 064, 071, 074, 086, and 088.

2) ALHA77004, 190, 191, 192, and 233.

3) ALHA77215, 216, 217, and 252.

Other paired specimens probably exist.

Note that the above meteorite list contains a change in classification for specimens ALHA77124 and ALHA77224.

1976 METEORITE COLLECTION

NUMBER	WT. (GMS)	CLASSIFICATION	PAGE
ALHA76002	307	Iron	
ALHA76004	52.5	LL3 Chondrite	
ALHA76005	317.3	Achondrite-eucrite	45
ALHA76006	271.0	H6 Chondrite	
ALHA76007	78.5	L6 Chondrite	
ALHA76008	281.3	H6 Chondrite	
ALHA76009	3,950	L6 Chondrite	
MBRA76001	1,096	H6 Chondrite	

1978 METEORITE COLLECTION

NUMBER	WT. (GMS)	CLASSIFICATION	
DRPA78001	15,100	Iron	46
DRPA78002	7,200	Iron	46
DRPA78003	144.2	Iron	47
DRPA78004	133.6	Iron	47
DRPA78005	18,450	Iron	48
DRPA78006	389.3	Iron	48
DRPA78007	11,700	Iron	49
DRPA78008	59,400	Iron	49
DRPA78009	138,100	Iron	50
ALHA78252	2,789	Iron	50

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77004 Location: Allan Hills

Field No.: 77122902 Field Contamination Category:

Weight (gms): 2230.2

Meteorite Type: H4 Chondrite

Physical Description:

The angular specimen, 7.0x5.5x2.0 cm, has many parallel fractures. Only the B surface has dull, brownish-black fusion crust. The other surfaces are weathered orangish-brown. Because of the severity of the weathering, it is impossible to define the shape, size, and color of the inclusions.

Other Characteristics:

When attempting to obtain a suitable thin section sample, the stone broke into six documented pieces. All pieces are severely weathered; no non-weathered surfaces were observed.

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, the chondrules ranging from 0.2-0.8 mm in diameter; a variety of types is present, the commonest being barred olivine, porphyritic olivine, and fine-grained or granular pyroxene. Much of the granular pyroxene is polysynthetically-twinned clinobronzite. Some of the chondrules are fragmented. The chondrules are set in a fine-grained granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in greater amount than troilite). The section is pervaded with brown limonitic staining, and veins and patches of limonite are associated with many of the metal grains. Microprobe analyses show olivine with slightly variable composition (Fa_{18}) and pyroxene with greater variability (Fs_{15-27}, average Fs_{16}).

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77014 Location: Allan Hills

Field No.: 77122931 Field Contamination Category: 2

Weight (gms): 308.8

Meteorite Type: H5 Chondrite

Physical Description:

No fusion crust is preserved on this tabular stone (9.0x6.0x2.5 cm). The exterior of the specimen is shiny, reddish-brown with lighter brownish-gold streaks randomly distributed over the surface. One fracture appears to penetrate the sample completely and numerous, smaller cracks are present, many of which are parallel, cover the exterior surfaces. This sample appears exfoliated.

Other Characteristics:

When the thin section sample was taken, no fresh metal was exposed on the stone.

Petrographic Description: Brian Mason

Chondritic structure is prominent in the thin section, but the margins of some chondrules are indistinct and tend to merge with the granular matrix. Some barred olivine and porphyritic olivine chondrules have gray turbid interstitial material, probably devitrified glass. Minor minerals include nickel-iron and troilite. A moderate amount of brown limonitic staining pervades the section, and small patches of limonite surround some of the metal grains. Plagioclase is present as small untwinned grains difficult to recognize. Microprobe analyses give the composition of the olivine as Fa_{18}, the orthopyroxene as Fs_{17}, and the plagioclase as An_{12}.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77015 Location: Allan Hills

Field No.: 77122945 Field Contamination Category: 2

Weight (gms): 411.1

Meteorite Type: L3 Chondrite

Physical Description:

The specimen is angular, 9.0x5.5x5.0 cm. Dark charcoal-brown fusion crust with vitreous luster covers approximately 50% of the sample. The fusion crust is preserved on the S surface, and is partially preserved on the B surface. The remainder of the sample is devoid of fusion crust, however, it is nearly the same color. Many fractures are present in the sample. Both angular lithic fragments and chondrules were observed on the B surface. They range in color from light brown to dark gray. The largest of these clasts is approximately 0.5 cm in length.

Other Characteristics:

When the meteorite was cleaved in half, one chip showed a surface with dark matrix and non-weathered metallic flakes, but the remainder of the meteorites' surfaces were very weathered.

Petrographic Description: Brian Mason

The section shows a close-packed aggregate of chondrules, 0.2-1.8 mm in diameter, with only a minor amount of fine-grained matrix. Chondrules are mostly olivine and olivine plus polysynthetically-twinned clinopyroxene; transparent pale brown glass is interstitial to olivine and pyroxene grains in some chondrules. Minor subequal amounts of nickel-iron and troilite are present, concentrated in the matrix and at chondrule margins; the nickel-iron grains are extensively corroded and altered to limonite, and thin veins of limonite occur throughout the section. Microprobe analyses show a wide range in the composition of olivine (Fa_1-Fa_{21}) and pyroxene (Fs_4-Fs_{24}); the pyroxene is a low-calcium clinopyroxene (CaO = 0.2-0.5%). This range of composition, together with the presence of glass and twinned clinopyroxene, indicates type 3, and the small amount of nickel-iron suggests L group; the meteorite is therefore tentatively classed as an L3 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77155 Location: Allan Hills

Field No.: Y78010307 Field Contamination Category: 4

Weight (gms): 305.3

Meteorite Type: L6 Chondrite

Physical Description:

This sample is very rough on the exterior. The knob-like surface relief features are weathered orangish-brown on their tops and commonly reveal more less-weathered (light gray) material on their sides. No fractures were noted. The patch of black fusion crust (.5x2 cm) is preserved on the B surface. The stone is 9.0x4.5x4.5 cm and is rounded on the edges. The E surface is slightly more angular than the other surfaces, possibly representing a fracture surface.

Other Characteristics:

When the meteorite was cleaved, a non-weathered interior was exposed. A few halos of iron-oxidation were observed around light colored inclusions. A small area of darker gray material is present close to the N side of the sample on both the E and W butt-ends.

Petrographic Description: Brian Mason

In thin section chondrules are sparse and tend to merge with the granular groundmass; chondrule types include porphyritic and barred olivine with interstitial devitrified glass, and fine-grained pyroxene. Plagioclase is present in minor amounts, as anhedral untwinned grains. Accessory whitlockite was identified with the microprobe. Opaque minerals include minor amounts of nickel-iron and troilite, and accessor chromite. Limonitic staining is prominent around the nickel-iron grains. Microprobe analyses gave the following mineral compositions: olivine, Fa_{24}; orthopyroxene, Fs_{20}; plagioclase, An_{10}.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77167 Location: Allan Hills

Field No.: 77123029 Field Contamination Category: 4

Weight (gms): 611.2

Meteorite Type: L-3 Chondrite

Physical Description:

This is an angular specimen approximately 12.5x8.0x6.0 cm, and is weathered very dark reddish brown. It appears that the S surface has small remnants of fusion crust, while the other surfaces are broken surfaces. Fractures are present on the N, S and B surfaces. Snow was present in a prominent fracture when the sample was removed from cold storage. Some light colored angular clasts and chondrules, up to as much as 0.5 cm, are apparent through the weathering rind. Many small holes are randomly distributed over the exterior of the stone, presumably due to the weathering out of lithic clasts and chondrules.

Other Characteristics:

When the sample was cleaved it broke into many pieces, none of which exposed fresh, non-weathered material.

Petrographic Description: Brian Mason

The thin section shows a close-packed aggregate of chondrules and chondrule fragments, with a minimal amount of dark fine-grained matrix. The chondrules range from 0.2-1.5 mm in diameter, and show a variety of types, the commonest being granular olivine, olivine-pyroxene, and fine-grained pyroxene (sometimes radiating). The pyroxene is polysynthetically-twinned clinopyroxene. The granular chondrules contain intergranular glass usually turbid and partly devitrified, but occasionally transparent and pale violet in color. Minor amounts of nickel-iron and troilite are present, often concentrated on the surface of chondrules. The meteorite is extensively weathered with brown limonitic staining pervading the section and numerous veins and small patches of limonite throughout. Microprobe analyses show a wide range in the composition of olivine (Fa_2-Fa_{41}) and pyroxene (Fs_3-Fs_{17}); the pyroxene is low-calcium, CaO=0.2-0.5%. This range of composition, together with the presence of glass and twinned clinopyroxene, indicates type 3, and the small amount of nickel-iron suggests L group; the meteorite is therefore tentatively classed as an L3 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77177 Location: Allan Hills

Field No.: Y77123110 Field Contamination Category: 4

Weight (gms): 368.2

Meteorite Type: H5 Chrondite

Physical Description:
The sample is angular and is approximately 7.0x6.5x5.5 cm. This appears to be a whole specimen, with the exception of a 3.0x4.0 cm area, which has been chipped away. A dull, black fusion crust covers approximately 30 to 40 percent of the sample. The portion of the sample not covered with fusion crust is weathered reddish-brown. A yellowish-brown clast ~0.5 cm in diameter was observed on the W surface.

Other Characteristics:

Petrographic Description: Brian Mason

The thin section shows well-developed chrondritic structure, with a variety of chrondrule types; chrondrule diameters range from 0.3-1.8 mm. The chrondrules are set in a granular matrix consisting largely of olivine and orthopyroxene, pervaded with brown limonitic staining. Minor amounts of nickel-iron and troilite are present in the matrix, nickel-iron in considerably greater amount than troilite. Microprobe analyses show olivine (Fa_{18}) and orthopyrozene (Fs_{16}) of uniform composition; minor plagioclase (An_{13}) and accessory whitlockite were also identified. The meteorite is classified as an H5 chrondite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77182 Location: Allan Hills

Field No.: Y78010313A Field Contamination Category: 4

Weight (gms): 1109

Meteorite Type: H5 Chondrite

Physical Description:

No fusion crust is apparent on this angular specimen, 12.5x8.0x7.0 cm. The overall color of the sample is orangish-brown. A band, appriximately 1.5 cm wide, of yellowish-green material crosses the meteorite on the E-W axis. It is apparent by looking at the T surface that this is not just a surface feature. Many random fractures cover the surface of the meteorite. Numerous irregular (lithic fragments) and chondrules, up to as much as 0.5 cm in diameter, are apparent. This sample appears exfoliated.

Other Characteristics:

Surfaces revealed by sawing exhibited metallic particles, approximately 1-2 mm in diameter, in addition to chondrules and lithic fragments. The largest of these inclusions is approximately 0.5 mm in length. Three fractures, 3 cm in length, are apparent in the cut face. The meteorite has no weathering rind and no weathering along fractures.

Petrographic Description: Brian Mason

The thin section shows well-developed chondritic structure, with a variety of chondrule types; chondrule diameters range from 0.5-1.5 mm. The chondrules are set in a granular matrix consisting mainly of olivine and orthopyroxene, with minor amounts of nickel-iron and lesser amounts of troilite; many of the nickel-iron grains are partly altered to red-brown limonite. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{17}) of uniform composition; minor plagioclase (An_{12}) was also identified. The meteorite is classed as an H5 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA 77190	Location:	Allan Hills, Antarctica
Field No.	77122915	Field Contamination Category:	1
Weight (gms)	387.1		
Meteorite Type	H4		

Physical Description:

The specimen is approximately 11.0 x 6.0 x 4.5 cm and is tabular. The N, T, and S surfaces have patchy remnants of thin, dull, black fusion crust. The E surface is highly oxidized, reddish-brown, fracture surface. The B surface is also a broken surface that is light brown. No unweathered material was exposed on the meteorite when it was cleaved in half. The sample is uniform reddish-brown throughout.

Other Characteristics:

After drying in the nitrogen cabinet for forty-eight hours, a small area of white material, presumably evaporites, developed on the freshly exposed interior surface.

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, but many chondrules appear to be partly fragmented (possibly shock-induced) and tend to merge with granular groundmass, which consists of olivine and pyroxene with minor amounts of nickel-iron and troilite. One large area of nickel-iron, 6x3 mm, was noted. The meteorite is severely weathered, with limonite veins throughout the section. Microprobe analyses show olivine with slightly variable composition (Fa_{17-19}, average Fa_{18}) and pyroxene with greater variability (Fs_{15-22}, average Fs_{17}). Accessory merrillite was identified with the microprobe. The meteorite is classified as an H4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No. ALHA 77191 Location: Allan Hills, Antarctica

Field No. 77122908

Weight (gms) 642.2

Meteorite Type H5 L4

Physical Description:

This 11.0 x 7.0 x 5.0 cm. specimen is semi-rounded. However, the B surface is concave. This specimen is extremely weathered, making it difficult to determine the amount of fusion crust present. The W surface has a small area of thin, less than .5mm thick, fusion crust. The iron oxide staining is semi-glossy and reddish-brown. Parallel fracture, in north-south direction, penetrate the stone. No unweathered material was exposed by cleaving the stone in half; the same reddish-brown oxidation staining that is present on the exterior of the stone penetrates throughout the specimen, with the exception of a few areas, approximately .5 cm in diameter, which are slightly lighter.

Other Characteristics:

This specimen is considered by Dr. Cassidy to be one of a group of nineteen samples that are likely to be related.

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, the chondrules ranging from 0.2 - 1.5 mm in diameter. One granular olivine chondrule on the edge of the section encloses a 0.6 mm elliptical inclusion of nickel-iron and troilite. The chondrules are set in a fine-grained granular matrix consisting largely of olivine and pyroxene, with minor nickel-iron and troilite (nickel-iron in excess of troilite). Brown limonitic staining pervades the section. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA77192	Location:	Allan Hills
Field No.	77172903	Field Contamination Category:	1
Weight (gms)	845.3		
Meteorite Type	H-4		

Physical Description:

The angular specimen (∿ 9.0 x 8.0 x 15.0 cm) is void of fusion crust. The entire stone is weathered reddish-brown, with the exception of a few small areas of gray matrix material that was exposed when the stone was cleaved in half. The severity of the weathering masks any textural characteristics.

Other Characteristics:

This is one of the nineteen specimens that Dr. Cassidy believes to be related. The meteorites that have been initially processed and comprise this group are listed below: ALHA77004; 77190; 77191; 77192, and 77233.

Petrographic Description: Brian Mason

The section shows moderately abundant chondrules, 0.3-0.9 mm in diameter, set in a granular groundmass of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). Some of the pyroxene is polysynthetically twinned clinobronzite. Brown limonitic staining pervades the section. Microprobe analyses show olivine with slightly variable composition (Fa_{16-18}, average Fa_{17}) and pyroxene with greater variability (Fs_{15-21}, average Fs_{16}). The meteorite is classified as an H4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77215 Location: Allan Hills

Field No.: 77122946 Field Contamination Category: 3

Weight (gms): 819.6

Meteorite Type: L4 Chondrite

Physical Description:

The surface of this specimen is mostly weathered surface, however a small remnant of the fusion crust remains. The E, W, and N surfaces are fracture surfaces that contain numerous chondrules and lithic clasts. The largest chondrule is approximately 0.5 cm in diameter. Both the chondrules and lithic clasts are commonly lighter color than the surrounding gray matrix. The fractures that are not covered with weathering rind range from greenish-brown to reddish brown. There are numerous fractures over the meteorites' surface. The sample is approximately 13.0x7.0x7.0 cm.

Other Characteristics:

The sample closely resembles ALHA77216, ALHA77217 and ALHA77252.

Petrographic Description: Brian Mason

The thin section shows well-developed chondritic structure, with a variety of chondrule types; chondrules range from 0.3-1.8 mm in diameter. The chondrules are set in a granular groundmass consisting largely of olivine and pyroxene (some grains polysynthetically twinned), with minor nickel-iron and troilite in approximately equal amounts. A minor amount of limonitic staining is present. Microprobe analyses show some variability in olivine and pyroxene compositions: olivine, Fa_{22}-Fa_{26}, average Fa_{23}; pyroxene, Fs_9-FS_{21}, average Fs_{15}. The meteorite is classified as an L4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77216 Location: Allan Hills

Field No.: 77122949 Field Contamination Category: 9

Weight (gms): 1470.0

Meteorite Type: L4 Chondrite

Physical Description:

Ice was present on the sample when it was removed from cold storage. Dull, black fusion crust (as much as 0.5 mm) covers half the specimen. The sample is approximately 15.0x9.0x8.0 cm. Field photographs show that the T and N surfaces were in contact with the ice at time of recovery. The overall color of this specimen is greenish-gray. Numerous inclusions (rounded and irregular) ranging to greater than 2.0 cm are apparent on the fracture surfaces, these range from white to whitish-gray to dark gray. The fracture surfaces show varying degrees of weathering, presumably due to different lengths of exposure time. This meteorite is very heterogeneous on a centimeter scale. Many fractures penetrate the sample.

Other Characteristics:

No fresh metal was observed when collecting a suitable thin section sample. This specimen resembles ALHA77215, ALHA77217, and ALHA77252.

Petrographic Description:

Most of the section shows well-developed chondritic structure, chondrules ranging from 0.3-1.2 mm in diameter. The chondritic part contains minor amounts of nickel-iron and troilite; a small amount of limonitic staining is associated with the metal grains. Three enclaves are present; two consist of granular olivine and and pyroxene, and measure at least 3 mm across; the third has a maximum of 2 mm, and consists of small grains of olivine and pyroxene in a translucent brown groundmass. Microprobe analyses show some variability in the chondritic olivine and pyroxene compositions; olivine, Fa_{23}-Fa_{26}, average Fa_{24}; pyroxene, Fs_{10}-Fs_{19}, average Fs_{16}. Olivine and pyroxene in the two granular enclaves have essentially identical and uniform composition, FA_{24} and Fs_{19} respectively. Olivine in the brown enclave has uniform composition, Fa_{24}, but the pyroxene is somewhat variable, FS_{13}-Fs_{21}, average Fs_{17}. The meteorite is classified as an L4 chondrite with enclaves.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77217 Location: Allan Hills

Field No.: 77122948 Field Contamination Category: 3

Weight (gms): 413.2

Meteorite Type: L4 Chondrite

Physical Description:

This stone is approximately 9.5x7.0x4.5 cm. Fusion crust (~1 mm thick) covers approximately 20% of the sample. The remaining surfaces are covered with iron oxide stain. The S surface is only lightly stained, presumably this is the most recently exposed surface. The broken surfaces show distinct clasts, ranging from white to dark gray, as much as 1.5 cm in length. The stone is extremely heterogeneous on a centimeter scale.

Other Characteristics:

This is very similar in appearance to ALHA77216, ALHA77215, and ALHA77252.

Petrographic Description: Brian Mason

The thin section shows moderately abundant chondrules set in a granular groundmass consisting largely of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite. Much of the pyroxene, especially in the chondrules, is polysynthetically twinned clinopyroxene. A little limonitic staining is present around nickel-iron grains. Microprobe analyses show some variability in olivine and pyroxene compositions: olivine, Fa_{17}-Fa_{25}, average Fa_{22}; pyroxene Fs_{9}-Fs_{26}, average Fs_{17}. The meteorite is classified as an L4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77231 Location: Allan Hills

Field No.: Y78010508 Field Contamination Category: 6

Weight (gms): 9270

Meteorite Type: L6 Chondrite

Physical Description:

This is a complete specimen, approximately 25.0x17.0x13.5 cm. All surfaces of the sample are covered with dull black fusion crust. The fusion crust has many polygonal fractures and is approximately 0.5 mm thick. There are several large fractures that cross the surface of the meteorite. There was snow/ice in the fractures when it was removed from cold storage. There are small areas along the fractures where the fusion crust has been removed and reveals greenish-gray material that does not have any obvious inclusions.

Other Characteristics:

When the meteorite was sawed a few light color clasts, as much as 1.5 cm in diameter, were observed. The metal in the meteorite has oxidation halos, although the weathering is not extensive.

Petrographic Description: Brian Mason

The thin section shows a granular aggregate of olivine and orthopyroxene, with minor subequal amounts of nickel-iron and troilite, and untwinned plagioclase. Chondrules are present, but their outlines are blurred and merge with the granular material. A little limonite is associated with some of the metal grains. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{21}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77233

Location: Allan Hills

Field No.: 77122913

Field Contamination Category: 1

Weight (gms): 4087

Meteorite Type: H4 Chondrite

Physical Description:

This stone is 15.0x14.0x10.5 cm. Thin, (<1/mm) dull, black, patchy fusion crust is present on the S and E surfaces. The remainder of the stone is shiny reddish-brown. White deposits, presumably evaporites, are present in minor cracks on all exterior surfaces.

Other Characteristics:

Chipping and cleaving of the specimen did not expose any non-weathered material.

Petrographic Description:

This section shows well-developed chondritic structure, the chondrules ranging from 0.2-2.8 mm in diameter; a variety of types is present, the commonest being porphyritic olivine, barred olivine, and fine-grained radiating pyroxene. The chondrules are set in a fine-grained granular groundmass consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in greater amount than troilite). Some of the pyroxene is polysynthetically twinned clinobronzite. Limonitic staining pervades the section, and veinlets and grains of limonite are common, generally in association with nickel-iron. Microprobe analyses show somewhat variable composition in olivine (Fa_{14-21}, average Fa_{17}) and pyroxene (Fs_{15-17}, average Fs_{16}). The meteorite is classified as an H4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77249

Location: Allan Hills

Field No.: 77122925

Field Contamination Category: 3

Weight (gms): 503.6

Meteorite Type: L3 Chondrite

Physical Description:

This is not a complete specimen. The S and T surfaces have very thin, dull, patches of fusion crust. The B surface has thin, shiny black fusion crust, portions of which have weathered to reddish-brown. There are numerous inclusions, both chondrules and lithic clasts, visible through the reddish-brown oxidation rind. The largest chondrule is approximately 0.5 cm in diameter and is lighter colored than the surrounding matrix. A few inclusions that are darker than the matrix are also observed; however, they are not as numerous or as large. The sample is angular, 11.0x6.5x5.0 cm, and has many obvious fractures on the exterior surface.

Other Characteristics:

Petrographic Description: Brian Mason

The thin section shows an aggregate of well-defined chondrules, 0.3-2.1 mm in diameter, set in a small amount of fine-grained groundmass. A wide variety of chondrule types is present, the commonest being barred olivine, porphyritic olivine, granular olivine-pyroxene, and fine-grained pyroxene. The olivine chondrules frequently have interstitial glass, usually turbid and partly devitrified, but occasionally transparent with a pale brown color. Pyroxene grains show polysynthetic twinning. Sparse nickel-iron and troilite is concentrated on the surfaces of chondrules. Limonitic staining pervades the section, and scattered grains of red-brown limonite are present. Microprobe analyses show a wide range in the composition of olivine (Fa_7-Fa_{35}, average Fa_{17}) and pyroxene (Fs_2-Fs_{25}, average Fs_{11}). This range of composition, together with the presence of glass and twinned clinopyroxene, indicates type 3, and the small amount of nickel-iron suggests L group; the meteorite is therefore tentatively classified as an L3 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77252

Location: Allan Hills

Field No.: 77122944

Field Contamination Category: 3

Weight (gms): 343.1

Meteorite Type: L4

Physical Description:

This sample suffered considerable damage during transport from the Antarctic and was noted as consisting of chips and fines on its arrival in California. One piece has dull, black, fusion crust present. The matrix of all pieces is greenish-gray and contains many inclusions, ranging to more than 1 cm in diameter. Many surfaces have an orangish-brown weathering rind.

Other Characteristics:

Appears macroscopically similar to ALHA77215, 216, 217

Petrographic Description: Brian Mason

The chip from which the thin section was made showed a marked division into two parts, the larger dark gray and chondrite, the smaller pale gray and granular. The granular part appears to contain some poorly defined chondrules; in the chondritic part chondrules are numerous and well-defined, sometimes broken and fragmentary. Minor subequal amounts of nickel-iron and troilite are present in both parts. A small amount of limonitic staining is present, concentrated around the metal grains. Microprobe analyses show olivine and pyroxene in the two parts to have essentially identical and uniform compositions: olivine, Fa_{23}, pyroxene, Fs_{20}. Minor plagioclase (An_{12}) was detected in both parts. This meteorite is an L-group chondrite, the chondrite part may be classified L4, the granular part L6.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77254 Location: Allan Hills

Field No.: 77122704 Field Contamination Category: 6

Weight (gms): 245.8

Meteorite Type: L5 Chondrite

Physical Description:

Very thin, dull, black fusion crust is present on two surfaces (T&N) of the meteorite. The surfaces are free of fusion crust, have a dull, orangish-brown weathering patina, with the exception of the B surface, which is a shiny orangish-brown. From field photographs it was determined that this angular specimen had its B surface in contact with the ice at the time of recovery. The B surface has slickensides. The specimen is 10.5x5.0x4.0 cm.

Other Characteristics: Brian Mason

Many inclusions are visible on the sawed surface of the meteorite, which range to as much as 1 cm in length. Discoloration, due to weathering, of the outer most material was observed to a depth of approximately 1.5 cm along the S surface

Petrographic Description:

The section shows well-developed chondritic structure, the chondrules ranging from 0.3-2.1 mm in diameter; a variety of types is present, the commonest being barred olivine, granular olivine and olivine-pyroxene, and radiating pyroxene. The chondrules are set in a granular matrix of olivine and orthopyroxene, with minor subequal amounts of nickel-iron and troilite. Limonitic staining and a few patches of red-brown limonite are associated with the metal grains. Fusion crust is present along one edge of the section. Microprobe analyses show olivine (Fa_{23}) and orthopyroxene (Fs_{20}) of essentially uniform composition. The meteorite is classified as an L5 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No. ALHA77255 Location: Allan Hills

Field No.

Weight (gms) 765

Meteorite Type Iron

Physical Description:

This sample is shaped like a boomerang and is approximately 15.5 x 7.0 x 1.5 cm. The two flat surfaces, B and T, have an irridescent goldish-red sheen on the brownish-black fusion crust. The B surface is darker brownish-red than the other surfaces and is concave. Small regmaglypts, ∿1 mm or less in depth, are present on the N and T surfaces. All corners on the specimen are smooth and rounded.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77258 Location: Allan Hills

Field No.: B78010303 Field Contamination Category: 5

Weight (gms): 597.3

Meteorite Type: H6 Chondrite

Physical Description:

This is a five sided specimen that is covered with polygonally fractured fusion crust. One small area has been stained by iron ixidation. The sample is ~10.0x 9.0x5.0 cm.

Other Characteristics:

Sawing the sample in half reveals that the fusion crust is $\lesssim$0.5 mm and the sample has no weathering rind. Metallic particles are visible in the yellowish-brown matrix. The matrix material appears to be very porous.

Petrographic Description: Brian Mason

In the section chondrules are sparse and poorly defined, merging with the granular groundmass, which consists of olivine and orthopyroxene with minor amounts of nickel-iron, troilite, and plagioclase. The section is moderately stained with brown limonite. Fusion crust is present along one edge. Microprobe analyses show olivine (Fa_{18}), orthopyroxene (Fs_{16}), and plagoiclase (An_{13}) of uniform composition; a little diopside ($Wo_{47}En_{47}Fs_{6}$) occurs in association with orthopyroxene. The meteorite is classified as an H6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77260

Location: Allan Hills

Field No.: 77123017

Field Contamination Category: 6

Weight (gms): 744.3

Meteorite Type: L3 (tentatively)

Physical Description:

The specimen is oblong 14.0x5.5x6.5 cm. A thin fusion crust, 0.5 mm, covers 50% of the specimen. There are several fractures that penetrate the stone and snow was preserved in these when it was removed from cold-storage. Light colored, chondrules and lithic clasts, up to as much as 0.5 cm in maximum length, were observed on the fractured surfaces. Apparently the reddish-brown color of the weathering rind masks out the darker inclusion on the exterior surfaces. The meteorite appears to be weathered throughout.

Other Characteristics:

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, chondrules ranging from 0.2-1.5 mm in diameter; some of the chondrules are irregular or broken. A variety of types is present, the commonest being barred olivine, granular olivine-pyroxene, and fine-grained radiating pyroxene. The barred and granular chondrules have interstitial glass, usually turbid and partly devitrified, but sometimes transparent and pale brown in color. Much of the pyroxene is polysynthetically-twinned clinopyroxene. The groundmass is fine-grained olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite. Limonitic staining and occasional patches of limonite are present throughout the section. Microprobe analyses show highly variable composition for both olivine (Fa_{7-23}, average Fa_{16}) and pyroxene (Fs_{1-28}, average Fs_{11}). The highly variable composition of olivine and pyroxene indicates a type 3 chondrite, and the small amount of nickel-iron suggests L group, so the meteorite is tentatively classified L3; however, certain assignment should await further investigation.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77261 Location: Allan Hills

Field No.: 77123021 Field Contamination Category: 6

Weight (gms): 411.7

Meteorite Type: L6 Chondrite

Physical Description:

The stone is angular and ~8.5x5.0x5.5 cm. Fusion crust covers ~75% of the sample, is dull black and approximately 0.5 mm thick. In places the fusion crust has weathered to a reddish color. Polygonal fractures are present on all surfaces with fusion crust. The surfaces devoid of fusion crust are polished. One large fracture penetrates the entire stone. A few weathered, reddish-brown, chondrules (?), up to as much as 0.5 cm, are apparent on the stone.

Other Characteristics:

Cleaving reveals fresh matrix material that is grayish-white and contains small metallic flakes. The exterior weathering penetrates the specimen up to a depth of 2.5 cm. One irregular (0.5 cm in maximum length), gray, lithic clast(?) is apparent on the cleaved surface.

Petrographic Description: Brian Mason

The section shows sparse and poorly-defined chondrules, merging with the granular groundmass, which consists largely of olivine and orthopyroxene with minor sub-equal amounts of nickel-iron and troilite; small grains of plagioclase are scattered throughout the groundmass. About one-third of the section is bordered by well-developed fusion crust, up to 0.6 mm thick. A little limonite and limonitic staining is present, concentrated around the nickel-iron grains. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{21}), and plagioclase (An_{11}) of uniform composition; accessory merrillite was identified with the microprobe. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77262 Location: Allan Hills

Field No.: Y78010309 Field Contamination Category: 6

Weight (gms): 861.5

Meteorite Type: H4 Chondrite

Physical Description:

The specimen is covered by dull brownish-black, polygonally fractured fusion crust on all surfaces with the exception of the B surface, which is only partially covered. The angular stone is approximately 9.5x7.5x6.5 cm. Snow/ice was present on the sample when it was removed from cold storage. Areas of the sample are covered with a thin coating, presumably evaporites.

Other Characteristics:

After drying the sample in the nitrogen cabinet, additional white material was noted around many of the surface cracks that was not present during initial processing. Small irregular and round inclusions are apparent on the sawed surface. Metallic particles present in the light gray matrix material of the sawed surface have oxidation halos. A weathering rind, as much as 0.8 cm thick, is present on the stone.

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, the chondrules ranging from 0.2-1.4 mm in diameter; a variety of types is present, the commonest being porphyritic to granular olivine, fine-grained pyroxene, and granular olivine-pyroxene. Some of the chondrules are fragmented. The chondrules are set in a fine-grained granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite (mickel-iron in greater amount than troilite). Some of the pyroxene is polysynthetically twinned clinobronzite. The meteorite is extensively weathered, with limonite pervading the section and also concentrated in veinlets. Microprobe analyses show somewhat variable composition in olivine (Fa_{15-19}, average Fa_{16}) and pyroxene (Fs_{13-16}, average Fs_{14}). The meteorite is classified as an H4 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No. ALHA77263 Location: Allan Hills

Field No.

Weight (gms) 1669

Meteorite Type Iron

Physical Description:

This orangish-brown, angular sample is approximately 15.0 x 5.5 x 8.0 cm (Figure 72). All surfaces have regmaglypts, however, the T surface has smaller regmaglypts, ∿3 mm in diameter, than the other surfaces that have regmaglypts as much as 2.5 cm in diameter. From field photographs it was determined that the T surface was in contact with the ice at the time of recovery; this surface has a more metallic luster than the other surfaces.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77270

Location: Allan Hills

Field No.: Y78010502

Field Contamination Category: 6

Weight (gms): 588.9

Meteorite Type: L6 Chondrite

Physical Description:

The sample is pyramidal, with the B surface flat, approximately 90% of the specimen is covered with a dull, brownish-black fusion crust, approximately 0.5 mm thick. The surfaces not covered with fusion crust have a weathering rind. The sample has a few fractures. The specimen measures 11.0x7.0x6.0 cm. When obtaining a suitable sample for thin section preparation, whitish-gray matrix material with small metallic flakes was exposed.

Other Characteristics:

After the sample was cleaved into halves, it became obvious that weathering along the fractures is severe. In non-fractured areas, the weathering-rind penetrates 1 to 3 mm below the fusion crust.

Petrographic Description: Brian Mason

The section shows sparse and poorly-defined chondrules, merging with the granular groundmass, which consists of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite; occasional small grains of plagioclase were noted. Fusion crust, up to 0.9 mm thick, rims part of the section. Limonitic straining and occasional grains of limonite occur in association with nickel-iron grains. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{21}), and plagioclase (An_{11}) of uniform composition; a little diopside ($Wo_{46}En_{45}Fs_9$) was noted in association with orthopyroxene. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77284 Location: Allan Hills

Field No.: Y78010501 Field Contamination Category: 6

Weight (gms): 376.2

Meteorite Type: L6 Chondrite

Physical Description:

The fusion crust on this angular stone is less than .5 mm thick, dull black, and covers all but the B surface, which is a planar fracture surface. Rounded and irregular clasts are visible in some areas on the B surface. One large fracture runs the length of the sample. The specimen is approximately 11.0x8.0x 3.5 cm.

Other Characteristics:

The material exposed during chipping to obtain a thin section sample, is grayish-white and exhibits a few small metallic flakes. A thin, 1 mm, weathering rind is apparent along the T, S, and N surfaces.

Petrographic Description: Brian Mason

The thin section shows sparse chondrules with indistinct borders, merging with the granular groundmass, which consists largely of olivine and orthopyroxene, with minor subequal amounts of nickel-iron and troilite, and a litte untwinned plagioclase. Some limonite is present, mainly in association with the nickel-iron. Microprobe analyses show olivine (Fa_{25}), orthopyroxene (Fs_{21}), and plagioclase (An_{11}) of uniform composition; one grain of apatite was identified with the microprobe. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEIORITE DATA SHEET

Sample No. ALHA 77285 Location; Allan Hills, Antarctica

Field No. Y78010510 Field Contamination Category: 6

Weight (gms) 271.1

Meteorite Type H6

Physical Description:

This semi-rounded specimen is approximately 5.0 x 6.0 x 6.5 cm, the B and S surfaces are flat. The sample is made up of three individual pieces that fit together; One of these pieces was generated in transport. A small, less than 2 cm, patch of dull, black, fusion crust is present on the B surface. The exterior of the meteorite has a reddish-brown patina. All interior surfaces of the meteorite are weathered and range in color from orangish-brown to reddish-brown.

Other Characteristics:

No unweathered material was exposed while attempting to obtain suitable material for thin sections. Ice was present on the sample when it was removed from cold storage.

Petrographic Description: Brian Mason

The section shows sparse and poorly defined chondrules tending to merge with the granular groundmass, which consists largely of olivine and orthopyroxene, with minor amounts of nickel-iron, troilite in lesser quantity, and plagioclase. The meteorite is extensively weathered, with brown staining and veins and patches of limonite throughout the section. Microprobe analyses show olivine (Fa_{18}), orthopyroxene (Fs_{16}), and plagioclase (An_{12}) of uniform composition. The meteorite is classified as an H6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No. ALHA77289 Location: Allan Hills

Field No.

Weight (gms) 2186

Meteorite Type Iron

Physical Description:

The sample is angular and oblong (22 x 10 x 5 cm). It is orangish-brown and has many regmaglypts. The B surface has radial and transverse flow lines resulting from its orientation during atmospheric entry. The B surface also shows a zone of preferential melting (?) ∿1 cm wide, that penetrates through the sample to the T surface. However, the zone of melting is only ∿.5 cm wide on the T surface.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA77294	Location:	Allan Hills, Antarctica
Field No.	B78010901	Field Contamination Category:	6
Weight (gms)	1351.3		
Meteorite Type	H5		

Physical Description:

Polygonally fractured, dull, brownish-black fusion crust, approximately 1 mm thick, covers all surfaces of the meteorite (~13.5 x 9.0 x 6.0 cm.), with the exception of the edges, which appear to have been spalled. White material, presumably evaporites, fill the grooves of the polygonal fractures on the B surface. This surface is more severely weathered than the other surfaces as evidenced by rounded areas of oxidation staining. The matrix of the stone is whitish-gray with areas of orangish-brown oxidation stain. Chondrules and irregular inclusions (lithic fragments?), as much as 2 mm in diameter, that are both lighter and darker than the matrix are apparent throughout the sample.

Other Characteristics:

After sixty hours of drying in the nitrogen cabinet, a crystalline (salt?) deposit was noted on the corner of the W, B, and S surfaces. When the stone was cut in half no weathering rind was visible. Approximately 15% of the sawed surface appears to be metallic particles.

Petrographic Description: Brian Mason

The section shows well-developed chondritic structure, with individual chondrules ranging from 0.6-1.8 mm in diameter. The chondrules are set in a granular groundmass consisting largely of olivine and orthopyroxene, with some nickel-iron and a lesser amount of troilite. A small amount of limonite staining is present around the nickel-iron grains. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA77296

Location: Allan Hills

Field No.: 78010211B

Field Contamination Category: 3

Weight (gms): 963.3

Meteorite Type: L6 Chondrite

Physical Description:

Remnants of fusion crust are present on the N surface of this angular specimen. The crust is a dull, orangish-brown, covers approximately 15% of the sample and is 1 mm thick. The B surface appears to have had the fusion crust removed; it is smoother than the remaining surface, which are fracture surfaces. The matrix is light gray and has iron oxidation associated with the included metallic particles. Both chondrules and lithic clasts, darker and lighter than the matrix material, are present. On the W surface, there is a subrounded, gray clast that is more than 1 cm in length. The specimen is 13.0x9.5x5.0 cm.

Other Characteristics:

In the field photographs of this sample, another specimen (ALHA77292) is also present, thus, perhaps, indicating that they are a paired fall.

Petrographic Description:

The section shows sparse and ill-defined chondrules set in a granular matrix of olivine and orthopyroxene, with minor amounts of nickel-iron, troilite, and untwinned plagioclase. A small amount of limonitic staining is associated with the metal grains. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{21}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA77297	Location:	Allan Hills, Antarctica
Field No.	78010210C	Field Contamination Category:	3
Weight (gms)	951.6		
Meteorite Type	L6		

Physical Description:

The overall shape of the specimen is oblong (12.0 x 7.5 x 6.0 cm). Shiny, black, polygonally fractured fusion crust (~.5 to 1 mm thick) is present on the B surface. On the B surface an area ~2 mm in diameter, possibly a partially melted chondrule, is shinier than the surrounding fusion crust. The N surface appears to be a recently fractured surface that is whitish gray with small, <1 mm, inclusions. Orangish brown oxidation staining is present on all surfaces.

Other Characteristics:

Cleaving the meteorite in half, revealed metallic flecks, <.5 mm in maximum diameter, that make up approximately 5% of the sample. Some haloing effects are apparent.

Petrographic Description: Brian Mason

Chondrules are sparse and poorly developed, tending to merge with the granular groundmass, which consists largely of olivine and orthopyroxene, with minor sub-equal amounts of nickel-iron and troilite, and a little untwinned plagioclase. A little limonitic staining is present around some of the nickel-iron grains. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{20}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an L6 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA77300	Location:	Allan Hills, Antarctica
Field No.	77123024	Field Contamination Category:	6
Weight (gms)	234.5		
Meteorite Type	H5		

Physical Description:

The stone is 9.0 x 5.0 x 4.5 cm and oblong. Half the surface appears to have had fusion crust that has been mostly ablated, leaving only dull, brown remnant patches. Half the specimen has a rough fracture surface. The exterior is uniformly weathered a dark orangish-brown.

Other Characteristics:

When the sample was cleaved in half, no unweathered material was exposed. The severity of the weathering caused the sample to crumble into many pieces during handling for photography.

Petrographic Description: Brian Mason

Chondritic structure is moderately well-developed, but chondrules tend to merge with the granular groundmass, which consists largely of olivine and orthopyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). The meteorite is extensively weathered, with veinlets and patches of limonite throughout. Microprobe analyses show olivine (Fa_{18}) and orthopyroxene (Fs_{16}) of uniform composition. The meteorite is classified as an H5 chondrite.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA 77304	Location:	Allan Hills, Antarctica
Field No.	B77123114	Field Contamination Category:	6
Weight (gms)	650.4		
Meteorite Type	LL 3		

Physical Description:

Dull, brownish-black fusion crust, approximately .5 to 1 mm thick, covers all but the W surface of this angular, 9.5 x 8.0 x 6.5 cm., sample. On the W surface and areas where the fusion crust has been plucked away, greenish matrix material with numerous chondrules and irregular lithic clasts ranging from light to dark gray and as much as 1 cm in diameter, is exposed. A fracture on the B surface appears to penetrate the entire stone.

Other Characteristics:

When the meteorite was cleaved in half, haloing effects were observed around some of the inclusions in the interior of the stone. There is no obvious weathering rind.

Petrographic Description: Brian Mason

The section shows a closely-packed aggregate of chondrules, with a minimum amount of fine-grained matrix; a little troilite and nickel-iron is present in the matrix. Some of the chondrules are unusually large, ranging up to 3 mm in diameter. The commonest types are barred and porphyritic olivine chondrules with interstitial glass; some of the glass is isotropic and transparent, but most is turbid and partly devitrified. Polysynthetically twinned clinopyroxene occurs with the olivine in some chondrules. A 6 x 3 mm enclave, consisting of closely-packed idiomorphic olivine crystals with interstitial turbid brown glass, is present at one edge of the section. Brown limonitic staining pervades the section. Microprobe analyses show olivine (Fa_{18-27}, average Fs_{24}) and pyroxene (Fs_{13-19}, average Fs_{15}) of variable composition; the olivine in the enclave has uniform composition, Fa_{25}. A few grains of calcic plagioclase, averaging An_{77}, were noted. The low content of nickel-iron and troilite suggest LL group, and the wide range of olivine and pyroxene compositions type 3, so the meteorite is tentatively classified LL3; however, certain assignment of group may require additional investigation.

ANTARCTIC METEORITE DATA SHEET

Sample No.: ALHA76005

Location: Allan Hills

Field No.:

Field Contamination Category: 1

Weight (gms): 317.3

Meteorite Type: Achondrite-Eucrite

Physical Description:

The fusion crust has been largely weathered from the surface of the sample. In the area where it remains, it is thin (<.5 mm) and shiny black. The existing fusion crust displays a radial pattern emanating from a point on the E surface. The interior of the stone is medium gray and contains inclusions that range from whitish-gray to black. There are several small fractures in the stone. A small amount of oxidation is present in the interior of the sample. The sample is approximately 6.6x7.8x4.3 cm.

Other Characteristics:

This is the same sample as Allan Hills #5 described by Olsen, et al, 1978, Meteorites, Vol. 13, pp. 209-225.

Petrographic Description:

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78001	Location:	Derrick Peak
Field No.	301		
Weight (gms)	15100		
Meteorite Type	Iron		

Physical Description:

This irregular shaped specimen is dark metallic reddish-brown. The B surface was touching the ground when the meteorite was recovered, this surface is yellowish-brown and highly oxidized. The T surface is covered with regmaglypts. The bottom of a few of these regmaglypts are stained by orangish-brown iron oxidation. The S & W surfaces are wider than the N & E surfaces. The sample is ∿22 x 20 x 15 cm.

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78002	Location:	Derrick Peak
Field No.	303		
Weight (gms)	7200		
Meteorite Type	Iron		

Physical Description:

The B surface of this 24 x 22 x 9.5 cm specimen was in contact with the ice at the time of recovery. The B surface is irregular; an area ∿5 cm long and 1.5 cm wide is ropy in appearance and has higher relief than the surrounding metal, which is probably due to preferential weathering of this material (Scheribersite?). The T surface has many regmaglypts, some of the deeper of which are stained by hydrous iron oxides. The S surface is partially covered with a yellowish-brown evaporite deposit. The S side of the sample is thicker than the N edge, thus resulting in an overall wedge shape for the specimen.

ANTARCTIC METEORITE DATA SHEET

Sample No. DRPA78003 Location: Derrick Peak

Field No. 337

Weight (gms) 144.2

Meteorite Type Iron

Physical Description:

This 7.5 x 3.5 x 2.5 cm oblong specimen has square corners and a ridge along the E W axis of the T surface. The T surface has shallow impressions (regmaglypts) along the S side of the ridge. The B surface is rougher than the T surface and is partially stained by oxidized iron; giving it an orange color. Some soil and evaporite deposits adhered to the B surface. The B, N, and W surfaces were in contact with the ground at the time of recovery.

ANTARCTIC METEORITE DATA SHEET

Sample No. DRPA78004 Location: Derrick Peak

Field No. 306

Weight (gms) 133.6

Meteorite Type Iron

Physical Description:

The N portion of the B surface was buried in the soil at the time the meteorite was recovered, the remaining portion of the B surface was in contact with the ground, however, it was not buried. The B surface has oxidation staining, which gives it an orangish-brown appearance. The meteorite is pitted over all the surfaces, there are a few small regmaglypts that are as much as 5 - 8 mm in diameter. The overall cover of this 4.5 x 4.5x2.5 cm specimen is metallic blackish-brown.

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78005	Location:	Derrick Peak, Antarctica
Field No.	304		
Weight (gms)	18450		
Meteorite Type	Iron		

Physical Description:

Overall color of the meteorite is metallic brownish-black with some reddish-brown due to the oxidation of the iron. The S half of the B surface was in contact with the ground at time of recovery. This surface (B) ranges in color from yellowish-brown to reddish-brown. The specimen is irregular in shape, ∿28 x 23 x 14 cm, and has many regmaglypts. The regmaglypts on the B surface have greater relief than than those on the T surface. The W surface is smoother than the rest of the specimen. The B-S surface is partially covered by what appears to be an evaporite deposit. Several small laths of schreibersite (?) are present on the sample.

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78006	Location:	Derrick Peak
Field No.	305		
Weight (gms)	389.3		
Meteorite Type	Iron		

Physical Description:

The T surface of the meteorite was in contact with the ice at the time of recovery. The sample has some consolidated soil on this surface, which is brownish-yellow. The overall color of the sample, ∿ 7.5 x 6.5 x 3.0 cm, is metallic brown. The S half of the B surface is smooth and silverish-brown, while the N half of the B surface is characterized by a silverish material that has slightly more relief than the background and could possibly be schreibersite(?), cohenite (?), daubreelite (?). This material with higher relief rings the outer edge of most of the regmaglypts.

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78007	Location:	Derrick Peak, Antarctica
Field No.	338		
Weight (gms)	11700		
Meteorite Type	Iron		

Physical Description:

The B surface of the meteorite was in contact with the ground at the time of recovery. This surface (B) is severely weathered and several millimeters of brown powder, hydrous iron oxides and soil (?) are present and completely mask the appearance of the original surface. The meteorite is extremely irregular with regmaglypts as deep as 3 to 4 cm. Where unoxidized the meteorite is dark metallic brown. Silvery laths (schreibersite ?), ∿1 cm long, are scattered over the surface of the meteorite.

ANTARTIC METEORITE DATA SHEET

Sample No.	DRPA78008	Location:	Derrick Peak
Field No.	336		
Weight (gms)	59,400		
Meteorite Type	Iron		

Physical Description:

This sample was very clean and fresh when recovered in Antarctica, but on its arrival in Houston, the sample contained large quantities of rust. The B surface was touching the ground when the iron was discovered. Half of the B surface is covered with a thin coat of soil as is part of the T surface, an area ∿8 cm in diameter. The overall color of the meteorite was metallic brownish-black while in the field, but now it is mostly reddish-brown due to oxidation. The meteorite is irregular but blocky. The surface is rough and has many regmaglypts. The deepest regmaglypts are ∿ 2 cm deep and are on the N half of the B surface. The remaining surfaces have regmaglypts, however, they are not as deep as the ones on the B surface but they are wider. Silvery platy inclusions (Schreibersite (?), cohenite (?), daubreelite (?)) are randomly scattered over the entire meteorite. The meteorite is approximately 37 x 25 x 21 cm.

ANTARCTIC METEORITE DATA SHEET

Sample No.	DRPA78009	Location: Derrick Peak, Antarctica
Field No.	302	
Weight (gms)	138,100	
Meteorite Type	Iron	

Physical Description:

This sample was very clean and fresh when recovered in the Antarctica. However, on its arrival in Houston, the sample was somewhat oxidized, though not as severely as DRPA78008. The original overall color was metallic brownish-black, but now parts of this meteorite are reddish brown. The T surface was in contact with the ground at time of recovery. This surface is concave and wavy (the E surface is also wavy). Silvery material is scattered randomly over the T-N-W surface, ten laths cover an area of ∿10 sq. cm. Each lath is oblong and from 1 to 4 cm in length. The B and W surfaces contain many regmaglypts, with the deepest being ∿4 cm in depth, thus giving these surfaces a very rough appearance. Silvery inclusions (schreibersite ?) with high relief and a tabular shape are scattered on this surface. The B surface is the most weathered surface.

ANTARCTIC METEORITE DATA SHEET

Sample No.	ALHA78252	Location: Allan Hills, Antarctica
Field No.	242	
Weight (gms)	2789	
Meteorite Type	Iron	

Physical Description:

The T surface of the meteorite was in contact with the ice at the time it was recovered. The surface (T) is convex and very smooth, the B surface is semi-concave. The meteorite is metallic brownish-black, with many spots of oxidation staining that are reddish-brown. In the center of the B surface is a hole ∿4 cm in diameter.

Striations exist on the T surface probably due to ablation during entry, the striations in the E-W direction dominate.