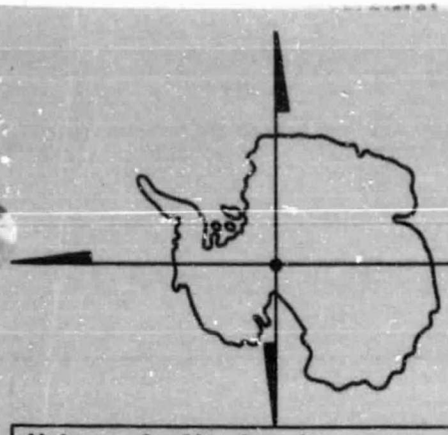
SQT



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.

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Antarctic Meteorite Descriptions 1976 - 1977 - 1978 - 1979

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ANTARCTIC METEORITE DESCRIPTIONS
1976 - 1977 - 1978 - 1979

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FEBRUARY, 1981

A great deal has happened in the discovery and curation of Antarctic meteorites over the past three years, and it seems appropriate to review briefly part of that which has occurred. The U.S. National Science Foundation has sponsored five expeditions to Antarctica to search for meteorites. As of this writing the fifth expedition is still there. Preliminary reports indicate they have recovered approximately one hundred specimens. For the 1976 through 1979 field seasons, these expeditions returned 11, 300, 305, and 73 meteorite specimens for each year, respectively. Expeditions sponsored by the Japanese Institute of Polar Research to the other side of the continent have also been highly successful in recovering meteorites.

This is the seventh Antarctic Meteorite Newsletter since the first issue was distributed in June, 1978. We are currently mailing copies of each Newsletter to approximately 500 individuals and institutions worldwide. The first meeting of the Meteorite Working Group for the purpose of recommending Antarctic meteorite allocations occurred in late September, 1978. From October, 1978, through January, 1981, the Meteorite Curation Facility at the Johnson Space Center prepared approximately 1200 samples of Antarctic meteorites and distributed these to approximately 90 research groups in 13 countries. In addition, 38 samples of iron meteorites were allocated by the Smithsonian Institution, which curates the iron meteorites from Antarctica. These numbers do not include more than 600 meteorites which were divided and sent to the Japanese Institute of Polar Research, or approximately 260 samples which were sent to the Smithsonian Institution to be classified. These ~1200 allocations do include samples of 288 pebble-sized chondrites (< 150 g each) which have been allocated to 5 investigator groups for classification and additional studies. Results of these classifications will be reported in the future. Approximately 115 kg total mass of stony meteorites are being curated at JSC, and ~160 kg of Antarctic irons are being curated at the Smithsonian. The JSC and Smithsonian curatorial facilities have polished thin sections of many of the Antarctic meteorites, which may be examined by visitors.

Initial processing and classification is complete on all Antarctic meteorites in the Johnson Space Center Curation Facility at this time, with the exception of the 288 pebbles being classified by 5 investigator groups. Therefore it seems appropriate to summarize in a more useful manner much of the descriptive information which has appeared in previous Newsletters. This Newsletter contains all previously distributed meteorite data sheets, plus a number of new ones for 1979 chondrites. These data sheets describe the entire Antarctic meteorite collection at JSC and the Smithsonian for the 1976 through 1979 field seasons, excepting the 288 pebbles mentioned above. These data sheets are arranged numerically by meteorite name/number and year of recovery. We have included a comprehensive sample index listing meteorite name/number, classification, and weathering category. We also include separate indices listing all petrologic type 3 and type 4 chondrites, all irons, all achondrites, and all carbonaceous chondrites in the collection. Note that classifications for a few meteorites have changed since earlier Newsletters. Two figures showing basic characteristics of the collection are also contained in this Newsletter. One figure shows the number of specimens as a function of recovered mass for all Allan Hills stones, all other stones, and all irons in the 1977-1979 collections. A second figure shows the number of chondrites in each chemical and petrological class.

Two hundred sixty-seven small meteorites in the 1977 and 1978 collections, which weighed less than 15 grams each, were divided on an alternate specimen basis with Japan. A table of the 133 small specimens which were sent in their entirety to the Japanese Institute of Polar Research is included in this Newsletter. In addition, the nine Derrick Peak iron meteorites recovered in 1978 are believed to be part of a common fall. Division of these specimens between the U.S. and Japan was made, in part, by sending three specimens, DRPA78001, 003, and 007, in their entirety to Japan.

Requests for allocations of Antarctic meteorites continue to be sizeable in number. Research interests are broad and include cosmic ray interactions, petrology, chemical composition, etc. Within the past year there has been an increased emphasis on consortium or cooperative studies of Antarctic meteorites, particularily for the complex achondrites. Among the larger and more active consortia are:

1) Several polymict eucrites from Allan Hills - led by Arch Reid of the University of Cape Town, South Africa.

2) EETA79001, a large and unusual Shergottite - led by Harry McSween of the University of Tennessee.

3) BTNA78004, an unusually brecciated LL-6 chondrite - led by Klaus Keil of the University of New Mexico.

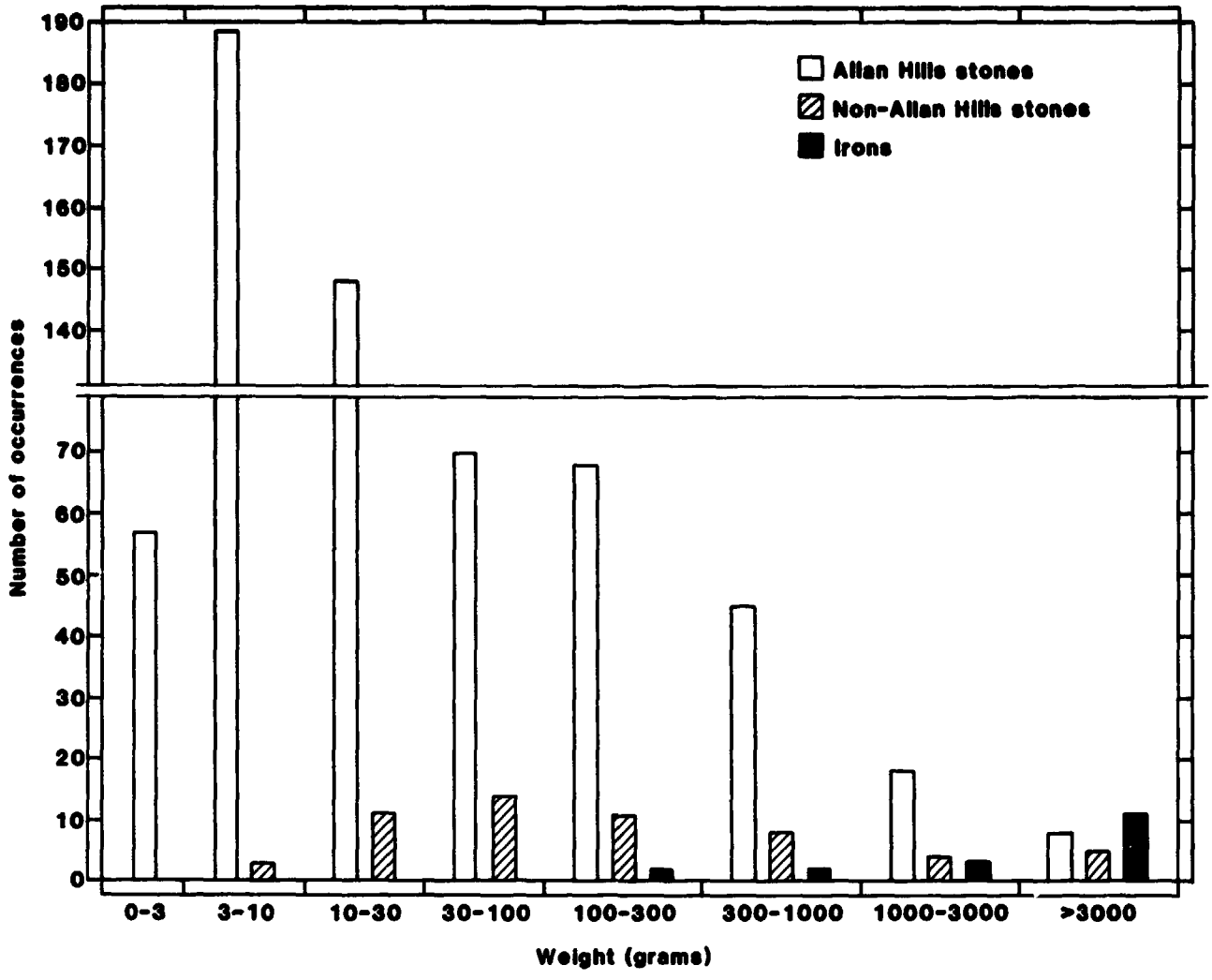
4) Cosmic ray interaction studies of ALHA78084, an ∿15 kg H-3 chondrite - approximately 65 samples have been taken from accurately recorded locations and allocated to seven investigator groups.

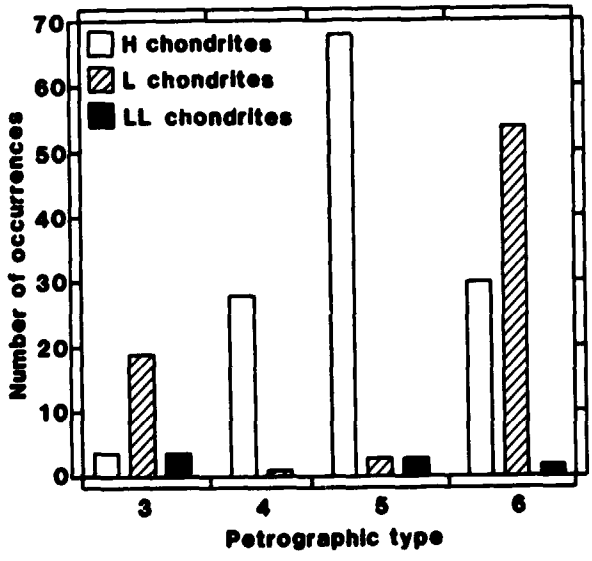
Several additional consortia are currently being formed.

During the coming year, Antarctic meteorite curatorial activities will be directed toward initial processing of the 1980 collection and the preparation of sample allocations. Investigators should submit requests for samples of Antarctic meteorites to:

Secretary, Meteorite Working Group
Curator's Branch, SN2
NASA, Johnson Space Center
Houston, TX 77058

We would like to thank Nell McComb, Alene Simmons, Sue Goudie, Claire Dardano, Sherry Feicht, John Annexstad, Arch Reid and Elbert King for their assistance on the compilation of this catalog.


Allan Hills stones
Non-Allan Hills stones
Irons
Number of occurrences
190
180
170
160
150
140
70
60
50
40
30
20
10
0
0-3
3-10
10-30
30-100
100-300
300-1000
1000-3000
>3000
Weight (grams)


H chondrites
L chondrites
LL chondrites
Number of occurrences
70
60
50
40
30
20
10
0
3
4
5
6
Petrographic type

Meteorite Specimens weighing less than 15 g each (plus 3 irons) which were sent in their entirety to the Japanese Institute of Polar Research.

ALHA77024	ALHA77077	ALHA77141
77028	77080	77144*
77030	77083	77145
77032	77090	77154
77035	77093	77169
77037	77095	77172
77040	77097	77179
77044	77099	77194
77048	77103	77196
77053	77105	77199
77055	77107	77203
77057	77110	77204
77059	77116	77206
77064*	77118*	77210
77065	77121	77229
77067	77123	77236
77072	77128	77238
77074*	77135	77243
77075	77137	

* JSC & SI have PTS of these specimen

ALHA78007	ALHA78093	ALHA78212
78009	78095	78214
78011	78097	78216
78014	78099	78218
78016	78118	78220
78020	78143	78222
78022	78148	78224
78024	78151	78226
78026	78155	78228
78030	78161	78230
78032	78167	78232
78034	78175	78234
78036	78177	78237
78054	78179	78240
78056	78181	78242
78058	78183	78244
78060	78185	78246
78061	78187	78248
78064	78192	78250
78066	78195	78254
78068	78198	78256
78071	78200	78258
78073	78202	78260
78083	78204	DRPA78001**
78087	78206	78003**
78089	78208	78007**
78091	78210	

** Irons

1976 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA76002	307.00	Iron-Group IA or Og			3
ALHA76004	52.50	LL-3 Chondrite	A	A	3
ALHA76005	317.30	Polymict Eucrite	A	A	4
ALHA76006	271.00	H-6 Chondrite	C	B	4
ALHA76007	78.50	L-6 Chondrite	B	A	5
ALHA76008	281.30	H-6 Chondrite	B/C	B	5
ALHA76009	3950.00	L-6 Chondrite	B	B	5
MBRA76001	1096.00	H-6 Chondrite	B/C	B	6

1977 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77001	252.00	L-6 Chondrite	B	B	9
ALHA77002	235.20	L-5 Chondrite	B	A/B	9
ALHA77003	779.60	H-3 Chondrite	A	A	10
ALHA77004	2230.00	H-4 Chondrite	C	C	11
ALHA77005	482.50	Achondrite (unique)	A	A	12
ALHA77009	235.50	H-4 Chondrite	C	A	13
ALHA77010	295.80	H-4 Chondrite	C	A	13
ALHA77011	291.50	LL-3 Chondrite	C	A	14
ALHA77012	180.20	H-5 Chondrite	C	A	14
ALHA77014	308.80	H-5 Chondrite	C	B/C	15
ALHA77015	411.10	L-3 Chondrite	C	B	15
ALHA77021	16.65	H-5 Chondrite	C	A	16
ALHA77025	19.40	H-5 Chondrite	C	B	17
ALHA77033	9.34	L-3 Chondrite	C	B	17
ALHA77061	12.61	H-5 Chondrite	B	A	18
ALHA77062	16.72	H-5 Chondrite	B	B	18
ALHA77064	6.47	H-5 Chondrite	B	B	19
ALHA77071	10.87	H-5 Chondrite	B	B	19
ALHA77074	12.07	H-5 Chondrite	B	B	20
ALHA77081	8.59	H? Chondrite	B	A	20
ALHA77086	19.44	H-5 Chondrite	C	B	21
ALHA77088	51.15	H-5 Chondrite	C	B	21

1977 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77102	12.25	H-5 Chondrite	B	B	22
ALHA77118	7.84	H-5 Chondrite	C	B	22
ALHA77119	6.36	H-5 Chondrite	C	B	23
ALHA77124	4.41	H-5 Chondrite	C	A	23
ALHA77140	78.62	L-3 Chondrite	C	B	24
ALHA77144	7.88	H-6 Chondrite	B	A	25
ALHA77148	13.10	H-6 Chondrite	C	B	25
ALHA77150	58.30	L-6 Chondrite	C	B	26
ALHA77155	305.30	L-6 Chondrite	A/B	A	26
ALHA77160	70.42	L-3 Chondrite	C	B	27
ALHA77164	38.14	L-3 Chondrite	C	C	27
ALHA77165	30.50	L-3 Chondrite	C	C	28
ALHA77167	611.20	L-3 Chondrite	C	B/C	28
ALHA77177	368.20	H-5 Chondrite	C	A	29
ALHA77180	190.80	L-6 Chondrite	C	A	30
ALHA77182	1134.70	H-5 Chondrite	B	B	30
ALHA77183	288.00	H-6 Chondrite	C	A	31
ALHA77190	387.10	H-4 Chondrite	C	C	31
ALHA77191	642.20	H-4 Chondrite	C	B/C	32
ALHA77192	845.30	H-4 Chondrite	C	C	32
ALHA77208	1733.00	H-4 Chondrite	C	C	33
ALHA77214	2111.00	L-3 Chondrite	C	C	34
ALHA77215	819.60	L-3 Chondrite	B	B/C	35
ALHA77216	1470.00	L-3 Chondrite	A/B	B/C	35
ALHA77217	413.20	L-3 Chondrite	B	B/C	36
ALHA77219	637.10	Mesosiderite	B	B	37
ALHA77221	229.20	H-4 Chondrite	C	A	37
ALHA77223	207.90	H-4 Chondrite	C	C	38
ALHA77224	786.90	H-4 Chondrite	C	C	39
ALHA77225	5878.00	H-4 Chondrite	C	C	39
ALHA77226	15323.00	H-4 Chondrite	C	C	40
ALHA77230	2473.00	L-4 Chondrite	B	B	41
ALHA77231	9270.00	L-6 Chondrite	A/B	A/B	41
ALHA77232	6494.30	H-4 Chondrite	C	C	42
ALHA77233	4087.00	H-4 Chondrite	C	B	42
ALHA77249	503.60	L-3 Chondrite	C	C	43
ALHA77250	10555.00	Iron-Group I or Og			44
ALHA77252	343.10	L-3 Chon. w/L6 Clasts	B	C	44
ALHA77254	245.80	L-5 Chondrite	A/B	A	45
ALHA77255	765.10	Iron			46
ALHA77256	676.20	Diogenite	A/B	A	46
ALHA77257	1995.70	Ureilite	A	B	47
ALHA77258	597.30	H-6 Chondrite	B/C	A/B	48
ALHA77259	294.00	H-5 Chondrite	C	B	48
ALHA77260	744.30	L-3 Chondrite	C	C	49
ALHA77261	411.70	L-6 Chondrite	B	B	49
ALHA77262	861.50	H-4 Chondrite	B	B	50
ALHA77263	1669.00	Iron-Group I or Og			51

1977 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77264	10.97	H-5 Chondrite	A/B	A	51
ALHA77268	272.00	H-5 Chondrite	C	C	52
ALHA77269	1045.00	L-6 Chondrite	B	A	52
ALHA77270	588.90	L-6 Chondrite	A/B	B	53
ALHA77271	609.50	H-6 Chondrite	C	A	53
ALHA77272	674.10	L-6 Chondrite	B/C	B	54
ALHA77273	492.00	L-6 Chondrite	B	B	55
ALHA77274	288.10	H-5 Chondrite	C	A	55
ALHA77277	142.70	L-6 Chondrite	A/B	A	56
ALHA77278	312.90	LL-3 Chondrite	A	A	56
ALHA77280	3226.00	L-6 Chondrite	B	B/C	57
ALHA77281	1231.00	L-6 Chondrite	B	B	58
ALHA77282	4127.10	L-6 Chondrite	B	B	58
ALHA77283	10510.00	Iron-Group I or Og			59
ALHA77284	376.20	L-6 Chondrite	A/B	B	59
ALHA77285	271.10	H-6 Chondrite	C	B	60
ALHA77286	245.80	H-4 Chondrite	C	B	61
ALHA77287	230.10	H-5 Chondrite	C	A	61
ALHA77288	1880.00	H-6 Chondrite	B	B	62
ALHA77289	2186.00	Iron-Group I or Og			62
ALHA77290	3784.00	Iron-Group I or Og			63
ALHA77292	199.60	L-6 Chondrite	B	A	63
ALHA77294	1351.30	H-5 Chondrite	A	A	64
ALHA77296	963.30	L-6 Chondrite	A/B	A	64
ALHA77297	951.60	L-6 Chondrite	A	B	65
ALHA77299	260.70	H-3 Chondrite	A	A	66
ALHA77300	234.50	H-5 Chondrite	C	B	66
ALHA77302	235.50	Polymict Eucrite	A	A	67
ALHA77304	650.40	LL-3 Chondrite	B	B	68
ALHA77305	6444.00	L-6 Chondrite	B/C	B	69
ALHA77306	19.91	Carbonaceous C2	A	A	70
ALHA77307	181.30	Carbonaceous C3	A	A	71
PGPA77006	19068.00	Iron-Group I or Og			72

1978 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA78006	8.00	Howardite	A	A	75
ALHA78019	30.30	Urellite	B/C	C	75
ALHA78038	363.00	LL-3 Chondrite	C	C	76
ALHA78039	299.00	L-6 Chondrite	B	B	76
ALHA78040	211.70	Polymict Eucrite	A	A	77
ALHA78042	214.10	L-6 Chondrite	B	A	77
ALHA78043	680.00	L-6 Chondrite	B	B	78
ALHA78044	164.10		B/C	B	79
ALHA78045	396.50	L-6 Chondrite	B/C	B	79
ALHA78048	190.60	L-6 Chondrite	A/B	B	80
ALHA78050	1045.00	L-6 Chondrite	B	B	80
ALHA78053	179.00	H-4 Chondrite	C	B	81
ALHA78074	200.20	L-6 Chondrite	B	B	81
ALHA78075	280.60	H-5 Chondrite	B/C	B	82
ALHA78076	275.60	H-6 Chondrite	B	B	82
ALHA78077	330.60	H-4 Chondrite	C	B	83
ALHA78078	290.30	L-6 Chondrite	A/B	A	83
ALHA78084	14280.00	H-3 Chondrite	B/C	B	84
ALHA78085	219.30	H-5 Chondrite	B	B	84
ALHA78102	336.90	H-5 Chondrite	B/C	B	85
ALHA78103	589.70	L-6 Chondrite	B	B	85
ALHA78104	672.40	L-6 Chondrite	B	A	86
ALHA78105	941.70	L-6 Chondrite	B	A	87
ALHA78106	464.50	L-6 Chondrite	A/B	A	87
ALHA78107	198.40	H-5 Chondrite	C	A	88
ALHA78108	172.50	H-5 Chondrite	B	B	88
ALHA78109	233.20	LL-5 Chondrite	A/B	A	89
ALHA78110	160.70	H-5 Chondrite	B/C	B	89
ALHA78111	126.80		B/C	A	90
ALHA78112	2485.00	L-6 Chondrite	B	B	90
ALHA78113	298.60	Aubrite	A/B	A	91
ALHA78114	808.10	L-6 Chondrite	B/C	B	91
ALHA78115	847.60	H-6 Chondrite	B	A	92
ALHA78126	606.90	L-6 Chondrite	B	B	92
ALHA78127	194.50	L-6 Chondrite	B/C	B	93
ALHA78128	154.70	H-5 Chondrite	C	B/C	93
ALHA78130	2733.00	L-6 Chondrite	B/C	B	94
ALHA78131	268.80	L-6 Chondrite	B/C	A	94
ALHA78132	656.00	Polymict Eucrite	A	A	95
ALHA78134	458.30	H-4 Chondrite	B/C	B/C	96
ALHA78153	151.70	LL-6 Chondrite	B/C	B	96
ALHA78158	15.10	Polymict Eucrite	A	A	97
ALHA78165	20.90	Polymict Eucrite	A	A	97
ALHA78188	0.87	L-3 Chondrite	C	B	98
ALHA78193	13.34	H-4 Chondrite	B/C	A	---
ALHA78196	11.18	H-4 Chondrite	B/C	B	---
ALHA78209	12.12	H-5 Chondrite	B/C	B	---
ALHA78211	11.49	H-6 Chondrite	B	B	---

1978 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA78213	9.56	H-6 Chondrite	B	B	---
ALHA78215	6.37	H-6 Chondrite	B/C	B	---
ALHA78221	5.39	H-5 Chondrite	B	A	---
ALHA78223	6.46	H-4 Chondrite	B	B	---
ALHA78225	4.56	H-5 Chondrite	B	A	---
ALHA78227	2.40	H-5 Chondrite	B/C	B	---
ALHA78229	1.93	H-6 Chondrite	B	B	---
ALHA78231	1.89	H-6 Chondrite	B/C	B	---
ALHA78233	1.30	H-5 Chondrite	B/C	B	---
ALHA78251	1312.00	L-6 Chondrite	B	A	98
ALHA78252	2789.00	Iron-Group IIIA			99
ALHA78261	5.11	Carbonaceous C2	A	A	99
ALHA78262	26.18	Ureilite	A	A	100
BTNA78001	160.70	L-6 Chondrite	B	B	100
BTNA78002	4301.00	L-6 Chondrite	B	A	101
BTNA78004	1079.00	LL-6 Brecciated	B	A	102
DRPA78001	15200.00	Iron			103
DRPA78002	7188.00	Iron			103
DRPA78003	144.20	Iron			103
DRPA78004	133.60	Iron			104
DRPA78005	18600.00	Iron			104
DRPA78006	389.30	Iron			104
DRPA78007	11800.00	Iron			105
DRPA78008	59400.00	Iron			105
DRPA78009	138100.00	Iron			105
META78001	624.40	H-4 Chondrite	B/C	B	106
META78002	542.20	L-6 Chondrite	B	A	106
META78003	1726.00	L-6 Chondrite	B	B	107
META78005	172.00	L-6 Chondrite	B	B	108
META78006	409.60	H-6 Chondrite	C	B	108
META78007	174.80	H-6 Chondrite	B/C	B	109
META78010	233.50	H-5 Chondrite	B	A	109
META78028	20657.00	L-6 Chondrite	B	B	110
RKPA78001	234.90	L-6 Chondrite	C	B	110
RKPA78002	8483.00	H-4 Chondrite	B	A/B	111
RKPA78003	1276.00	L-6 Chondrite	C	B	111
RKPA78004	166.90	H-4 Chondrite	A	A	112

1979 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA79001	32.30	L-3 Chondrite	C	A	115
ALHA79002	222.80	H-6 Chondrite	C	B	115
ALHA79003	5.10	L-3 Chondrite	B	B	116
ALHA79004	34.90	H-5 Chon. w/Enclaves	B/C	B	116
ALHA79005	60.00	H-6 Chondrite	B	B	117
ALHA79006	40.90	H-5 Chondrite	B/C	B	117
ALHA79007	142.30	L-6 Chondrite	A/B	B	118
ALHA79008	12.00	H-5 Chondrite	B	B	118
ALHA79009	75.70	H-5 Chondrite	C	A	119
ALHA79010	25.10	H-5 Chondrite	B/C	B	119
ALHA79011	14.00	H-5 Chondrite	B/C	A	120
ALHA79012	191.90	H-5 Chondrite	C	B	120
ALHA79013	28.30	H-5 Chondrite	C	B	121
ALHA79014	10.80	H-5 Chondrite	B	A	121
ALHA79015	64.00	H-5 Chondrite	B	B	122
ALHA79016	1146.00	H-6 Chondrite	B/C	B	122
ALHA79017	310.00	Polymict Eucrite	A	A	123
ALHA79018	120.70	L-6 Chondrite	B/C	A/B	123
ALHA79019	12.10	H-6 Chondrite	B	A	124
ALHA79020	4.20	H-6 Chondrite	B/C	B	125
ALHA79021	29.40	H-5 Chondrite	B	A	125
ALHA79022	31.40	H-3 Chondrite	A/B	B	126
ALHA79023	68.10	H-4 Chondrite	B/C	C	126
ALHA79024	21.60	H-6 Chondrite	C	B	127
ALHA79025	1208.00	H-5 Chondrite	C	A	127
ALHA79026	572.00	H-5 Chondrite	B	B	128
ALHA79027	133.20	L-6 Chondrite	B	A	128
ALHA79028	16.20	H-6 Chondrite	B	B	129
ALHA79029	505.50	H-5 Chondrite	C	B/C	129
ALHA79031	2.70	H-5 Chondrite	C	B	130
ALHA79032	2.60	H-5 Chondrite	C	B	---
ALHA79033	208.80	L-6 Chondrite	B	A	130
ALHA79034	12.60	H-6 Chondrite	B	A	---
ALHA79035	37.60	H-4 Chondrite	B	B	---
ALHA79036	20.20	H-5 Chondrite	B	B	131
ALHA79037	14.80	H-6 Chondrite	B	B	---
ALHA79038	49.60	H-5 Chondrite	C	B	131
ALHA79039	108.30	H-4 Chondrite	B	B	132
ALHA79040	13.20	H-5 Chondrite	B	A	---
ALHA79041	20.10	H-5 Chondrite	B	B	---
ALHA79042	11.40	H-5 Chondrite	B	A	---
ALHA79043	62.20	L-6 Chondrite	C	B	---
ALHA79045	115.40	L-3 Chondrite	C	B	132
ALHA79046	89.70	H-5 Chondrite	B	B	---
ALHA79047	19.30	H-5 Chondrite	B	B	---
ALHA79048	36.70	H-5 Chondrite	B	B	---
ALHA79049	54.00	H-6 Chondrite	C	B	---
ALHA79050	27.00	H-5 Chondrite	C	B	---

1979 ANTARCTIC METEORITE SUMMARY

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA79051	24.00	H-5 Chondrite	C	A	---
ALHA79052	22.60	L-6 Chondrite	B/C	B	---
ALHA79053	86.00	H-5 Chondrite	B/C	B	---
ALHA79054	36.00	H-5 Chondrite	B	A	---
ALHA79055	15.20	H-6 Chondrite	B/C	B	---
EETA79001	7942.00	Shergottite	A	A	133
EETA79002	2843.00	Diogenite	B	B	134
EETA79003	435.60	L-6 Chondrite	B	B	135
EETA79004	390.30	Eucrite	B	B	135
EETA79005	450.90	Polymict Eucrite	A	B	136
EETA79006	716.40	Howardite	B	B	137
EETA79007	199.90	H-5 Chondrite	B	B	137
EETA79009	140.30	L-5 Chondrite	B	B	138
EETA79010	287.30	L-6 Chondrite	B	C	138
EETA79011	86.40	Polymict Eucrite	B	B	139
RKPA79001	3006.00	L-6 Chondrite	B	C	139
RKPA79002	203.60	L-6 Chondrite	B	B	140
RKPA79003	182.20	H-6 Chondrite	B	A	141
RKPA79004	370.90	H-5 Chondrite	B/C	B	141
RKPA79008	73.00	L-3 Chondrite	B	B	142
RKPA79009	55.00	H-6 Chondrite	C	B	142
RKPA79012	12.80	H-6 Chondrite	B	B	143
RKPA79013	11.02	L-5 Chondrite	B/C	B	143
RKPA79014	77.70	H-5 Chondrite	B/C	B	144
RKPA79015	10022.00	Iron w/Silicate Incl.			144

IRON METEORITES

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA76002	307.00	Iron-Group IA or Og			3
ALHA77250	10555.00	Iron-Group I or Og			44
ALHA77255	765.10	Iron			46
ALHA77263	1669.00	Iron-Group I or Og			51
ALHA77283	10510.00	Iron-Group I or Og			59
ALHA77289	2186.00	Iron-Group I or Og			62
ALHA77290	3784.00	Iron-Group I or Og			63
PGPA77006	19068.00	Iron-Group I or Og			72
ALHA78252	2789.00	Iron-Group IIIA			99
DRPA78001	15200.00	Iron			103
DRPA78002	7188.00	Iron			103
DRPA78003	144.20	Iron			103
DRPA78004	133.60	Iron			104
DRPA78005	18600.00	Iron			104
DRPA78006	389.30	Iron			104
DRPA78007	11800.00	Iron			105
DRPA78008	59400.00	Iron			105
DRPA78009	138100.00	Iron			105
RKPA79015	10022.00	Iron w/Silicate Incl.			144

CARBONACEOUS CHONDRITES

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77306	19.91	Carbonaceous C2	A	A	70
ALHA77307	181.30	Carbonaceous C3	A	A	71
ALHA78261	5.11	Carbonaceous C2	A	A	99

CHONDRITES - TYPE 3

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA76004	52.50	LL-3 Chondrite	A	A	3
ALHA77003	779.60	H-3 Chondrite	A	A	10
ALHA77011	291.50	LL-3 Chondrite	C	A	14
ALHA77015	411.10	L-3 Chondrite	C	B	15
ALHA77033	9.34	L-3 Chondrite	C	B	17
ALHA77140	78.62	L-3 Chondrite	C	B	24
ALHA77160	70.42	L-3 Chondrite	C	B	27
ALHA77164	38.14	L-3 Chondrite	C	C	27
ALHA77165	30.50	L-3 Chondrite	C	C	28
ALHA77167	611.20	L-3 Chondrite	C	B/C	28
ALHA77214	2111.00	L-3 Chondrite	C	C	34
ALHA77215	819.60	L-3 Chondrite	B	B/C	35
ALHA77216	1470.00	L-3 Chondrite	A/B	B/C	35
ALHA77217	413.20	L-3 Chondrite	B	B/C	36
ALHA77249	503.60	L-3 Chondrite	C	C	43
ALHA77252	343.10	L-3 Chon. w/L6 Clasts	B	C	44
ALHA77260	744.30	L-3 Chondrite	C	C	49
ALHA77278	312.90	LL-3 Chondrite	A	A	56
ALHA77299	260.70	H-3 Chondrite	A	A	66
ALHA77304	650.40	LL-3 Chondrite	B	B	68
ALHA78038	363.00	LL-3 Chondrite	C	C	76
ALHA78084	14280.00	H-3 Chondrite	B/C	B	84
ALHA78188	0.87	L-3 Chondrite	C	B	98
ALHA79001	32.30	L-3 Chondrite	C	A	115
ALHA79003	5.10	L-3 Chondrite	B	B	116
ALHA79022	31.40	H-3 Chondrite	A/B	B	126
ALHA79045	115.40	L-3 Chondrite	C	B	132
RKPA79008	73.00	L-3 Chondrite	B	B	142

CHONDRITES - TYPE 4

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA77004	2230.00	H-4 Chondrite	C	C	11
ALHA77009	235.50	H-4 Chondrite	C	A	13
ALHA77010	295.80	H-4 Chondrite	C	A	13
ALHA77190	387.10	H-4 Chondrite	C	C	31
ALHA77191	642.20	H-4 Chondrite	C	B/C	32
ALHA77192	845.30	H-4 Chondrite	C	C	32
ALHA77208	1733.00	H-4 Chondrite	C	C	33
ALHA77221	229.20	H-4 Chondrite	C	A	37
ALHA77223	207.90	H-4 Chondrite	C	C	38
ALHA77224	786.90	H-4 Chondrite	C	C	39
ALHA77225	5878.00	H-4 Chondrite	C	C	39
ALHA77226	15323.00	H-4 Chondrite	C	C	40
ALHA77230	2473.00	L-4 Chondrite	B	B	41
ALHA77232	6494.30	H-4 Chondrite	C	C	42
ALHA77233	4087.00	H-4 Chondrite	C	B	42
ALHA77262	861.50	H-4 Chondrite	B	B	50
ALHA77286	245.80	H-4 Chondrite	C	B	61
ALHA78053	179.00	H-4 Chondrite	C	B	81
ALHA78077	330.60	H-4 Chondrite	C	B	83
ALHA78134	458.30	H-4 Chondrite	B/C	B/C	96
ALHA78193	13.34	H-4 Chondrite	B/C	A	---
ALHA78196	11.18	H-4 Chondrite	B/C	B	---
ALHA78223	6.46	H-4 Chondrite	B	B	---
META78001	624.40	H-4 Chondrite	B/C	B	106
RKPA78002	8483.00	H-4 Chondrite	B	A/B	111
RKPA78004	166.90	H-4 Chondrite	A	A	112
ALHA79023	68.10	H-4 Chondrite	B/C	C	126
ALHA79039	108.30	H-4 Chondrite	B	B	132
ALHA79035	37.60	H-4 Chondrite	B	B	---

ACHONDRITES

NUMBER	WEIGHT (GMS)	CLASSIFICATION	WEATHERING	FRACTURING	PAGE
ALHA76005	317.30	Polymict Eucrite	A	A	4
ALHA77005	482.50	Achondrite (unique)	A	A	12
ALHA77219	637.10	Mesosiderite	B	B	37
ALHA77256	676.20	Diogenite	A/B	A	46
ALHA77257	1995.70	Ureilite	A	B	47
ALHA77302	235.50	Polymict Eucrite	A	A	67
ALHA78006	8.00	Howardite	A	A	75
ALHA78019	30.30	Ureilite	B/C	C	75
ALHA78040	211.70	Polymict Eucrite	A	A	77
ALHA78113	298.60	Aubrite	A/B	A	91
ALHA78132	656.00	Polymict Eucrite	A	A	95
ALHA78158	15.10	Polymict Eucrite	A	A	97
ALHA78165	20.90	Polymict Eucrite	A	A	97
ALHA78262	26.18	Ureilite	A	A	100
ALHA79017	310.00	Polymict Eucrite	A	A	123
EETA79001	7942.00	Shergottite	A	A	133
EETA79002	2843.00	Diogenite	B	B	134
EETA79004	390.30	Eucrite	B	B	135
EETA79005	450.90	Polymict Eucrite	A	B	136
EETA79006	716.40	Howardite	B	B	137
EETA79011	86.40	Polymict Eucrite	B	B	139

1976 COLLECTION

Sample No.: ALHA76002 Location: Allan Hills
Field No.:
Weight (gms) 307.0
Meteorite Type: Iron-Group 1A or Ogg

Physical Description:
A thin black fusion crust covers the exterior of this specimen. The regmaglypts have a minor amount of iron oxide staining in the depressions.

Dimensions: ∿6.8 x 3.7 x 3.7 cm.

Petrographic Description:
This is the same sample as Allan Hills #2 as described in Olsen, et al., 1978. Eleven new meteorites from Antarctica, 1976-1977, Meteoritics, Vol. 13, No. 2, pp 209-225.

Sample No.: ALHA76004 Location: Allan Hills
Field No.:
Weight (gms): 52.50
Meteorite Type: LL3 Chondrite

Physical Description:
This specimen appears to have been covered with a thin reddish-black fusion crust on all exterior surfaces. The fusion crust appears to have been spalled off the rounded corners. The matrix of this stone is very dark gray. The inclusions, both chondrules and clasts, are numerous. The clasts are up to 1 cm in apparent maximum length. Both fresh metal and oxidized metal, surrounding some chondrules and lithic clasts, are present. The meteorite does not appear extensively weathered.

Approximate dimensions: 4.25 x 3.0 x 2.5 cm.

Petrographic Description:
For further discussion, see Olsen, et al., 1978. Eleven new meteorites from Antarctica, 1976-1977, Meteoritics, Vol. 3, No. 2, pp 209-225. This sample is described as Allan Hills #4.

Sample No.: ALHA76005 Location: Allan Hills
Field No.:
Weight (gms): 317.3
Meteorite Type: Achondrite (Polymict 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 (<.5mm) 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 6.6 x 7.8 x 4.3 cm.

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

Sample No.: ALHA76006 Location: Allan Hills
Field No.:
Weight (gms): 271.0
Meteorite Type: H6 Chondrite

Physical Description:
The stone has a remnant fusion crust that is black and <.5 mm thick. The fusion crust is patchy on the T surface and is more solid on the W surface. A reddish-brown surface underlies the fusion crust on the S and E surfaces. The fusion crust has many small fractures. The interior of the stone is iron oxide stained, however, gray clasts, some of which are circular in cross section are distinguishable under the binocular microscope.

Dimensions: 6.0 x 4.0 x 4.2 cm.

Petrographic Description:
This is same sample as Allan Hills #6, described in Olsen, et al., 1978.

Sample No.: ALHA76007 Location: Allan Hills
Field No.:
Weight (gms): 78.5
Meteorite Type: L6 Chondrite

Physical Description:
A black fusion crust that is as thick as .5 mm in spots covers the specimen. The fusion crust is both shiny and dull. The crust is rough with the iron oxide staining concentrated in the depressed areas. Iron oxide staining penetrates inward from the exterior of the meteorite. The interior of the meteorite is light gray and contains chondrules up to 2 mm in diameter.

Dimensions: ∿3.8 x 4.0 x 2.7 cm.

Petrographic Description:
This meteorite was described as Allan Hills #7 in Olsen et al., 1978.

Sample No. : ALHA76008 Location: Allan Hills
Field No.:
Weight (gms): 281.3
Meteorite Type: H6 Chondrite

Physical Description:
Specimen exhibits a thin (<.5 mm), reddish-black fusion crust. The fusion crust is absent in some places. Iron oxide staining is randomly scattered over the fusion crust. It appears that the meteorite has experienced preferential melting during entry. The two sawed surfaces are severely iron oxide stained.

Dimensions: 7.0 x 5.9 x 3.2 cm.

Petrographic Description:
Identical to Allan Hills #8 described in Olsen, et al., 1978.

Sample No.: ALHA76009 Location: Allan Hills
Field No.:
Weight (gms): 3950.5
Meteorite Type: L6 Chondrite

Physical Description:
Stone possesses remnants of a black fusion crust (∿1 mm thick). Much of the crust is fractured in a polygonal pattern. The specimen is fractured. One large, severely weathered fracture runs through the meteorite.

Dimensions: 18 x 13 x 7.6 cm.

Petrographic Description:
This meteorite described as Allan Hills #9 in Olsen et al., 1978.

Sample No.: MBRA76001 Location: Mt. Baldr
Field No.:
Weight (gms): 1096.0
Meteorite Type: H6 Chondrite

Physical Description:

The stone is covered with a reddish-brown fusion crust (<.5 mm) on two surfaces. Two surfaces are reddish-brown fracture surfaces, and two surfaces are cut. The fusion crust is pitted with numerous tiny holes. Several fractures penetrate the meteorite and iron oxide staining is present along some of these fractures. The matrix material is light gray.

Approximate dimensions: 10.7 x 5.6 x 7.4 cm.

Petrographic Description:
This meteorite has been described in Olsen, et al., 1978, as Mt. Baldr a.

1977 COLLECTION

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Sample No.: ALHA77001 Location: Allan Hills
Field No.: 78010210A
Weight (gms): 252.0
Meteorite Type: L6 Chondrite

Physical Description:
Fusion crust is mainly missing. One large surface was produced by breaking after fall; complementary fragment is probably in the collection. Original surfaces are considerably weathered. Sawed surface showed unweathered metal particles to within ~1 cm of the surface. Specimen contains several cracks and appears slightly friable.

One existing broken surface contained an irregular, medium gray, fine grained clast ~0.7 cm across. No clasts were noted on the sawed face.

Petrographic Description: Brian Mason
Antarctic meteorite ALHA77001 is a typical L6 chondrite. Chondrules are sparse and poorly defined; maximum diameter is 1.9 mm. Major minerals are olivine (Fa_{25}) and orthopyroxene ($Wo_{1.7}$ En_{77} Fs_{21}). About 10% of plagioclase (Ab_{83} An_{11} Or_6) is present as untwinned birefringent grains up to 0.15 mm across. Minor phases are nickel-iron (~8%), troilite (~6%), diopside (~4%), chromite (<1%) and merrillite (<1%). The small section examined shows no signs of shock or veining. A moderate amount of limonitic staining is present around most nickel-iron grains, none around troilite.

Sample No.: ALHA77002 Location: Allan Hills
Field No.: 77122927
Weight (gms): 235.2
Meteorite Type: L5 Chondrite

Physical Description:
Specimen reasonably angular with complete, brownish-black fusion crust which shows appreciable weathering. No broken surfaces to indicate crustal thickness. One large fracture. A few chipped corners show appreciable rusting.

Specimen is approximately 6.5 x 4.5 cms in diamension.

Petrographic Description:
The meteorite is classified as an L5 chondrite.

Chondrules are prominent and well-defined, 0.3-0.6 mm in diameter; most are porphyritic olivine, some fine-grained pyroxene. The matrix is dominantly olivine, in angular grains up to 1.0 mm in maximum dimension, with lesser amounts of orthopyroxene. Minor minerals in the matrix are nickel-iron, troilite, and chromite; plagioclase is present as very small grains difficult to recognize. The section is stained brown with limonitic materials and the metal grains are corroded evidently by terrestrial weathering, troilite is unaffected. Microprobe analyses show uniform composition in the olivine (Fa_{25}) and orthopyroxene ($Wo_{1.2}$ En_{77} Fs_{22}), plagioclase composition averages Ab_{84} An_{10} Or_6, but appears somewhat variable.

Sample No.: ALHA77003 Location: Allan Hills
Field No.: 77122920
Weight (gms): 779.6
Meteorite Type: H 3 Chondrite

Physical Description:
Specimen is very well rounded. No surface fissures are present. Fusion crust covers 33% of the meteorite's surface, (~100% T surface, 30% N and W surfaces. and 10% of E surface) and ranges from 1 to 3 mm thick. The crust is medium black and slightly glassy. The fusion crust is preserved on the surface (s) that were uppermost at the time of discovery (see field photo). The remaining surface of the meteorite is smooth, brownish-black, and has little iron-oxide staining. This surface is polished and may be the lower part of a fusion crust or a wind-polished surface. In an area ~1 cm x 2 cm this surface has been removed, revealing an interior surface that is partially iron-oxide stained.

This is a well indurated specimen. Repeated attempts to chip this meteorite for thin section samples were all partially successful.

Petrographic Description: Brian Mason
Numerous and well-defined chondrules, 0.1-0.6 mm in diameter, along with mineral clasts are present in a fine-grained groundmass colored brown with limonitic material. The chondrules exhibit a variety of form and structure, the commonest consisting of granular aggregates of olivine and polysynthetically twinned clinopyroxene; some chondrules have pale brown transparent glass interstitial to the olivine and pyroxene grains. Microprobe analyses show that both olivine and pyroxene are highly variable in composition. Olivine ranges from Fa_4 to Fa_{48}, with a mean of Fa_{22}; pyroxene ranges from Fs_2 to Fs_{25}, with a mean of Fs_{14}, and its calcium content averages 1% CaO. The highly variable composition of olivine and pyroxene indicates a type 3 chondrite, and the mean composition of the olivine and small amount of nickel-iron suggest L group, so the meteorite is tentatively classified L3; however, certain assignment of group should await further investigation.

Sample No.: ALHA77004 Location: Allan Hills
Field No.: 77122902
Weight (gms): 2230.0
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.

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}).

Sample No.: ALHA77005 Location: Allan Hills
Field No.: 77122928
Weight (gms): 482.5
Meteorite Type: Achondrite (unique)

Physical Description:
The specimen is well rounded on all faces except the south face, which is a partially broken surface. A well developed, dark fusion crust randomly covers approximately 5% of the meteorite's surface in small, thin patches. Parts of the stone are covered by a vitreous crust that possibly is the lower portion of the dark, outer fusion crust, which has been physically abraded. Some partially melted crystals are in contact with this glassy rind. The specimen's dimensions are ∿9.5 cm x 7.5 cm x 5.25 cm.

The specimen is well-indurated and difficult to chip. This would be a good meteorite for the study of fusion crust. The outer dark crust has apparently been removed by physical weathering. There is little evidence that the glassy rind has been affected by chemical weathering. The thin section chip may not be representative of the entire specimen.

On the cut surface the sample appears to be fresh. Variations in color of sawed surface suggest heterogeneities on a centimeter scale. Voids up to 2 mm in diameter are present on the sawed surface. Some of these voids show crystal structures on the peripheral surface, but they do not appear to extend into the cavity.

Petrographic Description: Brian Mason
This meteorite is an achondrite with the following modal composition (volume percent): olivine, ∿55; pyroxene ∿35; maskelynite, ∿8; opaques (mostly chromite, a little ilmenite, trace amounts of troilite and nickel-iron), ∿2. Olivine occurs as somewhat rounded anhedral to subhedral grains up to 2 mm long, and has an unusal pale brown color; microprobe analyses show a mean composition of Fa_{28}. Pyroxene occurs as colorless prismatic crystals up to 6 mm long, often poikilitically enclosing olivine; some crystals show coarse polsynthetic twinning; the composition is somewhat variable averaging $Wo_5\ Fs_{23}En_{72}$. Maskelynite is present as laths interstitial to olivine and pyroxene; it has labradorite composition (An_{53}) and contains 0.2-0.3% K_2O. The meteorite has been severely shocked, as is shown by the presence of maskelynite, undulose extinction in the pyroxene, and occasional areas of apparent shock melting. No signs of weathering were observed.

Meteorite ALHA77005 is a unique achondrite. The olivine is comparable in composition to that is chassignites, the pyroxene to that in diogenites, and the bulk composition will thus be intermediate between these two classes of achondrites. However, these classes are almost plagioclase-free, and maskelynite of similar composition is known only from the Shergotty and Zagami achondrites; these meteorites are quite different from ALHA77005 in consisting largely of calcium-rich clinopyroxene and containing no olivine.

Sample No.: ALHA77009 Location: Allan Hills
Field No.: 77122943
Weight (gms): 235.5
Meteorite Type: H4 Chondrite

Physical Description:
This is a complete specimen with fusion crust missing only on the corners and one small area on the T surface. The fusion crust, where present, is approximately 0.5 mm thick and black. On the surfaces not covered by fusion crust, many weathered inclusions are present. An ∿0.5 cm green inclusion, that appears to radiate, is present on the T surface. Much of the interior of the sample has weathered to a reddish-brown.

Dimensions: ∿6.5x4.5x4.3 cm.

Petrographic Description: Brian Mason
Chondritic structure is prominent. The usual variety of chondrule types is present, the commonest being barred olivine, granular olivine, and fine-grained radiating pyroxene. In a few of the barred chondrules the bars between the olivine are transparent brown glass, but in most the bars are turbid and devitrified. Some of the pyroxene is polysynthetically twinned clinobronzite. The groundmass between the chondrules consists of granular olivine and pyroxene, with minor amounts of nickel-iron and troilite. Remnants of fusion crust are present on one edge of the section. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{16}) of essentially uniform composition. The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77010 Location: Allan Hills
Field No.: 77122939
Weight (gms): 295.8
Meteorite Type: H4 Chondrite

Physical Description:
The exterior of the specimen is nearly a uniform reddish-brown. However, a small amount of thin, black fusion crust is present on the E surface. Several rounded (chondrules) and angular (lithic clasts) inclusions are apparent on the sawed surfaces. The inclusions are lighter in color than the reddish-brown, iron oxide stained matrix material.

Dimensions: 7.0x5.0x5.0 cm.

Petrographic Description: Brian Mason
Chondrules are prominent and well developed, 0.2-1.5 mm in diameter; a variety of types is present, the commonest being prophyritic olivine, granular olivine-pyroxene, and fine-grained pyroxene. Pyroxene grains in the olivine-pyroxene chondrules are polysynthetically twinned clinobronzite. The groundmass consists of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. The section shows a considerable degree of weathering in the form of small areas and veinlets of brown limonite. Microprobe analyses show olivine of essentially uniform composition (Fa_{18}) and pyroxene of somewhat variable composition (Fs_{15}-Fs_{18}, average Fs_{16}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77011 Location: Allan Hills
Field No.: 77122937
Weight (gms) 291.5
Meteorite Type: LL-3 Chondrite

Physical Description:
The major portion of the sample is covered with fusion crust. Inclusions are apparent through the thin fusion crust on the B surface. The fusion crust on the T surface is shiny blackish-red and appears to be more severely weathered than the other surfaces. Regmaglypts are present on the E surface. In areas where the fusion crust has been removed, probably by physical processes, many inclusions are apparent in the interior of the stone.

Petrographic Description: Brian Mason
Chondrules are numerous and well developed, 0.2-1.2 mm in diameter, and are close-packed with only a small amount of ground-mass. Some of the chondrules have prominent dark rims. The commonest types are granular olivine and prismatic or fine-grained pyroxene. Most of the pyroxene is polysynthetically twinned clinobronzite. Nickel-iron and troilite are present in unusually small amounts; troilite is concentrated in chondrule rims. A moderate amount of limonitic staining is present. Microprobe analyses show that olivine and pyroxene vary in composition; olivine ranges from Fa_4 to Fa_{36}, with a mean of Fa_{16}, and the pyroxene ranges from Fs_1 to Fs_{33}, with a mean of Fs_{12}. The low content of nickel-iron and troilite suggests LL group, and the meteorite is tentatively classified as an LL3 chondrite; however, definite assignment should await further investigation.

Sample No.: ALHA77012 Location: Allan Hills
Field No.: 77122942
Weight (gms): 180.2
Meteorite Type: H5 Chondrite

Physical Description:
The sample is roughly pyramidal in shape, with the E surface being semi-flat and a fracture surface. The B and S surfaces have very thin, patchy, black fusion crust. The remainder of the sample is stained reddish-brown by iron oxidation. No unweathered material was exposed during processing.

Petrographic Description: Brian Mason
Chondritic structure is well developed; chondrules are 0.3-0.9 mm in diameter, the commonest types being granular olivine, barred olivine, and fine-grained pyroxene. In the olivine chondrules the material interstitial to the olivine is a fine-grained aggregate probably of pyroxene and plagioclase. Some larger irregular aggregates of granular olivine (up to 6 mm in greatest dimension) are present. The matrix of the chondrules and aggregates is a granular aggregate of olivine and pyroxene, with minor nickel-iron and troilite (nickel-iron in excess of troilite). Somewhat eroded fusion crust is present along one edge. The section is pervaded with brown limonitic staining, and small patches and veinlets of limonite are present. Microprobe analyses show uniform olivine (Fa_{18}) and orthopyroxene (Fs_{16}) compositions. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77014 Location: Allan Hills
Field No.: 77122931
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.

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}.

Sample No.: ALHA77015 Location: Allan Hills
Field No.: 77122945
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.

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.

Sample No.: ALHA77021 Location: Allan Hills
Field No.: 77122744
Weight (gms): 16.65
Meteorite Type: H5 Chondrite

Physical Description:
A brownish-black fusion crust covers ~50% of the surface of specimen. The remaining surfaces are fracture surfaces which are severely weathered. The specimen was moderately difficult to chip. Chipping revealed an interior surface that is iron oxide stained.

Approximately 2.5 cm long.

Petrographic Description: Brian Mason
Chondritic structure well-developed; some chondrules are well-defined, others are irregular in form and tend to merge with the groundmass. Chondrules range from 0.3-1.0 mm in diameter, and show a variety of types: granular olivine and olivine-pyroxene, porphyritic olivine with interstitial partly-devitrified glass, barred olivine, fine-grained pyroxene and others. Fusion crust is present. Yellow-brown limonitic staining is pervasive throughout the section, and some limonite veinlets are present. Microprobe analyses show olivine (Fa_{18}) and orthopyroxene (Fs_{17}) of uniform composition; some small grains of sodic plagioclase were detected.

Sample No.: ALHA77025 Location: Allan Hills
Field No.: 77122727
Weight (gms): 19.40
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is tabular and rounded. The entire surface is covered with a brownish-black fusion crust. A few small fissures in the crust reveal a medium gray interior. Specimen is moderately weathered and chipped easily. The freshly chipped surface revealed some flecks of fresh metal, however, it is mostly iron oxide stained.

Approximate length is 3.0 cm.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to ALHA77021, which suggests that these two stones may be separate pieces of the same meteorite.

Sample No.: ALHA77033 Location: Allan Hills
Field No.: 77122734
Weight (gms): 9.34
Meteorite Type: L3 Chondrite

Physical Description:
Specimen is angular, rough and dark brown. Exterior surfaces do not appear to have fusion crust, but are highly weathered. The stone chipped easily, revealing a highly oxidized broken face.

Maximum overall length is ∿3.0 cm.

Petrographic Description: Brian Mason
The section shows a closely packed mass of chondrules (0.3-1.1 mm diameter) and irregular crystalline aggregates, with a little interstitial nickel-iron and troilite (1-2% of each) and a relatively small amount of fine-grained matrix. A considerable variety of chondrules is present, the commonest being granular olivine and olivine/polysynthetically-twinned clinopyroxene, porphyritic olivine, and fine-grained pyroxene. Some chondrules have intergranular transparent pale brown glass, in others the glass is turbid and partly devitrified. Yellow-brown limonitic staining pervades the section, and patches and veinlets of red-brown limonite are common. Microprobe analyses show olivine ranging in composition from Fa_8 to Fa_{38}, with a mean of Fa_{18}; the pyroxene is relatively uniform in iron content (Fs_{8-9}) but shows a considerable range in calcium ($Wo_{0.3-8.5}$). The low content of nickel-iron and troilite suggest L group, and the meteorite is classified L3.

Sample No.: ALHA77061 Location: Allan Hills
Field No.: 77122789
Weight (gms): 12.61
Meteorite Type: H5 Chondrite

Physical Description:
Approximately one-half of the specimen's surface is covered by a thin, brownish-black fusion crust. The other half of the specimen is a light-to-medium gray, fracture surface with appreciable iron oxide staining. Chondrules appear to be present on fractured surface, however, they are not prominent. This is not a complete stone. From field photographs it is apparent that the B surface was in contact with the ice.

Maximum dimension is approximately 2.5 cm.

Petrographic Description: Brian Mason
Chondrules numerous but poorly defined, their margins merging with the granular groundmass; a variety of types is present, including porphyritic olivine, barred olivine, radiating pyroxene, and others. Fusion crust is present on one edge. The section is pervaded with a moderate amount of yellow-brown limonitic staining, concentrated around grains of nickel-iron; occasional discrete patches of brown limonite are present. Microprobe analyses show uniform olivine (Fa_{18}) and orthopyroxene (Fs_{17}) compositions; some small grains of sodic plagioclase were also detected.

Sample No.: ALHA77062 Location: Allan Hills
Field No.: 77122784
Weight (gms): 16.72
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is angular. Approximately ½ surface is covered with a thin, brownish-black fusion crust. A light to medium gray fracture surface comprises the remaining 50% of the meteorite's exterior surface. Iron oxide staining is present on the fracture surface, but not to the extent that it obliterates the detection of chondrules and other inclusions. Irregular white inclusions, probably feldspar, approximately ½ cm in length are present. Near one of these inclusions is a ½ cm area devoid of weathered metal fragments. From field photographs it appears that the T surface was in contact with the ice. Maximum dimension of sample is approximately 2.75 cm.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to Allan Hills 77061 and 77064, which suggests that these three stones may be separate pieces of the same meteorite.

Sample No.: ALHA77064 Location: Allan Hills
Field No.: 77122786
Weight (gms): 6.47
Meteorite Type: H5 Chondrite

Physical Description:
The sample is angular. Approximately ½ the exterior surface is covered by a brownish-black fusion crust that ranges up to ½ mm in thickness. The remaining exterior surface is light to medium gray with appreciable iron-oxide staining. Several rounded inclusions, some of which are ringed with black material, are present on the fracture surface. From field photographs it appears that the B surface is resting on the ice.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to Allan Hills 77061 and 77062, which suggests that these three stones may be separate pieces of the same meteorite.

Sample No.: ALHA77071 Location: Allan Hills
Field No.: 77122711
Weight (gms): 10.87
Meteorite Type: H5 Chondrite

Physical Description:
A relatively smooth brownish-black fusion crust covers approximately 50% of the sample. The remaining surfaces are fracture faces. These surfaces are brown, moderately weathered and show iron oxide staining.

Approximate maximum length is 2.0 cm.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to ALHA77061, 77062, and 77064, which suggests that these stones may be separate pieces of the same meteorite.

Sample No.: ALHA77074 Location: Allan Hills
Field No.: 77122721
Weight (gms): 12.07
Meteorite Type: H5 Chondrite

Physical Description:
The stone is moderately angular. Approximately 70% of the sample's exterior surface is covered by a brownish-black fusion crust. The remaining surfaces are fracture surfaces that are yellowish-brown and severely weathered. An irregular cavity ~4 mm diameter is present on one fracture surface.

Chipping for a thin section sample revealed fresh metal fragments on the interior.

Approximate maximum dimension is 2.5 cm.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to Allan Hills 77061, 77062, 77064, and 77071, which suggests that these stones may be separate pieces of the same meteorite.

Sample No.: ALHA77081 Location: Allan Hills
Field No.: 77122716
Weight (gms): 8.59
Meteorite Type: H? Chondrite

Physical Description:
The stone is angular to subrounded. Highly weathered, brownish-black through reddish-brown fusion crust, and remnants of fusion crust, cover approximately 50 to 70% of the meteorite's surface. One face is a broken surface that shows iron oxide staining and has a granular texture. The longest side of the sample is ~2.0 cm.

Petrographic Description: Brian Mason
The meteorite is an equigranular (grains 0.1-0.3 mm across) aggregate of approximately equal amounts of olivine and orthopyroxene, with minor amounts of diopside, plagioclase, nickel-iron, and troilite, and accessory chromite. Fusion crust is present along one edge. A moderate amount of yellow-brown limonitic staining is present, concentrated around nickel-iron grains. Microprobe analyses show the minerals are uniform in composition: olivine, Fa_{11}; orthopyroxene, $Wo_{1.7}Fs_{11}En_{87}$; diopside, $Wo_{45}Fs_{5}En_{50}$; plagioclase, An_{15}, with 0.8% K_2O.

The classification of this meteorite presents difficulties. The structure is achondritic, but the mineralogical composition is similar to that of the common chondrites, which suggests that this meteorite may be a completely recrystallized chondrite. However, the composition of the olivine and orthopyroxene is intermediate between that for the bronzite (H) and enstatite (E) chondrites. The meteorite resembles some silicate inclusions in iron meteorites.

This meteorite is identical in mineral composition and structure to Acapulco, a recent Mexican fall.

Sample No.: ALHA77086 Location: Allan Hills
Field No.: 77122759
Weight (gms): 19.44
Meteorite Type: H5 Chondrite

Physical Description:
The overall color of the sample is brownish-black and severely weathered. About 30% of the meteorite's surface is covered with remnants of fusion crust. The remainder of the surface represents three fracture faces. From field photographs it appears that the T surface was on the ice.

The sample was difficult to chip. The fresh interior surface is not as weathered as the exterior surface.

The longest dimension of the sample is approximately 2.5 cm.

Petrographic Description: Brian Mason
Chondrules numerous, some well-defined, others irregular in form and tend to merge with the groundmass. They range from 0.3-1.2 mm in diameter, and show a variety of types, the commonest being porphyritic olivine, barred olivine, and radiating or fine-grained pyroxene. Fusion crust is present on one edge. The section is pervaded by yellow-brown limonitic staining, and patches and veinlets of brown limonite are present. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{17}) of uniform composition; some small grains of sodic plagioclase were detected.

Sample No.: ALHA77088 Location: Allan Hills
Field No.: 77122783
Weight (gms): 51.15
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is angular and highly weathered. Several fissures are obvious on the brownish-black surface. Approximately 30% of the surface is slightly rounded and represents the remnants of a fusion crust. From field photographs it is apparent that the S-E surface was in contact with the ice. This is not a complete specimen.

A thin section sample was removed from the T surface. The specimen appears to be weathered throughout.

The longest dimension is nearly 3.5 cm.

Petrographic Description: Brian Mason
This meteorite is similar in texture, mineral composition, and degree of weathering to ALHA77086, which suggests that these two stones may be separate pieces of the same meteorite.

Sample No.: ALHA77102 Location: Allan Hills
Field No.: 77122767
Weight (gms): 12.25
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is angular, highly weathered and dark brownish-black. Approximately 40% of the surface is the remnant of a fusion crust, the remaining surfaces are fracture surfaces. From field photographs it is apparent that the T surface was in contact with the ice. This is not a complete specimen. It's maximum dimension is approximately 2.5 cm.

The interior of the meteorite appears very weathered after removing the thin section sample.

Petrographic Description: Brian Mason
Chondrules prominent and well-developed, ranging from 0.3-1.5 mm in diameter; a variety of types is present, including barred olivine, granular olivine, olivine-pyroxene, and radiating pyroxene chondrules. The groundmass consists of granular olivine, pyroxene, nickel-iron, and troilite. Fusion crust is present along one edge. The section is pervaded by yellow-brown limonitic staining, and patches and veinlets of red-brown limonite are present, concentrated around grains of nickel-iron. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{15}) of uniform composition; some small grains of sodic plagioclase were detected.

Sample No.: ALHA77118 Location: Allan Hills
Field No.: 77123118
Weight (gms): 7.84
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is rounded. A brownish-black fusion crust covers approximately 75% of the meteorite's surface. Approximately 25% of the specimen is a fracture surface. This is a nearly complete specimen. No fresh metal was observed on chipping. The maximum dimension is ~2.5 cm. From field photographs it is evident that the B surface was in contact with the ice.

Petrographic Description: Brian Mason
Chondritic structure well-developed, with a variety of chondrule types, the commonest being barred olivine, granular and porphyritic olivine, and fine-grained pyroxene. The matrix is fine- to medium-grained, consisting of olivine, pyroxene, nickel-iron, and troilite. Fusion crust is present on one side of the section. The section is pervaded by yellow-brown limonitic material. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{17}) of uniform composition; some small grains of sodic plagioclase were detected.

Sample No.: ALHA77119 Location: Allan Hills
Field No.: 77123120
Weight (gms): 6.36
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is nearly tabular and almost completely covered with a thin, weathered fusion crust. The fusion crust has a slight patina. No fresh metal was observed on chipping. The fresh interior surface is gray. Maximum dimension of specimen is ~2.0 cm.

Petrographic Description: Brian Mason
Chondrules common, some sharply defined, others with indistinct borders merging with the groundmass. Yellow-brown limonitic staining pervades the section, and patches and veinlets of red-brown limonite are common. Fusion crust is present on one edge. Microprobe analyses show olivine (Fa_{18}) and orthopyroxene (Fs_7) of uniform composition; some small grains of sodic plagioclase were detected.

Sample No.: ALHA77124 Location: Allan Hills
Field No.: 77123119
Weight (gms): 4.41
Meteorite Type: H5 Chondrite

Physical Description:
Specimen is rounded and nearly completely covered with a thin, weathered fusion crust. From field photographs it is known that the B surface was in contact with the ice. The maximum dimension of the specimen is ~1.5 cm. No fresh metal was observed when the sample was chipped to obtain a thin section sample.

Petrographic Description: Brian Mason
Chondrules sparse and not easily distinguished from the granular groundmass, which consists of olivine, pyroxene, nickel-iron, and troilite; accessory chromite is present. Yellow-brown limonitic staining pervades the section. Fusion crust is present on one edge. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{16}) of uniform composition; grains of sodic plagioclase were detected.

Sample No.: ALHA77140 Location: Allan Hills
Field No.: Y77123124
Weight (gms): 78.62
Meteorite Type: Tentatively L3 Chondrite

Physical Description:
The specimen is roughly conical shaped. The basal portion is irregular and appears to be a broken surface. The remainder of the meteorite's surface is only slightly pitted and is suggestive of a fusion crust. The entire meteorite is a dark reddish-brown with considerable rust-like staining. The extensive weathering of the stone has apparently removed or altered most of the fusion crust.

Petrographic Description: Brian Mason
The section examined consists of an elliptical non-chondritic enclave, 8x5 mm, completely enclosed in highly chondritic material. The enclave consists of polysynthetically-twinned clinoenstatite (somewhat variable composition, averaging $Wo_{0.2}Fs_7En_{93}$) poikilitically enclosing irregular to globular isotropic or weakly anisotropic masses. These masses have variable composition (SiO_2 59-83%, FeO 15-31%, MgO 5-9%, K_2O 2.7-4.3%, Na_2O 0.6-2.6%, Al_2O_3 ~0.3%, CaO, TiO_2, <0.1%); they appear to be devitrified glass, and some analyses are close to that of merrihueite. The enclave has a little interstitial nickel-iron and troilite. The chondritic portion consists of a close-packed mass of chondrules, with a relatively small amount of fine-grained matrix. Chondrules range in diameter from 0.2 to 2 mm, and exhibit a variety of form and structure; the component consists of granular aggregates of olivine and polysynthetically-twinned clinopyroxene, sometimes with a little interstitial glass. Both olivine and clinopyroxene are highly variable in composition. Olivine ranges from Fa_8 to Fa_{44}, with an average of Fa_{25}; pyroxene ranges from Fs_2 to Fs_{17}, with an average of Fs_7 and a low calcium content, averaging 0.2% CaO. Troilite and nickel-iron are interstitial to the chondrules, and part of the nickel-iron has weathered to limonitic material. The highly variable composition of olivine and pyroxene indicates a type 3 chondrite, and the mean composition of the olivine and the amount of nickel-iron suggest L group, so the meteorite is tentatively classified L3; however, certain assignment of group should await further investigation.

Sample No.: ALHA77144 Location: Allan Hills
Field No.: 77123106
Weight (gms): 7.88
Meteorite Type: H6 Chondrite

Physical Description:
The specimen is rounded with a thin, patchy fusion crust covering ~75% of the stone's surface. The remainder of the stone is covered by a reddish-brown weathering rind. This appears to be a complete specimen. Its maximum dimension is ~2 cm. After chipping it was determined that the meteorite is weathered throughout.

Petrographic Description: Brian Mason
Chondritic structure not prominent, the rather sparse chondrules merging with the granular groundmass, which consists of olivine, pyroxene, nickel-iron, and troilite, with accessory chromite. A moderate amount of limonitic staining is concentrating around nickel-iron grains. Fusion crust is present on one edge. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{17}) of uniform composition; medium-grained sodic plagioclase was also seen.

Sample No.: ALHA77148 Location: Allan Hills
Field No.: 77123107
Weight (gms): 13.10
Meteorite Type: H6 Chondrite

Physical Description:
75% of the sample is covered by a thin, patchy fusion crust. A reddish-brown weathering rind covers the remaining ~25% of the meteorite's surface. Rounded inclusions are visible on the fractured surface. Many large and small fissures are present. These fissures probably attributed to the severely weathered condition of the meteorite. This is not a complete specimen. Its maximum dimension is ~2.5 cm. From the field photographs it was determined that the B surface was in contact with the ice.

Petrographic Description: Brian Mason
Chondritic structure not prominent, the rather sparse chondrules merging with the granular groundmass, which consists of olivine, pyroxene, nickel-iron, and troilite. The section is extensively stained with yellow-brown limonitic material, which is also present as small patches and veinlets. Fusion crust is present on one edge. Microprobe analyses show olivine (Fa_{18}) and orthopyroxene (Fs_{16}) of uniform composition; medium grained sodic plagioclase was also seen.

Sample No.: ALHA77150 Location: Allan Hills
Field No.: 77123101
Weight (gms): 58.30
Meteorite Type: L6 Chondrite

Physical Description:
Maximum dimension of specimen is ~3.25 cm. Fusion crust covers the B and S surfaces, the remainder of the specimen is a fracture surface which is brownish-red. The fracture surface has a fine grained, granular texture with some crystal faces apparent. The fissures on the fracture surface are iron oxide stained. When chipping, many very fine pieces fell off. The sample appears to be weathered throughout.

Petrographic Description: Brian Mason
Chondrules are sparse and barely distinguishable from the granular groundmass, which consists of olivine, pyroxene, nickel-iron, and troilite. The section contains a fine-grained enclave, 1.5 mm across, consisting of olivine, pyroxene, and numerous minute nickel-iron grains. Yellow-brown limonitic staining is pervasive throughout the meteorite. Microprobe analyses show olivine (Fa_{25}) and orthopyroxene (Fs_{22}) of uniform composition; medium-grained sodic plagioclase was also seen.

Sample No.: ALHA77155 Location: Allan Hills
Field No.: Y78010307
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.

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 accessory 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}.

Sample No.: ALHA77160 Location: Allan Hills
Field No.: 77123006
Weight (gms): 70.42
Meteorite Type: L3 Chondrite

Physical Description:
Approximately 80% of surface is dark brown and angular with a slight patina. The patina is probably a result of chemical weathering and wind ablation. The remainder of the stone is covered by a spotty, thin, black fusion crust. This is not a complete specimen. The maximum dimension is approximately 5.5 cm. From field photographs it is apparent that the B surface was in contact with the ice.

Petrographic Description: Brian Mason
Chondrules abundant, 0.2-2.5 mm diameter, in a minimal amount of dark fine-grained matrix; some chondrules are spherical, but many are elliptical to irregular in form. Chondrules are mainly composed of barred or porphyritic olivine, some with polysynthetically twinned clinopyroxene. Interstitial glass in chondrules is pale gray, transparent to turbid. Minor subequal amounts of troilite and nickel-iron are present, the nickel-iron extensively altered to red-brown limonitic material, which pervades the section along chondrule boundaries. Microprobe analyses show a wide range of olivine composition, Fa_3-Fa_{46}, and a similar range in pyroxene composition. This range in composition, together with the presence of glass and twinned clinopyroxene, indicates type 3, and the small amount of nickel-iron suggests L group.

Sample No.: ALHA77164 Location: Allan Hills
Field No.: 77123003
Weight (gms): 38.14
Meteorite Type: L3 Chondrite

Physical Description:
Specimen is angular. Approximately 75% of the exterior surface of the sample is a fracture surface. This surface is dark brown and has a patina, which is probably due to a combination of chemical weathering and wind erosion. Nearly 25% of the sample is covered by a dark brown, patchy, thin fusion crust. This is not a complete specimen. Its maximum length is ~3.0 cm. No fresh metal was observed when the meteorite was chipped for thin section preparation.

Petrographic Description: Brian Mason
This specimen is similar in texture, mineral composition, and degree of weathering to ALHA77160, which suggests it may be another piece of the same meteorite.

Sample No.: ALHA77165 Location: Allan Hills
Field No.: 77123004
Weight (gms): 30.50
Meteorite Type: L3 Chondrite

Physical Description:
About 50% of surface of meteorite is angular, dark brown and has a patina, probably the result of chemical weathering and wind ablation. The remaining 50% of the sample is smooth and contains patches of fusion crust. This is not a complete specimen. Its maximum length is approximately 3.5 cm. No fresh metal was revealed by chipping the sample for thin section preparation. From field photographs it is apparent that the N.W. surface was in contact with the ice.

Petrographic Description: Brian Mason
This specimen is similar in texture, mineral composition, and degree of weathering to ALHA77160 and 77164, which suggests it may be another piece of the same meteorite.

Sample No.: ALHA77167 Location: Allan Hills
Field No.: 77123029
Weight (gms): 611.2
Meteorite Type: L3 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.

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.

Sample No.: ALHA77177 Location: Allan Hills
Field No.: Y77123110
Weight (gms): 368.2
Meteorite Type: H5 Chondrite

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.

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 orthopyroxene (Fs_{16}) of uniform composition; minor plagioclase (An_{13}) and accessory whitlockite were also identified. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77180 Location: Allan Hills
Field No.: Y77123109
Weight (gms): 190.8
Meteorite Type: L6 Chondrite

Physical Description:
Remnant fusion crust remains on three surfaces of the sample. The other surfaces are fracture surfaces that are stained reddish-brown by iron oxidation.

One fine grained gray inclusion, approximately 1 cm in diameter, was exposed in the sample during processing. The interior of the specimen is fine grained and light gray.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite. A little untwinned plagioclase is present. One edge of the section is bordered by remnants of fusion crust. A small amount of limonite is present, concentrated near the fusion crust. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{20}), and plagioclase (An_{10}) of uniform composition; one grain of diopside ($Wo_{48}En_{46}Fs_6$) was analyzed. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA77182 Location: Allan Hills
Field No.: Y78010313A
Weight (gms): 1134.7
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, approximately 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.

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.

Sample No.: ALHA77183 Location: Allan Hills
Field No.: Y76010314
Weight (gms): 288.0
Meteorite Type: H6 Chondrite

Physical Description:
This is a well rounded specimen, with the exception of the B surface which is flat. No fusion crust is present on the sample, and all surfaces are stained uniformly reddish-brown. Outlines of small inclusions are visible on the T surface.

No unweathered material was observed when the stone was cleaved.

Petrographic Description: Brian Mason
Some well-defined chondrules are present, but most of the section consists of a granular aggregate of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. A little limonite is present, usually in association with the nickel-iron. Microprobe analyses show olivine (Fa_{19}), orthopyroxene (Fs_{16}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA77190 Location: Allan Hills
Field No.: 77122915
Weight (gms): 387.1
Meteorite Type: H4 Chondrite

Physical Description:
The specimen is approximately 11.0x6.0x4.5 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.

After drying in the nitrogen cabinet for forth-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.

Sample No.: ALHA77191 Location: Allan Hills
Field No.: 77122908
Weight (gms): 642.2
Meteorite Type: H4 Chondrite

Physical Description:
This 11.0x7.0x5.0 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 .5 mm thick, fusion crust. The iron oxide staining is semi-glossy and reddish-brown. Parallel fractures, 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.

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 H4 chondrite.

Sample No.: ALHA77192 Location: Allan Hills
Field No.: 77122903
Weight (gms): 845.3
Meteorite Type: H4 Chondrite

Physical Description:
The angular specimen (~9.0x8.0x15.0 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.

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: 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.

Sample No.: ALHA77208 Location: Allan Hills
Field No.: 77122904
Weight (gms): 1733.0
Meteorite Type: H4 Chondrite

Physical Description:
The specimen is angular, highly fractured, and severaly weathered. No fusion crust remains on the specimen. The fractures appear to penetrate throughout the stone. Numerous inclusions are visible on the brown weathered surfaces.

Approximate dimensions: 13.75x10x9 cm.

No fresh metal or unweathered surface was exposed when obtaining material for a thin section.

Petrographic Description: Brian Mason
Chondrules are numerous and well-developed, ranging from 0.3 to 0.9 mm in diameter; a variety of types is present, the commonest being granular olivine, porphyritic olivine, and fine-grained or granular pyroxene. Much of the granular pyroxene is polysynthetically twinned clinobronzite. Minor amounts of nickel-iron (~15%) and troilite (~5%) are distributed throughout the groundmass. The meteorite is extensively weathered, with limonite pervading the section and also concentrated in veinlets. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{14}) of essentially uniform composition. The uniform olivine and pyroxene composition and the presence of clinobronzite indicate that the meteorite should be classified as an H4 chondrite.

Sample No.: ALHA77214 Location: Allan Hills
Field No.: 77122798
Weight (gms): 2111.0
Meteorite Type: L3 Chondrite

Physical Description:
Specimen is angular with remnants of fusion crust on ∿30% of the exterior surface. Another ∿30% of the meteorite may have previously been covered with fusion crust, but has been abraded away. The remaining portion of the sample is a fracture surface. The stone contains many fissures. Snow (ice?) was observed in several of the fissures when the meteorite was removed from cold storage. It ranges in color from brown through brownish-black, and has a weathering patina on all surfaces with the exception of the fracture surface. Some iron-oxide staining is apparent on exterior surface, however, the material adjacent to the fissures and the fracture surface are most severely iron oxide stained. A number of chondrule-like structures are obvious. Chipping revealed that the meteorite is very weathered and friable along fracture surfaces. This is not a complete specimen.

Its approximate measurements are 16 cm x 9.5 cm.

Petrographic Description: Elbert King
This section is rather badly weathered with much of the metal oxidized to hematite. Some of the large hematite areas are colloform. However, the narrow end of the slide is much more weathered than the wider end, giving some hope that the deep interior of the stone may be much fresher. Troilite is abundant and outlines the margins of many chondrules.

Chondrule margins are sharply distinguishable from the fine-grained matrix. At least two chondrules contain fresh pinkish-brown glass that shows strain isogyres in crossed polarizers. Most chondrules appear to be fluid drop chondrules, and some are broken or are only small portions of their original volumes as judged from their radii of curvature. Some chondrules, which range in size to more than 4 mm in maximum diameter, contain large euhedral olivine crystals and some large euhedral olivine and pyroxene crystals occur as individual crystals with no apparent crystallized liquid attached. A number of the fluid drop and lithic chondrules appear to be surrounded by fine-grained troilite-rich, dark rims or rinds, but the exact nature of the rims is difficult to distinguish because of the weathering.

The largest chondrule shows interesting poikilitic textures, with pyroxene enclosing smaller round grains of olivine and another pyroxene (?). The rim of this chondrule is of low interference color pyroxene (?), large patches of which are in optical continuity. It deserves detailed study, particularly microprobe analysis, and may be a peculiar lithic fragment. Most other chondrule textures appear to be normal for low petrologic type ordinary chondrites.

One troilite-rich, fine-grained lithic fragment is obvious (∿1.9 mm maximum dimension) that deserves detailed study. Two small fragments of finely devitrified glass are present, ranging to 0.2 mm.

The matrix in this stone is very difficult to see because of the weathering. It appears dark to opaque, very fine-grained and troilite-rich.

Sample No.: ALHA77215 Location: Allan Hills
Field No.: 77122946
Weight (gms): 819.6
Meteorite Type: L3 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 13.0 x 7.0 x 7.0 cm.

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 L3 chondrite.

Sample No.: ALHA77216 Location: Allan Hills
Field No.: 77122949
Weight (gms): 1470.0
Meteorite Type: L3 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 15.0 x 9.0 x 8.0 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.

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

Petrographic Description: Brian Mason
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 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 unifrom composition, Fa_{24}, but the pyroxene is somewhat variable, Fs_{13}-Fs_{21}, average Fs_{17}. The meteorite is classified as an L3 chondrite with enclaves.

Sample No.: ALHA77217 Location: Allan Hills
Field No.: 77122948
Weight (gms): 413.2
Meteorite Type: L3 Chondrite

Physical Description:
This stone is approximately 9.5 x 7.0 x 4.5 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.

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 L3 chondrite.

Sample No.: ALHA77219 Location: Allan Hills
Field No.: 78012502
Weight (gms): 637.1
Meteorite Type: Mesosiderite

Pysical Description:
This is not a complete specimen. It is rounded to subangular and a dark brown weathering rind covers the entire stone. Many inclusions of various sizes are present on the highly weathered surface; these objects are glassy, dark greenish-black, and range from angular to subrounded. The inclusions are up to 1 cm in diameter.

Approximate diameter: 12 x 8 x 7 cm.

Petrographic Description: Brian Mason
The polished thin section is dominated by large orthopyroxene clasts (up to 6 mm across in a groundmass consisting largely of crushed and comminuted orthopyroxene (grains up to 0.6 mm across). The groundmass also contains about 20% of nickel-iron (kamacite and taenite) in grains averaging about 0.3 mm, rare grains of plagioclase (An_{90}), troilite, chromite, merrillite, and a silica polymorph (probably tridymite). The groundmass encloses a rounded aggregate (3 mm across) of fine-grained (up to 0.15 mm) olivine, composition Fa_{26}. The composition of the orthopyroxene clasts and groundmass is somewhat variable, Fs_{24-28}, with CaO ranging from 0.5-2.3%; one grain of diopsidic pyroxene was analyzed, $Wo_{43}En_{45}Fs_{12}$.

The major material of this section is characteristic of a diogenite; however, the presence of a considerable amount of nickel-iron and the olivine enclave is unique for this class of achondrites, and suggests a possible affinity to the mesosiderites. The identification as a mesosiderite has been confirmed by examination of a cut surface of the whole specimen.

Sample No.: ALHA77221 Location: Allan Hills
Field No.: 78012504
Weight (gms): 229.2
Meteorite Type: H4 Chondrite

Physical Description:
All surfaces of the meteorite, with the exception of the S surface, have remnant patches of thin, dull black fusion crust. The exterior surfaces devoid of fusion crust are stained by iron oxidation. Several clasts, approximately 1 mm in diameter, are apparent on the S surface. The specimen is fractured.

Chipping revealed no unweathered material in the interior of the sample.

Petrographic Description: Brian Mason
Chondrules are numerous and well developed, and unusally large, ranging up to 3 mm in diameter; the commonest types are granular and barred olivine. One example of a chondrule within a chondrule (barred olivine) was noted. The groundmass consists of olivine and pyroxene, with a fair amount of nickel-iron in relatively large (up to 1.2 mm) grains, and a smaller amount of troilite. The groundmass is pervaded with fine-grained black material, probably carbonaceous. A little limonite is present. Microprobe analyses show olivine (Fa_{18}) of essentially uniform composition and slightly variable pyroxene (Fs_{13}-Fs_{15}, average Fs_{14}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77223 Location: Allan Hills
Field No.: 78012505
Weight (gms): 207.9
Meteorite Type: H4 Chondrite

Physical Description:
The T surface of this specimen has patches of dull black fusion crust. The remainder of the sample is stained reddish brown by iron oxidation. The surfaces devoid of fusion crust are fracture surfaces. Several cracks penetrate the sample.

Petrographic Description: Brian Mason
Chondritic structure is well developed; chondrules range from 0.2-1.5 mm in diameter, and are of the usual types, the commonest being barred olivine, granular olivine and olivine-pyroxene, and fine-grained pyroxene. The groundmass consists of fine-grained 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. The section is extensively veined with red-brown limonite. Microprobe analyses show olivine of uniform composition (Fs_{17}), and pyroxene of somewhat variable composition (Fs_{15}-Fs_{29}, average Fs_{17}); some analyzed spots within pyroxene grains showed CaO contents up to 15%, suggesting exsolution of diopsidic pyroxene. The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77224 Location: Allan Hills
Field No.: 78012506
Weight (gms): 786.9
Meteorite Type: H4 Chondrite

Physical Description:
Specimen is angular, extremely weathered and friable. When meteorite was removed from cold storage and placed in the processing cabinet, many pieces fell off the main mass. There are many surface fissures that appear to continue throughout the meteorite. The B surface (not photographed) shows patches of fusion crust (very thin) and remnants of regmaglypts. The reddish-brown iron-oxide staining that is the prevalent color has an iridescent-like sheen on the B surface. The remaining exterior surfaces have small patches of a brownish-black fusion crust. Ice was observed in surface cracks when the specimen was removed from cold storage. This is not a complete specimen. The T surface appears to be a fracture surface. Small inclusions were observed on the weathered exterior surface. The T.S. and T.L. chips were taken from chips generated from sample when removed from cold storage.

Approximate size : 13 x 14 cm.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, with individual chondrules 0.2 - 1.0 mm in diameter; chondrule types include granular and porphyritic olivine, barred olivine, and fine-grained pyroxene. Minor amounts of troilite and nickel-iron are present, the nickel-iron being extensively weathered to limonite, which pervades the section. Black veinging is prominent, the black color being partly due to fine-grained troilite. Microprobe analyses show olivine (Fa_{19}) and orthopyroxene (Fs_{17}) of essentially uniform composition.

Sample No.: ALHA77225 Location: Allan Hills
Field No.: 77122910
Weight (gms): 5878.0
Meteorite Type: H4 Chondrite

Physical Description:
This specimen has no fusion crust and is uniformly weathered and stained reddish-brown, however, some surfaces are more shiny than others. The sample is extremely fractured. One brassy colored clast is present on the T surface, possibly a troilite nodule. The B surface has what appears to be slickensides, but because of the severe weathering of the specimen it is impossible to determine this unambiguously. No unweathered material is present on the exterior of the sample. When the specimen was cleaved it fell into many pieces and no unweathered material was exposed.

Dimensions: 20 x 19 x 11 cm.

Petrographic Description: Brian Mason
Chondrules are numerous and well-defined, ranging from 0.5 to 1.8 mm in diameter; a variety of types is present, the commonest being prophyritic olivine and olivine-pyroxene, barred olivine, and fine-grained radiating pyroxene. Much of the pyroxene in the olivine-pyroxene chondrules is polysynthetically twinned clinobronzite. Minor amounts of nickel-iron (~15%) and troilite (~5%) are distributed throughout the groundmass. The meteorite is extensively weathered, with limonite pervading the section and also concentrated in veinlets. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{16}) of essentially uniform composition. The olivine and pyroxene composition and the presence of clinobronzite indicate that the meteorite can be classified as an H4 chondrite.

Sample No.: ALHA77226 Location: Allan Hills
Field No.: 77122901
Weight (gms): 15323.0
Meteorite Type: H4 Chondrite

Physical Description:
A small patch of dull black fusion crust was present on the S surface of the sample. The ' surface of the specimen was concave and flow bands were present in the T-B direction. The specimen is severely fractured and during processing crumbled into many pieces. Nearly all the material exposed during processing was extensively stained by iron-oxidation. However, a few small areas on the exposed material are not as severely stained by iron oxidation and appear light gray.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-1.8 mm in diameter; they are set in a fine-grained 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 (Fa_{18}) and pyroxene (Fs_{16}) of essentially uniform composition. The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77230 Location: Allan Hills
Field No.: 77122703
Weight (gms): 2473.3
Meteorite Type: L4 Chondrite

Physical Description:
This is a subrounded to angular specimen which is nearly a complete stone. A brownish-black fusion crust, approximately .5 to 1 mm thick, covers the specimen, with the exception of small broken surfaces. The portion of the fusion crust that was in contact with the ice has an iridescent-like sheen. The specimen has several surface fissures.

The specimen was difficult to chip for thin section material. Snow was present along fissures on the interior of the stone. The surface of the meteorite that was in contact with the ice was more severely weathered than the uppermost portion. Weathering is along fissures to a depth of ∿.5 mm.

Petrographic Description: Brian Mason
The section shows a closely-packed aggregate of chondrules, some spherical, but many appear fragmented and broken. A variety of chondrule types are present: barred olivine, porphyritic olivine, fine-grained pyroxene, etc. Chondrule size ranges from 0.3 to 1.0 mm; interstitial material in some chondrules is turbid devitrified glass. Some pyroxene shows polysynthetic twinning. Minor subequal amounts of troilite and nickel-iron are present. A moderate amount of limonitic staining pervades the section. Fusion crust is present on one edge. Microprobe analyses show olivine of fairly uniform composition (Fa_{22}-Fa_{25}, average Fa_{23}) and pyroxene averaging Fs_{21}.

Sample No.: ALHA77231 Location: Allan Hills
Field No.: Y78010508
Weight (gms): 9270.0
Meteorite Type: L6 Chondrite

Physical Description:
This is a complete specimen, approximately 25.0 x 17.0 x 13.5 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.

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.

Sample No.: ALHA77232 Location: Allan Hills
Field No.: 77122905
Weight (gms): 6494.3
Meteorite Type: H4 Chondrite

Physical Description:
The sample is rounded and only small patches of remnant fusion crust remain on the exterior surface. The sample is severely weathered, the entire specimen is uniformly stained reddish-brown, and fractured. When the sample was sawed it crumbled into many pieces. All of the surfaces exposed during processing were severely weathered. White deposits developed on some surfaces of the meteorite while they dried in the nitrogen cabinet.

Dimensions: 20 x 19 x 14 cm.

Petrographic Description: Brian Mason
The section shows well-developed chondritic structure, the chondrules ranging from 0.4 to 1.2 mm in diameter. Chondrule types include porphyritic olivine, granular olivine and olivine-pyroxene, and fine-grained radiating pyroxene; in the porphyritic chondrules the olivine crystals are set in a turbid devitrified glass. Much of the pyroxene is polysnythetically twinned clinobronzite. The chondrules are in a fine-grained granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron (~15%) and troilite (~5%). The meteorite is considerably weathered, with limonite pervading the section and also concentrated in veinlets. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{15}) of essentially uniform composition. The olivine and pyroxene composition and the presence of clinobronzite indicate that the meteorite can be classified as an H4 chondrite.

Sample No.: ALHA77233 Location: Allan Hills
Field No.: 77122913
Weight (gms): 4087.0
Meteorite Type: H4 Chondrite

Physical Description:
This stone is 15.0x14.0x10.5 cm. Thin, (<1mm) 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.

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.

Sample No.: ALHA77249 Location: Allan Hills
Field No.: 77122925
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.

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.

Sample No.: ALHA77250 Location: Allan Hills
Field No.: 77122930
Weight (gms): 10.555 kg
Meteorite Type: Iron - Group I or Og

Physical Description:
The overall color of the specimen is reddish-brown to brown with some areas of golden brown. The specimen is tabular with angular peaks on the T surface which form a ridge. There are numerous regmaglypts on all surfaces. Rounded holes ∿1-2 cm deep were noted on the S surface. Dark gray material lines the bottom of some of these depressions. Golden-brown squama-like patches appear randomly over the entire meteorite, one larger patch ∿2 cm x 1 cm appears on the B surface.

Ice was preserved on this sample when it was removed from the freezer. Approximate dimensions: 27 x 13 x 11 cm.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 60 cm^2 of macroetched surface was examined. Kamacite band widths are in the 2.5 to 3.5 mm range, with a length to width ratio of about 4. Neumann bands are present, and the rim of the slice contains several areas that have been converted to a α_2 by atmospheric ablation. Patches of recrystallized kamacite occur throughout the slice. Taenite is present along kamacite grain boundaries and some area of comb plessite were observed. One large troilite and one large troilite-carbon inclusion are present. These inclusions are surrounded by schreibersite which in turn is surrounded by cohenite. Schreibersite is also present as a grain boundary precipitate. External weathering is uniform and moderately severe. The specimen is a coarse octahedrite, a typical Group I or Og meteorite.

Sample No.: ALHA77252 Location: Allan Hills
Field No.: 77122944
Weight (gms): 343.1
Meteorite Type: L3 Chondrite with L6 clasts

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.

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 L3, the granular part L6.

Sample No.: ALHA77254 Location: Allan Hills
Field No.: 77122704
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.

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: Brian Mason
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.

Sample No.: ALHA77255 Location: Allan Hills
Field No.: 77122929
Weight (gms): 765.1
Meteorite Type: Iron - unclassified

Physical Description:
This sample is shaped like a boomerang and is approximately 15.5x7.0x1.5 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.

Tentative Description: Roy S. Clarke, Jr.
Approximately 10 cm^2 of macroetched surface and 20 cm^2 of sawn surface were examined. The etch pattern is uniform, indistinct, fine, and free of inclusions. The complete rim of the specimen has been altered by atmospheric ablation. The saw cut that removed the slice from the main mass passed through the edge of a spherical silicate (?) inclusion approximately 5 mm in diameter. Most of this inclusion remains within the butt. Several small inclusions that appear to be sulfides are present on this sawn surface. External weathering appears to have been moderate. This is an unusual meteorite, and insufficient information is available at this time for even a tentative classification.

Sample No.: ALHA77256 Location: Allan Hills
Field No.: Y78010310
Weight (gms): 676.2
Meteorite Type: Achondrite (diogenite)

Physical Description:
The sample is rounded with the fusion crust randomly distributed over approximately 15% of the surface. The remaining surface is free of fusion crust and appears to have been abraded away. The fusion crust is dull black. The surface area not covered with fusion crust is weathered and ranges from yellowish-brown to grayish-green. The various colors are limited to discrete areas. Several areas of iron oxide staining are present on the surface. This appears to be a complete stone. Approximate dimensions: 9.5x7.5x6.75 cm.

Part of the specimen may be brecciated, and the thin section may not be representative of the entire meteorite.

Petrographic Description: Brian Mason
This meteorite consists almost entirely (∿97%) of coarse (grains up to 6 mm) orthopyroxene clasts, with comminuted grain boundaries; microprobe analyses give the composition $Wo_2Fs_{23}En_{75}$. Some orthopyroxene grains contain small blebs of clinopyroxene, with composition $Wo_{46}Fs_8En_{46}$. Accessory minerals include plagioclase (∿1%), troilite (<1%), and very rare minute grains of nickel-iron. A small area of limonite was noted, and moderate limonitic staining along grain boundaries.

Meteorite ALHA77256 is a typical hypersthene achondrite (diogenite).

Sample No.: ALHA77257 Location: Allan Hills
Field No.: Y78010301
Weight (gms): 1995.7
Meteorite Type: Achondrite (ureilite)

Physical Description:
Approximately one-half of the sample's surface is rounded and mostly covered with fusion crust ~2 mm thick. This crust is dark brown with areas of reddish (iron oxide?) staining. Small areas of the fusion crust have been plucked revealing crystalline structure. The remaining two-thirds of the sample consists of three planes which are fracture surfaces. These surfaces are crystalline, rough on a mm scale, and show no evidence of fusion crust. The fracture surfaces are dark brownish-black and are moderately weathered with small patches of what appears to be iron oxide stain.

Crystalline grains with well-developed crystal faces set in a black, fine-grained matrix make up the broken surface. Some grains are covered with a dark stain and others are milky white to clear. The small, white to clear anhedral grains are aligned in a strip across the broken surface (N & T views) and part of the fusion crust.

The sample is not a complete stone. It's approximate measurements are 16x11x9.5 cm.

The small white anhedral grains are visible on the surface of the meteorite in the field photos. One grain was removed and placed in an aluminum cup and allowed to warm. The grain retained its original form after an hour of warm temperature.

Petrographic Description: Brian Mason
This meteorite is an achondrite (ureilite), consisting almost entirely of anhedral to subhedral olivine (~80%) and pyroxene (~15%); it is fairly coarse-grained, with olivine grains up to 4 mm, pyroxene to 3 mm. The olivine grains show undulose extinction. The pyroxene shows coarse polysynthetic twinning. Grain boundaries are marked by a concentration of carbonaceous material; trace amounts of troilite and nickel-iron, partly altered to limonite, occur along grain boundaries. Microprobe analyses show olivine of variable compositions (Fa_{9-23}, average Fa_{13}) and with unusually high Ca (0.2-0.3%) and Cr (0.3-0.4%) contents. The pyroxene is a low-calcium clinopyroxene with composition average $Wo_7En_{81}Fs_{12}$. The meteorite is extremely resistant to cutting and polishing, which probably indicates the presence of diamond, as in other ureilites.

Sample No.: ALHA77258 Location: Allan Hills
Field No.: B78010303
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 oxidation. The sample is ~10.0x9.0x5.0 cm.

Sawing the sample in half reveals that the fusion crust is <0.5 mm thick 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 plagioclase (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.

Sample No.: ALHA77259 Location: Allan Hills
Field No.: 77123008
Weight (gms): 294.0
Meteorite Type: H5 Chondrite

Physical Description:
This appears to be a nearly complete specimen, with only a small portion of the T surface not intact. The fractured portion of the T surface is yellowish-brown and weathered with slight traces of inclusions discernible in the stone. The remaining surfaces are covered with remanant patches of dull black fusion crust over a reddish brown iron oxide stained weathered surface. Regmaglypts are present on the E/S surface. The stone was difficult to chip.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, chondrules ranging from 0.2-1.2 mm in diameter; a variety of types is present, the commonest being barred olivine, granular olivine and fine-grained pyroxene. The groundmass consists of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. The section is partly rimmed with fusion crust. Brown limonitic staining pervades the section. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77260 Location: Allan Hills
Field No.: 77123017
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.

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.

Sample No.: ALHA77261 Location: Allan Hills
Field No.: 77123021
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.

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 subequal 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.

Sample No.: ALHA77262 Location: Allan Hills
Field No.: Y78010309
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 white coating, presumably evaporites.

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 (nickel-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.

Sample No.: ALHA77263 Location: Allan Hills
Field No.: Y78010304
Weight (gms): 1669.0
Meteorite Type: Iron - Group I or Og

Physical Description:
This orangish-brown, angular sample is approximately 15.0x5.5x8.0 cm. 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.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 20 cm^2 of macroetched surface was examined. Kamacite band widths are in the 2 to 2.5 mm range with a length to width ratio of 2 to 4. Neumann bands are present, and along more than half of the rim of the slice kamacite has been converted to α_2 by atmospheric ablation. Areas of recrystallized kamacite are unevenly distributed over the surface. Comb taenite/plessite areas and grain boundary taenite are present. Grain boundary schreibersite is present as is one 3x1.5 mm schreibersite. External weathering appears to have been moderately severe. This specimen is a coarse octahedrite, a typical Group I or Og meteorite.

Sample No.: ALHA77264 Location: Allan Hills
Field No.: B78010301
Weight (gms): 10.97
Meteorite Type: H5 Chondrite

Physical Description:
The stone is tabular with well-defined edges and is completely covered by a slightly glassy, brownish-black fusion crust. One surface shows cracks that have weathered rusty, and a cavity which is a nearly perfect hemisphere.

Chipping for a thin section sample revealed a fresh surface containing rust stains and fresh metal particles.

The approximate dimensions of sample: 2.75x2.0x1.5 cm.

Petrographic Description: Brian Mason
Chondrules are prominent and well-defined, 0.3-1.2 mm in diameter; prophyritic olivine, barred olivine, and radiating pyroxene chondrules were noted. The matrix is medium-grained (grains up to 0.2 mm), and consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase; the plagioclase occurs as small grains in the matrix and in the bars of some chondrules. Fusion crust, up to 1 mm thick, is preserved on one edge. The sections show extensive limonitic staining, and limonite is concentrated around nickel-iron grains. Microprobe analyses give a mean composition of Fa_{19} for olivine and Fs_{16} for orthopyroxene. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77268 Location: Allan Hills
Field No.: Y78010311
Weight (gms): 272.0
Meteorite Type: H5 Chondrite

Physical Description:
This appears to be a complete specimen with dull black fusion crust on all surfaces. One small area of material with an iridescent sheen is present on the T surface. A large fracture penetrates the entire stone.

No unweathered material was exposed in the meteorite during processing.

Petrographic Description: Brian Mason
Chondritic structure is well developed; chondrules range from 0.3-1.8 mm in diameter, some being broken or irregular in form. The usual types of chondrules are present, the commonest being granular and porphyritic olivine and fine-grained pyroxene. The groundmass consists of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite); it is extensively veined with red-brown limonite. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{16}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77269 Location: Allan Hills
Field No.: Y78010312
Weight (gms): 1045.0
Meteorite Type: L6 Chondrite

Physical Description:
Ice was observed on the meteorite when it was removed from the freezer. This specimen is pyramidal with well-defined edges. Three surfaces are smooth with remnants of brownish-black fusion crust. The other surface is rough on a centimeter scale and has patches of dull, black fusion crust, especially on the high portion of the surface and along the edges. This surface appears to have been broken late during entry and only partially developed a fusion crust. The smooth faces show small voids where it appears that inclusions have been removed. Small fissures are apparent on the surface. Small pieces of fresh metal appeared on the chipped surface.

Dimensions approximately 10.5x10x8 cm.

Petrographic Description: Brian Mason
Chondrules are relatively sparse, with margins that tend to merge with the granular groundmass. Troilite and nickel-iron are present in minor approximately equal amounts. Limonitic staining pervades the section. Fusion crust, up to 1 mm thick, surrounds most of the section. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{22}) of uniform composition.

Sample No.: ALHA77270 Location: Allan Hills
Field No.: Y78010502
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.

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 plaigoclase (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.

Sample No.: ALHA77271 Location: Allan Hills
Field No.: Y78010603
Weight (gms): 609.5
Meteorite Type: H6 Chondrite

Physical Description:
This is a complete, rounded specimen. Approximately 25% of the total sample is covered with a dull black fusion crust. The crust appears in small patches on the meteorite's surface and is approximately 1 mm thick. The portion of the meteorite not covered with fusion crust is a dark brown weathered surface. Small inclusions are visible on this surface. The sample was difficult to chip. When the material was collected for thin section preparation, no fresh metal was observed. The sample fractured along a small fissure. The interior of the bulk meteorite was weathered along this fissure.

Dimensions approximately 8.0x7.5x5.0 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and tend to merge with the granular groundmass, which consists largely of subequal amounts of olivine and orthopyroxene with minor amounts of nickel-iron (~20%), plagioclase (~10%), and troilite (~5%). Microprobe analyses show olivine (Fa_{18}), orthopyroxene (Fs_{16}), and plagioclase (An_{13}) of uniform composition. The section shows a moderate degree of weathering, with small areas and veins of brown limonite.

Sample No.: ALHA77272 Location: Allan Hills
Field No.: Y78010509
Weight (gms): 674.1
Meteorite Type: L6 Chondrite

Physical Description:
Specimen is angular in shape. A thin, <1 mm thick, black fusion crust covers approximately 50% of the meteorite. The crust appears moderately stained, probably by an iron oxide weathering rind. Several large surface fractures are present. The S surface, which is covered by a fusion crust, is concave. The remaining 50% of the specimen is a fracture surface that is yellowish-brown. More than ½ of the fracture surface is iron oxide stained. Where this is not present, the matrix is a fine grained, whitish-gray material. Several very fine grained, rounded inclusions are apparent on the fracture surface. This is not a complete specimen.

From the field photos it was determined that the B surface was in contact with the aluminum foil. It is not known if this surface (B) was in contact with the ice prior to placement on the foil. The broken surface produced during chipping showed only oxidized metal.

Petrographic Description: Elbert King
This meteorite contains abundant fresh metal and troilite. One troilite grain is more than 4 mm in maximum dimension. Many metal and troilite grains show alteration to hematite and limonite/geothite, and some metal and troilite grains include thin veins of oxide alteration. However, the overall appearance of the meteorite is fresh and oxidation of the metal and troilite is scattered, not pervasive.

Chondrule outlines and margins are indistinct, but some barred and radiating chondrule structures are clearly visible. The largest chondrule still visible in this section (total area less than 1 cm^2) has a maximum diameter of approximately 1.6 mm. No fresh glass was seen in the chondrules or matrix. In fact, some areas that appear to have been glass are now coarsely crystalline. Several of the chondrules have the textures of fluid drop chondrules, but the meteorite is so recrystallized that no lithic chondrules can now be recognized. One chondrule is recrystallized such that its margin cannot be recognized except by an outline of small troilite grains.

Most of the larger olivine and pyroxene grains have very patchy and undulatory extinction. Some mineral grains show physical dislocations. Also apparent are numerous closely spaced fractures in some mineral grains. It seems likely that the meteorite has experienced light to moderate shock. The largest single crystals of olivine are more than 1 mm maximum dimension. Grains of plaigoclase (oligoclase?) with prominent twinning are common.

No unusual textural features were observed in this section.

Electron microprobe analysis of five olivines shows that it is close to Fa_{26}.

Sample No.: ALHA77273 Location: Allan Hills
Field No.: Y78010511
Weight (gms): 492.0
Meteorite Type: L6 Chondrite

Physical Description:
Sample is not a complete stone. Black fusion crust remains on four surfaces of the angular specimen (~50% of the sample covered) which is less than 1 mm thick. The broken surface shows a light gray, fine-grained matrix with areas of iron oxide staining. This surface is only moderately weathered and shows small cracks. Chondrules are not prominent.

Approximate size: 14x6.5x5 cm.

Petrographic Description: Brian Mason
Chondrules are few and poorly defined, tending to merge with the granular groundmass, which consists of subequal amounts of olivine and orthropyroxene, with minor amounts of plagioclase (~10%), nickel-iron (~8%), and troilite (~5%). Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{20}), and plagioclase (An_{12}) of essentially uniform composition. Limonitic staining pervades the section.

Sample No.: ALHA77274 Location: Allan Hills
Field No.: Y78010504
Weight (gms): 288.1
Meteorite Type: H5 Chondrite

Physical Description:
A small patch of dull black fusion crust remains on the B surface. The remaining surfaces are devoid of fusion crust and are weathered and stained reddish-brown by iron oxidation. One small fracture is present on the B surface.

After sawing the interior of the sample revealed small metallic flecks, probably due to the abrasion of the saw blade against the metal included in the meteorite, as the remainder of the stone's sawed surface appeared a reddish-brown.

Dimensions: 7.5x6.0x3.0 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, but many of the chondrules have indistinct margins and tend to merge with the groundmass. Chondrules range up to 2.4 mm in diameter, the commonest types are granular olivine and fine-grained radiating pyroxene. The groundmass consists of olivine and pyroxene with minor amounts of nickel-iron and troilite. Brown limonitic staining pervades the section. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{16}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77277 Location: Allan Hills
Field No.: B78010501
Weight (gms): 142.7
Meteorite Type: L6 Chondrite

Physical Description:
Sample is rounded and severely weathered over approximately 75% of the exterior surface. No fusion crust was present. The exterior of the stone had nodules which easily fell off the bulk meteorite. The remaining 25% of the exterior surface appears fresh, light gray and has a granular texture. The specimen has many rounded white clasts.

Approximate size: 5.5x4.5x3.0 cm.

Petrographic Description: Brian Mason
This meteorite resembles ALHA77273 closely, in structure, mineralogy, and composition of the olivine, orthopyroxene, and plagioclase. Weathering is not so pronounced, however, being limited to local limonitic staining around grains of nickel-iron.

Sample No.: ALHA77278 Location: Allan Hills
Field No.: Y78010601
Weight (gms): 312.9
Meteorite Type: LL3 Chondrite

Physical Description:
Sample ALHA77278,0 is moderately rounded. Approximately 95% of the surface is covered by a dull black fusion crust (with exception of the B surface) that is ~1-2 mm thick. The fusion crust on the B (posterior) surface is reddish, shows well-developed radial flow lines, and is more oxidized than the other surfaces. Several spots, ~1 cm diameter, where the fusion crust has been plucked, reveal interior material that is light gray and moderately iron-oxidized.

This appears to be a complete specimen, whose dimensions are ~8.0x5.5x4.5 cm.

A freshly chipped surface reveals a small amount of metal and appears relatively unweathered. This stone appears to be a low petrologic type.

Petrographic Description: Brian Mason
The meteorite consists of a close-packed aggregate of spherical to ellipsoidal chondrules (0.3-1.8 mm diameter) with interstitial nickel-iron and troilite (concentrated as rims to chondrules) and relatively little matrix. Most chondrules consist of granular or porphyritic olivine, sometimes accompanied by polysynthetically-twinned clinopyroxene, and with partly devitrified glass between the mineral grains. Microprobe analyses show that both olivine and pyroxene are variable in composition; olivine ranges from Fa_{11} to Fa_{29}, with a mean of Fa_{24}, and pyroxene is low-calcium (Ca=0.1-0.4%) with Fs ranging from 9 to 21 and a mean of 12.

Some unusual enclaves were noted in the polished thin section. One, 1.5 mm across, consisted of numerous small (max. 0.2 mm) grains of olivine and pyroxene in a brown-black semi-translucent matrix, possibly carbonaceous. Another, 3 mm long, consisted of an aggregate of olivine (composition Fa_{13}-Fa_{26}) and orthopyroxene (Fs_{16-17}) grains with a little interstitial turbid glass.

The section shows a slight amount of yellow-brown limonitic straining, concentrated near the fusion crust.

Sample No.: ALHA77280 Location: Allan Hills
Field No.: Y78010512
Weight (gms): 3226.0
Meteorite Type: L6 Chondrite

Physical Description:
Specimen is angular. Approximately 75% of the exterior surface is covered with a brownish-black fusion crust. In several places the fusion crust has spalled away revealing a heavily oxidized material. One face of the specimen is a broken surface, which is light gray and moderately iron oxide stained. The surface is irregular and has numerous linear fractures and a few 1-2 mm spherical inclusions.

Approximate dimensions: 18.5x13.0x10.0 cm.

When the specimen was removed from storage for initial processing, Antarctic snow was still present on the meteorite's exterior surface.

Petrographic Description: Brian Mason
This meteorite resembles ALHA77273 and 77277 closely, in structure, mineralogy, and composition of the olivine, orthopyroxene, and plagioclase. Weathering appears to be quite extensive, most of the section being stained brown by limonitic material.

Sample No.: ALHA77281 Location: Allan Hills
Field No.: Y78010801
Weight (gms): 1231.0
Meteorite Type: L6 Chondrite

Physical Description:
Specimen is angular and appears to be a complete specimen. A brownish-black fusion crust, with polygonal fractures, approximately 2 mm thick, covers nearly 90% of the meteorite's exterior surface. The B surface is in part void of fusion crust. Many inclusions (2-5 mm dia.) are present on this iron oxide stained surface. Fractures are present on the surface of the specimen and post-chipping observations revealed that weathering occurred along these fracture surfaces. The interior portion of the meteorite, away from fractures, is not weathered.

Specimen's dimensions: ∿13.0x10.5x6.5 cm.

Petrographic Description: Brian Mason
This meteorite resembles ALHA77280 closely, in structure, mineralogy, composition of olivine, orthopyroxene, and plagioclase, and in degree of weathering. Fusion crust is present along one edge of the section.

Sample No.: ALHA77282 Location: Allan Hills
Field No.: Y78010306
Weight (gms): 4127.1
Meteorite Type: L6 Chondrite

Physical Description:
Specimen is angular. Approximately 70% of the meteorite's surface is covered with fusion crust, which is ∿2 mm thick. The fractured surface is weathered. This surface has a granular texture and contains rounded to angular, light colored clasts.

The fresh surface revealed during chipping is whitish to whitish-gray and contains tiny flecks of metal.

This is not a complete specimen. Approximate dimensions are: 17.5x13.0x9.0 cm.

Petrographic Description: Brian Mason
This meteorite resembles ALHA77280 and 77281 in all respects, except possibly for a lesser degree of weathering, limonitic staining being limited to areas around nickel-iron grains; however, this may simply reflect a source further from the surface.

Sample No.: ALHA77283 Location: Allan Hills
Field No.: Y78010305
Weight (gms).: 10510.0
Meteorite Type: Iron - Group I or Og

Physical Description:
Specimen is reddish brown to brown. The B surface is flat and the remainder of the sample is semi-rounded, suggesting that this is an oriented specimen. Radial and transverse flow marks are evident across all surfaces with the exception of the B. A few rounded holes from ∿1 cm to 3 cm in diameter are present on all surfaces. Some of these depressions are filled with dark gray material. Golden-brown patches ∿3 mm in diameter are distributed over the meteorite's exterior surface.

Ice was preserved in some of the regmaglypts when the sample was removed from the freezer. Approximate dimensions: 15.0x12.5x6.0 cm.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 30 cm^2 of macroetched surface was examined. Kamacite band widths average approximately 1.8 mm with a length to width ratio ranging from 2 to 4. Neither Neumann bands nor ablation produced α_2 were observed. Structures suggestive of shock deformation are present in the kamacite. Grain boundary taenite and comb plessite areas are abundant. The surface is dominated by an unusually large amount of uniformly distributed cohenite. The cohenite is badly shattered and plucked seriously during preparation of the slice. A large troilite-graphite inclusion is present, surrounded in turn by schreibersite and cohenite. Several schreibersite inclusions enclosed in cohenite are present in the kamacite near the troilite-graphite inclusion. Difficulty was encountered in sawing through several troilite-graphite areas. Where this happened, small black knobby protrusions were present within the carbon-rich areas. These observations suggest that these areas contain diamond. External weathering of this specimen appears to have been severe. This meteorite is a carbon-rich coarse octahedrite, a Group I or Og meteorite. It has characteristics that suggest it may be a fragment of a crater forming fall.

Sample No.: ALHA77284 Location: Allan Hills
Field No.: Y78010501
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 11.0x8.0x3.5 cm.

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 orthropyroxene, with minor subequal amounts of nickel-iron and troilite, and a little 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.

Sample No.: ALHA77285 Location: Allan Hills
Field No.: Y78010510
Weight (gms): 271.1
Meteorite Type: H6 Chondrite

Physical Description:
This semi-rounded specimen is approximately 5.0x6.0x6.5 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.

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.

Sample No.: ALHA77286 Location: Allan Hills
Field No.: Y78010506
Weight (gms): 245.8
Meteorite Type: H4 Chondrite

Physical Description:
The B surface and portions of the N surface are devoid of fusion crust. The remaining surfaces have remnants of a thin black fusion crust. The surfaces that are devoid of fusion crust are rough on a small scale. It appears that many ∿1 mm inclusions produce the roughness. Chondrules and lithic clasts are present in the sample. Only one small fracture occurs on the T surface.

No unweathered material was exposed when the sample was sawed.

Dimensions: ∿7.5x5.5x3.5 cm.

Petrographic Description: Brian Mason
The section shows a close-packed aggregate of chondrules, 0.2-1.8 mm in diameter, with a relatively minor amount of matrix material. A variety of chondrule types is present, the commonest being granular olivine, olivine-pyroxene, and fine-grained pyroxene. Much of the granular pyroxene in chondrules is polysynthetically twinned clinobronzite. The matrix consists of fine-grained olivine and pyroxene with minor nickel-iron and troilite; some of the troilite occurs as rims to chondrules. The matrix is infiltrated with veinlets of red-brown limonite. Microprobe analyses show olivine of essentially uniform composition (Fs_{12}-Fs_{16}, average Fs_{14}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA77287 Location: Allan Hills
Field No.: Y78010503
Weight (gms): 230.1
Meteorite Type: H5 Chondrite

Physical Description:
Small patches of remnant fusion crust remain on the T and B surfaces of the specimen. The remaining surfaces are smooth and are weathered a reddish-brown. Small areas of the exterior surface have an iridescent sheen.

No unweathered material was exposed during the processing of the sample.

Petrographic Description: Brian Mason
Chondritic structure not prominent, the chondrules tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor amounts of nickel-iron and troilite. The section is extensively veined with brown limonite. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{16}) of uniform composition; a little fine-grained plagioclase (An_{11}) and one grain of merrillite were also identified. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77288 Location: Allan Hills
Field No.: Y78010602
Weight (gms): 1880.0
Meteorite Type: H6 Chondrite

Physical Description:
The overall form of the specimen is angular. Four surfaces are rounded and smooth with a brown weathering rind and patches of dull black fusion crust ∿1-2 mm thick. The other surfaces are fracture surfaces which also are covered with a brown weathering rind. Numerous fractures penetrate the stone. Inclusions are apparent on the severely weathered surfaces.

Approximately 12.0x10.0x8.0 cm.

No fresh metal or non-weathered surfaces observed in the process of obtaining material for thin sections or thermoluminescence studies. All surfaces exposed had a reddish-brown iron oxide staining.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which is made up largely of olivine and orthopyroxene, with minor amounts of nickel-iron (∿15%), plagioclase (∿10%), and troilite (∿5%). Microprobe analyses show olivine (Fa_{19}), orthopyroxene (Fs_{17}), and plagioclase (An_{12}) of essentially uniform composition. The meteorite is considerably weathered, with pervasive limonitic staining throughout the section.

Sample No.: ALHA77289 Location: Allan Hills
Field No.: 78010401
Weight (gms): 2186.0
Meteorite Type: Iron - Group I or Og

Physical Description:
The sample is angular and oblong (22x10x5 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 ∿0.5 cm wide on the T surface.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 25 cm^2 of macroetched surface was examined. Kamacite band widths are difficult to measure as the kamacite crystals tend to be stubby and irregular in outline. Estimated band widths are in the 2 to 3 mm range. Patches of α_2 produced by atmospheric ablation are present along about half of the rim of the slice. Neumann bands are present. The dominant surface feature to the unaided eye is a highly speckled appearance due to abundant recrystallized kamacite fairly uniformly distributed over the surface. Modest amounts of grain boundary taenite and occasional small comb plessite areas are present. Schreibersite is present along grain boundaries. No large troilite or schreibersite are present and cohenite was not observed. External weathering is moderately severe. The specimen is a coarse octahedrite, a Group I or Og meteorite.

Sample No.: ALHA77290 Location: Allan Hills
Field No.: Y78010505
Weight (gms): 3784.0
Meteorite Type: Iron - Group I or Og

Physical Description:
Sample is subrounded to angular with a roughly tabular form. The entire specimen is covered with regmaglypts and is reddish to golden brown. From a field photo it was determined that the meteorite was sitting with the B surface on the ice. Irregular, dull metallic red splotches and a scaly iron oxide area, ~7x5 cm, are present on the B-E surface. Present on the T surface is a ~2 cm depression containing a dull black material.

Approximate dimensions: 15.5x16.0x6.0 cm.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 70 cm^2 of macroetched surface was examined. Kamacite band widths are in the 2 to 3 mm range with a length to width ratio of 2 to 4. Along most of one edge of the specimen, kamacite has been converted to α_2 by atmospheric ablation. Neumann bands are present. Patches of recrystallized kamacite are sparsely distributed on the surface, and particularly concentrated around a large troilite-graphite inclusion that abutts only kamacite. Taenite is present at grain boundaries and in small comb plessite areas. Lamallar and grain boundary schreibersite are present. A kamacite area contains what appears to be partially decomposed cohenite surrounding a void that probably had contained schreibersite. The remnant of part of a troilite inclusion with bordering schreibersite is present at the edge of the slice. External weathering has been moderately severe. This specimen is a coarse octahedrite, a Group I or Og meteorite.

Sample No.: ALHA77292 Location: Allan Hills
Field No.: 78010211A
Weight (gms): 199.6
Meteorite Type: L6 Chondrite

Physical Description:
This is not a complete specimen. The T surface is less severely weathered than any of the remaining surfaces. The N surface has remnants of dull black fusion crust. The surfaces devoid of fusion crust are stained reddish-brown by iron oxidation and are rough. On fractured surfaces it appears as if rounded and irregular inclusions are present in the sample. This sample appears macroscopically similar to ALHA77180, 218, 267, 292 and 301.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, their margins tending to merge with the granular groundmass, which consists of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron and troilite. The nickel-iron grains show a small amount of limonitic alteration. Microprobe analyses show olivine (Fa_{24}), orthopyroxene (Fs_{20}), and plagioclase (An_{10}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA77294 Location: Allan Hills
Field No.: B78010901
Weight (gms): 1351.3
Meteorite Type H5 Chondrite

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.

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.

Sample No.: ALHA77296 Location: Allan Hills
Field No.: 78010211B
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 surfaces, 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 13.0 x 9.5 x 5.0 cm.

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.

Sample No.: ALHA77297 Location: Allan Hills
Field No.: 78010210C
Weight (gms): 951.6
Meteorite Type: L6 Chondrite

Physical Description:
The overall shape of the specimen is oblong (12.0x7.5x6.0 cm). Shiny black, polygonally fractured fusion crust (~0.5 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.

Cleaving the meteorite in half, revealed metallic flecks, <0.5 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 subequal 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.

Sample No.: ALHA77299 Location: Allan Hills
Field No.: 77123030
Weight (gms): 260.7
Meteorite Type: H3 (tentative)

Physical Description:
Sample ALHA77299 is nearly tabular. A thin, glassy, spotty fusion crust covers approximately 10-15% of the meteorite's surface, however, it is mostly confined to the T surface. The remaining surfaces are smooth and medium brown. Much of the meteorite's surface that is not covered by fusion crust is glassy. The B surface has only small glassy areas and is appreciably iron-oxide stained.

Specimen is ~9.5x5.5x3.5 cm.

Stone was difficult to chip. The broken surface produced by chipping contains chondrules and fresh metal.

Petrographic Description: Brian Mason
The section shows a closely-packed mass of chondrules (0.15-1.5 mm diameter) and irregular crystalline aggregates with interstitial nickel-iron and troilite and a relatively small amount of matrix. A considerable variety of chondrules is present, many of granular or porphyritic olivine with transparent to turbid interstitial glass; other types include fine-grained pyroxene, medium-grained olivine and polysynthetically-twinned clinopyroxene, and barred olivine. The section is stained yellow-brown with limonitic material, with small areas (up to 0.4 mm across) of red-brown limonite along one edge (near surface?). Microprobe analyses show olivine ranging in composition from Fa_{11} to Fa_{21}, with a mean of Fa_{16}; the pyroxene is low-calcium (CaO=0.4-1.2%), with a range in composition from Fs_{15} to Fs_{20} and a mean of Fs_{18}. The composition of the olivine and the amount of nickel-iron suggest H group, the meteorite is tentatively classified H3; however, certain assignment of group should await further investigation.

Sample No.: ALHA77300 Location: Allan Hills
Field No.: 77123024
Weight (gms): 234.5
Meteorite Type: H5 Chondrite

Physical Description:
The stone is 9.0x5.0x4.5 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.

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 orthropyroxene, 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 orthropyroxene (Fs_{16}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA77302 Location: Allan Hills
Field No.: 77123022
Weight (gms): 235.5
Meteorite Type: Achondrite (polymict eucrite)

Physical Description:
Specimen is angular to subrounded. A glassy, thin, black fusion crust covers ~70% of the surface. In places the fusion crust has been physically plucked away. Large cavities are randomly distributed on the surface of the stone. The material exposed in these circumstances is fresh and unweathered, showing feldspar cleavages. The E surface (orthogonal photo) has a large, ~2 cm, clast protruding. This clast could easily be removed. The clast has an obviously coarser grain size and darker color than the bulk meteorite. Plagioclase crystals on this surface are several mm long. The B surface (orthogonal photo) has an irregularly shaped clast that in specific areas is different in texture and color from the bulk meteorite. Specimen's approximate dimensions: 9.25x5.5x4.0 cm. This appears to be a complete stone.

Several small interior and exterior chips were generated during chipping. The exposed fresh surfaces are light gray, much like the light colored patch described above.

The sample contains a large clast, ~1.5x1.5 cm, which is darker gray than the comminuted groundmass. Additionally, there are several smaller inclusions which appear similar to the large clast. Numerous light inclusions ranging up to ~3 mm in maximum length were also exposed on the sawed surface. The meteorite appears to have suffered little, if any, weathering.

Petrographic Description: Brian Mason
This meteorite is a brecciated pyroxene-plagioclase achondrite (polymict eucrite). It consists largely of pigeonite (~60%) as brown grains up to 2 mm, and plagioclase (~35%) as colorless grains up to 4 mm, in a comminuted groundmass of these minerals. A little troilite (<1%) and rare minute grains of nickel-iron are present. Fusion crust rims part of the section. No evidence of weathering was seen. Microprobe analyses show a range of compositions in the pigeonite: Wo_{3-14}, En_{32-56}, Fs_{37-64}; a few grains of subcalcic ferroaugite averaging $Wo_{25}En_{27}Fs_{48}$ were also analyzed. Plagioclase ranges in composition from An_{75} to An_{94}. The section contains a large (6 mm) fine-grained enclave of similar composition.

Sample No.: ALHA77304 Location: Allan Hills
Field No.: B77123114
Weight (gms): 650.4
Meteorite Type: LL3 Chondrite

Physical Description:
Dull, brownish-black fusion crust, approximately 0.5 to 1 mm thick, covers all but the W surface of this angular, 9.5x8.0x6.5 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.

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, rangining 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 6x3 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 Fa_{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.

Sample No.: ALHA77305 Location: Allan Hills
Field No.: B77123108
Weight (gms): 6444.0
Meteorite Type: L6 Chondrite

Physical Description:
Snow(ice?)was observed in cracks of the meteorite when it was removed from the freezer. The exterior surface does not have a fusion crust with the exception of an ∿5 cm diameter area, which is dark and 1-2 mm thick, however, it does have a reddish-brown weathering rind. The iron-oxide staining that is apparent on the exterior surface is heavier adjacent to the several fissures which are present on the surface of the meteorite. It appears that the roundness of the stone may be due to exfoliation. Rounded inclusions are apparent on the surface. It appears that the entire specimen has experienced moderate weathering on the exterior surface. During chipping ∿25% of the specimen fell off along a fissure. The interior portion is both weathered and fresh in appearance. Fresh metal is apparent on surfaces not adjacent to fissures. After sawing the specimen, small metal chips were visible throughout the sample. The sample is very hard, even though many parallel cracks run throughout the entire sample.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, merging with the granular groundmass. Troilite and nickel-iron are present in minor, approximately equal amounts. About 10% of plagioclase is present, as small untwinned grains. The meteorite is relatively unweathered, with a limited amount of limonitic staining associated with nickel-iron grains. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{21}) of uniform composition.

Sample No.: ALHA77306 Location: Allan Hills
Field No.: 78010402
Weight (gms): 19.91
Meteorite Type: Carbonaceous Chondrite - Type C2

Physical Description:
Color: The color is a charcoal-gray with a slight olive-green cast. Weathering rind is 2.0-4.0 mm deep and of a lighter gray then the interior.

Interior: Interior is a fine-grained gray matrix with ≈2-3% light colored inclusions throughout groundmass. Inclusions are irregular in shape. No obvious chondrules are present BUT a few 0.1-0.2 spherical-shaped areas are present. These areas are lighter in color. No white veins were observed.

Fusion Crust: Crust is present on approximately 40-60% of the sample. Differential weathering has removed fusion crust in one large area. Remainder of fusion crust is cracked and broken, with furrows across specimen. Crust remaining stands above the interior of the specimen ≈0.5-1.0 mm. Selected areas of crust are vesicular and glassy. The specimen is remarkably free of limonite stain.

Post Chip: When the specimen was cleaved into two halves, a greenish-gray weathering rind was observed to have penetrated into the meteorite to a depth of ∿1 mm. The interior, non-weathered portion, of the meteorite is a dull, blackish-gray. Small vugs are randomly distributed throughout the meteorite. It was not possible to determine if crystals are present in the vugs.

Petrographic Description: Brian Mason
Examination shows that it is a C2 carbonaceous chondrite. Chondrules are sparse, small (up to 0.5 mm diameter), and poorly defined; most consist largely of granular olivine, and some contain small globular grains of nickel-iron. The bulk of the meteorite (80-90%) consists of opaque to translucent olive-brown matrix, the translucent material showing weak birefringence; an X-ray powder photograph shows that the matrix consists largely of a layer-lattice silicate, which by analogy with other C2 meteorites can be tentatively identified as a ferriginous chlorite. Scattered through the matrix are colorless birefringent grains, mostly olivine, up to 0.3 mm but usually less than 0.1 mm across. Rare grains of chromite are present in the matrix. A notable feature is the apparent absence of metallic sulphides. The meteorite is moderately porous, containing irregular voids up to 0.3 mm across; the specific gravity, 2.58, measured on a small fragment, is therefore probably somewhat lower than the true value. No evidence of weathering was seen, which suggests that the meteorite may be a recent fall.

Sample No.: ALHA77307 Location: Allan Hills
Field No.: 78010702
Weight (gms): 181.3
Meteorite Type: Carbonaceous Chondrite - Type C-3

Physical Description:
The rounded specimen is covered with a dull black fusion crust 1-2 mm thick over most of the surface. Specimen is complete with the exception of one end where a fracture surface covers 1/8 of the specimen's total surface area. The fusion crust has polygonal fractures over most of the exterior surface. In a few places this fusion crust has been broken away revealing a black fine-grained matrix. Specimen shows several large fractures. On the surface neighboring one of these fractures there is a white material which may be an evaporite deposit. The side of the specimen that was in contact with the ice at the time of recovery is slightly reddish.

Dimensions: 4.5 x 4.0 x 5.0 cm.

Small, irregular white inclusions and several chondrules are apparent on a freshly-broken surface.

Petrographic Description: Brain Mason
The section shows a closely-packed aggregate of mineral grains (up to 0.2 mm), mineral aggregates (up to 0.8mm), and rather sparse small (0.1-0.5 mm) chondrules, set in a dark brown to black opaque matrix; the matrix makes up 40-50% of the section. The mineral grains, aggregates, and chondrules consist of olivine and polysynthetically-twinned clinopyroxene in approximately equal amounts. Microprobe analyses show that most of the olivine has forsterite composition, $Fa_{\sim 1}$, with a few grains ranging up to Fa_{30}; the average for 30 grains is Fa_5. The pyroxene is mostly clinoenstatite, $Fs_{\sim 1}$, but with a few more iron-rich grains. A little (1-2%) nickel-iron is present in the matrix as scattered grains, many partly altered to brown limonite. Fine-grained sulfide (~5%) is dispersed through the matrix. Fusion crust, 0.5 mm thick, is present along one edge of the section.

The meteorite is a carbonaceous chondrite; an X-ray powder photograph shows that the matrix consists largely of olivine and pyroxene with some magnetite, which indicates a C3 classification.

Sample No.: PGPA77006 Location: Victoria Valley
Field No.: 78012301
Weight (gms): 19068.0
Meteorite Type: Iron - Group I or Og

Physical Description:
This sample is an iron meteorite with an ablation pitted surface. Approximately one-half the specimen (north, east, and bottom hemisphere) is brownish-black with a metallic luster. This area appears to have been polished by physical processes (wind ablation). The opposite hemisphere (south, west, and top portion) is chemically weathered. The color of this surface ranges from rust through gray to greenish. This surface is flaking.

Approximate dimension of specimen: 20 cms diameter

The specimen appears to have been partially buried at sometime. Several inclusions and voids where former inclusions existed are present on the surface.

Tentative Classification: Roy S. Clarke, Jr.
An area of approximately 80 cm^2 of macroetched surface was examined. Kamacite band widths are in the 1.5 to 2 mm range, with length to width ratios ranging from 4 to 10. Neumann bands are abundant, and the kamacite along about half of the rim of the slice has been converted to α_2 by atmospheric ablation. Taenite and taenite-plessite areas occupy at least half of the kamacite grain boundaries, and a number of areas of comb plessite are present. Schreibersite is present in grain boundaries, and one area of lamellar schreibersite surrounded by cohenite is present. Cohenite and schreibersite are present at the edge of the slice in an area that may have bordered a troilite inclusion. No large inclusions were observed. External weathering of the specimen ranges from light to severe. The specimen is a coarse octahedrite, a typical Group I or Og meteorite.

1978 COLLECTION

Sample No.: ALHA78006 Location: Allan Hills
Field No.: 277
Weight (gms): 8.0
Meteorite Type: Howardite

Physical Description:
This is a nearly complete specimen (3.0 x 1.5 x 2.0 cm). Shiny black fusion crust covers all of the stone with the exception of portions of the E, W and S surfaces. Where the sample is void of fusion crust, light to dark gray interior material is exposed. A non-weathered brecciated surface with no metal exposed was revealed upon cleaving this stone in half.

Petrographic Description: Brian Mason
The thin section shows a complex breccia of angular fragments (grains up to 1 mm long) of pyroxene (orthopyroxene and pigeonite) and plagioclase, with numerous polymineralic enclaves, set in a matrix of comminated pyroxene and plagioclase. Accessory chromite and ilmenite and trace amounts of troilite and nickel-iron are present. The enclaves are holocrystalline pyroxene-plagioclase aggregates, and vary considerably in texture from coarse-grained gabbroic to fine-grained basaltic types. Slight weathering is indicated by small areas of rusty staining, usually in association with metal grains. Microprobe analyses show a wide range in pyroxene composition: $Wo_{2-12}En_{31-72}Fs_{25-61}$; a number of grains with uniform composition $Wo_3En_{11}Fs_{26}$ suggests the presence of a diogenitic component. Plagioclase averages An_{91}. A single grain of iron-rich olivine (Fa_{81}) was analyzed. The meteorite is classified as a polymict pyroxene-plagioclase achondrite (howardite).

Sample No.: ALHA78019 Location: Allan Hills
Field No.: 274
Weight (gms): 30.3
Meteorite Type: Ureilite

Physical Description:
Fusion crust is present on all surfaces but is patchy and does not cover the entire stone. The fusion crust is smooth, dull brownish black and has polygonal fracture. Where the fusion crust is not present the surface is reddish-brown and crystalline. One fracture penetrated the entire stone.

The stone (3.0 x 2.5 x 3.0 cm) was cleaved in half and no unweathered material was exposed. The entire sample is reddish-brown throughout. The interior is crystalline which breaks apart when handled.

Petrographic Description: Brian Mason
The thin section shows an aggregate of rounded to subhedral grains (0.5 - 3 mm across) of olivine, with minor pyroxene. The grains are rimmed with black carbonaceous material. Trace amounts of troilite and nickel-iron are present, the latter largely altered to translucent brown limonite concentrated along grain boundaries. Microprobe analyses show olivine of uniform composition (Fa_{22}) with notably high CaO (0.4%) and Cr_2O_3(0.7%) contents; the pyroxene is a pigeonite of composition $Wo_{10}Fs_{18}En_{72}$. This meteorite is a ureilite, with mineral compositions essentially identical to those in the Kenna ureilite (Geochim. Cosmochim. Acta, 40, p. 1430, 1976); it appears to be relatively unshocked compared to most ureilites.

Sample No.: ALHA78038 Location: Allan Hills
Field No.: 278
Weight (gms): 363.0
Meteorite Type: LL3 Chondrite

Physical Description:
This angular sample is approximately 12 x 5 x 5 cm. and appears shiny and reddish-brown due to weathering and staining by iron oxidation. Several fractures penetrate deeply into the sample. One small remnant patch of shiny black fusion crust remains on the B surface. During processing the sample fell apart and revealed no unoxidized material.

Petrographic Description: Brian Mason
The section shows a close-packed aggregate of chondrules, 0.3 - 2.7 mm in diameter, and a few angular enclaves (some are chondrule fragments) in a minor amount of dark fine-grained matrix. A wide variety of chondrules are present, the commonest being granular olivine and olivine-pyroxene, porphyritic olivine, and fine-grained pyroxene. Most of the pyroxene is polysynthetically twinned. Many of the chondrules have dark rims. Troilite is present in minor amounts in the matrix. Weathering is extensive, the section being rimmed and veined with brown limonite, and little nickel-iron remains. Microprobe analyses show olivine ranging from Fa_4 to Fs_{19}, with a mean of Fa_{22}; pyroxene ranges from Fs_2 to Fs_{19}, with a mean of Fs_8 and CaO ranging from 0.1 to 1.3 weight percent. The low content of nickel-iron and troilite suggests LL group, and the meteorite is tentatively classified as an LL3 chondrite.

Sample No.: ALHA78039 Location: Allan Hills
Field No.: 288
Weight (gms): 299.0
Meteorite Type: L6 Chondrite

Physical Description:
The sample is totally covered with black fusion crust, with the exception of an ~4.0 x 2.5 cm. area that is devoid of fusion crust and reveals a light gray interior. The dimensions of the sample are approximately 8 x 4 x 5 cm. Cleaving the sample revealed a light gray matrix with light gray clasts. A very well defined weathering rind penetrated the sample to a depth of 1 mm. - 1 cm. Scattered areas of oxidized metal were apparent throughout the interior of the specimen.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, with margins that tend to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite and some plagioclase. A minor amount of limonitic staining is associated with the nickel-iron grains. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{21}) of uniform composition; most of the plagioclase is stoichiometric (An_{11}), but some has the appropriate Ca content but is considerably deficient in Na, suggesting partial conversion to maskelynite. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78040 Location: Allan Hills
Field No.: 284
Weight (gms): 211.7
Meteorite Type: Polymict Eucrite

Physical Description:
Snow and ice were present on the sample when it was removed from cold storage. This is a complete unweathered specimen (∿9.0x5.0x3.0 cm). Black, shiny fusion crust ∿.5 mm thick covers all the surfaces of the stone. The crust has been removed from the edges by spallation and has been preferentially weathered away on the surfaces in small circular areas. The B and T surfaces have had the most fusion crust removed, thus revealing light to medium gray matrix material that contains small (<1 mm) elongated white grains, probably feldspar. The T and S surfaces each have a 1.0 cm clast present. These clasts have a slightly lighter color than the surrounding fusion crust. On the N surface an oval vug is present. Inside this vug is a weathered yellowish-brown inclusion ∿0.5 cm diameter that has a coarser texture than the surrounding matrix material.

Cleaving this stone revealed a non-weathered surface with small (1-2 mm) dark gray minerals in the matrix material.

Petrographic Description: Brian Mason
The thin section shows a complex breccia of angular fragments, up to 1 mm long, of pyroxene (mostly pigeonite) and plagioclase, with numerous enclaves (the largest 3 mm across), in a matrix of comminuted pyroxene and plagioclase. The enclaves consist of pyroxene and plagioclase and range in texture from doleritic to gabbroic. Accessory chromite and ilmenite and trace amounts of troilite and nickel-iron are present. No evidence of weathering was seen. Fusion crust rims part of the section. Microprobe analyses show pigeonite ranging in composition from $Wo_6Fs_{33}En_{61}$ to $Wo_7Fs_{52}En_{41}$; a few grains of ferroaugite, averaging $Wo_{33}Fs_{40}En_{27}$, were analysed. Plagioclase ranges in composition from An_{80} to An_{94} with an average of An_{86}. The meteorite is classified as a polymict eucrite (pyroxene-plagioclase achondrite).

Sample No.: ALHA78042 Location: Allan Hills
Field No.: 268
Weight (gms): 214.1
Meteorite Type: L6 Chondrite

Physical Description:
The T surface of this ∿5.5 x 4.5 x 5.0 cm sample has a 4 x 3 cm area where reddish black fusion crust has been preserved. The remainder of the sample is composed of fracture surfaces that are weathered reddish-brown.
Sawing of the sample revealed a light gray matrix with both rounded and irregular inclusions, as much as 1mm in diameter. The exterior margins of the sample are weathered and stained by iron-oxidation, while the interior of the sample appears relatively fresh.

Petrographic Description: Brian Mason
Chondritic structure is poorly developed; the chondrules are sparse and poorly defined and tend to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor plagioclase, nickel-iron, and troilite, and accessory chromite. Some of the nickel-iron grains are unusually large, ranging up to 2.5 mm. A minor amount of brown limonitic staining is present around the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{24}; orthopyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78043 Location: Allan Hills
Field No.: 264
Weight (gms): 680.0
Meteorite Type: L6 Chondrite

Physical Description:
The sample is approximately 10.0 x 8.5 x 6.0 cm., and covered with a black fusion crust, ~1 mm. thick, that has some weathering. The W surface appears to be less weathered than the remaining surfaces. A large chondrule is present on the B surface. The T surface is a fracture surface with some remnant patches of fusion crust present. The matrix of the sample is yellowish green with some small (<3 mm.) clasts apparent. During processing the sample broke along previously existing fractures, which were weathered and stained by iron oxidation. Only a few metallic flecks were present in the greenish-gray to orangish matrix material.

Petrographic Description: Brian Mason
The section shows sparse chondrules with diffuse margins, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, a little plagioclase, and accessory chromite. Minor limonitic staining is present around nickel-iron grains. Well-preserved fusion crust 0.5 mm thick is present along one edge. Microprobe analyses give the following compositions: olivine Fa_{25}; pyroxene, Fs_{21}; plagioclase, An_{10}; accessory merrillite was identified with the microprobe. The meteorite is an L6 chondrite.
ALHA 78043 is an L6 chondrite similar in all respects to ALHA 78045.

Sample No.: ALHA78044 Location: Allan Hills
Field No.: 282
Weight (gms): 164.1
Meteorite Type:

Physical Description:
Patches of brown and black fusion crust cover entire specimen except for a 2 x 2 cm area on the B surface. Many clasts are visible on the exterior surfaces. Several fractures penetrate the interior of the stone. Chipping revealed an interior that is mostly weathered. Dark gray inclusions up to 2 mm in diameter are visible in the unweathered light gray matrix.

Dimensions: 6.5 x 4 x 3.5 cm.

Petrographic Description:

Sample No.: ALHA78045 Location: Allan Hills
Field No.: 263
Weight (gms): 396.5
Meteorite Type: L6 Chondrite

Physical Description:
The sample is approximately 8.5 x 5.0 x 5.0 cm. and tabular. The blackish-brown fusion crust covers the complete sample with the exception of an 2.5 x 3.5 cm. area on the T/E surfaces which is highly polished and very smooth. In three areas the fusion crust has been removed revealing matrix material that is reddish-yellow. Three large fractures penetrate the sample. During processing the specimen was cleaved along one of the fractures and broke into two approximately equal pieces, revealing no unoxidized material.

Petrographic Description: Brian Mason
The section shows sparse chondrules with diffuse margins, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, a little plagioclase, and accessory chromite. Minor limonitic staining is present around nickel-iron grains. Well-preserved fusion crust 0.5 mm thick is present along one edge. Microprobe analyses give the following compositions: olivine Fa_{25}; pyroxene, Fs_{21}; plagioclase, An_{10}; accessory merrillite was identified with the microprobe. The meteorite is an L6 chondrite.
ALHA 78045 is an L6 chondrite similar in all respects to ALHA 78043.

Sample No.: ALHA78048 Location: Allan Hills
Field No.: 281
Weight (gms): 190.6
Meteorite Type: L6 Chondrite

Physical Description:
All sides of the specimen are at least partially covered with fusion crust, that ranges in color from brown to black. In areas where the fusion crust has been removed, a light gray matrix with iron-oxidation staining is revealed. Shallow regmaglypts are present on all sides of the sample. When the sample was cleaved a thin (1-2 mm.) weathering rind was exposed. The interior of the stone was light gray with darker gray inclusions and some unoxidized metal fragments.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. Limonitic staining is present in association with nickel-iron grains, and some of the grains have a rim of brown limonite. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{21}) of uniform composition; most of the plagioclase is stoichiometric (An_{11}), but some is deficient in Na, suggesting partial conversion to maskelynite. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78050 Location: Allan Hills
Field No.: 262
Weight (gms): 1045.0
Meteorite Type: L6 Chondrite

Physical Description:
This is not a complete specimen. The N, T and B surfaces are fracture surfaces that are stained reddish-brown by iron-oxidation. Inclusions in the meteorite are apparent on these surfaces and patches of remnant fusion crust remain on the B surface. The fusion crust, where present, is mottled brown and black.

Unoxidized (<5%) metallic particles, and some metallic particles with oxidation halos are apparent on the sawed surfaces of the sample. Fracturing, with oxidation staining along the margins, is apparent on the W sawed face, as are small irregular inclusions.

Dimensions: 15 x 8 x 6 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and ill-defined, their borders tending to merge with the granular groundmass, which consists of olivine and pyroxene, minor subequal amounts of nickel-iron and troilite, a little plagioclase, and accessory chromite. A little limonitic staining is associated with some of the nickel-iron grains. Microprobe analyses show olivine (Fa_{23}), orthopyroxene (Fs_{20}), and plagioclase (An_{12}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78053 Location: Allan Hills
Field No.: 267
Weight (gms): 179.0
Meteorite Type: H4 Chondrite

Physical Description:
This 8.0 x 6.0 x 2.5 cm specimen has a small amount of thin, shiny black fusion crust on the B face. The remainder of the sample is smooth, weathered and stained reddish-brown by iron-oxidation. Fractures are present on the T and B surfaces.

No unweathered material was exposed in the meteorite during processing.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-1.1 mm across; the commonest types are porphyritic olivine (with turbid partly devitrified glass between the olivine crystals), granular olivine and olivine-pyroxene, and fine-grained pyroxene. The chondrules are set in a fine-grained granular groundmass of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Some of the pyroxene is polysynthetically twinned clinobronzite. Brown limonitic staining pervades the section, and veinlets and patches of red-brown limonite are present. Microprobe analyses give the following compositions: olivine, Fa_{17}; pyroxene, Fs_{16}. The meteorite is classified as an H4 chondrite.

Sample No.: ALHA78074 Location: Allan Hills
Field No.: 280
Weight (gms): 200.2
Meteorite Type: L6 Chondrite

Physical Description:
This is not a complete specimen. Shiny fusion crust (1-2mm thick) covers B, W, and portions of S, N, and E surfaces. Polygonal fractures are present on the B and N surfaces.

Where fracture surfaces are present they are rough and slightly weathered and stained by iron oxidation. The matrix of the sample is light gray and included clasts and chondrules are darker gray. Some oxidation halos are apparent.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly developed, with margins that tend to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite and some plagioclase; accessory chromite was noted. Well preserved fusion crust, 0.4 mm thick, is present along one edge of the section. A minor amount of brown limonitic staining occurs immediately below the fusion crust. Microprobe analyses give the following compositions: olivine, Fa_{24}; orthopyroxene, Fs_{21}; plagioclase, An_{10}. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78075 Location: Allan Hills
Field No.: 253
Weight (gms): 280.6
Meteorite Type: H5 Chondrite

Physical Description:
A thin, shiny fusion crust covers most of this specimen (7 x 6 x 3 cm), with the exception of portions of the T and W faces. The surfaces devoid of fusion crust are smooth and weathered to a shiny dark reddish-brown. Several non-penetrating fractures are present on the sample.

Light colored inclusions and metal fragments are apparent in the dark matrix material of the sample.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.2-1.5 mm across; they include a variety of types, the commonest being porphyritic olivine, granular olivine, and fibrous radiating pyroxene. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-rion in excess of troilite). Brown limonitic staining pervades the section, and some veinlets and patches of red-brown limonite are present. Microprobe analyses give the following compositions: olivine, Fa_{18}, pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78076 Location: Allan Hills
Field No.: 252
Weight (gms): 275.6
Meteorite Type: H6 Chondrite

Physical Description:
A thin (≤ 1mm.) black fusion crust covers most of the sample (8.0 x 5.0 x 4.5 cm). Some small areas of the fusion crust have been physically removed and other areas are stained reddish by iron-oxidation. Polygonal fractures are present on the T and N surfaces. In areas where the fusion crust is absent, clasts of 1-2 mm are apparent in the oxidized material. When the sample was cleaved, clasts as much as 3 mm. in diameter were exposed in the grayish matrix material. The sample is friable and only minor amounts of iron-oxidation are apparent surrounding metallic flakes.

Petrographic Description: Brian Mason
Chondrules are present, but are poorly defined and tend to merge with the granular groundmass, which consists of olivine and pyroxene, with minor amounts of nickel-iron and troilite, and a little plagioclase. A rounded aggregate of closely packed chromite grains with interstitial plagioclase, possibly a chondrule, was noted. Minor limonitic staining is present, concentrated around the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{13}. The meteorite is an H6 chondrite.

Sample No.: ALHA78077 Location: Allan Hills
Field No.: 257
Weight (gms): 330.6
Meteorite Type: H4 Chondrite

Physical Description:
A thin, shiny, black fusion crust covers this 6.5 x 6.0 x 5.0 cm. specimen. In spots the fusion crust is weathering away, revealing a smooth brownish-red surface. Several deep cracks penetrate the sample. During processing the sample cleaved along one of these fractures, revealing no unoxidized material.

Petrographic Description: Brian Mason
Chondritic structure is well developed, chondrules ranging from 0.3 - 1.5 mm across; the commonest types are porphyritic olivine, granular olivine and olivine-pyroxene, and fine-grained pyroxene. The chondrules are set in a granular groundmass of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Some of the pyroxene is polysynthetically twinned clinobronzite. Limonitic staining pervades the section, and veinlets and patches of red-brown limonite are present. Microprobe analyses show olivine of essentially uniform composition (Fa_{19}) and somewhat variable pyroxene (Fs_{15}-Fs_{18}, mean Fs_{17}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA78078 Location: Allan Hills
Field No.: 279
Weight (gms): 290.3
Meteorite Type: L6 Chondrite

Physical Description:
This 6.0 x 4.5 x 8.0 cm. stone is totally covered with thin, black fusion crust with the exception of the corners of the specimen, which have been removed. Processing of the meteorite revealed a light gray matrix, speckled with light and dark clasts. Fresh metallic material is also present.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, some plagioclase, and accessory chromite. Some of the nickel-iron grains are unusually large, up to 2.4 mm across. Minor limonitic staining is present around some of the metal grains. Microprobe analyses give the following compositions: olivine, Fa_{24}; orthopyroxene, Fs_{20}; plagioclase, An_{11}. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78084 Location: Allan Hills
Field No.: 270
Weight (gms) 14280.0
Meteorite Type: H3 Chondrite

Physical Description:
This is a complete specimen with splotchy brown and black fusion crust covering the entire meteorite. Several large fractures penetrate the interior of the stone. A thin white deposit was evident along some of these cracks after the meteorite was dried. Many light colored rounded and irregular inclusions are apparent on the cut faces, some as large as 4 mm in diameter. Metal is visible though most of the metal have halos around them, giving the cut faces a marbled look of small fresh areas and large oxidized areas.

Petrographic Description: Brian Mason
The section shows a close-packed aggregate of chondrules, 0.3-1.2 mm in diameter, and a few angular enclaves (some are chondrule fragments), in a minor amount of fine-grained matrix. A wide variety of chondrules is present, the commonest being porphyritic olivine and olivine-pyroxene with interstitial glass; some of the glass is brown and transparent, but much of it is turbid and partly devitrified. The pyroxene is polysynthetically twinned clinobronzite. The matrix contains a considerable amount of fine-grained nickel-iron and a lesser amount of troilite. Weathering is extensive, with veins and patches of brown limonite throughout the section. Microprobe analyses show olivine of rather uniform composition, averaging Fa_{18}, and pyroxene of variable composition, Fs_{8-24}, average Fs_{13}. The mean composition of the olivine and the amount of nickel-iron indicate H group and the meteorite is classified as an H3 chondrite.

Sample No.: ALHA78085 Location: Allan Hills
Field No.: 435
Weight (gms): 219.3
Meteorite Type: H5 Chondrite

Physical Description:
Only the B surface of the specimen (6.5 x 4.5 x 3.5 cm.) has a very thin, black fusion crust. The remaining surfaces of the sample are fracture surfaces that are weathered and stained a dark reddish-brown. A small clast (~2mm), that appears to be troilite is present on the T surface.

During processing of the meteorite, the brecciated character of the meteorite and the interior light-dark structure was exposed. The light portion of the chondrite exists as numerous clasts in a wide range of sizes. These light colored clasts are surrounded by dark material.

C-2

Petrographic Description: Brian Mason
Chondritic structure [illegible]l developed in parts of the section, but in other parts it is less pro[illegible], possibly as a result of local brecciation. The chondrules are set in a fine-grained granular groundmass which consists largely of olivine and pyroxene, with minor nickel-iron and troilite (nickel-iron in excess of troilite). Brown limonitic staining is present in parts of the section, along with veinlets and patches of red-brown limonite. Microprobe analyses give the following compositions: Olivine, Fa_{18}; orthopyroxene, Fs_{16}; plagioclase, An_{12}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78102 Location: Allan Hills
Field No.: 494
Weight (gms): 336.9
Meteorite Type: H5 Chondrite

Physical Description:
A large proportion of the exterior of this 9.0 x 6.0 x 6.0 cm sample is weathered and stained by iron oxidation and spotted with small patches of black fusion crust. Except for the inner most material, this sample is totally weathered. The light matrix material of the inner most material is spotted with iron-oxidation and contains many small (as great as 3 mm. in maximum diameter) dark clasts.

Petrographic Description: Brian Mason
Chondritic structure is fairly prominent, but the margins of the chondrules are frequently ill-defined and tend to merge with the granular groundmass, which consists of olivine and pyroxene with minor amounts of nickel-iron and troilite. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{17}. The meteorite is an H5 chondrite.

Sample No.: ALHA78103 Location: Allan Hills
Field No.: 243
Weight (gms): 589.7
Meteorite Type: L6 Chondrite

Physical Description:
The rounded specimen is approximately 11 x 7 x 4 cm.. The entire sample, with possible exception of a small patch of remnant fusion crust on the E surface, is weathered and stained by iron-oxidation. The B surface is the less severely weathered of all the surfaces, and several chondrules, 3-5 mm in diameter, are apparent. The matrix of the sample is greenish-gray. Several fractures are present on the T surface. The sample broke along at fracture during processing of the meteorite. Some oxidation halos, and some metallic flakes are visible in the greenish gray matrix of the sample. The sample appears to have a weathering rind, ~3 mm. in depth, along the T surface. The sample cannot be magnetically orientated.

Petrographic Description: Brian Mason
Chondrules are sparse and have diffuse margins which tend to merge with the granular matrix, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, some plagioclase, and accessory chromite. Minor limonitic staining is present around nickel-iron grains. Well-preserved fusion crust, 0.5 mm thick, is present along one edge. Microprobe analyses give the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA 78103 is an L6 chondrite similar to ALHA 78104 in all respects.

Sample No.: ALHA78104 Location: Allan Hills
Field No.: 241
Weight (gms): 672.4
Meteorite Type: L6 Chondrite

Physical Description:
The W surface of the meteorite is partially covered with black fusion crust, which is weathering away. The remainder of the specimen is rough on a centimeter scale, and is weathered and stained by iron-oxidation. A large clast, ~7 mm., is present on the N surface, and a smaller clast, ~3 mm., that appears metallic is present on the T surface. A number of smaller clasts, which appear to be metallic, are scattered over the surface of the specimen.
When the specimen was cleaved during processing, a light gray matrix with metallic particles was exposed. An area ~1 cm. x 3 cm. in the matrix is a darker gray. A weathering rind, ~5 mm. deep, occurs along some exterior margins.

Petrographic Description: Brian Mason
Chondrules are sparse and have diffuse margins which tend to merge with the granular matrix, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, some plagioclase, and accessory chromite. Minor limonitic staining is present around nickel-iron grains. Well-preserved fusion crust, 0.5 mm thick, is present along one edge. Microprobe analyses give the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA78104 is an L6 chondrite similar to ALHA78103 in all respects.

Sample No.: ALHA78105 Location: Allan Hills
Field No.: 249
Weight (gms): 941.7
Meteorite Type: L6 Chondrite

Physical Description:
The exterior of the sample is irregular and rough on a mm scale. The character of the exterior appears to be the result of the weathering of the fusion crust. Small patches of fusion crust remain on the B and N surfaces. Where the sample is devoid of fusion crust, light to medium gray matrix material with chondrules and lithic clasts is exposed.

When the specimen was cleaved the interior of the sample appeared greenish-gray and fine grained. Only a very small amount of a metallic mineral phase is present in the sample. One fracture that penetrates the specimen is stained by iron oxidation along the margins.

Dimensions: 11 x 7 x 6 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and ill-defined, their borders tending to merge with the granular groundmass, which consists mainly of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of limonitic staining is associated with some of the nickel-iron grains. Microprobe analyses show olivine (Fa_{29}), orthopyroxene (Fs_{20}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78106 Location: Allan Hills
Field No.: 400
Weight (gms): 464.5
Meteorite Type: L6 Chondrite

Physical Description:
Ice was noted on the sample when removed from the freezer. This semi-pyramidal shaped specimen appears to be unweathered. It is completely covered with a spotted brown, black, polygonally fractured, ∿1mm thick fusion crust. Shallow regmaglypts are present on all surfaces. A small portion ∿2cm. x 1cm., of fusion crust was broken off the W surface, revealing a nonweathered, light gray matrix with dark and light clasts, as much as 1mm. in diameter.
When the meteorite was cleaved in half during processing, abundant unoxidized metal was observed. Light and dark clasts, as much as 2mm. in diameter, were present in the light gray matrix.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. Well-developed fusion crust, 0.6 mm thick, rims one edge of the section. The meteorite appears to be completely unweathered, being free of limonitic staining (a recent fall?). Microprobe analyses give the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}; plagioclase, An_{11}. The meteorite is an L6 chondrite.

Sample No.: ALHA78107 Location: Allan Hills
Field No.: 473
Weight (gms): 198.4
Meteorite Type: H5 Chondrite

Physical Description:
The B, S, and portions of the E surfaces are covered with a thin, black polygonally fractured fusion crust, which is slightly stained by iron-oxidation. There are shallow regmaglypts present on the S surface. The remaining surfaces are fracture surfaces and are weathered and stained a reddish-brown. No unweathered material was exposed in the sample during processing.

Petrographic Description: Brian Mason
Chondritic structure is well developed, chondrules ranging from 0.3-1.2 mm across; a variety of types is present, the commonest being granular olivine and olivine-pyroxene, barred olivine, and fine-grained pyroxene. The chondrules are set in a fine-grained aggregate of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). Limonitic staining pervades the section, and occasional patches of red-brown limonite are seen. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{17}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78108 Location: Allan Hills
Field NO.: 399
Weight (gms): 172.5
Meteorite Type: H5 Chondrite

Physical Description:
Only the T and N surfaces of the specimen (6.0 x 5.5 x 4.0 cm) have remnant patches of fusion crust. The other surfaces of the specimen are fracture surfaces that have been weathered and stained by iron-oxidation. Several fractures are apparent on the exterior of the sample.

This sample appears to be severely shocked. During chipping many slicken side surfaces were exposed. The sample is brecciated and two veins of black material (~1mm wide) with higher relief that the surrounding material, are present in the interior of the stone.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-0.9 mm across. The chondrules are set in a fine-grained matrix which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). Brown limonitic staining is present around the metal grains. Microprobe analyses give the following compositions: olivine, Fa_{18}; orthopyroxene, Fs_{16}; plagioclase, An_{12}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78109 Location: Allan Hills
Field No.: 248
Weight (gms): 233.2
Meteorite Type: LL5 Chondrite

Physical Description:
Dull black fusion crust covers approximately 75% of this approximately 7.0 x 5.5 x 3.5 cm. sample. The portions of the specimen devoid of fusion crust are light gray in color with abundant dark gray chondrules that are as great as 2 cm. in maximum diameter. These chondrules are easily removed from the exterior of the sample, and many fall out on handling. Several larger gray clasts and what appears to be troilite nodules, ranging from ∿3 mm. to 10 mm. are also present.
Where the sample was cleaved to divide with Japan, a light gray interior that is essentially free of iron oxidation was exposed. However, some material that appears to be troilitic in the interior of the specimen is oxidized and friable.

Petrographic Description: Brian Mason

Chondrules are prominent and well-defined, 0.6-2.4 mm in diameter; some are broken or deformed. A variety of types is present, the commonest being granular olivine, barred olivine, and fine-grained pyroxene. The matrix is dominantly olivine with lesser amounts of pyroxene, and a little nickel-iron and troilite; plagioclase is present as very small grains difficult to recognize. The section shows a little limonitic staining around some metal grains. Microprobe analyses gave the following compositions: olivine, Fa_{28}; orthopyroxene, Fs_{23}; plagioclase, An_{11}. The meteorite is classified as an LL5 chondrite.

Sample No.: ALHA78110 Location: Allan Hills
Field No.: 499
Weight (gms): 160.7
Meteorite Type: H5 Chondrite

Physical Description:
All but the B surface of the sample (7.0 x 5.0 x 2.5 cm.) is covered with a thin, patchy, black fusion crust. Small rounded and irregular inclusions are visible through the fusion crust. The B surface of the sample is weathered and stained reddish-brown by iron-oxidation and has two chondrules protruding from the surface. Several fractures penetrate the sample.

The matrix of the sample is reddish-brown and has many inclusions and chondrules (as great as 2mm in diameter) as well as metallic fragments.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-1.4 mm across; a variety of types is present, the commonest being granular olivine and olivine-pyroxene, porphyritic olivine, and fine-grained pyroxene. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. A considerable amount of brown limonite is present, generally in association with the metal grains. Microprobe analyses give the following compositions: olivine, Fa_{18}; orthopyroxene, Fs_{16}; plagioclase, An_{13}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78111 Location: Allan Hills
Field No.: 472
Weight (gms): 126.8
Meteorite Type:

Physical Description:
Sample is wedge-shaped and has fusion crust along one edge. Remainder of sample may or may not have remnant fusion crust. One surface contains many chondrules which could be plucked out. Only a small area (0.6 cm) through the center of the stone is unweathered. The unweathered matrix is light gray in color. Some fresh metal is visible. When the meteorite was chipped, it broke into many pieces.

Dimensions: 7.5 x 5.5 x 2 cm.

Petrographic Description:

Sample No.: ALHA78112 Location: Allan Hills
Field No.: 260
Weight (gms): 2485.0
Meteorite Type: L6 Chondrite

Physical Description:
Snow and/or ice was present on the sample, ~14 x 13 x 13 cm., when it was removed from cold storage. The specimen is covered with a 0.5 mm to 1 mm. fusion crust on four surfaces. On one of these surfaces the fusion crust has weathered to a brown color, while on the other surfaces the fusion crust is black. The S surface is a fracture surface that is 80% weathered and stained by iron-oxidation. The unweathered material is yellowish and appears homogeneous. Three fractures are present on the sample, two of these appear to be shallow. Sawing the specimen during processing revealed a light gray matrix material with oxidation halos around most of the visible metallic grains. Two interior cracks exist, but with no preferential weathering along them. Clasts as much as 3 mm. in diameter are present.

Petrographic Description: Brian Mason
Chondrules are sparse and ill-defined, their borders tending to merge with the granular groundmass, which consists mainly of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of limonitic staining is accociated with the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{25}; pyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is an L6 chondrite. ALHA 78114 is another L6 chondrite, similar to ALHA 78112 in all respects.

Sample No.: ALHA78113 Location: Allan Hills
Field No.: 385
Weight (gms): 298.6
Meteorite Type: Aubrite

Physical Description:
This specimen is brecciated. Visible on the exterior surfaces are abundant very large enstatite grains (~2.5 x 2.0 cm) and less numerous dark clasts. Patches of very thin black fusion crust are present on only three of the six surfaces. Half of the B surface has thin yellowish-green weathering discoloration. Very small spots (<1 mm) of iron oxidation are present on 3 surfaces. Overall dimensions of this sample are 8.5 x 6.5 x 3 cm.

The cut face shows many large white enstatite clasts. Few of these contain isolated rounded blebs of metal, of which some have oxidation haloes around. Surrounding these white clasts is fine grained dark gray material. In places this material appears as veins, while in other areas it is much larger in diameter.

Petrographic Description: Brian Mason
The thin section consists almost entirely of clasts of orthopyroxene up to 2 mm long in a groundmass of comminuted pyroxene. Accessory amounts of sulfides and nickel-iron are present as small grains in the groundmass. The section shows a moderate amount of brown limonitic staining, concentrated around the metal grains. Microprobe analyses show that the pyroxene is an iron-free enstatite (FeO<0.1%) with minor and variable amounts of CaO (0.2 - 0.6, average 0.5%). The meteorite is an aubrite (enstatite achondrite).

Sample No.: ALHA78114 Location: Allan Hills
Field No.: 382
Weight (gms): 808.1
Meteorite Tupe: L6 Chondrite

Physical Description:
The B surface of the meteorite is planar and contains small patches of dull black fusion crust on a shiny reddish-brown background, which may possibly be severely weathered fusion crust. All other surfaces of the specimen are totally covered with dull black fusion crusts with the exception of some small areas on the S surface where it has been removed. Small regmaglypts are present on the S surface. Many shallow voids are present on the exterior of this sample. One large fracture that appears to penetrate the stone was noted.
This specimen was cleaved along the large crack, which exposed mostly weathered material. The unweathered material exposed during processing is light gray and flecked with light and dark, ~1mm., clasts.

Petrographic Description: Brian Mason
Chondrules are sparse and ill-defined, their borders tending to merge with the granular groundmass which consists mainly of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of limonitic staining is associated with the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{25}; pyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA 78114 is another L6 chondrite, similar to ALHA 78112 in all respects.

Sample No.: ALHA78115 Location: Allan Hills
Field No.: 294
Weight (gms): 847.6
Meteorite Type: H6 Chondrite

Physical Description:
This sample is smooth and rounded. There is scattered fusion crust on the B and E surfaces, and a very small amount on the W surface. The fusion crust is black, thin and pitted. Where the sample is devoid of fusion crust it is smooth and weathered a reddish-brown. Clasts and chondrules, as much as 9 mm. in diameter, are present. It appears that one corner on the N surface has been broken off, but the surface is weathered and stained similar to the remainder of the sample.
The interior of the meteorite, exposed during processing, contains metallic particles and is moderately weathered.

Petrographic Description: Brian Mason
A few ill-defined chondrules are present. Most of the section shows a granular aggregate consisting largely of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite (nickel-iron in excess of troilite). Grains of brown limonite are present throughout the section, and are concentrated below remnants of fusion crust along one edge. Microprobe analyses give the following compositions: olivine Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{12}. The meteorite is an H6 chondrite.

Sample No.: ALHA78126 Location: Allan Hills
Field No.: 383
Weight (gms): 606.9
Meteorite Type: L6 Chondrite

Physical Description:
The NE corner of this sample (~12 x 8 x 5 cm) has been removed. A thin, ~1mm, black fusion crust that is polygonally fractured in the B surface, and is weathering to a brown in some areas, covers the remainder of the specimen. Some areas of the fusion crust have weathered away, revealing a partially weathered, yellowish-gray matrix material. Some metallic looking particles are apparent on the broken surface. A deep fracture extends along the T and S faces.
During processing of the sample, it became apparent that weathering penetrated the sample as much as 0.5 cm. below the fusion crust. The matrix material exposed during processing is greenish-gray, with several veins of what appears to be darker matrix material penetrating it. Small metallic locking particles were also apparent in this friable sample.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, their borders tending to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of brown limonitic staining is present around the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{25}; pyroxene, Fs_{21}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA 78130, 78131 are L6 chondrites similar in all respects to ALHA78126.

Sample No.: ALHA78127 Location: Allan Hills
Field No.: 495
Weight (gms): 194.5
Meteorite Type: L6 Chondrite

Physical Description:
Sample is covered with very thin, shiny fusion crust on the T, B, N and W surfaces. The S surface has remnant patches of fusion crust and the E surface is a fracture surface. The B surface is partially stained by iron oxidation. Where fusion crust is absent, the sample is reddish-brown. Polygonal fractures cover most surfaces.

Chipping the sample during processing revealed that nearly the entire sample is severely weathered. One small area of the matrix is not severely weathered and is yellowish gray.

Petrographic Description: Brian Mason
Chondritic structure is poorly developed, the sparse chondrules tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, a little plagioclase, and accessory chromite. Minor limonitic staining is associated with the metal grains. Microprobe analyses gave the following compositions: olivine, Fa_{24}; orthopyroxene, Fs_{20}; plagioclase, An_{10}; and a single grain of diopside, $Wo_{46}En_{47}Fs_{7}$. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78128 Location: Allan Hills
Field No.: 250
Weight (gms): 154.7
Meteorite Type: H5 Chondrite

Physical Description:
The sample is completely devoid of fusion crust. It is weathered and stained a dark reddish-brown and is shiny in some areas. On the B surface the specimen has some small spots that are nearly black, while in other areas the weathering is not as severe and chondrules (max. diameter 2mm.) can be detected. The sample is extensively fractured.

Chipping revealed only a slight amount of material that was not severely weathered.

Petrographic Description: Brian Mason
Chondritic structure moderately well developed, with chondrules ranging from 0.2-2.4 mm across; the commonest types are granular olivine, barred olivine, and fine-grained radiating pyroxene. The groundmass consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. The meteorite is extensively weathered, with much of the nickel-iron altered to brown limonite. Microprobe analyses give the following compositions: olivine, Fa_{19}; orthopyroxene, Fs_{17}; plagioclase, An_{10}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA78130 Location: Allan Hills
Field No.: 386
Weight (gms): 2733.0
Meteorite Type: L6 Chondrite

Physical Description:
This specimen, 18 x 9 x 9 cm , is completely covered with a thin, dull black fusion crust, with the exception of an ~4 x 4 cm. area on the W surface and along the edges of the sample. Preferential weathering of the fusion crust around included clasts occurs. The sample is covered with shallow regmaglypts and several large fractures penetrate the sample.
Chipping of the sample during processing revealed a severely oxidized interior for ~ 70% of the sample. The unweathered portion is light gray and speckled with light and dark clasts, ~ 1-2 mm.. Several larger (~ 0.5 cm.) gray clasts were noted. Small veins of a darker gray material, ~ 2-3 cm. in length and 3 mm. wide, are present in the lighter matrix material.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, their borders tending to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of brown limonitic staining is present around the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{25}; pyroxene, Fs_{21}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA 78130, 78131 are L6 chondrites similar in all respects to ALHA78126.

Sample No.: ALHA78131 Location: Allan Hills
Field No.: 404
Weight (gms): 268.8
Meteorite Type: L6 Chondrite

Physical Description:
A thin, shiny black fusion crust covers the specimen, with the exceptions of most of T surface and portions of the N and B surfaces. Shallow regmaglypts are present on the S, W, and T surfaces. The surfaces that are devoid of fusion crust are weathered and stained by iron-oxidation and range texturally from smooth to rough on a centimeter scale. Several light colored clasts are present on the surfaces devoid of fusion crust. No fractures are present on the sample. When the meteorite was cleaved during processing, only a small amount of unweathered material was exposed.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, their borders tending to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, plagioclase, and accessory chromite. A moderate amount of brown limonitic staining is present around the nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{25}; pyroxene, Fs_{21}; plagioclase, An_{10}. The meteorite is an L6 chondrite.
ALHA78130, 78131 are L6 chondrites similar in all respects to ALHA78126.

Sample No.: ALHA78132 Location: Allan Hills
Field No.: 406
Weight (gms): 656.0
Meteorite Type: Polymict Eucrite

Physical Description:
Snow/ice was present on the sample when it was removed from cold storage. This appears to be a complete specimen (11x10x8 cm) with vitreous black fusion crust on all sides. The overall shape is pyramidal with the B surface being flat. The fusion crust on the T surface has flow bands, most prominent in the N-S direction and less prominent in the W-E direction. The B surface has radial flow lines in area that is concave. The fusion crust on the S surface is much duller than on the rest of the stone. The crust has been spalled or chipped in some areas, revealing a medium gray interior material. Small (<1 mm) inclusions, both lighter and darker than the matrix are apparent. Several holes (voids) that penetrate the fusion crust by as much as ∿1 cm were noted over the entire stone. One in particular is ∿9 mm in diameter and ∿1 cm deep and contains a yellowish grain (?) ∿2 mm long.

The cut face shows a light gray matrix dotted with rounded and irregular shaped grains (?) that are both lighter and darker than the matrix. The largest grain is ∿.5 cm in diameter. The voids that are present on the exterior of this specimen did not appear in the interior. A vein (?) of white grains extends for 6 cm across the cut face in the W-E direction.

Petrographic Description: Brian Mason
The thin section shows a complex breccia of angular fragments (up to 1 mm across) of pyroxene (mostly pigeonite) and plagioclase, with numerous enclaves, in a matrix of comminuted pyroxene and plagioclase with accessory chromite and ilmenite. Most enclaves are ophitic to subophitic intergrowths of plagioclase and pyroxene, but one large elliptical one, 6 mm long, consists largely of pyroxene clasts. Microprobe analyses show pigeonite (with some augite exsolution lamellae) ranging in composition ($Wo_{7-15}Fs_{40-68}$), and plagioclase An_{78-91}, average An_{88}; the pyroxene in the pyroxene enclave has composition $Wo_6Fs_{32}En_{62}$, and appears to be an inverted pigeonite. The meteorite is a pyroxene-plagioclase achondrite; its classification is a polymict eucrite.

Sample No.: ALHA78134 Location: Allan Hills
Field No.: 403
Weight (gms): 458.3
Meteorite Type: H4 Chondrite

Physical Description:
Snow and ice remained on the sample (7.0 x 5.0 x 7.5 cm.) when it was removed from cold storage. Dull black fusion crust covers nearly 40% of the sample. The remaining surfaces are weathered and stained by iron oxidation. On the S surface the inclusions in the meteorite have a higher relief that the surrounding matrix, probably as a result of preferential weathering. Inclusions (chondrules and lithic fragments) are visible on the other fracture surfaces but have not experienced any preferential weathering. In several areas the weathered material appears granular. Several large fractures penetrate the sample. When the sample was divided during processing, 60% of the interior was stained reddish-brown. The remaining 40% is light gray and contains many clasts, (1mm or less). Oxidation halos are also present in this material.

Petrographic Description: Brian Mason
Chondrules are numerous and well developed, ranging from 0.3-1.2 mm across; a variety of types is present, the commonest being granular olivine and olivine-pyroxene, and radiating fibrous pyroxene. The chondrules are set in a fine-grained aggregate of olivine and pyroxene, with minor nickel-iron and troilite (nickel-iron in greater amounts than troilite). Some of the pyroxene is polysynthetically twinned clinobronzite. The meteorite is extensively weathered, with veinlets and patches of red-brown limonite throughout the section. Microprobe analyses show olivine of essentially uniform composition (Fa_{18}) and somewhat variable pyroxene (Fs_{15}-Fs_{20}, mean Fs_{17}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA78153 Location: Allan Hills
Field No.: 492
Weight (gms): 151.7
Meteorite Type: LL6 Chondrite

Physical Description:
Fusion crust is present on the N, B and portions of the E surfaces. The fusion crust is thick (1-2 mm.) and dull brownish-black, and has a blistery texture. Many polygonal fractures are present. A weathering rind (as great as 5mm thick) is present in some areas. The fracture surfaces are dark brown in isolated areas, but the overall color is greenish-yellow. It appears that some large clasts have been plucked from the exterior surfaces of the sample.

The sample shows an unusual weathering pattern. Veins of dark reddish-brown are adjacent to areas of yellowish material. Also areas of less severely weathered matrix material, which is gray, was exposed during processing of the sample. No clasts or chondrules are discernible.

Petrographic Description: Brian Mason
Chondritic structure is barely discernible the section showing a rather uniform granular aggregate of olivine and pyroxene with minor amounts of troilite and plagioclase, a little nickel-iron, and accessory chromite. A little limonitic staining is present in association with the metal grains. Microprobe analyses give the following composition: olivine, Fa_{29}; orthopyroxene, Fs_{24}; plagioclase, An_{11}; and a single grain of diopside, $Wo_{46}En_{45}Fs_{9}$. The meteorite is classified as an LL6 chondrite.

Sample No.: ALHA78158 Location: Allan Hills
Field No.: 362
Weight (gms): 15.1
Meteorite Type: Polymict Eucrite

Physical Description:
This is not a complete specimen. Fusion crust which is shiny black, is present on one surface. All other surfaces are fracture surfaces which show a medium gray matrix with white flecks. Some clasts (<1 mm) are oxidized to a yellow color. An area ∿.5 cm diameter on the B surface is a darker gray and appears very homogeneous -- this appears to be a rounded clast. One fracture goes completely across the sample. Overall dimensions are 3.0x2.5x2 cm.

This meteorite looks very similar in appearance to ALHA78165.

Petrographic Description: Brian Mason
The polished thin section of this meteorite is identical in all respects with that of ALHA78132 (except for the pyroxene xenolith in ALHA78132). Microprobe analyses show similar composition for both pyroxene and plagioclase. In the absence of evidence to the contrary it appears that ALHA78158 and ALHA78132 are probably pieces of a single meteorite.

Sample No.: ALHA78165 Location: Allan Hills
Field No.: 370
Weight (gms): 20.9
Meteorite Type: Polymict Eucrite

Physical Description:
This is not a complete specimen (∿3.5x3.0x1.5 cm). Shiny, black fusion crust covers only one surface. The other surfaces are fracture surfaces which have a medium gray matrix with <1 mm white clasts. A few of these clasts are weathered and yellow in color. When this stone was cleaved in half, a dark gray clast (∿.5 cm) was exposed.

This meteorite looks very similar in appearance to ALHA78158.

Petrographic Description: Brian Mason
Most of the section is an ophitic intergrowth of plagioclase-pigeonite breccia, with clasts up to 0.3 mm across. Fusion crust rims a considerable part of the section. Microprobe analyses of the ophitic portion shows pigeonite of fairly uniform composition, averaging $Wo_{11}Fs_{53}En_{36}$, with a little ferroaugite ($Wo_{38}Fs_{32}En_{30}$), and plagioclase ranging An_{83-90}, average An_{86}. Pyroxene in the breccia is pigeonite ranging from $Wo_8Fs_{37}En_{55}$ to $Wo_8Fs_{61}En_{31}$; one grain of ferroaugite, $Wo_{44}Fs_{29}En_{27}$, was analyzed. The meteorite is a polymict pyroxene-plagioclase achondrite.

Sample No.: ALHA78188 Location: Allan Hills
Field No.: 040
Weight (gms): 0.87
Meteorite Type: L3 Chondrite

Physical Description:
No fusion crust remains on this reddish-brown totally weathered sample.

Petrographic Description: Brian Mason
The meteorite consists of a close-packed aggregate of chondrules, 0.3-1.2 mm across, with a relatively small amount of matrix. Porphyritic olivine chondrules contain intergranular glass, some of which is transparent brown but much is turbid from partial devitrification. Other chondrules consist of granular olivine and polysynthetically-twinned low-Ca clinopyroxene. Many chondrules have dark rims consisting largely of troilite. A little nickel-iron is present. Weathering is extensive, with veins and patches of brown limonite throughout the section. Microprobe analyses show variable composition for both olivine and pyroxene; olivine, Fa_{1-34}, average Fa_{15}; pyroxene, Fs_{5-29}, average Fs_{17}. The variability in olivine and pyroxene composition indicates type 3, and the low metal content suggest L group, so the meteorite is tentatively classified an L3 chondrite.

Sample No.: ALHA78251 Location: Allan Hills
Field No.: Allan Camp #1
Weight (gms): 1312.0
Meteorite Type: L6 Chondrite

Physical Description:
The exterior of the sample is rough and irregular and macroscopically appears similar to ALHA77105. The sample is completely devoid of fusion crust.

A small piece of material has been removed from the S surface, revealing a fine grained, greenish-gray interior. Metallic particles are apparent in the interior of the sample, and some oxidation of these has occurred.

Oxidation haloes around metallic particles (~10%) are also apparent on the sawed surfaces of the sample. Several fractures are apparent with iron oxidation along their margins.

Dimensions: 12 x 7.5 x 10 cm.

Petrographic Description: Brian Mason

Chondrules are sparse and poorly defined, merging with the granular groundmass, which consists mainly of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite, and accessory chromite. Limonitic staining is prominent around the nickel-iron grains. Microprobe analyses show olivine (Fa_{23}), orthopyroxene (Fs_{20}), and plagioclase (An_{10}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA78252 Location: Allan Hills
Field No.: 242
Weight (gms): 2789.0
Meteorite Type: Iron-Group III A

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.

Tentative Classification: Roy S. Clarke, Jr.

An area of approximately 30 cm^2 of macroetched surface was examined. Kamacite band widths are in the 0.5 mm range, with a length to width ratio ranging from 10 to 50. One edge of the slice has a continuous rim of α_2 produced by atmospheric ablation. Neumann bands are present and the kamacite has a matte appearance. Some kamacite bands are mildly deformed. Kamacite grains are continuously bordered by taenite or taenite-plessite areas. Plessite areas cover perhaps 40% of the surface area. Several small troilites are present. External weathering is moderately severe. This specimen is a medium octahedrite (Om) of narrow band width, probably a Group III A meteorite.

Sample No.: ALHA78261 Location: Allan Hills
Field No.: 491
Weight (gms): 5.113
Meteorite Type: Carbonaceous Chondrite - C2

Physical Description:
This triangular sample (2.5 x 1.5 x 1.0 cm) is totally covered with thin, dull, black, polygonally fractured fusion crust, except along the edges where the fusion crust has abraded away. The matrix revealed in these areas is greenish-black and has small (<1 mm) rounded and irregular white clasts throughout. Small voids, as much as 1mm in diameter, are present on two surfaces. Chipping of the specimen during processing revealed abundant rounded and irregular inclusions in the meteorite.

Petrographic Description: Brian Mason
The section shows numerous tiny grains (up to 0.1 mm) and irregular aggregates (up to 0.3 mm) of olivine and polysynthetically twinned clinopyroxene, and a few small chondrules, in a translucent isotropic olive-brown matrix. The section contains very little troilite as minute scattered grains, and a little nickel-iron as inclusions in the chondrules. Porous fusion crust up to 2.5 mm thick rims part of the section. Microprobe analyses show that both olivine and pyroxene have variable composition. Olivine ranges from Fa_0 to Fa_{50}, with an average of Fa_6; it has a notable chromium content, Cr_2O_3 ranging from 0.3-0.6 weight percent. Pyroxene is generally close to clinoenstatite in composition, ranging from Fs_1 to Fs_8, with an average of Fs_7. This meteorite is a carbonaceous (C2) chondrite, and shows a close similarity to ALHA77306.

Sample No.: ALHA78262 Location: Allan Hills
Field No.: 500
Weight (gms): 26.18
Meteorite Type: Ureilite

Physical Description:

The overall shape of this specimen (4.0 x 2.5 x 2.0 cm) is triangular. A thin, dull black fusion crust is present on three surfaces. The remaining surfaces are fracture surfaces that are rough on a small scale. The surface roughness appears to be the result of exposed crystal faces. The overall color is very dark greenish-black. Chipping of the specimen during processing revealed a brownish coarse grained material. Many crystal faces were exposed on the interior surfaces.

Petrographic Description: Brian Mason
The section consists almost entirely of olivine, in rounded to subhedral grains 0.3-2.2 mm across; most of the olivine is colorless, but some grains have a pale brownish tint. A little pyroxene of similar grain size is present. The grains are rimmed with black carbonaceous material, which contains trace amounts of nickel-iron and troilite. Very thin fusion crust rims part of the section. Microprobe analyses show olivine and pyroxene of uniform composition. Olivine has a composition of Fa_{22}; and a notably high content of calcium (CaO 0.4 weight percent) and chromium (Cr_2O_3 0.8 weight percent). Pyroxene composition is $Wo_8Fs_{19}En_{73}$, with Cr_2O_3 1.2 weight percent. This meteorite is a ureilite and resembles ALHA 78019 in all respects.

Sample No.: BTNA78001 Location: Bates Nunatak
Field No.: 328
Weight (gms): 160.7
Meteorite Type: L6 Chondrite

Physical Description:
The sample (10 x 6 x 1 cm.) is flat and has black fusion crust on all surfaces, with the exception of the B and portions of the W surfaces. The sample has been fractured into two pieces across its middle. The B surface is polished and has a mottled yellowish-red-brown appearance.

Chipping of the specimens revealed a medium gray matrix with inclusions (<1mm.). The sample has a prominent (1mm) weathering rind.

Petrographic Description: Brian Mason
Chondritic structure is barely discernible, the sparse chondrules merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite, maskelynite, and accessory chromite. The section shows some dark veinlets, up to 0.6 mm thick, which consist of a very fine-grained aggregate of opaque material and transparent isotropic material; the latter may be majorite and ringwoodite. Brown limonitic staining pervades the section. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{21}) of uniform composition; the maskelynite has CaO (2.0%) appropriate to oligoclase composition, but has deficient and variable Na_2 content (4.3-7.0%). The meteorite is classified as an L6 chondrite.

Sample No.: BTNA78002 Location: Bates Nunatak
Field No.: 325 and 326
Weight (gms): 4301.0
Meteorite Type: L6 Chondrite

Physical Description:
This specimen consists of two individual pieces that fit together. Nearly the entire sample is covered with thin, dull brown fusion crust (apparently weathered) that is dotted with black fusion crust. The fusion crust appears to have been physically removed from some small areas on all surfaces and an approximately 7.0 x 10.0 cm area on the S surface of the sample appears to have been broken away. The areas devoid of fusion crust are light grayish-green where they are not stained by iron oxidation. A few flecks of metallic phase minerals are discernible in these areas.

The T surface of the meteorite has flow bands in the E-W direction and regmaglypts are visible on the B surface.

The plane on which this specimen broke is very flat and is 90% iron oxide stained a reddish-brown. The areas not iron oxide stained are the same greenish-gray color seen on the exterior surfaces of the sample. Some small metallic mineral flakes are visible on these fracture surfaces.

Dimensions: 20 x 12 x 14 cm.

Petrographic Description: Brian Mason
Two polished thin sections were examined, one from BTNA78002,3 and one from BTNA78002,6. They are identical in all respects and confirm the macroscopic identification of these as two pieces of a single meteorite. Chondrules are sparse and poorly defined, merging with the granular groundmass, which consists of olivine and pyroxene, with minor maskelynite and subequal amounts of nickel-iron and troilite. A little limonitic staining is associated with the nickel-iron grains. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{20}) of uniform composition; the maskelynite has CaO (2.0%) appropriate to oligoclase composition, but has deficient and variable Na_2O content (3.2-6.6%). The meteorite is classified as an L6 chondrite.

Sample No.: PTNA78004 Location: Bates Nunatak
Field No.: [illegible]4
Weight (gms): 1079.0
Meteorite Type: LL6 Chondrite

Physical Description:
One surface of this sample is a fracture surface. The remaining surfaces of the sample are covered with thin (0.5 mm) dull black fusion crust. Regmaglypts are present on the N and S surfaces.

Macroscopically, the sample appears to be composed of angular, light colored clasts, surrounded by greenish-brown to gray intersititial material. The clasts comprise approximately 70% of the surface area and have a wide range in size; some are as much as 2.0 cm in diameter. Chondrules are apparent on the surfaces exposed during cleaving.

Dimensions: 12 x 7 x 7 cm.

Petrographic Description: Brian Mason
The section shows a granular aggregate consisting mainly of olivine and pyroxene (average grain size 0.1-0.2 mm), with minor amounts of plagioclase, nickel-iron, and troilite, and accessory chromite. Chondritic structure is barely visible in a few places, and the chondrules are somewhat fragmented. Many of the silicate grains show undulose extinction. The meteorite has a brecciated structure, and the breccia fragments are outlined by an anastomosing network of black glassy veinlets which contain numerous minute troilite globules. A small amount of limonite staining is present around some of the nickel-iron grains. Microprobe analyses show olivine (Fa_{30}) and orthopyroxene (Fs_{24}) of essentially uniform composition; plagioclase is somewhat variable in composition, An_{13}-An_{22}, average An_{19}. The black glass is quite variable in composition, as follows (range and average, in weight percent): SiO_2 31.5-49.9, 40.4; Al_2O_3 0-6.3, 2.8; FeO 17.5-40.9, 23.9; MgO 16.7-31.3, 27.3; CaO 0-3.3, 1.6; Na_2O 0-2.4, 1.1; TiO_2 0-0.15, 0.09; MnO 0.3-0.5, 0.4. The meteorite is classed as an LL6 chondrite; it shows to a high degree the brecciation characteristic of many LL chondrites.

Sample No.: DRPA78001 Location: Derrick Peak
Field No.: 301
Weight (gms): 15200.0
Meteorite Type: Iron

Physical Description:
This irregular shape 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 is 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.

Sample No.: DRPA78002 Location: Derrick Peak
Field No.: 303
Weight (gms): 7188.0
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.

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.

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 4.5 x 2.5 cm specimen is metallic blackish-brown.

Sample No.: DRPA78005 Location: Derrick Peak
Field No.: 304
Weight (gms): 18600.0
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 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.

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.

Sample No.: DRPA78007 Location: Derrick Peak
Field No.: 338
Weight (gms): 11800.0
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.

Sample No.: DRPA78008 Location: Derrick Peak
Field No.: 336
Weight (gms): 59400.0
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 B surface. The remainding 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.

Sample No.: DRPA78009 Location: Derrick Peak
Field No.: 302
Weight (gms): 138100.0
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.

Sample No.: META78001 Location: Meteorite Hills
Field No.: 323
Weight (gms): 624.4
Meteorite Type: H4 Chondrite

Physical Description:
This sample is shaped like a boomerang and is entirely covered with fusion crust. The fusion crust on the B surface has an irridescent sheen, is much thinner than the fusion crust on the remainder of the sample, and has a well defined area of weathering, 1 cm from the edge of the sample. Remaining surfaces have dull, brownish-black fusion crust. Small regmaglypts are apparent on the T and N surfaces and flow bands are present in the B surface at the E and W ends. Small fractures exist on the T and B surfaces, but they do not appear to penetrate the specimen.

The interior material of the meteorite ranges from being completely weathered and iron oxide stained to unweathered. The weathered portions are massive and are preferentially located in the T half of the sample. The unweathered areas are light grayish-green and contain unoxidized metallic fragments.

Dimensions: 14.5 x 8 x 3 cm.

Petrographic Description: Brian Mason
Chondritic structure barely observable, the sparse chondrules merging with the granular groundmass, which consists of olivine and pyroxene with minor amounts of nickel-iron and troilite (the nickel-iron in excess of troilite). The section shows areas of blackening which appear to be due to fine-grained troilite, possibly a shock effect. Minor limonitic staining pervades part of the section. Microprobe analyses show olivine of essentially uniform composition (Fa_{17}) and somewhat variable pyroxene (Fs_{14}-Fs_{21}, average Fs_{16}). The meteorite is classified an an H4 chondrite.

Sample No.: META78002 Location: Meteorite Hills
Field No.: 334
Weight (gms): 542.2
Meteorite Type: L6 Chondrite

Physical Description:
Thin dull black fusion crust is present on three surfaces of this pyramidal specimen. The fusion crust is pitted, apparently due to the preferential weathering of small inclusions. The T, W and B are fracture surfaces that are stained reddish-brown. Many clasts, as much as 3 mm in diameter, can be seen on the T and W surfaces.

Chipping for a suitable thin section sample revealed a greenish-gray matrix which contained metallic particles, some of which have iron oxidation halos.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, merging with the granular groundmass, which consist of olivine and pyroxene with minor amounts of plagioclase, nickel-iron and trolite. A little limonitic staining is associated with the nickel-iron grains. Well-preserved fusion crust, 0.6 mm thick, is present along one edge of the section. Microprobe analyses show olivine (Fa_{23}), orthopyroxene (Fs_{20}), and plagioclase (An_{10}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: META78003 Location: Meteorite Hills
Field No.: 335
Weight (gms): 1726.0
Meteorite Type: L6 Chondrite

Physical Description:
The E, T and W surfaces of the sample are covered with a thin (∿1mm) dull black fusion crust that has been removed in some areas, revealing a reddish weathered surface. The remaining surfaces are fracture surfaces that are weathered and stained reddish. Light colored inclusions are apparent on the fracture surface. Chipping and sawing of the meteorite during processing revealed a greenish-gray matrix with many oxidation halos around inclusions. Dimensions of sample: ∿15.0 x 7.5 x 8.0 cm.

Petrographic Description: Brian Mason
The section shows sparse chondrules with diffuse margins which tend to merge with the granular groundmass. The groundmass consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, some plagioclase, and accessory chromite. Fusion crust, 0.3 mm thick, is present along one edge. Minor limonitic staining is associated with the nickel-iron grains. Microprobe analyses give the following compositions: Fa_{24}; pyroxene, Fs_{21}; plagioclase, An_{10}. The meteorite is an L6 chondrite.

Sample No.: META78005 Location: Meteorite Hills
Field No.: 339
Weight (gms): 172.0
Meteorite Type: L6 Chondrite

Physical Description:
Three surfaces of the sample (6.5 x 5.5 x 4.0 cm) are covered with dull, polygonally fractured, black fusion crust. The surfaces devoid of fusion crust are fracture surfaces that are reddish-yellow, due to weathering and iron oxidation staining, and contain many inclusions with greater relief that the surrounding matrix material.

Chipping of the meteorite during processing, revealed a light, gray matrix with small clasts. Non-oxidized metallic particles are present.

Petrographic Description: Brian Mason
Chondritic structure is barely discernible, the sparse chondrules merging with the granular groundmass, which consists largely of olivine and pyroxene, with minor subequal amounts of olivine and pyroxene, some plagioclase, and accessory chromite. Minor limonitic staining is present around the metal grains. Microprobe analyses give the following compositions: olivine, Fa_{24}; orthopyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is classified as an L6 chondrite.

Sample No.: META78006 Location: Meteorite Hills
Field No.: 349
Weight (gms): 409.6
Meteorite Type: H6 Chondrite

Physical Description:
This sample is entirely covered by fusion crust and when it was removed from cold-storage ice was present on the sample. The ice looked as if it had been melted and refrozen. The meteorite was cleaved in processing and 3/4 of the meteorite was found to be stained by iron oxidation. The remaining 1/4 of the sample is light gray and spotted with areas of iron oxidation staining. A few darker colored inclusions are present in the sample.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, merging with the granular groundmass, which consists of olivine and pyroxene with minor amounts of plagioclase, nickel-iron, and troilite (nickel-iron in excess of troilite). Brown limonitic staining and occasional grains of limonite are associated with the nickel-iron. Microprobe analyses show olivine (Fa_{18}), orthopyroxene (Fs_{15}), and plagioclase (An_{13}) of uniform composition. The meteorite is classified as an H6 chondrite.

Sample No.: META78007 Location: Meteorite Hills
Field No.: 347
Weight (gms): 174.8
Meteorite Type: H6 Chondrite

Physical Description:
Fusion crust ranging from dull-black to iridescent red-brown totally covers this irregular shaped meteorite. The interior of the stone is 75% weathered. The unweathered part appears to have many clasts; one 0.5 cm diameter clast was noted. This stone was magnetically oriented in Antarctica and the orientation has been kept throughout processing.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene, with minor amounts of nickel-iron and troilite, and a little plagioclase. Weathering is extensive, with brown limonitic staining throughout the section. Well-preserved fusion crust is present along one edge. Microprobe analyses give the following compositions: olivine, Fa_{19}; orthopyroxene, Fs_{17}, plagioclase, An_{13}. The meteorite is an H6 chondrite.

Sample No.: META78010 Location: Meteorite Hills
Field No.: 351
Weight (gms): 233.5
Meteorite Type: H-5 Chondrite

Physical Description:
Ice was present on the sample when it was removed from cold storage. Smooth black fusion crust covers the entire speciman.
Upon cleaving this stone into approximately two equal halves, a light dark structure was revealed. Dark vein-like areas, which contain small light colored clasts (~0.1 - 0.2 cm.), totally enclosed large lighter colored clasts as large as 1 cm x 0.5 cm.. In some areas the stone is weathered to a dark reddish-brown.
Dimensions: 8.5 x 5 x 4.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is moderately well developed, but the chondrules tend to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). Microprobe analyses give the following compositions: olivine, Fa_{19}; pyroxene, Fs_{17}. The meteorite is classified as an H5 chondrite.

Sample No.: META78028 Location: Meterorite Hills
Field No.: 333
Weight (gms): 20657.0
Meteorite Type: L-6 Chondrite

Physical Description:
Four surfaces of this angular stone are covered with a thin, dull, black fusion crust, and two surfaces are fracture surfaces which are red-brown in color. Sawing this specimen in half revealed an interior with a light gray matrix that contains inclusions up to 5 mm. in diameter. Oxidation halos occur around all of the metal and gives the cut face a mottled look. Two large fractures run across the saw face, one has a large area of oxidation along its entire length. Further sawing exposed a chondrule ~8 mm. in diameter.
Dimensions: 35 x 17 x 21 cm.

Petrographic Description: Brian Mason
The section shows sparse and poorly defined chondrules whose margins merge with the granular groundmass, which consists largely of olivine and pyroxene with minor subequal amounts of nickel-iron and troilite, and a little plagioclase. A minor amount of brown limonitic staining is present, mostly in association with the grains of nickel-iron. Microprobe analyses show olivine (Fa_{25}), orthopyroxene (Fs_{21}), and plagioclase (An_{10}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: RKPA78001 Location: Reckling Peak
Field No.: Reckling Peak #1
Weight (gms): 234.9
Meteorite Type: L6 Chondrite

Physical Description:
A thin, dull black fusion crust covers 2 surfaces of this angular sample. The other surfaces are fracture surfaces and are stained reddish-brown by iron oxidation. Several cracks appear to penetrate the specimen.

When the sample was cleaved only a very small amount of unweathered material was observed. This material is grayish in color. No inclusions were discernible.

Dimensions: 9 x 5 x 4.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor amounts of maskelynite, nickel-iron, and troilite. One edge is bordered by a small amount of fusion crust. Some limonite is present, usually in association with nickel-iron. The section is cut by a dark glassy veinlet, about 0.05 mm thick; clear isotopic material in this veinlet is tentatively identified as ringwoodite and majorite. Microprobe analyses show olivine (Fa_{28}) and orthopyroxene (Fs_{20}) of uniform composition; the maskelynite has CaO content (2.4%) appropriate to oligoclase composition, but has deficient and variable NaO content (3.4-6.2%). Accessory merrillite was identified with the microprobe. The meteorite is classified as an L6 chondrite.

Sample No.: RKPA78002 Location: Reckling Peak
Field No.: Reckling Peak #2
Weight (gms): 8483.0
Meteorite Type: H4 Chondrite

Physical Description:
This tabular shaped meteorite has 4 flat and 2 semi-rounded surfaces with sharp ridges. 0.5 mm thick black, polygonally fractured fusion crust covers the entire specimen except for areas along the ridges where it has been broken off. The areas void of fusion crust are greenish-brown in color and contain numerous inclusions. One fracture penetrates the interior of the meteorite. After drying for several days in the nitrogen cabinet, minute amounts of white deposit appeared along the polygonal fractures. The cut face reveals a weathering rind ∿1-4 mm thick. Abundant metal blebs are obvious with most of the metal having oxidation halos around them. Several chondrules (∿2 mm diameter) are present.

Dimensions: 17 x 13.5 x 17 cm.

Petrographic Description: Arch Reid
Chondrules, ranging from 0.2 to 1.5 mm but mostly sub mm., are abundant and many are well-defined. Porphyritic chondrules, with equant euhedral olivines and with elongate skeletal olivines in turbid devitrified glass, are common. Fine-grained pyroxene-rich chondrules, including excentroradial pyroxene aggregates, are also common. Spherical chondrules have well-defined borders whereas irregular chondrules and chondrule fragments tend to merge with the matrix. The matrix contains abundant metallic iron, troilite, olivine and pyroxene with some isolated large olivine and pyroxene crystals. Olivine and pyroxene are unzoned and some of the pyroxene grains are polysynthetically twinned clinobronzite. Microprobe analyses show uniform olivine ($Fa_{18.5}$) and pyroxene ($Wo_{1.5}En_{83}Fs_{15.5}$). Limonite staining is present in minor amounts. The meteorite is classified as an H4 chondrite.

Sample No.: RKPA78003 Location: Reckling Peak
Field No.: Reckling Peak #3
Weight (gms): 1276.0
Meteorite Type: L6 Chondrite

Physical Description:
This sample was found in Antarctica as two individual pieces, which fit together perfectly. All surfaces with the exception of 2 are covered with thin, dull black fusion crust. The surfaces devoid of fusion crust have weathered a deep reddish-brown, as have the two surfaces that fit together. The W butt end has a clast, ∿1 cm in diameter, that appears to be troilite.

Upon chipping the meteorite to obtain a suitable thermoluminescence sample, the interior of the specimen was exposed, revealing weathered surfaces composed of very dark gray and very light gray matrix material, possibly the result of weathering processes.

Petrographic Description: Brian Mason
This thin section is indistinguishable from that of RKPA78001, both in texture and mineral composition. It contains maskelynite of similar variable composition, and includes a veinlet like that in RKPA78001, again with material tentatively identified as ringwoodite and majorite. The meteorite is an L6 chondrite. RKPA78003 and RKPA78001 are presumably pieces of a single meteorite.

Sample No.: RKPA78004 Location: Reckling Peak
Field No.: Reckling Peak #4
Weight (gms): 166.9
Meteorite Type: H4 Chondrite

Physical Description:
All but one surface of the sample is covered with thin, dull black fusion crust, although portions of the fusion crust on another surface appear to have been physically plucked away. The portions of the sample devoid of fusion crust are shiny reddish-brown. Chipping this small stone was impossible. Sawing revealed an interior with many clasts discernible in the dark gray matrix. Metallic fragments are present. On the cut face of the sample it appears that the inclusions in the meteorite have a more dense population around the circumference of the sample, from the exterior margin to a depth of approximately 1 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, but many of the chondrules appear to be deformed or broken. The groundmass consists of finely granular olivine and pyroxene, with minor amounts of nickel-iron and troilite (nickel-iron in excess of troilite). Well-preserved fusion crust is present along one edge of the section. Brown limonitic staining pervades the section, and veinlets and patches of limonite are present. Microprobe analyses show olivine of essentially uniform composition (Fa_{17}) and pyroxene of somewhat variable composition (Fs_{14}-Fs_{21}, average Fs_{16}); some analysed spots within the pyroxene grains show up to 15% CaO, suggesting exsolution of diopsidic pyroxene. The meteorite is classified as an H4 chondrite.

1979 COLLECTION

Sample No.: ALHA79001 Location: Allan Hills
Field No.: 1171
Weight (gms): 32.31
Meteorite Type: L3 Chondrite (tentative)

Physical Description: Roberta Score
Five exterior surfaces have a dull reddish-brown color while the sixth surface has a iridescent reddish-brown color. Though the interior is extremely weathered, clasts are visible.

ALHA79001 and ALHA79003 are probably the same meteorite.

Dimensions: 4 x 3.5 x 1.5

Petrographic Description: Brian Mason

The polished thin section shows a closely packed aggregate of chondrules (0.2-2mm in diameter) and irregular crystalline aggregates, set in a small amount of dark fine-grained matrix which includes minor subequal amounts of nickel-iron and troilite. A considerable variety of chondrules is present, the most common being granular olivine with or without polysynthetically twinned clinopyroxene, porphyritic olivine, and fine-grained pyroxene. Some chondrules have intergranular transparent pale brown glass, in others the glass is turbid and partly devitrified. Some weathering is indicated by the presence of a moderate amount of brown limonite as veins and patches. Microprobe analyses show a wide range in the composition of olivine (Fa_{6-39}) and pyroxene (Fs_{2-31}); the pyroxene is a low-calcium clinopyroxene (CaO = 0.2-1.8%). 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.

Sample No.: ALHA79002 Location: Allan Hills
Field No.: 1172
Weight (gms): 222.8
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
A reddish-brown remnant fusion crust covers the entire stone with the exception of one small patch of black fusion crust. Several cracks penetrate the interior of the stone. No unweathered material was exposed by chipping.

Dimensions: 8 x 5 x 4.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, plagioclase, and troilite. Weathering is extensive, with veins and patches of brown limonite throughout the section. Microprobe analyses gave the following mineral compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{19}. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79003 Location: Allan Hills
Field No.: 1162
Weight (gms): 5.1
Meteorite Type: L3 Chondrite (tentative)

Physical Description: Roberta Score
Weathered black fusion crust covers most of this stone. Clasts are visible where the sample is devoid of fusion crust.

Dimensions: 2 x 1 x 1 cm.

Petrographic Description: Brian Mason
The section is texturally identical and the olivine and pyroxene show a similar range of composition to these minerals in ALHA79001; hence these two specimens are probably pieces of a single meteorite.

Sample No.: ALHA79004 Location: Allan Hills
Field No.: 1159
Weight (gms): 34.9
Meteorite Type: H5 Chondrite with enclaves

Physical Description: Roberta Score
Most of this tabular stone has been weathered to a reddish-brown color. Patches of yellow are visible on one surface. Approximately 5% of the interior is gray in color while the remaining material has been weathered to a deep reddish-brown color.

Dimensions: 5 x 3 x 1.5 cm.

Petrographic Description: Brian Mason
The section shows well-developed chondritic structure, with chondrules ranging from 0.2-1.2 mm in diameter; a variety of types is present, the commonest being granular and porpyritic olivine and fine-grained pyroxene. The matrix is fine to medium-grained, and consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. An enclave of granular polysynthetically twinned clinopyroxene, 2.4 mm across, is present on one edge of the section. The specimen is somewhat weathered, with brown limonitic staining throughout the section. Microprobe analyses show olivine (Fa_{16}) and pyroxene (Fs_{14}) of essentially uniform composition in the chondrules and groundmass; the composition of the pyroxene in the enclave is variable, as follows: Wo 0.6-3.7, En 60-85, Fs 11-38. The meteorite is classified as an H5 chondrite, although the enclave properly belongs to a lower type.

Sample No.: ALHA79005 Location: Allan Hills
Field No.: 1195
Weight (gms): 60.0
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
When this stone was received in the laboratory, the sample was broken in three pieces that fit together perfectly. Dull black fusion crust totally covers this meteorite. The interior has a 2 mm thick weathering rind around the entire inside. Crystal faces of the grains are visible.

Dimensions: 3.5 x 5 x 1.5 cm.

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 pyroxene, with minor amounts of nickel-iron, plagioclase, and troilite. Some limonitic staining is present on the edge of the section, probably the result of near-surface weathering. Microprobe analyses show olivine (Fa_{18}), pyroxene (Fs_{16}), and plagioclase (An_{11}) of uniform composition. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79006 Location: Allan Hills
Field No.: 1197
Weight (gms): 40.9
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Dull black fusion crust covers all but two surfaces of this meteorite. Areas devoid of fusion crust are reddish-brown in color and contain clasts. The interior material is brownish-yellow in color and contains many clasts. The surface that was exposed was along a pre-existing crack and therefore the stone may be less weathered than it appears at first glance.

Dimensions: 6 x 2.5 x 2 cm.

Petrographic Description: Brian Mason
The section is moderately chondritic, with chondrules ranging from 0.3-1.2 mm in diameter. The chondrules are set in a fine- to medium-grained groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite; brown limonitic staining is present around the nickel-iron grains. Remnants of fusion crust, up to 0.3 mm thick, are present along one edge. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79007 Location: Allan Hills
Field No.: 1176
Weight (gms): 142.3
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
Dull black fusion crust covers 50% of this stone. Areas devoid of fusion crust range in color from light gray to yellowish-brown. Many clasts are visible, one in particular is 1.0 x 0.6 cm in diameter, greenish-yellow in color and very fined grained. The interior is relatively fresh. A small weathering rind is visible in some areas and small bits of oxidation are scattered throughout the light gray colored matrix.

Dimentions: 6 x 4 x 4 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly developed; maximum diameter is 2.4 mm. Major minerals are olivine (Fa_{23}) and orthopyroxene (Fs_{19}); minor constituents are plagioclase (An_{10}), nickel-iron, and troilite. A slight amount of weathering is indicated by limonitic staining around some of the nickel-iron grains. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA79008 Location: Allan Hills
Field No.: 1164
Weight (gms): 12.0
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
This angular shaped stone has four of six surfaces that are covered with dull black fusion crust. The areas devoid of fusion crust range in color from yellow to reddish-brown. The interior is light gray in color and contain medium gray colored clasts. Oxidation is apparent along cracks, also apparent is a small weathering rind that is not continuous around the interior.

Dimensions: 3 x 1.5 x 1.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging up to 1 mm in diameter; on one edge of the section is a granular olivine pyroxene enclave, 3 mm across, possibly part of a larger chondrule. The matrix consists largely of fine- to medium-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. Brown limonitic staining is pervasive throughout the section. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{15}) of uniform composition, both in the enclave and the main part of the section. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79009 Location: Allan Hills
Field No.: 1152
Weight (gms): 75.7
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Stone is totally covered with iridescent brown and dull black fusion crust. Most of the interior of the stone has been weathered to a deep reddish-brown color. Some white evaporite deposit was noted just under the fusion crust.

Dimensions: 5 x 4 x 3 cm.

Petrographic Description: Brian Mason
Chondritic structure is moderately well developed, with chondrules ranging from 0.4-1.5 mm in diameter. The matrix consists mainly of granular olivine and pyroxene, with minor amounts of nickel-iron and troilite. Weathering is extensive, with veins of limonite throughout the section. Fusion crust rims one edge of the section. Microprobe analyses show olivine (Fa_{18}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79010
Field No.: 1182
Weight (gms): 25.1
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Patches of dull black fusion crust cover only two surfaces. The other surfaces are fracture surfaces that are a reddish-brown color. The interior is mostly weathered though some small inclusions are visible.

Dimensions: 3.5 x 2 x 2.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-0.9 mm in diameter. The chondrules are set in fine-grained granular groundmass consisting largely of olivine and pyroxene, with minor nickel-iron and troilite. The section is pervaded by brown limonitic staining. Microprobe analyses show olivine (Fa_{17}) and pyroxene (Fs_{15}) of uniform composition. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79011 Location: Allan Hills
Field No.: 1150
Weight (gms): 14.0
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
This rounded stone is totally covered with weathered dull brown and black fusion crust. The interior is mostly weathered but some light gray colored matrix is visible which contains several weathered rounded inclusions (<1 mm diameter).

Dimensions: 2 x 2 x 1.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is fairly well-developed, but the chondrules are small, ranging up to 0.6 mm across. They are set in a fine- to medium-grained matrix, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Fusion crust, up to 0.5 mm thick, rims part of the section. Some limonitic staining is present, mainly in association with nickel-iron grains. Microprobe analyses gave the following mineral compositions: olivine, Fa_{18}; pyroxene, Fs_{16}. Accessory merrillite was identified with the microprobe. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79012 Location: Allan Hills
Field No.: 1052
Weight (gms): 191.9
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Fusion crust exists as thin patches over all but one surface. Several cracks penetrate the interior of this meteorite. The overall color of the stone is a deep reddish-brown. No unweathered material was exposed when the sample was chipped.

Dimensions: 9 x 5.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, with chondrules 0.5-1.2 mm in diameter. The chondrules are set in a fine-grained matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Weathering is extensive, with limonitic staining and areas of red-brown limonite throughout the section. Remnants of fusion crust are present along one edge. Microprobe analyses gave the following compositions: olivine, Fa_{17}; pyroxene, Fs_{15}; accessory merrillite was identified. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79013 Location: Allan Hills
Field No.: 1167
Weight (gms): 28.3
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
The exterior of the stone is totally covered with a dull fusion crust, while the interior of the stone is 95% weathered. A few inclusions are apparent in the unweathered material.

Dimensions: 3 x 3 x 1.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, with chondrules ranging from 0.4-1.9 mm in diameter; one large pyroxene chondrule, 3.1 mm across, was noted. The groundmass between the chondrules consists largely of granular olivine and pyroxene, with minor amounts of nickel-iron and troilite. Fusion crust, up to 0.6 mm thick, partly rims the section. Brown limonitic staining is present throughout. Microprobe analyses gave the following compositions: olivine, Fa_{16}; pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79014 Location: Allan Hills
Field No.: 1058
Weight (gms): 10.8
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
All except one surface is covered with a thin brown and black colored fusion crust. That one surface is a planar weathered fracture surface that ranges in color from yellow to reddish brown. Chipping revealed an interior with a small (1mm) weathering rind. Chondrules are obvious in the unweathered (50% of the stone) interior material.

Dimensions: 3.5 x 2 x 1 cm.

Petrographic Description: Brian Mason
Chondritic structure is moderately well-developed, chondrules ranging up to 1.8 mm across. The groundmass between the chondrules is fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. Some limonitic staining is present, concentrated around the nickel-iron grains. Microprobe analyses gave the following mineral compositions: olivine, Fa_{16}; pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79015 Location: Allan Hills
Field No.: 1169
Weight (gms): 64.0
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Sample was in two pieces when it was received in the lab. When put together, the stone has a tabular shape with the top surface being rounded and the bottom flat. Most of the stone is covered with a dull porous-looking black fusion crust. The interior material has a 1-2 mm weathering rind. The general color of the interior is light gray with reddish-brown oxidation scattered throughout. Darker gray clasts are visible.

Dimensions: 4.5 x 2.5 x 2 cm.

Petrographic Description: Brian Mason
Chondrules are prominent, ranging from 0.6-1.2 mm across. They are set in a granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. The section is partly rimmed with fusion crust. Some limonitic staining is present, mainly in association with nickel-iron grains. Microprobe analyses gave the following mineral compositions: olivine, Fa_{17}; pyroxene, Fs_{15}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79016 Location: Allan Hills
Field No.: 1057
Weight (gms): 1146.0
Meteorite Type: H6 Chondrite

Physical Description: Carol Schwarz
Sample is mostly covered with black fusion crust including two surfaces that once were fracture surfaces. Shallow regmaglypts exist on several faces. Several cracks penetrate the interior. Chipping revealed a 1 to 3 cm thick dark reddish brown weathering rind. The rest of the interior material is not as severely weathered as the weathering rind, it has a yellowish color and is quite friable. Metal flecks are visible.

Dimensions: 13 x 8 x 6.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists mainly of olivine and pyroxene, with minor amounts of nickel-iron, sodic plagioclase, and troilite, and accessory chomite. A vein of nickel-iron up to 0.5 mm thick traverses the section. Microprobe analyses show olivine (Fa_{17}), orthopyroxene (Fs_{15}), and plagioclase (An_{13}) of uniform composition; accessory merrillite was identified with the microprobe. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79017 Location: Allan Hills
Field No.: 1199
Weight (gms): 310.0
Meteorite Type: Polymict Eucrite

Physical Description: Roberta Score
This achondrite is mostly covered with a shiny black fusion crust that contains flow bands on all surfaces. The areas devoid of fusion crust are medium-gray in color and speckled with light and dark colored clasts which are <1 mm in diameter. Large clasts up to 0.5 cm in length were noted.

The interior, which was exposed through chipping, is lighter gray in color than the exterior. Several clasts up to 1.2 cm were exposed. This meteorite looks similar to other eucrites in the 1977, 1978 and 1979 collection.

Dimensions: 7.5 x 6 x 4.5

Petrographic Description: Arch Reid
The meteorite is a breccia with mostly angular but a few subrounded clasts. Pyroxene and feldspar dominate, ranging up to 2 mm and down to very fine grains in the matrix. Some of the larger pyroxene clasts, up to 2mm, have sharp outer rims .03 mm thick of contrasting composition. A variety of clast types occur and these include: 1) pigeonite vitrophyres comprising euhedral to skeletal pigeonites ($Wo_4En_{48}Fs_{49}$) up to .6mm, in a very fine grained matrix; 2) fragments of eucrite with igneous textures; 3) dark aphanitic clasts and; 4) a feldspar-rich clast with only minor pyroxene. The analysed pyroxenes are all low Ca pigeonites, $Wo_6En_{65}Fs_{28}$ to $Wo_8En_{41}Fs_{52}$. Some large single pyroxenes $Wo_6En_{65}Fs_{29}$ have sharply defined outer rims of $Wo_7En_{40}Fs_{53}$. Feldspars range from $Or_{.1}Ab_7An_{93}$ to $Or_{.3}Ab_{12}An_{88}$ with more sodic grains ($Or_2Ab_{21}An_{77}$) in some of the igneous clasts. The meteorite shows a limited range of mineral compositions and clast types in a preliminary examination and is classified as a polymict eucrite or a howardite.

Sample No.: ALHA79018 Location: Allan Hills
Field No.: 1175
Weight (gms): 120.7
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
Thin brown and black patchy fusion crust covers all but one surface of this stone. This particular surface ranges in color from yellow to deep reddish-brown. Several inclusions are visible. The interior surfaces are mainly weathered with small areas of fresh material. Several black veins are apparent which may have been cracks that have oxidized severely. Several rounded inclusions up to 3 mm in diameter exist.

Dimensions: 4.5 x 5.0 x 3.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is barely discernible, the section showing a granular aggregate consisting largely of olivine and pyroxene, with minor amounts of maskelynite, nickel-iron, and troilite, and accessory chromite. An irregular enclave, 3.6 mm in maximum dimension, consists of fine-grained intergrown olivine and maskelynite. Veins, up to 0.3 mm thick, appear to contain ringwoodite and majorite. Fusion crust is present along one edge of the section; patches of limonite are present. Microprobe analyses gave the following compositions: olivine, Fa_{22} (Fa_{25} in the enclave); pyroxene, Fs_{20}; the maskelynite has CaO content (2.2%) appropriate to oligoclase, but the Na_2O is low and variable (Na_2O= 1.0-3.8%). The meteorite is classified as an L6 chondrite.

Sample No.: ALHA79019 Location: Allan Hills
Field No.: 1193
Weight (gms): 12.1
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Brownish-black fusion crust covers three surfaces of this angular stone. The other three surfaces are fractured surfaces. Only one of these surfaces is relatively unweathered with inclusions visible in the gray colored matrix. Chipping revealed a weathering rind from <1 mm to 3 mm thick. The interior material is light gray in color with obvious metal.

Dimensions: 2 x 2 x 1.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly developed, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. A minor amount of limonitic staining is present in association with the nickel-iron grains. Microprobe analyses gave the following compositions: olivine, Fa_{17}; pyroxene, Fs_{15}; plagioclase, An_{12}. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79020 Location: Allan Hills
Field No.: 1186
Weight (gms): 4.2
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Most of the stone is covered with dull brown and black fusion crust. Areas devoid of fusion crust range in color from yellow to reddish-brown. In these areas, inclusions are visible. Several fractures penetrate the interior of the stone.

Dimensions: 2 x 1.5 x 1 cm.

Petrographic Description: Brian Mason
Chondritic structure is poorly developed, the sparse chondrules tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of plagioclase, nickel-iron, and troilite. Remnants of fusion crust rim much of the section. A moderate amount of limonitic staining is present around the nickel-iron grains. Microprobe analyses gave the following mineral compositions: olivine, Fa_{17}; pyroxene, Fs_{15}; plagioclase, An_{14}. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79021 Location: Allan Hills
Field No.: 1192
Weight (gms): 29.4
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Stone is mostly covered with dull black fusion crust. The interior is light gray in color with reddish-brown oxidation scattered throughout. Inclusions are apparent.

Dimensions: 4.5 x 2 x 1.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is moderately well-developed, chondrules ranging up to 1.5 mm in diameter. The groundmass consists largely of granular olivine and pyroxene, with minor amounts of nickel-iron and troilite. Limonitic staining is present around the nickel-iron grains. One edge of the section is rimmed with fusion crust. Microprobe analyses gave the following compositions: olivine, Fa_{18}; pyroxene, Fs_{17}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79022 Location: Allan Hills
Field No.: 1151
Weight (gms): 31.4
Meteorite Type: H3 Chondrite

Physical Description: Roberta Score
Stone is mostly covered with dull black fusion crust. The areas devoid of fusion crust appear to have been spalled off or preferentially plucked off because they occur along ridges. These areas are clastic and yellowish-green in color. Several fractures cut into the interior of the sample. Upon chipping, the meteorite crumbled but a relatively fresh interior was exposed. Many inclusions of various colors are visible (from black to white). The largest inclusion is white in color and 0.7 cm in its longest dimension. A small (<1mm) weathering rind is visible. No metal is obvious but a few oxidation haloes are.

Dimensions: 3.5 x 2.5 x 2 cm.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, with chondrules ranging up to 1.8 mm in diameter; some have dark rims consisting largely of troilite. Intergranular glass is present in many of the chondrules; most of it is turbid and partly devitrified, but some is transparent and pale brown. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite; limonitic staining is present around the metal grains. Much of the pyroxene of variable composition: olivine, Fa_{1-28}, average Fa_{17}, and pyroxene, Fs_{9-22}, average Fs_{16}. The meteorite is classified as an H3 chondrite.

Sample No.: ALHA79023 Location: Allan Hills
Field No.: 1157
Weight (gms): 68.1
Meteorite Type: H4 Chondrite

Physical Description: Roberta Score
This flat sample has one small patch of weathered fusion crust. The rest of the stone is iridescent reddish-brown in color. Several cracks penetrate the interior. Upon chipping, the meteorite fell into many small pieces. 90% of the interior is weathered, 10% is medium gray in color with many inclusions and oxidation haloes scattered throughout. The chip for thin section was taken from the freshest material.

Dimensions: 5 x 4 x 1.5 cm.

Petrographic Description: Brian Mason
The section shows numerous chondrules and chondrule fragments, 0.2-1.8 mm across. They are set in a granular groundmass which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Weathering is extensive, shown by limonitic stains and veining throughout the section. Microprobe analyses show olivine of essentially uniform composition (Fa_{17}) and somewhat variable pyroxene (Fs_{14-17}, average Fs_{15}). The meteorite is classified as an H4 chondrite.

Sample No.: ALHA79024 Location: Allan Hills
Field No.: 1054
Weight (gms): 21.6
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Three surfaces of this stone contain dull porous-looking fusion crust. The other surfaces have weathered to a reddish-brown color. Inclusions were visible on only one surface. No unweathered material was exposed when the stone was chipped.

Dimensions: 3.5 x 2 x 1.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene with minor amounts of plagioclase, nickel-iron, and troilite. Weathering is extensive, with veins and patches of red-brown limonite throughout the section. Microprobe analyses gave the following mineral compositions: olivine, Fa_{17}; pyroxene, Fs_{15}; plagioclase, An_{11}. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA77025 Location: Allan Hills
Field No.: 1050
Weight (gms): 1208.0
Meteorite Type: H5 Chondrite

Physical Description: Carol Schwarz
This is not a complete specimen. Thin black fusion crust covers only two surfaces. The other surfaces are weathered and reddish-brown in color with some inclusions visible. The meteorite was very hard and difficult to chip but no unweathered material was exposed.

Dimensions: 10 x 13 x 7 cm.

Petrographic Description: Brian Mason
Chondrules are well-defined, 0.3-1.2 mm in diameter; they are set in a granular groundmass of olivine and pyroxene, with minor amounts of nickel-iron and troilite, and accessory chromite. Weathering is extensive, with veins and patches of limonite throughout the section. Microprobe analyses show olivine (Fa_{17}) and orthopyroxene (Fs_{15}) of uniform composition; a few small grains of plagioclase (An_{13}) were analysed. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79026 Location: Allan Hills
Field No.: 1056
Weight (gms): 572.0
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
The shape of this meteorite is angular with flat faces. It is covered with a very thin black to brown fusion crust. The interior material is friable and fractured. Some fresh metal flecks are visible. The matrix is gray with oxidation haloes scattered throughout. A weathering rind from 1 to 5 mm is apparent in some areas.

Dimensions: ∿9 x 6 x 5.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is moderately well-developed; most chondrules are ∿1 mm in diameter, but some larger ones are present; one consisting of granular olivine with interstitial devitrified glass is 3 mm across. The matrix is fine- to medium-grained, and consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Brown limonitic staining is present around the nickel-iron grains. Microprobe analyses show olivine (Fa_{18}) and orthopyroxene (Fs_{16}) of uniform composition; a little fine-grained plagioclase (An_{19}) was identified with the microprobe. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79027 Location: Allan Hills
Field No.: 1156
Weight (gms): 133.2
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
This stone looks as though it may fit together with ALHA79018 to make one stone. Dull black fusion crust covers five surfaces. Patches of fusion crust exist on the fracture surface indicating that this stone broke during entry in the atmosphere. The fracture surface ranges from yellowish-green to red-brown in color. Many inclusions are visible, the largest is 4 mm in its longest dimension (which looks similar to a inclusion in ALHA79018). The interior is light gray in color with reddish-brown oxidation scattered throughout. A 2 mm thick weathering rind is visible.

Dimensions: 5.5 x 4.5 x 3 cm.

Petrographic Description: Brian Mason
Chondrules are barely discernible, merging with the granular matrix which consists largely of olivine and pyroxene, with minor plagioclase, nickel-iron, and troilite. Fusion crust, up to 0.6 mm thick, rims part of the section. The meteorite is almost unweathered, with only traces of limonitic alteration around the nickel-iron grains. Microprobe analyses gave the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}; plagioclase, An_{10}. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA79028 Location: Allan Hills
Field No.: 1154
Weight (gms) 16.2
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Stone is totally covered with brown to black fusion crust. Chipping revealed a 1 mm thick weathering rind. The interior is light gray in color with reddish-brown oxidation scattered throughout.

Dimensions: 2.5 x 2 x 1 cm.

Petrographic Description: Brian Mason
Chondrules are few and ill-defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. Accessory merrillite was identified with the microprobe. Fusion crust, up to 0.5 mm thick, rims part of the section. Minor weathering is indicated by limonitic staining around the nickel-iron grains. Microprobe analyses gave the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{11}. The meteorite is classified as an H6 chondrite.

Sample No.: ALHA79029 Location: Allan Hills
Field No.: 1099
Weight (gms): 505.5
Meteorite Type: H5 Chondrite

Physical Description: Carol Schwarz
Sample has very thin patchy fusion crust on four of six surfaces. Where the fusion crust has been worn away, the surfaces are dark reddish-brown in color. The entire meteorite has an iridescent sheen. Several large penetrating fractures are obvious. Chipping revealed a weathered reddish-brown interior. Only a small ($5mm^2$) area is less severely weathered.

Dimensions: 10 x 7 x 4.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well-developed, with chondrules ranging from 0.3-1.5 mm in diameter. The chondrules are set in a granular groundmass of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Weathering is extensive, with brown limonite pervading the section. Microprobe analyses give olivine composition Fa_{18}, orthopyroxene Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79031 Location: Allan Hills
Field No.: 1178
Weight (gms): 2.7
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
The stone is totally weathered.

ALHA79031 and ALHA79032 are probably the same meteorite based on field notes and hand specimen observation.

Dimensions: 2.0 x 1.5 x 0.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is fairly well-developed, with chondrules ranging up to 1.5 mm across. The chondrules are set in a matrix of fine-to medium-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. Weathering is extensive, the section being pervaded with red-brown limonite. Microprobe analyses gave the following compositions: olivine, Fa_{16}; pyroxene, Fs_{14}; accessory merrillite was identified with the microprobe. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79033 Location: Allan Hills
Field No.: 1170
Weight (gms): 208.8
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
All except one surface (which is a fracture surface) are covered with dull black to brown fusion crust. The fracture surface has weathered to a reddish-brown color, but several millimeter size inclusions are apparent on this surface. A 1 mm to 5 mm thick weathering rind is visible in the interior of this meteorite. The material exposed through chipping is light-gray in color with darker gray colored inclusions and mottled with reddish-brown oxidation. Metal is apparent but most of it has oxidation haloes around them.

Dimensions: 7.5 x 6.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, their margins merging with the granular groundmass, which consists largely of olivine and pyroxene with minor amounts of plagioclase, nickel-iron, and troilite. Fusion crust up to 0.6 mm thick is present along one edge. There is a moderate degree of weathering, shown by limonitic staining around nickel-iron grains. Microprobe analyses show olivine (Fa_{24}), pyroxene (Fs_{20}), and plagioclass (An_{10}) of uniform composition. The meteorite is classified as an L6 chondrite.

Sample No.: ALHA79036 Location: Allan Hills
Field No.: 1155
Weight (gms): 20.2
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Five surfaces are covered with a brown and black fusion crust. One fracture surface is mainly weathered but the clastic nature of this stone is still obvious. Chipping revealed a light gray colored interior with many clasts that has a 1-2 mm thick weathering rind.

Dimensions: 3.5 x 2 x 1 cm.

Petrographic Description: Brian Mason
Chondrules are prominent, ranging up to 1.5 mm across, but their margins tend to be diffuse and merge with the granular groundmass, which consists largely of olivine and pyroxene with minor amounts of nickel-iron and troilite. Fusion crust, up to 1 mm thick, rims one edge of the section. The meteorite is moderately weathered, with red-brown limonite filling voids in the fusion crust and limonitic staining around nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79038 Location: Allan Hills
Field No.: 1158
Weight (gms): 49.6
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Patches of black fusion crust appear on one surface. The rest of the stone has been weathered to a deep reddish-brown color. No unweathered material was exposed when the sample was chipped.

Dimensions: 5 x 3.5 x 1 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-1.2 mm across. They are set in a granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Fusion crust, up to 0.5 mm thick, rims one edge of the section. Weathering is extensive, with brown limonitic staining throughout the section. Microprobe analyses give the following compositions: olivine, Fa_{17}; pyroxene, Fs_{15}. The meteorite is classified as an H5 chondrite.

Sample No.: ALHA79039 Location: Allan Hills
Field No.: 1059
Weight (gms): 108.3
Meteorite Type: H4 Chondrite

Physical Description: Roberta Score
The top of this stone is concave while the bottom is flat. ALHA79039 is totally covered with a thin black fusion crust which the bottom surface has a blistery texture. Several fractures penetrate the interior of this meteorite. The interior material is mainly weathered though areas of light gray clastic material do exist.

Dimensions: 6 x 5 x 2.5 cm.

Petrographic Description: Brian Mason
Chondrules are abundant and well-developed, ranging from 0.3-1.5 mm in diameter. A variety of types is present, including granular and porphyritic olivine, barred olivine, and fine-grained radiating pyroxene. The groundmass consists largely of fine-grained olivine and pyroxene, with minor amounts of nickel-iron and troilite. Some of the pyroxene is polysynthetically-twinned clinobronzite. Brown limonitic staining pervades the section. Fusion crust, up to 1 mm thick, rims part of the section. Microprobe analyses show olivine (Fa_{16}) and pyroxene (Fs_{15}) of essentially uniform composition. The meteorite is classified as an H4 chondrite.

Sample No.: ALHA79045 Location: Allan Hills
Field No.: 1177
Weight (gms): 115.4
Meteorite Type: L3 Chondrite

Physical Description: Roberta Score
A small patch of weathered fusion crust is visible on one surface. What may be remnant fusion crust on two surfaces is iridescent reddish-brown. The remaining three surfaces have weathered to a dull reddish-brown in color but the clastic nature of this meteorite is highly visible. One particular inclusion is 4 mm in diameter and yellow in color. The interior of the stone revealed through chipping is totally weathered.

Dimension: 5.5 x 4.5 x 3 cm.

Petrographic Description: Brian Mason
The meteorite consists of a close-packed aggregate of chondrules (0.3-2.1 mm across) and irregular clasts (some of them chondrule fragments), with a relatively small amount of matrix material. Chondrule types include porphyitic and granular olivine and olivine-pyroxene, barred olivine, and fine-grained pyroxene. Some chondrules have black troilite-rich rims. Intergranular glass in chondrules may be transparent and pale brown, but is usually turbid and partly devitrified. Only a small amount of nickel-iron is present. Most of the pyroxene shows polysynthetic twinning. Brown limonitic staining pervades the section. Microprobe analyses show variable composition for both olivine and pyroxene: olivine, Fa_{2-38}, average Fa_{29}; pyroxene Fs_{2-29}, average Fs_{8}. The variability of olivine and pyroxene compositions indicates type 3, and the low metal content suggests L group, so the meteorite is tentatively classified as an L3 chondrite.

Sample No.: EETA79001 Location: Elephant Moraine
Field No.: 1043
Weight (gms): 7942.0
Meteorite Type: Shergottite

Physical Description: Roberta Score

All but one surface of this achondrite (22 x 17 x 14 cm.) is covered with black fusion crust, but there are areas on all surfaces where the fusion crust has been plucked away. One surface has a deep regmaglypt that is covered with fusion crust. The areas devoid of fusion crust are white-gray in color and the matrix appears porous. Veins (~0.5 mm wide) of dark material criss-cross each other. Whitish-yellow clasts (~3mm diameter) are scattered all over this achondrite. Most of the specimen appears very fine-grained but a small part near the E surface has a different lithology.

Sawing this meteorite exposed a light colored interior with rounded white clasts, as large as 0.5 cm in diameter. Several large black fine-grained clasts as large as 2.5 cm are scattered over the cut face. Some of these black clasts contain glass lined vugs. Upon chipping one of these clasts containing a vug, the entire clast popped out easily with no matrix adhering to the clasts. Numerous veins of black material criss-cross each other. Most of these veins run through a black clast. The longest vein is 14 cm long. Near the W end of the cut face are brownish colored clasts which may or may not be pyroxene. 90% of the cut face is fine-grained. 10% (near the E end) of the cut face consists of intergrown pyroxene and feldspar in a basaltic texture.

Petrographic Description: Arch Reid

Thin sections were cut from the three different lithologies: 1) the main mass of the meteorite; 2) the material with basaltic texture that is present at one end of the sample, and; 3) the dark clasts included in the main mass.

The main mass is a shocked but unbrecciated pyroxenite with pyroxene as the major phase but also containing maskelynite, Mg-Al chromite, iron sulphide and ilmenite(?). The major pyroxene is polysynthetically twinned pigeonite (?) (resembling twinned clinobronzite) ranging in composition from $Wo_5En_{70}Fs_{25}$ to $Wo_{12}En_{50}Fs_{38}$. Orthopyroxene forms the cores of larger pyroxene grains and ranges in composition from $Wo_{1.5}En_{83}Fs_{16}$ to $Wo_3En_{78}Fs_{19}$. The larger pyroxenes grains, up to 3.5 mm, comprise untwinned cores zoned outward to polysynthetically twinned rims. The smaller pyroxenes, .3 to 1 mm, are twinned clinopyroxenes and are intergrown with maskelynite laths. The maskelynite ranges in composition from $Or_1Ab_{39}An_{60}$ to $Or_{1.5}Ab_{44}An_{55}$. A few large olivines, Fo_{77} to Fo_{73} range up to 2.5 mm.

The less abundant lithology closely resembles Shergotty in texture but is finer grained. The major minerals are clinopyroxene and maskelynite: calcium phosphate, SiO_2, ilmenite (?) and magnetite (?) are also present. Elongate clinopyroxene and laths of maskelynite are about one mm long and generally subparallel: many of the maskelynite grains contain pyroxene inclusions. Analysed pigeonites range from $Wo_{10}En_{52}Fs_{38}$ to $Wo_{18}En_{15}Fs_{67}$. The maskelynite also shows a range in composition from $Or_{.5}Ab_{38}An_{62}$ to $Or_4Ab_{50}An_{46}$.

The dark clasts are apparently loci of melting; in many cases they connect with the thin black glassy (?) veinlets that traverse much of the meteorite. Thin sections from these dark areas show glass (with relict olivine, pyroxene and maskelynite inclusions), devitrified glass, areas with mosaic texture and vesicular areas with quench textures. The dark areas appear to be more common in olivine-bearing portions of the main mass.

The meteorite is classed as a shergottite because of the close similarities to the shergottites in texture and mineralogy. Both lithologies however are distinct from Shergotty and Zagami.

Sample No.: EETA79002 Location: Elephant Moraine
Field No.: 1206
Weight (gms): 2843.0
Meteorite Type: Diogenite

Physical Description: Roberta Score
This rounded meteorite has dull black fusion crust on all surfaces except for one which is a fracture surface. Fusion crust has been plucked away in places revealing a medium-gray colored matrix with many light to cream colored clasts (~.5 cm diameter). Several areas have been heavily oxidized giving these patches a red-brown color. Many fractures penetrate this meteorite.

Chipping this sample revealed an extensive orange-brown weathering rind as wide as 1 cm. The interior matrix is blue-gray in color with many small (<1mm) clasts. Two white clasts 0.5 cm diameter were exposed. No metal was obvious.

Dimensions: 15 x 13.5 x 10 cm.

Petrographic Description: Arch Reid
The one thin section cut from the meteorite is a breccia with a very cohesive fine grained matrix. Clasts are monomineralic, angular and range up to 2 mm. One angular lithic clast is polymineralic but extremely fine grained. The vast majority of the mineral fragments are low calcium pyroxenes of near constant composition, $Wo_2En_{76}Fs_{22}$. The only other silicate phase identified was olivine, Fo_{75-76}. Small areas within the breccia are rich in very fine opaque minerals. The meteorite is a diogenite but is texturally distinct from the common diogenites.

Sample No.: EETA79003 Location: Elephant Moraine
Field No.: 1033
Weight (gms): 435.6
Meteorite Type: L6 Chondrite

Physical Description: Carol Schwarz
Specimen is covered with a thin, shiny black fusion crust which is pitted and weathered in some areas. A few small (1-2 mm) rounded gray clasts are visible in the areas devoid of fusion crust. The interior material is friable and with numerous oxidation haloes. Metal is visible.

Dimentions: 7.5 x 6 x 5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists mainly of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase, and accessory chromite. Minor limonitic alteration is present around 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.

Sample No.: EETA79004 Location: Elephant Moraine
Field No.: 1037
Weight (gms): 390.3
Meteorite Type: Eucrite

Physical Description: Roberta Score
Dimensions: 11 x 6.5 x 4 cm.

This oblong achondrite is covered with a thin dull fusion crust on all but two surfaces. The exterior matrix appears medium to dark gray in color and contains numerous clasts as large as 2 cm in diameter. Most of the larger clasts are dark in color though light colored clasts do exist. Vugs are apparent in this meteorite. Most are concentrated on surface in an area devoid of fusion crust. These vugs are as deep as 1 cm, as wide as 0.5 cm.

The interior matrix is light gray in color with many inclusions. The one clast seen on the exterior extends 2.0x0.8 cm into the interior and appears to be easily plucked out. Many of the clasts in this achondrite will be easily plucked out. Several spots of severe oxidation are visible.

Petrographic Description: Arch Reid
Thin section shows a breccia dominantly made up of pyroxene and feldspar fragments in a fine-grained matrix. Much of the matrix is dark, fine-grained and may be recrystallized. The clasts are generally angular but some have less well-defined outlines and may have undergone reheating. Mineral fragments range up to 1.3 mm and comprise pyroxene (some showing exsolution), feldspar and less common opaques. Angular lithic clasts include fragments of very fine grained eucrite (2-5 mm), fine grained eucrite, and dark aphanitic material (1.6 mm). Pyroxene compositions show a range in Ca contents with little variation in Mg/Fe ($Wo_2En_{45}Fs_{53}$ to $Wo_{40}En_{36}Fs_{24}$ with low Ca compositions most abundant, in the few grains analysed). Feldspars analysed range from $Or_1Ab_8An_{93}$ to $Or_1Ab_{14}An_{85}$. The meteorite is classed as a eucrite.

Sample No.: EETA79005 Location: Elephant Moraine
Field No.: 1046
Weight (gms): 450.9
Meteorite Type: Polymict Eucrite

Physical Description: Roberta Score
One surface of this achondrite is concave while the rest of the meteorite is convex. Fusion crust is visible only on one surface and it is very shiny and polygonally fractured. The matrix is medium gray in color and is speckled with light and dark clasts; the largest being 3 mm in diameter. Vugs are apparent all over the sample.

Chipping a corner off the meteorite revealed one fine-grained black clast ~0.5 cm in diameter. The color of the interior matrix is considerably lighter gray in color than the exterior.

Dimensions: 10.5 x 8 x 7 cm.

Petrographic Description: Arch Reid
The meteorite is a fine breccia of pyroxene and feldspar fragments with also a large number of small lithic clasts. The matrix is very fine grained; individual mineral fragments range up to 1.2 mm. Larger mineral fragments show evidence of deformation and some pyroxene grains show exsolution. Clast types include: 1) small dark aphanitic clasts, up to .7 mm; 2) fine grained eucrite fragments up to 1 mm, the most common clast type, and; 3) recrystallized eucrite, one clast 2.1 mm. There are also a few small fragments of brown devitrified glass. The pyroxenes analysed are all pigeonites, $Wo_7En_{59}Fs_{34}$ to $Wo_{14}En_{35}Fs_{52}$, with a range of Ca contents and Mg/Fe ratios. Feldspars range from $Or_{.1}Ab_4An_{96}$ to $Or_{.7}Ab_{16}An_{83}$. No very high Mg pyroxenes were found and the meteorite is a polymict eucrite or a howardite.

Sample No.: EETA79006 Location: Elephant Moraine
Field No.: 1042
Weight (gms): 716.4
Meteorite Type: Howardite

Physical Description: Roberta Score
Dull to shiny black fusion crust appears on only part of one surface on this achondrite. Many vugs are apparent, some of which have clasts in their interior. The medium gray matrix contains a variety of clasts (dark gray, yellow, white colored clasts), the largest being 1 cm in its longest dimension. Several rounded spots of oxidation are obvious and several cracks appear to penetrate the sample.

Dimensions: 14 x 8.5 x 4.5 cm.

Petrographic Description: Arch Reid
The thin section shows a fine breccia with angular pyroxene and feldspar fragments and less common opaques. The larger pyroxene fragments up to 1 mm are commonly deformed and some show exsolution. There are a variety of clast types and these include the following: 1) small eucritic fragments with fine grain size, clasts up to 2 mm; 2) polymineralic pyroxene-feldspar intergrowths; 3) fragments of brown devitrified glass, up to 1 mm; 4) one fragment, 2 mm, with feldspar >>pyroxene; 5) one fragment, 2 mm, with pyroxene >>feldspar, and; 6) one 4.5 mm recrystallized eucrite clast with mosaic texture. Analysis of pyroxenes yields a wide range of compositions from $Wo_1En_{80}Fs_{19}$ to $Wo_{15}En_{28}Fs_{57}$. The meteorite contains a variety of clast types and a wide range of pyroxene compositions and is classed as a howardite.

Sample No.: EETA79007 Location: Elephant Moraine
Field No.: 1008;1000
Weight (gms): 199.9
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
When this meteorite was received in the lab, it was numbered as two individual samples. Since these pieces fit together perfectly, they have been renumbered as one specimen. Black fusion crust covers all surfaces except for a few areas where it has broken off. The area where the stone was cracked into two pieces has a 5 mm thick weathering rind and many chondrules are obvious. The small area exposed by chipping for a thin section piece is gray in color with reddish-brown oxidation mottled throughout.

Dimensions: 8 x 4.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondrules, 0.3-1.2 mm across, are abundant; many of them are broken and fragmented. They are set in a granular matrix consisting largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Remnants of fusion crust, up to 0.4 mm thick, rim one edge of the section. A moderate degree of weathering is indicated by brown limonitic staining concentrated below the fusion crust and around the nickel-iron grains. Microprobe analyses give the following compositions; olivine, Fa_{18}; pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: EETA79009 Location: Elephant Moraine
Field No.: 1049;1044
Weight (gms): 140.3
Meteorite Type: L5 Chondrite

Physical Description: Roberta Score
When this meteorite was received in the lab, it was numbered as two individual specimens, consisting of three pieces. Since all three pieces fit together perfectly, they have been renumbered as one sample. Dull black fusion crust covers most of the stone. The interior of this meteorite is whitish-gray in color with a weathering rind as much as 4 mm thick. Oxidation exists as haloes throughout the broken surface, fine-grained dark gray colored inclusions are numerous. One tabular inclusion is 1.4 cm in its longest dimension.

Dimensions: 6 x 5 x 3 cm.

Petrographic Description: Brian Mason
Chondrules are moderately abundant, but many are deformed and fragmented. The matrix consists of fine-grained olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite; much of the nickel-iron and troilite is finely dispersed throughout the silicates, possibly a shock effect. Brown limonitic staining pervades much of the section. Microprobe analyses give the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}. The meteorite is classified as an L5 chondrite.

Sample No.: EETA79010 Location: Elephant Moraine
Field No.: 1045
Weight (gms): 287.3
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
The exterior of this meteorite has been weathered to a brownish-yellow to reddish-brown color. Only one small patch ($3cm^2$) of black fusion crust exists. The exterior surface appears clastic. The interior matrix is whitish-gray in color with reddish-brown oxidation scattered throughout. A small weathering rind was noted.

Dimensions: 8.5 x 6 x 4 cm.

Petrographic Description: Brian Mason
Chondrules are barely discernable, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene and minor amounts of maskelynite, nickel-iron, and troilite. A minor degree of weathering is shown by brown limonitic staining around some metal grains. Microprobe analyses gave the following compositions: olivine, Fa_{24}; pyroxene, Fs_{20}; the maskelynite has the CaO content of oligoclase,but the NaO content is low and variable, 4.9-6.3%. The meteorite is classified as an L6 chondrite.

Sample No.: EETA79011 Location: Elephant Moraine
Field No.: 1040
Weight (gms): 86.4
Meteorite Type: Polymict Eucrite

Physical Description: Roberta Score
A patch of dull black fusion crust appears only on one surface. The rest of this achondrite is medium-gray in color. Several types of clasts are visible on the exterior with the largest one being ~0.7 cm in its longest dimension.

The interior revealed through chipping is lighter gray in color than the exterior and contains many clasts.

This achondrite looks similar to other eucrites already processed from 1979, 1978 and 1977 collection.

Petrographic Description: Arch Reid
The thin section shows a fine breccia with highly angular small monomineralic pyroxene and feldspar clasts predominating. Pyroxene grains range up to 2.5 mm with the large fragments showing evidence of deformation. Some single pyroxene fragments show exsolution textures. Among the small lithic clasts present are included: 1) fragments of brown devitrified glass, up to 1.6 mm; 2) fine grained eucrite clasts with granoblastic texture, up to .6 mm; 3) fine grained eucrite fragments, up to .7mm and; 4) medium grained eucrite up to 1.6 mm. Pyroxenes have a range of compositions from $Wo_4En_{67}Fs_{30}$ to $Wo_2En_{37}Fs_{61}$. The more magnesian pyroxenes all have low Ca contents but the more Fe-rich varieties range from $Wo_2En_{37}Fs_{61}$ to $Wo_{35}En_{27}Fs_{38}$. Feldspar ranges in composition from $Or_{.2}Ab_7An_{93}$ to $Or_{.5}Ab_{19}An_{80}$. The meteorite is classified as a polymict eucrite or a howardite.

Sample No.: RKPA79001 Location: Reckling Peak
Field No.: 1200
Weight (gms): 3006.0
Meteorite Type: L6 Chondrite

Physical Description: Carol Schwarz
A small amount of ice was noticed when this meteorite was unpacked. This is not a complete specimen. Thin shiny black fusion crust appears as small patches on each surface. The rest of the surfaces are fractured and rough and yellowish-brown in color. Chondrules can be distinguished, most are small and tan in color but the largest one seen is 6 mm in diameter. Several indentations in the surfaces indicate chondrules may have been plucked out. There is a vein (1-3 mm wide) of dark material on one surface, probably indicating weathering along a fracture. Fractures are numerous, making the meteorite friable. A small amount of white powder deposit is visible on the fusion crust. The interior matrix is light gray to yellow in color. No metal is visible, oxidation exists as haloes. Gray and cream-colored chondrules ~2 mm in diameter were exposed.

RKPA79001 and RKPA79002 may be pieces of a single meteorite.

Dimensions: 20 x 12 x 8 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists of olivine and pyroxene with minor amounts of maskelynite, nickel-iron, and troilite. There is a minor amount of limonitic staining around the nickel-iron grains. Microprobe analyses show olivine (Fa_{24}) and orthopyroxene (Fs_{20}) of uniform composition; the maskelynite has CaO content (2.2%) appropriate to oligoclase composition, but has deficient and variable Na_2O content (4.3-5.2%). The meteorite is classified as an L6 chondrite. It resembles RKPA78001 and 78003 in all respects, and may be another stone from a single fall.

Sample No.: RKPA79002 Location: Reckling Peak
Field No.: 1201
Weight (gms): 203.6
Meteorite Type: L6 Chondrite

Physical Description: Roberta Score
Dull black fusion crust covers parts of three surfaces. One surface is highly polished in the areas where the fusion crust is. Clasts as large as 3 mm in diameter are visible on the exterior and are identical to those seen in RKPA79001. The surface devoid of fusion crust has weathered to brownish-yellow and reddish-brown color. These areas are rough in texture. The interior matrix is whitish-gray in color with oxidation haloes scattered throughout. A small weathering rind was noted.

RKPA79001 and RKPA79002 may be pieces of a single meteorite.

Dimensions: 8.5 x 5.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of maskelynite, nickel-iron, and troilite; accessory chromite was noted. Veins up to 2 mm thick of fine-grained material appear to contain ringwoodite and majorite. The meteorite is somewhat weathered, with brown limonitic staining in association with nickel-iron grains. Microprobe analyses give the following composition: olivine, Fa_{24}; pyroxene, Fa_{20}; the maskelynite has CaO (2.3%) appropriate to oligoclase composition, but Na_2O is low and variable (3.6-6.9%). The meteorite is classified as an L6 chondrite.

Sample No.: RKPA79003 Location: Reckling Peak
Field No.: 1185
Weight (gms): 182.2
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Black fusion crust totally covers all surfaces of this semi-rounded stone. Small areas where the fusion crust has been plucked off reveal a reddish-brown matrix with many inclusions. Numerous attempts to obtain a fresh chip for thin sections failed. Several small exterior chips which may or may not be representative of this stone were obtained. The chips obtained look granular in texture and reddish-brown in color and contain fusion crust.

Dimensions: 7 x 4.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, being barely distinguishable from the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, plagioclase, and troilite. Weathering is indicated by moderate limonitic staining around metal grains, and some small areas of brown limonite. Microprobe analyses gave the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{12}. The meteorite is classified as an H6 chondrite.

Sample No.: RKPA79004 Location: Reckling Peak
Field No. : 1001, 1002, 1003, 1007, 1009, 1047
Weight (gms): 370.9
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
When the Reckling Peak pebbles were brought out to be initially processed, it was found that six stones appeared identical. Field notes state that they were found close to each other. Therefore they have been renumbered as one specimen. All six stones have the same black-brown fusion crust on at least one surface. No stone was totally covered with fusion crust, but two stones have fusion crust on a fracture surface indicating the meteorite broke up in the atmosphere upon entry. The fracture surfaces have all weathered to a reddish-brown color and have a uniform pitted surface where chondrules and clasts have been plucked away. Numerous chondrules are obvious from 3 mm to<<1 mm in diameter. The interiors of the pebbles are mostly weathered with some gray colored material existing.

Petrographic Description: Brian Mason
Three sections were examined, made from different pieces of this meteorite. No significant differences were noted, and they are described as a single sample. Chondritic structure is well defined, but the margins of the chondrules are diffuse and tend to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite; a little plagioclase is present, as small grains not easily discerned. Weathering is indicated by brown limonitic staining throughout the sections. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{13}. The meteorite is classified as an H5 chondrite.

Sample No.: RKPA79008 Location: Reckling Peak
Field No.: 1183
Weight (gms): 73.0
Meteorite Type: L3 Chondrite

Physical Description: Roberta Score
Black fusion crust covers 50% of this stone. Areas devoid of fusion crust are greenish-black in color and extremely clastic. Numerous clasts (rounded and irregular in shape) exist in the 1 mm to 2 mm size fraction. These range in color from cream to black. Two larger clasts (0.7 cm and 1.5 cm in longest dimension) are visible and are cream colored. The interior matrix is medium to dark gray in color.

Dimensions: 5 x 3.5 x 3.5 cm.

Petrographic Description: Brian Mason
Chondrules are abundant, ranging from 0.3-1.8 mm in diameter; a wide variety of types is present, the commonest being granular olivine and olivine-pyroxene, barred olivine, and fine-grained pyroxene. The granular chondrules have intergranular glass, sometimes pale brown and transparent, but commonly turbid and partly devitrified. Irregular clasts, probably chondrule fragments, are also present. Some of the pyroxene in the chondrules is polysynthetically twinned clinoenstatite or clinobronzite. The matrix is fine-grained olivine and pyroxene, with minor subequal amounts of nickel-iron and troilite. Remnants of fusion crust, up to 0.3 mm thick, are present along one edge. Minor weathering is indicated by brown limonitic staining in association with the fusion crust and the nickel-iron grains. Microprobe analyses show that most of the olivine has composition Fa_{23}, but a range of composition Fa_{1-29} is present; pyroxene composition is variable, Fs_{2-28}, average Fs_{15}. The meteorite is classified as an L3 chondrite.

Sample No.: RKPA79009 Location: Reckling Peak
Field No.: 1048
Weight (gms): 55.0
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Stone is completely covered with brown and black fusion crust. No unweathered material was exposed during processing.

Dimensions: 4 x 3 x 2 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. Weathering is extensive, with veins and patches of red-brown limonite throughout the section. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}; plagioclase, An_{13}. The meteorite is classified as an H6 chondrite.

Sample No.: RKPA79012 Location: Reckling Peak
Field No.: 1202
Weight (gms): 12.8
Meteorite Type: H6 Chondrite

Physical Description: Roberta Score
Stone is totally covered with black and brown fusion crust. Several cracks penetrate the meteorite. The interior of the stone has a 0.5 cm thick weathering rind. Only a small amount of gray-colored unweathered material exists.

Dimensions: 2.5 x 2 x 1 cm.

Petrographic Description: Brian Mason
Chondrules are sparse and poorly defined, tending to merge with the granular groundmass, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron, troilite, and plagioclase. Fusion crust, up to 0.6 mm thick, rims much of the section. The meteorite shows a moderate degree of weathering indicated by brown limonitic material concentrated in the fusion crust and around nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{18}, pyroxene, Fs_{16}; plagioclase, An_{13}. The meteorite is classified as an H6 chondrite.

Sample No.: RKPA79013 Location: Reckling Peak
Field No.: 1187
Weight (gms): 11.02
Meteorite Type: L5 Chondrite

Physical Description: Roberta Score
Stone is totally covered with dull brown and black fusion crust. Chipping exposed mostly weathered material. Two inclusions are visible, both are rounded 2 mm in diameter, and gray in color.

Dimensions: 2.5 x 1 x 1.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-2.2 mm across. Fusion crust, up to 0.5 mm thick rims most of the section. Brown limonitic staining pervades the section, and is concentrated around the nickel-iron grains and below the fusion crust. Microprobe analyses give the following compositions: olivine, Fa_{23}; pyroxene, Fs_{20}; accessory merrillite was identified with the microprobe. The meteorite is classified as an L5 chondrite.

Sample No.: RKPA79014 Location: Reckling Peak
Field No.: 1203
Weight (gms): 77.7
Meteorite Type: H5 Chondrite

Physical Description: Roberta Score
Sample is totally covered with a black fusion crust. Several cracks penetrate the sample. The interior is mainly weathered with only a small area being unweathered and light gray in color.

Dimensions: 4 x 3 x 3.5 cm.

Petrographic Description: Brian Mason
Chondritic structure is well developed, with chondrules ranging from 0.3-1.2 mm across. The chondrules are set in a granular matrix, which consists largely of olivine and pyroxene, with minor amounts of nickel-iron and troilite. Fusion crust, up to 0.5 mm thick, rims part of the section. Considerable weathering is indicated by red-brown limonite filling voids in the fusion crust and by limonitic staining around nickel-iron grains. Microprobe analyses give the following compositions: olivine, Fa_{18}; pyroxene, Fs_{16}. The meteorite is classified as an H5 chondrite.

Sample No.: RKPA79015 Location: Reckling Peak
Field No.: 1180
Weight (gms): 10022.0
Meteorite Type: Iron with silicate (orthopyroxene?) inclusions

Physical Description: Roberta Score
The overall color of this meteorite is deep reddish-brown. Many greenish-brown, platey silicate inclusions as large as 1.2 cm are obvious. The dimensions of this sample are ∿26 x 18.5 x 13 cm.

Petrographic Description: Arch Reid
The meteorite is an iron with slightly weathered exterior in which are set silicate fragments about 5 mm in average size. The most common fragments of this type are greenish single crystals showing cleavage that are probably orthopyroxenes. These silicate fragments appear to be present throughout the meteorite. To confirm their presence in the interior a ∿.5 cm slice was cut from a protruding portion (slice is triangular, approximately 4 x 2.5 cm). The major portion of the slice is kamacite with lesser taenite. Approximately ten percent of the interior consists of ellipsoidal to subangular inclusions which are dominantly troilite, silicate, or troilite plus silicate. The silicate has the composition of a magnesian orthopyroxene:in the largest inclusion, a second phase may be intergrown with the pyroxene. Other phases present include chromite and schreibersite. The composition of the pyroxene has not been accurately determined but is estimated to be around Wo_2 $En_{73}Fs_{25}$. The meteorite is an iron with abundant silicate inclusions.

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