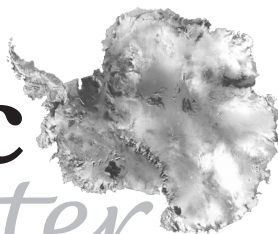


Antarctic Meteorite Newsletter



Volume 22, Number 2

August 1999



Program News

New Meteorites

Marilyn Lindstrom

This newsletter contains classifications of 274 new meteorites from the 1997 and 1998 ANSMET collections. Descriptions are given for 9 meteorites; 3 eucrites, 2 aubrites, 2 carbonaceous chondrites and 2 unequilibrated or unusual ordinary chondrites. The most interesting are GRA98098, an unbrecciated eucrite with cross-cutting veins, and QUE97186, a CV3 chondrite. The two aubrites, while not particularly small (50 g each), are unfortunately quite weathered. More new meteorites from the 1998 collection will be described next newsletter, as well as numerous LL5 chondrites from the 1997 collection.

Smithsonian's Dept. of Mineral Sciences Relocates

Tim McCoy

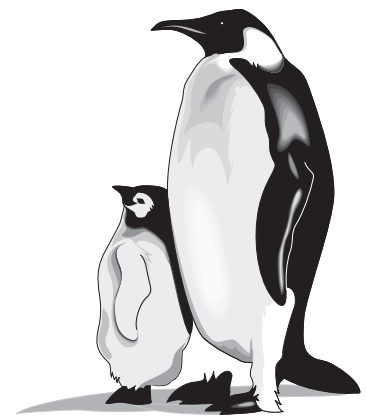
In 2000, the Smithsonian's Dept. of Mineral Sciences will move into temporary quarters to allow renovation of the heating, ventilation and air conditioning systems in the department. We anticipate that the move out of our department will occur during Jan.-Feb., 2000, and the return move in Jan.-Feb., 2001. We will move the entire meteorite collection and the electron microprobe. Description of Antarctic meteorites should occur without noticeable disruption. During the time the collection is being physically moved between the department and our temporary quarters, no meteorites will be distributed from the Smithsonian collection. Any requests for meteorites which will be needed before March 31, 2000, including those for the Lunar and Planetary Science Conference, must be received by November 15, 1999. Any requests received after that date will likely not be filled until well into 2000.

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

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

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**Sample Request Deadline
September 3, 1999**

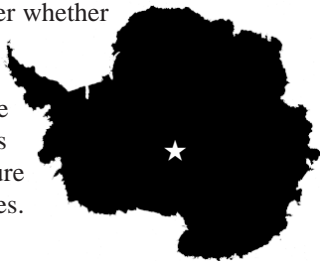
**MWG Meets
September 17-18, 1999**



Upcoming ANSMET Field Season Update

Ralph Harvey

Several icefields in the Walcott N ev  region are the major target of the 1999-2000 ANSMET season. This region, between the Beardmore and Law Glaciers, has produced numerous meteorites from the Lewis Cliff, MacAlpine Hills, and Queen Alexandra icefields. In addition to systematic searches of these areas, the team will conduct recon-naisance of the Geologists and Miller Ranges to discover whether they are suitable choices for future searches.



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New MWG Chair and Secretary

Marilyn Lindstrom

In March Ursula Marvin stepped down as MWG chair after two terms of superb leadership of the committee. Her association with the Antarctic Meteorite Program began with helping to establish the unique collaboration between three government agencies (NSF-NASA-SI) and included early service as a MWG committee member. She also participated in two ANSMET expeditions to collect meteorites. As MWG chair she deftly guided the committee through numerous debates and assisted NASA and NSF in the programs that responded to the announcement of possible fossil life in one of our martian meteorites. Her gentle but firm guidance will be missed. Meanwhile Greg Herzog has taken over as the new chairman whose experience and humor will lead us into the new millennium.

Further changes occurred as Faith Vilas recently resigned as MWG secretary and was replaced by Kinberly Cyr, a planetary scientist from the University of Arizona who studied water in the solar nebula.

NIPR Collects 4100 Meteorites!

Marilyn Lindstrom

Our colleagues in the meteorite department at NIPR in Tokyo resumed Antarctic meteorite collection in a big way by recovering 4100 meteorites. The field party led by Hideyasu Kojima left Japan late in 1997, wintered at Syowa Station in Antarctica, then collected meteorites beginning in October 1998. The team returned in spring of 1999. The 4100 meteorites were collected mostly from the Yamato Mountains, with another 21 from the Belgica Mountains. NIPR will return to Antarctica this fall for another extended expedition led by Dr. Naoya Imae.

Initial results of the collection were presented in June at the NIPR Symposium on Antarctic Meteorites at which the Smithsonian and NASA curators and the new MWG Chairman were guests of NIPR. Although the new meteorites are not yet available, watch for classifications and instructions on how to request meteorites in future issues of *Meteorites News* which is published by NIPR. Inquiries and requests for all Japanese Antarctic meteorites should be addressed to:

Dr. Hideyasu Kojima
Antarctic Meteorite Research Center
National Institute of Polar Research
9-10 Kaga 1-chome, Itabashi-ku, Tokyo 173-8515, Japan
Ph (81) 03-3962-2938; FAX (81) 03-3962-5711

New Meteorites

From 1997-1998 Collection

Pages 4-12 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 22(1), Feb. 1999. Specimens of special petrologic type (carbonaceous chondrite, unequilibrated ordinary chondrite, achondrite, etc.) are represented by separate descriptions unless they are paired with previously described meteorites. However, some specimens of non-special petrologic type are listed only as single line entries in Table 1. For convenience, new specimens of special petrological type are also recast in Table 2.

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

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

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

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

Antarctic Meteorite Locations

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

STE — Stewart Hills
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range
WSG — Mt. Wisting

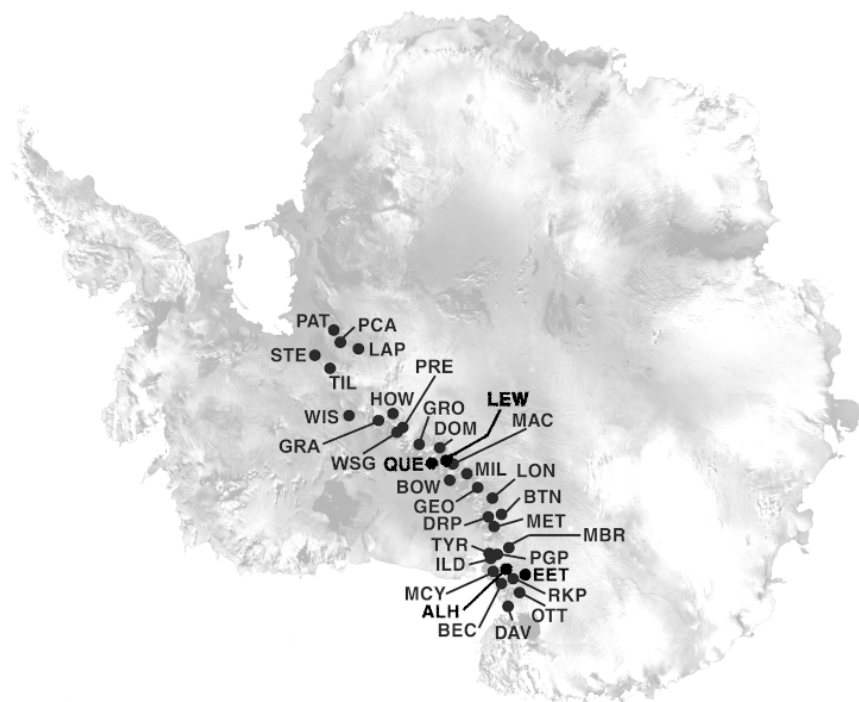


Table 1: List of Newly Classified Antarctic Meteorites**

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|----------------|------------|------------|------|------|
| GRO 95 659 | 6.9 | H6 CHONDRITE | B | B | 19 | 17 |
| QUE 97 150 ~ | 0.6 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 151 ~ | 1.6 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 152 ~ | 0.3 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 153 ~ | 7.5 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 154 ~ | 9.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 155 ~ | 27.2 | LL5 CHONDRITE | A | A | | |
| QUE 97 156 ~ | 6.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 157 ~ | 4.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 158 ~ | 45.2 | LL5 CHONDRITE | B/C | A/B | | |
| QUE 97 159 ~ | 0.7 | LL5 CHONDRITE | B | B | | |
| QUE 97 160 ~ | 32.3 | LL5 CHONDRITE | B | B/C | | |
| QUE 97 161 ~ | 1.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 162 ~ | 4.8 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 163 ~ | 8.7 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 164 ~ | 11.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 165 ~ | 7.3 | LL5 CHONDRITE | B | B | | |
| QUE 97 166 ~ | 5.6 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 167 ~ | 2.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 168 | 24.8 | H3 CHONDRITE | C | B | 9-23 | 1-25 |
| QUE 97 169 | 15.2 | H5 CHONDRITE | C | A/B | 18 | 17 |
| QUE 97 170 ~ | 11.8 | LL5 CHONDRITE | A | A | | |
| QUE 97 171 ~ | 43.5 | LL5 CHONDRITE | A | A | | |
| QUE 97 172 ~ | 44.6 | LL5 CHONDRITE | A/B | B/C | | |
| QUE 97 173 ~ | 70.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 174 ~ | 58.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 175 ~ | 29.8 | LL5 CHONDRITE | A | A | | |
| QUE 97 176 ~ | 2.8 | LL5 CHONDRITE | A | A | | |
| QUE 97 177 ~ | 41.4 | LL5 CHONDRITE | A | A | | |
| QUE 97 178 ~ | 53.8 | LL5 CHONDRITE | A | A | | |
| QUE 97 179 ~ | 13.7 | LL5 CHONDRITE | B | B | | |
| QUE 97 180 ~ | 232.5 | LL5 CHONDRITE | B | B/C | | |
| QUE 97 181 ~ | 89.8 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 182 ~ | 109.7 | LL5 CHONDRITE | A | A | | |
| QUE 97 183 ~ | 83.9 | LL5 CHONDRITE | A | A | | |
| QUE 97 184 ~ | 134.9 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 185 ~ | 37.8 | LL5 CHONDRITE | B | B/C | | |
| QUE 97 186 | 72.7 | CV3 CHONDRITE | B | B | 0-31 | 1-2 |
| QUE 97 187 ~ | 2.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 188 ~ | 5.5 | LL5 CHONDRITE | A | A/B | | |
| QUE 97 189 ~ | 3.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 190 ~ | 59.2 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 191 ~ | 7.1 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 192 ~ | 3.9 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 193 ~ | 36.8 | LL5 CHONDRITE | C | B | | |
| QUE 97 194 | 4.6 | H5 CHONDRITE | C | B | 19 | 16 |
| QUE 97 195 ~ | 0.8 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 196 ~ | 4.0 | LL5 CHONDRITE | A/B | A/B | | |

~Classified by using refractive indices.

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|----------------|------------|------------|------|------|
| QUE 97 197 | 20.7 | H5 CHONDRITE | C | A/B | 19 | 17 |
| QUE 97 198 ~ | 1.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 199 ~ | 3.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 200 ~ | 20.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 201 ~ | 0.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 202 ~ | 30.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 203 ~ | 17.2 | LL5 CHONDRITE | B/C | B/C | | |
| QUE 97 204 ~ | 14.1 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 205 ~ | 14.6 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 206 ~ | 17.0 | LL5 CHONDRITE | B | B | | |
| QUE 97 207 ~ | 38.0 | LL5 CHONDRITE | B | B | | |
| QUE 97 208 | 38.2 | H5 CHONDRITE | C | CE | 19 | 17 |
| QUE 97 209 ~ | 17.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 210 ~ | 85.0 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 211 | 53.6 | H5 CHONDRITE | B | A/B | 18 | 17 |
| QUE 97 212 ~ | 4.8 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 213 ~ | 57.9 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 214 ~ | 8.1 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 215 | 10.9 | H5 CHONDRITE | C | B/C | 19 | 17 |
| QUE 97 216 ~ | 9.6 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 217 ~ | 9.9 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 218 | 18.6 | L5 CHONDRITE | A/B | A | 25 | 21 |
| QUE 97 219 ~ | 8.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 220 ~ | 4.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 221 ~ | 10.0 | LL5 CHONDRITE | B | B | | |
| QUE 97 222 ~ | 8.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 223 ~ | 4.6 | LL5 CHONDRITE | B | B | | |
| QUE 97 224 | 11.0 | H6 CHONDRITE | CE | C | 19 | 17 |
| QUE 97 225 ~ | 14.3 | LL5 CHONDRITE | B | B | | |
| QUE 97 226 | 34.9 | H5 CHONDRITE | B/C | B | 18 | 16 |
| QUE 97 227 ~ | 9.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 228 ~ | 1.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 229 ~ | 5.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 230 ~ | 11.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 231 ~ | 47.6 | LL5 CHONDRITE | B | B | | |
| QUE 97 232 | 86.3 | H5 CHONDRITE | C | CE | 18 | 16 |
| QUE 97 233 ~ | 39.3 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 234 ~ | 3.0 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 235 ~ | 17.2 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 236 ~ | 9.5 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 237 ~ | 1.1 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 238 ~ | 32.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 239 ~ | 1.2 | LL5 CHONDRITE | C | B | | |
| QUE 97 240 ~ | 12.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 241 ~ | 2.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 242 | 26.9 | H5 CHONDRITE | C | A/B | 18 | 16 |
| QUE 97 243 ~ | 46.9 | LL5 CHONDRITE | B/C | B/C | | |
| QUE 97 244 ~ | 9.6 | LL5 CHONDRITE | B | B/C | | |
| QUE 97 245 ~ | 7.0 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 246 ~ | 0.4 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 247 ~ | 50.7 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 248 ~ | 26.0 | LL5 CHONDRITE | B | B | | |

~Classified by using refractive indices.

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|----------------|------------|------------|------|------|
| QUE 97 249 ~ | 43.6 | LL5 CHONDRITE | A | A | | |
| QUE 97 250 ~ | 8.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 251 ~ | 0.9 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 252 ~ | 8.9 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 253 ~ | 31.9 | LL5 CHONDRITE | B/C | B/C | | |
| QUE 97 254 ~ | 3.6 | LL5 CHONDRITE | B | B | | |
| QUE 97 255 ~ | 0.4 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 256 ~ | 0.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 257 ~ | 6.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 258 ~ | 2.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 259 ~ | 0.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 260 ~ | 23.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 261 ~ | 47.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 262 ~ | 31.2 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 263 ~ | 23.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 264 ~ | 37.4 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 265 ~ | 15.5 | LL5 CHONDRITE | B/C | B/C | | |
| QUE 97 266 ~ | 28.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 267 ~ | 19.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 268 ~ | 36.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 269 ~ | 21.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 270 | 4.9 | H5 CHONDRITE | B/C | A | 18 | 16 |
| QUE 97 271 ~ | 1.8 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 272 ~ | 13.9 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 273 ~ | 2.8 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 274 ~ | 15.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 275 ~ | 61.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 276 ~ | 9.3 | LL5 CHONDRITE | A | A | | |
| QUE 97 277 ~ | 22.0 | LL5 CHONDRITE | A | A | | |
| QUE 97 278 ~ | 32.7 | LL5 CHONDRITE | A | A | | |
| QUE 97 279 ~ | 27.3 | LL5 CHONDRITE | A | A | | |
| QUE 97 280 ~ | 10.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 281 ~ | 23.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 282 ~ | 1.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 283 ~ | 37.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 284 ~ | 23.9 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 285 | 20.9 | H6 CHONDRITE | B/C | C | 20 | 17 |
| QUE 97 286 ~ | 58.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 287 ~ | 23.0 | LL5 CHONDRITE | B | B | | |
| QUE 97 288 ~ | 100.4 | L6 CHONDRITE | B/CE | B | | |
| QUE 97 289 | 51.9 | AUBRITE | C | C | | 0.1 |
| QUE 97 290 ~ | 129.8 | L6 CHONDRITE | B | A/B | | |
| QUE 97 291 ~ | 14.1 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 292 | 104.0 | H5 CHONDRITE | C | A/B | 18 | 16 |
| QUE 97 293 | 3.6 | LL6 CHONDRITE | B/C | B | 30 | 26 |
| QUE 97 294 | 14.9 | H5 CHONDRITE | B | A/B | 20 | 17 |
| QUE 97 295 | 2.2 | H6 CHONDRITE | C | A/B | 19 | 17 |
| QUE 97 296 ~ | 2.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 297 ~ | 2.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 298 ~ | 4.3 | LL5 CHONDRITE | B | B | | |
| QUE 97 299 | 1.8 | H5 CHONDRITE | C | B | 19 | 17 |
| QUE 97 300 ~ | 24.7 | LL5 CHONDRITE | A/B | B | | |

~Classified by using refractive indices.

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|----------------|------------|------------|------|------|
| QUE 97 301 ~ | 4.7 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 302 ~ | 4.7 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 303 ~ | 18.8 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 304 ~ | 0.8 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 305 ~ | 29.5 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 306 ~ | 3.8 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 307 ~ | 13.4 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 308 ~ | 5.8 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 309 ~ | 0.7 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 310 ~ | 7.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 311 ~ | 25.3 | LL5 CHONDRITE | B | B | | |
| QUE 97 312 ~ | 4.2 | LL5 CHONDRITE | B/C | B | | |
| QUE 97 313 ~ | 20.1 | LL5 CHONDRITE | B/C | B | | |
| QUE 97 314 ~ | 2.0 | LL5 CHONDRITE | B | B | | |
| QUE 97 315 ~ | 7.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 316 | 23.4 | LL6 CHONDRITE | A/B | B | 30 | 24 |
| QUE 97 317 | 7.6 | H5 CHONDRITE | C | B | 19 | 17 |
| QUE 97 318 ~ | 7.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 319 ~ | 2.0 | L6 CHONDRITE | C | B | | |
| QUE 97 320 | 12.1 | H5 CHONDRITE | C | A | 18 | 16 |
| QUE 97 321 ~ | 96.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 322 ~ | 0.7 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 323 ~ | 20.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 324 ~ | 46.9 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 325 ~ | 43.3 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 326 ~ | 12.2 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 327 ~ | 5.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 328 ~ | 6.3 | L6 CHONDRITE | B | B | | |
| QUE 97 329 ~ | 70.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 330 ~ | 27.8 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 331 | 36.7 | L5 CHONDRITE | B/C | B | 26 | 22 |
| QUE 97 332 ~ | 36.5 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 333 ~ | 11.5 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 334 ~ | 43.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 335 ~ | 9.7 | LL5 CHONDRITE | B | B | | |
| QUE 97 336 ~ | 1.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 337 | 16.7 | L6 CHONDRITE | C | B | 25 | 21 |
| QUE 97 338 ~ | 23.0 | L6 CHONDRITE | C | B | | |
| QUE 97 339 ~ | 7.5 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 340 ~ | 9.7 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 341 ~ | 21.7 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 342 | 177.0 | H5 CHONDRITE | C | B | 17 | 15 |
| QUE 97 343 | 76.2 | H5 CHONDRITE | B/C | B | 18 | 16 |
| QUE 97 344 ~ | 31.9 | LL5 CHONDRITE | B | B | | |
| QUE 97 345 ~ | 40.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 346 ~ | 130.2 | L6 CHONDRITE | B/C | B | | |
| QUE 97 347 ~ | 98.0 | L6 CHONDRITE | B/C | A/B | | |
| QUE 97 348 | 50.7 | AUBRITE | C | C | | 0.2 |
| QUE 97 349 ~ | 24.8 | LL5 CHONDRITE | B | B | | |
| QUE 97 350 | 71.2 | L6 CHONDRITE | B | A/B | 24 | 21 |
| QUE 97 351 ~ | 47.5 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 352 ~ | 9.1 | LL5 CHONDRITE | A/B | B | | |

~Classified by using refractive indices.

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|----------------|------------|------------|------|------|
| QUE 97 353 ~ | 25.0 | LL5 CHONDRITE | B | C | | |
| QUE 97 354 ~ | 20.1 | LL5 CHONDRITE | B | C | | |
| QUE 97 355 ~ | 15.0 | LL5 CHONDRITE | B | C | | |
| QUE 97 356 | 11.6 | H6 CHONDRITE | C | A | 18 | 16 |
| QUE 97 357 | 4.7 | H5 CHONDRITE | C | A/B | 19 | 16 |
| QUE 97 358 ~ | 8.9 | L6 CHONDRITE | C | A/B | | |
| QUE 97 359 ~ | 0.5 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 360 | 139.9 | L6 CHONDRITE | B/C | A/B | 24 | 20 |
| QUE 97 361 ~ | 14.1 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 362 ~ | 16.5 | L6 CHONDRITE | B/C | A/B | | |
| QUE 97 363 ~ | 73.3 | LL5 CHONDRITE | B | B/C | | |
| QUE 97 364 ~ | 28.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 365 ~ | 12.8 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 366 ~ | 85.6 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 367 ~ | 8.1 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 368 ~ | 13.8 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 369 ~ | 3.2 | LL5 CHONDRITE | B | A | | |
| QUE 97 370 ~ | 1.3 | LL5 CHONDRITE | B | B | | |
| QUE 97 371 ~ | 1.0 | L6 CHONDRITE | C | A/B | | |
| QUE 97 372 ~ | 0.7 | LL5 CHONDRITE | B | B | | |
| QUE 97 373 ~ | 5.4 | LL5 CHONDRITE | B | B | | |
| QUE 97 375 ~ | 4.2 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 376 ~ | 4.2 | LL5 CHONDRITE | B | B | | |
| QUE 97 377 ~ | 1.7 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 378 ~ | 1.3 | L6 CHONDRITE | A/B | B | | |
| QUE 97 379 ~ | 2.7 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 380 ~ | 31.9 | LL5 CHONDRITE | A/B | B | | |
| QUE 97 381 ~ | 2.8 | L6 CHONDRITE | B | B | | |
| QUE 97 382 ~ | 0.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 383 | 3.1 | H5 CHONDRITE | B | B | 18 | 16 |
| QUE 97 384 ~ | 28.6 | LL5 CHONDRITE | B | B | | |
| QUE 97 385 ~ | 12.5 | LL5 CHONDRITE | B | B | | |
| QUE 97 386 ~ | 21.5 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 387 ~ | 54.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 388 ~ | 3.5 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 389 ~ | 6.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 390 ~ | 64.9 | LL5 CHONDRITE | A | C | | |
| QUE 97 391 ~ | 21.5 | LL5 CHONDRITE | A | A | | |
| QUE 97 392 ~ | 25.3 | LL5 CHONDRITE | A | A | | |
| QUE 97 393 ~ | 7.3 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 394 ~ | 38.8 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 395 ~ | 54.5 | LL5 CHONDRITE | A | A | | |
| QUE 97 396 ~ | 16.8 | LL5 CHONDRITE | A | A/B | | |
| QUE 97 397 ~ | 75.8 | LL5 CHONDRITE | A | A/B | | |
| QUE 97 398 ~ | 44.1 | LL5 CHONDRITE | B | B | | |
| QUE 97 399 ~ | 31.2 | LL5 CHONDRITE | A | A/B | | |
| QUE 97 400 ~ | 34.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 401 ~ | 42.3 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 402 ~ | 43.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 403 ~ | 116.3 | LL5 CHONDRITE | A/B | A | | |
| QUE 97 404 ~ | 20.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 405 ~ | 20.5 | LL5 CHONDRITE | A/B | A/B | | |

~Classified by using refractive indices.

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|---------------|------------|------------------------|------------|------------|------|------|
| QUE 97 406 ~ | 16.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 407 ~ | 18.0 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 408 ~ | 29.6 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 409 ~ | 2.4 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 410 ~ | 25.6 | LL5 CHONDRITE | B | B | | |
| QUE 97 411 ~ | 5.5 | LL5 CHONDRITE | A | A | | |
| QUE 97 412 ~ | 0.8 | LL5 CHONDRITE | B | A/B | | |
| QUE 97 413 ~ | 3.0 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 415 ~ | 12.2 | LL5 CHONDRITE | A/B | B/C | | |
| QUE 97 417 ~ | 8.7 | LL5 CHONDRITE | A/B | A/B | | |
| QUE 97 418 ~ | 4.7 | LL5 CHONDRITE | B | B | | |
| QUE 97 419 ~ | 1.3 | LL5 CHONDRITE | B | B | | |
| GRA 98 001 | 7296.7 | H5 CHONDRITE | C | B/C | 19 | 17 |
| GRA 98 005 | 202.9 | C2 CHONDRITE | CE | B/C | 0-4 | 1-2 |
| GRA 98 006 | 163.7 | EUCRITE (BRECCIATED) | A/B | A | | 60 |
| GRA 98 033 | 123.2 | EUCRITE (BRECCIATED) | A/B | A | | 64 |
| GRA 98 098 | 779.2 | EUCRITE (UNBRECCIATED) | B | A | | 59 |

~Classified by using refractive indices.

****Notes to Tables 1 and 2:**

“Weathering” Categories:

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

“Fracturing” Categories:

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

Table 2: Newly Classified Specimens Listed By Type **

| Sample Number | Weight (g) | Classification | Weathering | Fracturing | % Fa | % Fs |
|--------------------------------|------------|------------------------|------------|------------|------|------|
| Achondrites | | | | | | |
| QUE 97 289 | 51.9 | AUBRITE | C | C | | 0.1 |
| QUE 97 348 | 50.7 | AUBRITE | C | C | | 0.2 |
| GRA 98 006 | 163.7 | EUCRITE (BRECCIATED) | A/B | A | | 60 |
| GRA 98 033 | 123.2 | EUCRITE (BRECCIATED) | A/B | A | | 64 |
| GRA 98 098 | 779.2 | EUCRITE (UNBRECCIATED) | B | A | | 59 |
| Carbonaceous Chondrites | | | | | | |
| QUE 97 186 | 72.7 | CV3 CHONDRITE | B | B | 0-31 | 1-2 |
| GRA 98 005 | 202.9 | C2 CHONDRITE | CE | B/C | 0-4 | 1-2 |
| Chondrites - Type 3 | | | | | | |
| QUE 97 168 | 24.8 | H3 CHONDRITE | C | B | 9-23 | 1-25 |

~Classified by using refractive indices.

Table 3: Tentative Pairings for New Specimens

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

AUBRITES

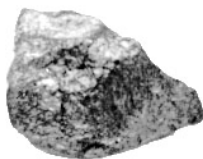
QUE 97348 with QUE 97289

Petrographic Descriptions

Sample No.: QUE 97 168
Location: Queen Alexandra
 Range
Dimensions (cm): 3.0x2.5x1.5
Weight (g): 24.75
Meteorite Type: H3 Chondrite
 (estimated 3.6)

Macroscopic Description: Kathleen McBride

The exterior of this ordinary chondrite is covered completely with smooth, shiny fusion crust, exhibiting numerous oxidation halos. The interior is mostly rust with abundant metal. There are mm-sized chondrules that are stained with rust and appear as small specks. This meteorite is very hard.



Thin Section (.2) Description: Tim McCoy

The section exhibits numerous well-defined chondrules (most ~0.5 mm in diameter), metal and troilite. Weak shock effects are present. Polysynthetically twinned pyroxene is abundant. Weathering is pervasive, with extensive staining. Silicates are unequilibrated; olivines range from Fa₉₋₂₃ and pyroxenes from Fs₁₋₂₅. The meteorite is probably an H chondrite of subtype ~3.6.

Sample No.: QUE 97 186
Location: Queen Alexandra
 Range
Dimensions (cm): 5.0x2.5x2.5
Weight (g): 72.712
Meteorite Type: CV3 Chondrite

Macroscopic Description: Kathleen McBride

The exterior of this carbonaceous chondrite has brown/black shiny fusion crust covering 100% of its surface area. It is fractured and has oxidation halos. The interior has a



dark matrix with some rust and metal. Irregularly shaped chondrules are light colored, stained with rust. Other inclusions appear rusty, tan and gray in color.

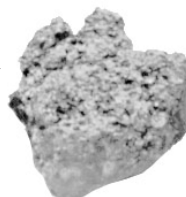
Thin Section (.2) Description: Tim McCoy

The section exhibits large chondrules (up to 3 mm) and CAIs in a dark matrix. Olivines range from Fa₁₋₃₁, with most Fa₁₋₅, and pyroxenes from Fs₁₋₂. The meteorite is an unequilibrated carbonaceous chondrite, probably a CV3.

Sample No.: QUE 97 289;
 97 348
Location: Queen Alexandra
 Range
Dimensions (cm): 4.5x3.0x2.0;
 5.0x3.0x2.0
Weight (g): 51.898; 50.749
Meteorite Type: Aubrite

Macroscopic Description: Kathleen McBride

This aubrite is extremely altered and is very rusty inside and out. It has small thin patches of fusion crust that comprise less than 5% of the surface area. It is very friable and crumbles easily. QUE97348 contains mm-sized inclusions.



QUE 97 289



QUE97348

Thin Section (.2) Description: Tim McCoy

The section consists of mm-sized enstatite grains (Fs_{0,1}), feldspar of variable composition (An₄₋₃₅), Si-bearing metal (1.9 wt. % Si), Ti-bearing troilite, daubreelite, alabandite and schreibersite. The latter phases often occur as rounded enclaves in the enstatite. Weathering is extensive with much of the metal and sulfides replaced by terrestrial weathering

products. The two meteorites are paired and are an unusual aubrite. It is similar in many respects to LEW 88055 (Casanova et al., 1993, LPSC XXIV, 259-260).

Sample No.: QUE 97 294
Location: Queen Alexandra
 Range
Dimensions (cm): 3.0x2.0x1.0
Weight (g): 14.942
Meteorite Type: H5 Chondrite

Macroscopic Description: Kathleen McBride

100% of this ordinary chondrite's exterior has rough, black fusion crust with oxidation halos. The interior is a steel gray color with rusty patches and is somewhat flaky. It is very dense with no visible inclusions.



Thin Section (.2) Description: Tim McCoy

This meteorite is a strongly shocked H5 chondrite (Fa₂₀,Fs₁₇) with shock blackening and dispersion of metal and troilite. Olivines exhibit planar fractures and mosaicism.



Sample No.: GRA 98005
Location: Graves Nunataks
Dimensions (cm): 8.0x5.5x2.5
Weight (g): 202.85
Meteorite Type: C2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior of this carbonaceous chondrite is dull and black with white evaporites along the edges. The top face has a large yellowish brown inclusion. The meteorite appears to have no fusion crust. The interior is brown, very weathered and crumbles easily. Evaporite deposits are present on the interior surface.

Thin Section (.6) Description: Tim McCoy

The section consists of a few small chondrules (up to 0.5 mm), mineral grains and CAIs set in a black matrix; rare metal and sulfide grains are present. Olivine compositions are Fa_{0-4} , orthopyroxene is Fs_{1-2} . The matrix consists dominantly of an Fe-rich serpentine. The meteorite is a C2 chondrite.



Sample No.: GRA 98006
Location: Graves Nunataks
Dimensions (cm): 6.5x6.0x2.5
Weight (g): 163.70
Meteorite Type: Eucrite

Macroscopic Description: Kathleen McBride

40% of the exterior of this achondrite is covered by thin, shiny black fusion

crust. Exposed interior is medium gray in color with white and tan inclusions. The interior is a gray matrix with tan and white clasts, 1 to 4 mm in diameter. This meteorite is coherent and moderately hard.

Thin Section (.6) Description: Tim McCoy

The section consists dominantly of a mixture of mm-sized orthopyroxene ($Fs_{60}Wo_3$), with lamellae of augite ($Fs_{30}Wo_{42}$), and plagioclase ($An_{90}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~30. The meteorite is brecciated and severely shocked. The meteorite is a eucrite.



Sample No.: GRA 98033
Location: Graves Nunataks
Dimensions (cm): 6.0x4.0x3.0
Weight (g): 123.20
Meteorite Type: Eucrite

Macroscopic Description: Kathleen McBride

80% of the surface of this achondrite is covered with black fusion crust with shiny patches. There are several large (0.5-2.0 cm) "vugs" where sample material has weathered or has been plucked. The interior has a sugary texture, with a grayish green matrix. Black grains and some clasts are interspersed throughout the matrix. Pure white inclusions, rusty halos and streaks are visible. Several white clasts with matrix material incorporated into the clast are present.

Thin Section (.6) Description: Tim McCoy

The section consists dominantly of a mixture of mm-sized orthopyroxene ($Fs_{64}Wo_2$), with lamellae of augite ($Fs_{28}Wo_{44}$), and plagioclase ($An_{88}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~30. The meteorite is a brecciated eucrite.



Sample No.: GRA 98098
Location: Graves Nunataks
Dimensions (cm): 10.0x6.8x5.5
Weight (g): 779.2
Meteorite Type: Eucrite

Macroscopic Description: Kathleen McBride

The exterior of this meteorite is coarse grained and crystalline with white linear, criss-crossing veins of sugary textured material. The matrix consists of reddish-brown crystals, milky white feldspar crystals, some euhedral and gray translucent crystals. Some thin black patches of shiny fusion crust are present (about 10%). The interior is similar to the exterior except the interior veins are more yellowish in color.

Thin Section (.18) Description: Tim McCoy

The section consists dominantly of a mixture of mm-sized orthopyroxene ($Fs_{59}Wo_5$), with 1-5 micron lamellae of augite ($Fs_{35}Wo_{33}$), and plagioclase ($An_{89}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~31. A sub-equal mixture of plagioclase and SiO_2 with minor pyroxene dominates the white veins seen in hand sample. The dominant opaques are Fe, Ti- and Fe, Ti, Cr, Al-oxides with minor iron sulfide and rare iron metal. The meteorite is a eucrite.

Oxygen Isotope Analysis: Robert Clayton

The oxygen isotope analysis of GRA98098 is $\delta^{18}O=+3.3$; $\delta^{17}O=+1.4$. This is a typical HED composition.

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

Cosmochemistry Group, Dept. Chemistry and Biochemistry
University of Arkansas, Fayetteville, AR 72701 USA

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

| Sample | Class | Natural TL [krad at 250°C] | | Sample | Class | Natural TL [krad at 250°C] | |
|----------|-------|-------------------------------|-------|----------|-------|-------------------------------|-------|
| QUE97014 | EUC | 14 | + 4 | QUE97036 | L6 | 6.6 | + 0.3 |
| QUE97053 | EUC | 12 | + 1 | QUE97037 | L6 | 5.8 | + 0.7 |
| QUE97001 | How | 3.3 | + 0.3 | QUE97038 | L6 | 12.1 | + 0.1 |
| QUE97002 | How | 10.4 | + 0.5 | QUE97046 | L6 | 41.9 | + 0.2 |
| QUE97030 | H3.4 | 32 | + 1 | QUE97049 | L6 | 7.5 | + 0.1 |
| QUE97006 | H5 | 66 | + 4 | QUE97050 | L6 | 8.6 | + 0.1 |
| DEW96600 | H6 | 28.5 | + 0.4 | QUE97054 | L6 | 48.3 | + 1.1 |
| MET96506 | H6 | 31.8 | + 0.4 | QUE97057 | L6 | 13.1 | + 0.2 |
| MET96520 | H6 | 70.5 | + 0.7 | QUE97078 | L6 | 7.2 | + 0.3 |
| QUE97008 | L3.4 | 5 | + 2 | QUE97013 | LL5 | 40.7 | + 0.3 |
| MET96515 | L3.5 | 12 | + 1.0 | QUE97015 | LL5 | 10.4 | + 0.1 |
| QUE97034 | L4 | 42.7 | + 0.5 | QUE97016 | LL5 | 8.2 | + 0.1 |
| MET96507 | L5 | 67 | + 1 | QUE97017 | LL5 | 3.5 | + 0.4 |
| MET96510 | L5 | 67.6 | + 0.1 | QUE97019 | LL5 | 5.0 | + 0.5 |
| MET96513 | L5 | 66.2 | + 0.5 | QUE97020 | LL5 | 2.8 | + 0.3 |
| QUE97007 | L5 | 89 | + 1 | QUE97021 | LL5 | 1.6 | + 0.2 |
| QUE97022 | L5 | 35.8 | + 0.3 | QUE97024 | LL5 | 6.1 | + 0.1 |
| QUE97031 | L5 | 23.8 | + 0.2 | QUE97025 | LL5 | 1.2 | + 0.3 |
| QUE97039 | L5 | 84.7 | + 0.3 | QUE97026 | LL5 | 65.9 | + 2.2 |
| QUE97047 | L5 | 46 | + 3 | QUE97028 | LL5 | 41.3 | + 0.2 |
| QUE97048 | L5 | 4 | + 1 | QUE97040 | LL5 | 1.4 | + 0.1 |
| EET96021 | L6 | 24.7 | + 0.1 | QUE97041 | LL5 | 7.6 | + 0.1 |
| MET96509 | L6 | 59 | + 1 | QUE97042 | LL5 | 0.7 | + 0.1 |
| MET96511 | L6 | 10.9 | + 0.1 | QUE97043 | LL5 | 4.0 | + 0.3 |
| MET96512 | L6 | 19.5 | + 0.1 | QUE97045 | LL5 | 10.7 | + 0.1 |
| MET96514 | L6 | 45.9 | + 0.5 | QUE97051 | LL5 | 2.2 | + 0.9 |
| QUE97009 | L6 | 93 | + 1 | QUE97052 | LL5 | 8.0 | + 0.1 |
| QUE97018 | L6 | 2 | + 2 | QUE97058 | LL5 | 9.4 | + 0.6 |
| QUE97029 | L6 | 9.4 | + 0.1 | QUE97059 | LL5 | 7.9 | + 0.1 |
| QUE97032 | L6 | 37.6 | + 0.1 | QUE97069 | LL5 | 6 | + 2 |
| QUE97033 | L6 | 10.3 | + 0.1 | QUE97070 | LL5 | 0.5 | + 0.1 |
| QUE97035 | L6 | 2 | + 2 | QUE97085 | LL5 | 7.5 | + 0.5 |
| | | | | QUE97086 | LL5 | 12.3 | + 0.1 |
| | | | | QUE97010 | LL6 | 18 | + 2 |
| | | | | QUE97011 | LL6 | 7 | + 1 |
| | | | | QUE97012 | LL6 | 2 | + 2 |
| | | | | QUE97023 | LL6 | 21.4 | + 0.1 |
| | | | | QUE97044 | LL6 | 5.4 | + 0.1 |

continued on page 14

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

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

MET 96515 and QUE 97008 were classified as type 3.5 and 3.4, respectively (AMN 21:2 and AMN 22:1). Their TL sensitivities are similar to type 3.1 unequilibrated ordinary chondrites (Sears *et al.*, 1991, *Proc. Lunar Planet. Sci.*, 21, 493-512). It is possible these meteorites are highly shocked but only weak shock features were noted in QUE 97008 (AMN 22:1). Other meteorites with very low TL sensitivities and thus candidates for histories involving extensive shock processing are QUE 97010, QUE 97011, QUE 97012, QUE 07029, QUE 97033, QUE 97035, and QUE 97037.

QUE 97030 is confirmed as type 3.4 by TL sensitivity (AMN 22:1).

QUE 97014 and QUE 97053 have TL sensitivities similar to eucrites of petrologic type 5 in the classification system of Takeda *et al.* (1983, *Proc. 8th Symp. Antarctic Meteor.*, 181-205) and Batchelor and Sears (1991, *GCA*, 55, 3831-3844). It is, however, possible that QUE 97053 has a low TL sensitivity due to shock processing (AMN 22:1).

Pairings suggested by TL data:

EUC: QUE 97053 possibly with QUE 97014 (Note, however, strong petrographic differences, AMN 22:1)

L3: MET 96515 with MET 96503 (AMN 22:1)

L5: MET 96510 and MET 96513 with MET 96507

L5: QUE 97022 with the QUE 90218 group (AMN 15:2 and 18:2)

L5: QUE 97039 with QUE 97007

L5: QUE 97048 with the QUE 90205 group (AMN 15:2)

L6: QUE 97033 with QUE 97029

L6: QUE 97018, QUE 97029, QUE 97033, QUE 97035, and QUE 97037 with the QUE 94202 group (AMN 19:2)

L6: QUE 97049 with QUE 97036

LL5: QUE 97017, QUE 97019, QUE 97020, QUE 97021, QUE 97024, QUE 97025, QUE 97040, QUE 97041, QUE 97043, QUE 97045, QUE 97051, QUE 97052, QUE 97059, QUE 97086 and possibly QUE 97069 with QUE 97016.

LL5: QUE 97028 with QUE 97013

LL6: QUE 97012 with QUE 97011

Sample Request Guidelines

All sample requests should be made in writing to:

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

Requests that are received by the Curator before **Sept. 3, 1999**, will be reviewed at the MWG meeting on **Sept. 17-18, 1999**, to be held in Washington D.C. Requests that are received after the **Sept. 3** deadline may possibly be delayed for review until the MWG meets again in the Fall of 1999. **PLEASE SUBMIT YOUR REQUESTS ON TIME.** Questions pertaining to sample requests can be directed in writing to the above address or can be directed to the curator by phone, FAX, or e-mail.

Requests for samples are welcomed from research scientists of all countries, regardless of their current state of funding for meteorite studies. Graduate student requests should be initialed or countersigned by a supervising scientist to confirm access to facilities for analysis. All sample requests will be reviewed in a timely manner. Those requests that do not

meet the JSC Curatorial Guidelines will be reviewed by the Meteorite Working Group (MWG), a peer-review committee which meets twice a year to guide the collection, curation, allocation, and distribution of the U.S. collection of Antarctic meteorites. Issuance of samples does not imply a commitment by any agency to fund the proposed research. Requests for financial support must be submitted separately to the appropriate funding agencies. As a matter of policy, U.S. Antarctic meteorites are the property of the National Science Foundation and all allocations are subject to recall.

Each request should accurately refer to meteorite samples by their respective identification numbers. Specific requirements for sample types within individual specimens, or special handling or shipping procedures should be explained in each request. Each request should include a brief justification, which should contain: 1) what scientific problem will be addressed; 2) what analytical approach will be used; 3) what sample masses are required; 4) evidence that the proposed analyses can be performed by the requester or collaborators; and

5) why Antarctic meteorites are best suitable for the investigation. For new or innovative investigations, proposers are encouraged to supply additional detailed information in order to assist the MWG. Requests for thin sections which will be used in destructive procedures such as ion probing, etching, or even repolishing, must be stated explicitly. Consortium requests must be initialed or countersigned by a member of each group in the consortium. All necessary information, in most cases, should be condensable into a one-or two-page letter.

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

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Meteorites On-Line

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

| | |
|---|---|
| JSC Curator, Antarctic meteorites | http://www-curator.jsc.nasa.gov/curator/antmet/antmet.htm |
| JSC Curator, martian meteorites | http://www-curator.jsc.nasa.gov/curator/antmet/marsmets/contents.htm |
| JSC Curator, Mars Meteorite Compendium | http://www-curator.jsc.nasa.gov/curator/antmet/mmc/mmc.htm |
| Antarctic collection | http://www.cwru.edu/affil/ansmet |
| LPI martian meteorites | http://cass.jsc.nasa.gov/lpi/meteorites/mars_meteorite.html |
| NIPR Antarctic meteorites | http://www.nipr.ac.jp/ |
| BMNH general meteorites | http://www.nhm.ac.uk/mineralogy/collections/meteor.htm |
| UHI planetary science discoveries | http://www.soest.hawaii.edu/PSRdiscoveries |
| Meteoritical Society | http://www.uark.edu/studorg/metsoc |
| Meteorite! Magazine | http://www.meteor.co.nz |
| Geochemical Society | http://www.geochemsoc.org |

Other Websites of Interest

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|---------------------------------------|---|
| Mars Exploration | http://mars.jpl.nasa.gov |
| Lunar Prospector | http://lunar.arc.nasa.gov |
| Near Earth Asteroid Rendezvous | http://near.jhuapl.edu/ |
| Stardust Mission | http://stardust.jpl.nasa.gov |
| Genesis Mission | http://genesismission.jpl.nasa.gov |
| Contour Mission | http://www.jhuapl.edu/public/pr/CONTOUR/ |

