tions an iron he had found at Derrick Peak. We also owe thanks to Austin Kovacs and Tom Fenwick for an effort to measure ice thickness at the Allan Hills site.

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Uncontaminated carbonaceous chondrites from the Antarctic

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Recent antarctic expeditions have discovered large concentrations of meteorites (Cassidy et al, 1977; Yanai, 1978) that are unique in that they appear to have been protected from terrestrial contamination. Several of these meteorites are carbonaceous chondrites that provide the only known source of extraterrestrial organic compounds available for analysis on Earth. Such analysis can provide us with a fuller understanding of the abiotic synthesis of primordial organic compounds in the early solar nebula and also of the origins of prebiotic organic compounds on the primitive Earth that lead to the appearance of life.

Two such meteorites, Yamato 74662 and Allan Hills A.77306, have been examined for amino acids. Both exterior and interior fractions have been analyzed for abundance by an amino acid analyzer using a fluorescence detector. They have also been analyzed for optical activity by derivatizing to N–TFA–isopropyl esters of amino acids and have been analyzed by a gas chromatograph equipped with a Chirasil Val glass capillary column and a nitrogen detector. All work was carried out in a Class 100 clean room. Solvents were tested for purity, and a sand blank and Murchison meteorite were

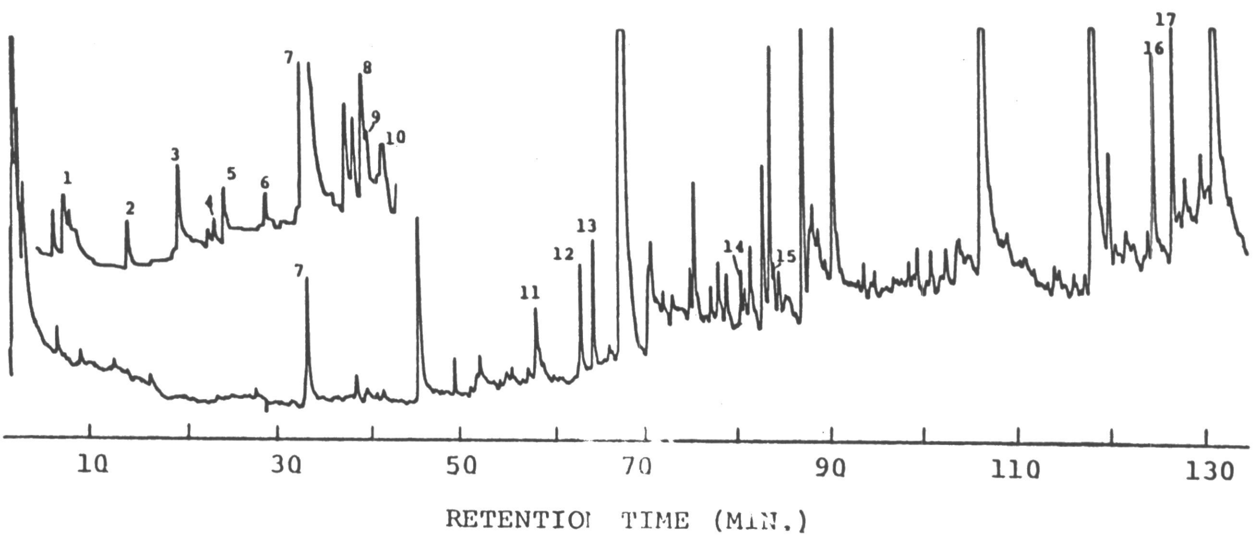

Figure 1. Gas chromatograms of N-TFA-isopropyl esters of amino acids. Chromatogram inset at top left represents interior fraction; chromatogram below that represents exterior fraction. The peaks as identified on each chromatogram are as follows: 1. sarcosine; 2. D–alanine; 3. L–alanine, 4. D–α–aminobutyric acid, 5. D–valine, 6. L–α–aminobutyric acid + L–valine; 7. glycine; 8. β–alanine; 9. D–β–aminobutyric acid; 10. L–β–aminobutyric acid; 11. γ–aminobutyric acid; 12. D–aspartic acid; 13. L–aspartic acid; 14. D–glutamic acid; 15. L–glutamic acid; 16. D–lysine; and 17. lysine. (Source: Kotra 1979).

processed in parallel to provide for monitoring of procedure efficiency.

The accompanying table shows the abundances found in the meteorites' hydrolyzed fraction by the amino acid analyzer. Additional amino acids have been identified by gas chromatography. Both meteorites contain nonbiological amino acids, which indicate that the organic compounds are not of terrestrial origin; this is verified by gas chromatography, which shows that the amino acids are racemic.

Figures 1 and 2 depict gas chromatograms of N–TFA–isopropyl esters of amino acids of the interior and exterior fractions of the two meteorites.

The interior and exterior portions of both meteorites

Table 1. Amino acids in Allan Hills and Yamato meteorites (nm/g meteorite)

Amino Acid	Allan Hills Exterior	Allan Hills Interior	Yamato Exterior	Yamato Interior
Aspartic acid	0.5	0.3	1.1	1.2
Serine	—	—	—	0.2
Glutamic acid	0.2	0.5	4.9	4.0
Glycine	4.4	4.0	34.0	34.0
Alanine	0.7	0.8	13.0	13.0
Threonine			0.1	0.2
Sarcosine			4.6	5.4
α–aminoisobutyric acid	0.1	0.4	3.9	3.7
α–aminobutyric acid	0.1	0.1	6.7	6.7
Valine			4.3	3.4
Alloisoleucine			2.7	2.7
Isoleucine			2.4	2.2
Leucine			1.6	1.3
β–alanine			16.0	14.0
β–aminobutyric acid + γ–aminobutyric acid			18.0	17.0

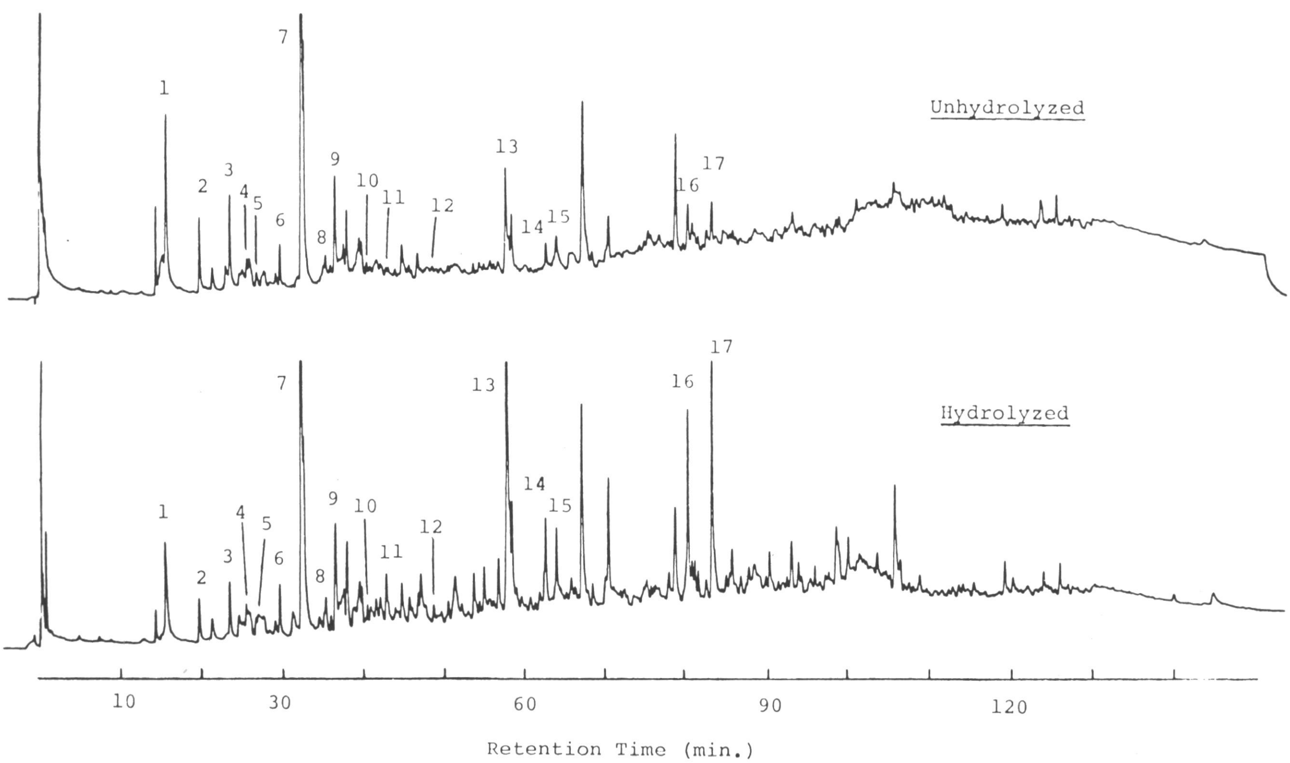

Figure 2. Gas chromatograms of N–TFA–isopropyl esters of amino acids of the interior specimen. The peaks as identified on the chromatogram are as follows: 1. sarcosine; 2. D–alanine; 3. L–alanine; 4. D–α–amino–n–butyric acid; 5. D–valine; 6. L–α–amino–n–butyric acid + L–valine; 7. glycine; 8. D–norvaline; 9. β–alanine; 10. L–norvaline; 11. D–leucine; 12. L–leucine; 13. γ–aminobutyric acid; 14. D–aspartic acid: 15. L–aspartic acid, 16. D–Glutamic acid; and 17. L–glutamic acid. (Source: Shimoyama, Ponnamperuma, and Yanai, in press).

contain approximately the same amount of amino acids. This is in contrast with the Murchison and other carbonaceous chondrites, in which the exterior fraction usually has a greater abundance owing to contamination. It is clear not only that does the antarctic ice flow and topology provide unique fields where meteorites accumulate but also that the ice sheet preserves them from terrestrial organics, thereby making them the least contaminated meteorites known.

Dr. Takesi Nagata, director of the National Institute of Polar Research (Japan) kindly provided a portion of the Yamato meteorite. The Allan Hills meteorite was distributed by the Meteorite Working Group.

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Japanese scientific activities in Victoria Land, 1978–79

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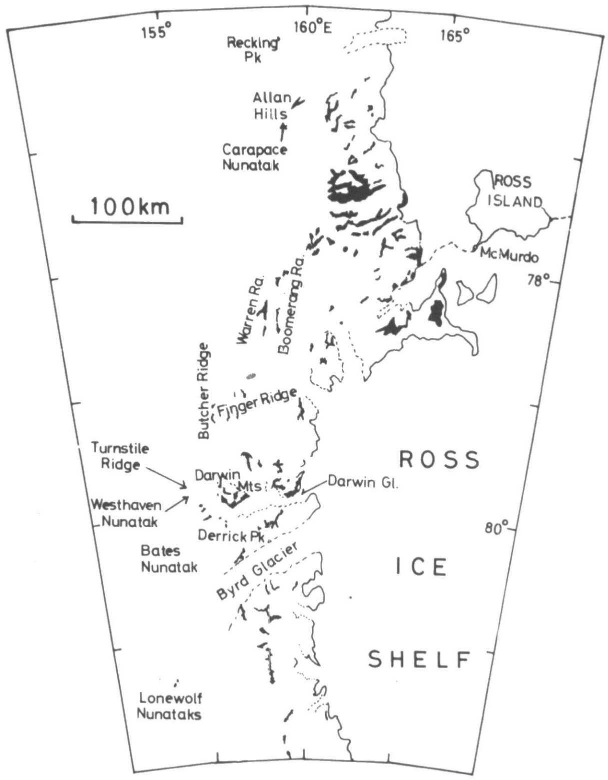
Three Japanese scientists visited McMurdo Station and Victoria Land during the austral summer season of 1978–79. Glaciologist F. Nishio, geologist K. Shiraishi, and geophysicist M. Funaki, all from the National Institute of Polar Research, conducted their research while staying at McMurdo Station from 27 October 1978 to 19 January 1979.

The four visiting scientists participated in the following four research programs:

1. *Glaciological survey of Allan Hills bare icefield* (F. Nishio). The purpose of this survey was to investigate the mechanism whereby a large number of meteorites have accumulated within a limited area of bare ice surface near Allan Nunatak. A trangulation chain stretching for a distance of about 15 kilometers was installed in the bare icefield on the plateau side of Allan Nunatak during the period from 7 December to 2 January. Ice samples for the dating of ice and crystallographic study were also collected in the bare icefield. The U.S. participant in this survey was John O. Annexstad.



The Allan Hills and Darwin Glacier areas.

2. *Geological survey and sampling of typical rock specimens in dry valleys area* (K. Shiraishi). As a part of a comparative study of the geological structure of East Antarctica, a geological survey of dike rocks was conducted in the dry valleys area. Many dikes were identified and their relationships determined in the field in Wright Valley, near Vanda Station. The chronological succession of intrusion is as follows: black-colored lamprophyre A and B; gray-colored lamprophyre; prophyry A, B, and C; granitic porphyry A and B; felsitic dike, basalt (Ferrar dolerite); and acidic dike in dolerite. In contrast, only a few dikes were recognized in Taylor Valley.

3. *Sampling of typical rock specimens for paleomagnetic study* (M. Funaki). About 420 rock specimens were collected for paleomagnetic study in the Wright Valley, Taylor Valley, Allan Hills, Carapace Nunatak, and Ross Island areas. These specimens consist of various gneisses, marble, and granitic varieties of basement; sandstone,