free channels along the west antarctic coast. The channel entrance width in the Cape Colbeck area may be as much as 200 kilometers, depending on the development of specific synoptic conditions (figure 4). When northerly winds predominate in the troposphere (usually in early autumn) the channels become narrower and are packed with large ice fragments.

The success of my scientific program was aided by the cooperation and assistance of both scientific and support personnel at McMurdo Station. I had regular opportunities to communicate by radio with the Soviet Union's Molodezhnaya Station. During February and March 1973, during installation of a new SAE station (Russkaya) at Cape Burks (74°45'S. 137°07'W.), I had daily contact with the Soviet diesel-electric vessel *Ob'* to exchange hydrometeorological information.

During my stay at McMurdo I also was able to join several LC-130 Hercules airplane and UH-1N helicopter flights from the station. During these flights I made visual observations of snow transfer over the antarctic plateau and took still and motion picture photographic surveys of snow transfer and the formation of snow "clouds" over the plateau. On January 2, 1974, along with four others headed by P. Astakhov, who had been at McMurdo to observe Dry Valley Drilling Project operations, I was flown to the Soviet Union's Vostok Station. With the first SAE IL-14 airplane flight of the season I was transferred to Mirnyy to continue aerial observations of snow transfer over the antarctic plateau at altitudes of 200 to 400 meters. I returned to the Soviet Union in April 1974 aboard the steamer *Bashkiriya.*

Despite a heavy work load, I did participate in McMurdo's social life. I attended movies and enjoyed playing table tennis. Also I refereed a chess tournament by radio between teams at McMurdo and Molodezhnaya. Many evenings and sleepless nights were spent analyzing the chess board. During the winter I headed a Russian-language study group. Using motion pictures, I tried to record an impression of life and work at the station. Although nearly 2 years have passed, I remember well the warm and friendly atmosphere at McMurdo during the 1973 austral winter, and I wish success and good health to all of my winter colleagues.

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Microparticles from the Byrd Station deep ice core

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Due to the nature of its processes, the atmosphere provides little information about past circulation and climate. Inferences about these features therefore must be drawn from other evidence such as deep sea cores and glacial ice. Recent microparticle analyses at the Institute of Polar Studies indicate a relationship between particle concentration with depth and oxygen isotope stratigraphy. In both the 1966 Camp Century, Greenland (1,387 meters long), and the 1968 Byrd Station, Antarctica (2,164 meters long), deep ice cores a great increase in the concentration of microparticles is associated with a large decrease in δ oxygen-18 values that are usually associated with Wisconsin glacial stage ice (Thompson, 1973; Thompson, 1974).

A pilot project has been initiated at The Ohio State University for the individual examination and analysis of microparticles from these ice cores. This study combines the use of a light microscope, a scanning electron microscope, and an energy dispersive X-ray analysis system to examine and to assess the elemental compositions of individual particles.

Initial results from the Byrd Station core indicate that most of the particles deposited during Wisconsin time are chemically dissimilar from those deposited since. The Wisconsin particles generally contain a greater abundance of silicon, potassium, calcium, and

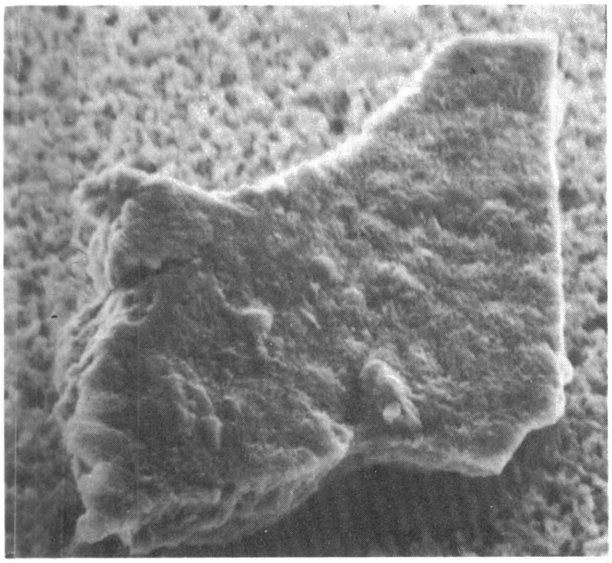

Figure 1. Sample B-3, 1: depth, 566 meters; magnification, x1,800; iron, manganese, aluminum; approximate time of deposition (ATD), 5,000 years ago.

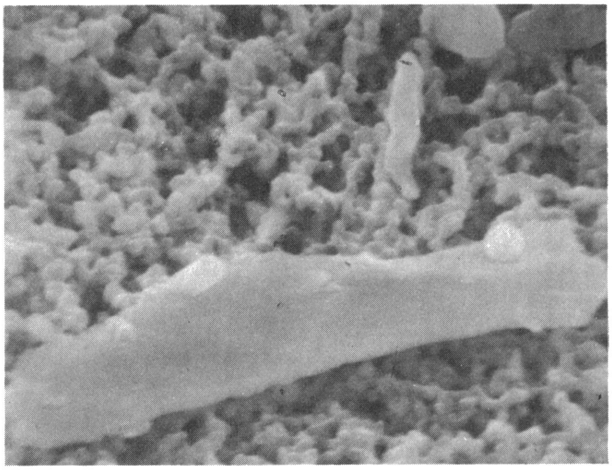

Figure 2. Sample B-5, 6: depth, 1,046 meters; magnification, x4,600; long particle—iron, manganese; spherule—iron, phosphorus, sulfur, silicon, aluminum; ATD, 11,000.

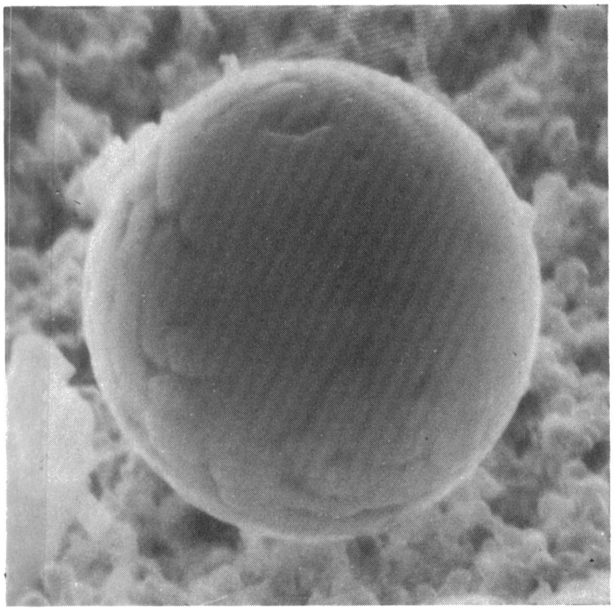

Figure 3. B-7, 4: depth, 1,194 meters; magnification, x5,500; iron; ATD, 14,000.

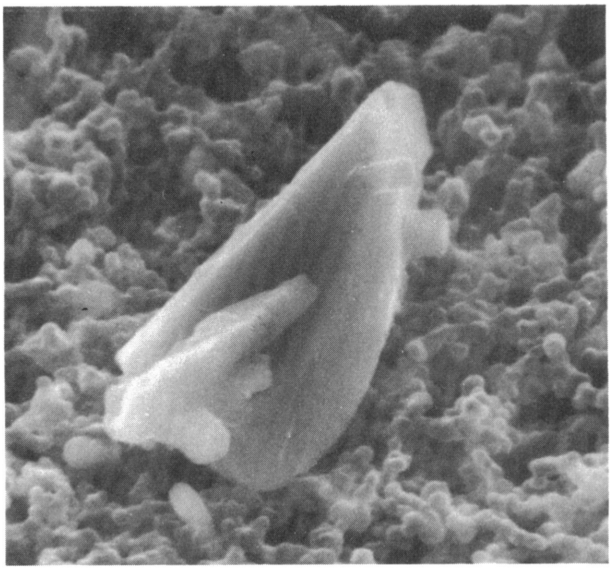

Figure 4. Sample B-8, 2: depth, 1,342 meters; magnification, x5,100; silicon, aluminum, potassium, iron, calcium; ATD, 16,000.

titanium than post-Wisconsin particles. Conversely, there appears to be less sulfur, phosphorus, and aluminum in most Wisconsin particles (table).

These results may indicate a change in the sources of particulate material deposited during and after the Wisconsin glacial stage. Further analyses of these microparticles, coupled with present atmospheric circulation theory, may allow these particles to be traced

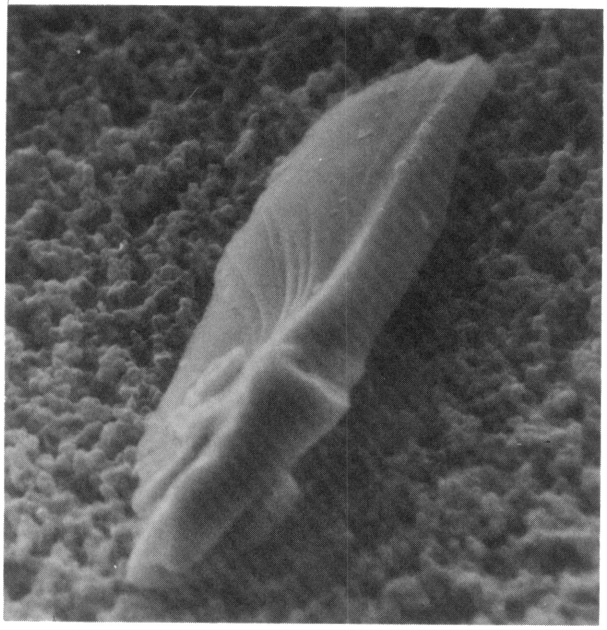

Figure 5. Sample B-9, 5: depth, 1,387 meters; magnification, x3,000; iron, titanium, silicon, aluminum, potassium, calcium; ATD, 17,000.

to their sources. Such information could help to explain the causal mechanisms of glacial advance as well as to establish some base from which to extrapolate the circulations of past climates.

The micrographs (figures 1 through 5) show examples of particles found in the Byrd Station core. The background material is 0.45-micrometer Millipore filter paper. Primary elements are listed in order of decreasing abundance; approximate times of deposition (ATD), as calculated from microparticle variations (Thompson, 1973), are listed in years before present.

References

Thompson, L.G. 1973. Analysis of the concentration of microparticles in an ice core from Byrd Station, Antarctica. The Ohio State University Research Foundation, Institute of Polar Studies. *Report,* 46: 34.

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Particle data from selected sections of the Byrd Station deep ice core.

Sample number	Depth (meters)	Elemental abundance	Approximate time of deposition
B–1, 3	199.5	Fe, P, Si, S, Al	2,000
B–1, 6	199.5	Si, Al, S, Fe	2,000
B–2, 5	401.8	Fe, P, S, Al*, Si*	4,000
B–2, 9	401.8	Fe, Si, P, Al, S, Cr, Ti	4,000
B–3, 2	566.0	Fe, Al, K, Ti, Ca	5,000
B–3, 4	566.0	Fe, Ni, Al, S, Si	5,000
B–4, 1	700.0	Fe, P, Al, S	8,000
B–4, 6	700.0	Fe, P, Al*, Si*	8,000
B–5, 2	897.5	Fe, Sn, Si, Al, P, Mg	11,000
B–5, 4	897.5	Fe, Si, P, Mg	11,000
B–6, 6	1,046.8	Si, Ca, Al, K, Fe	12,000
B–6, 9	1,046.8	Ca, Mg, Si, Al, Fe	12,000
B–7, 3	1,194.5	Si*, S*, Al	14,000
B–7, 6	1,194.5	Si, S*, Al*, Ca, Fe	14,000
B–8, 1	1,342.9	Si**, Al, K, Fe, Ca	16,000
B–8, 3	1,342.9	Si**, Al, K, Fe	16,000
B–9, 6	1,387.6	Ti**, Fe, Si	17,000
B–9, 8	1,387.6	Si**, Al, K, Fe, Ca	17,000
B–10, 3	1,389.7	Si, Al*, Fe*	17,500
B–10, 5	1,389.7	Si**, Al, K, Ti, Mg, Ca	17,500
B–11, 4	1,599.5	Si**, Al, K, Fe, Ca, Ti	20,000
B–11, 6	1,599.5	Si*, Fe*, Ti, Mn, Al	20,000
B–12, 3	1,634.5	Fe**, Ni, Al	20,500
B–12, 4	1,634.5	Si, Al, Fe	20,500
B–13, 5	1,900.6	Si**, Al, K, Fe	23,000
B–13, 8	1,900.6	Si, Al, K, Fe	23,000
B–14, 1	2,139.6	Si**, Al*, Fe*, K*, Ca	27,000
B–14, 7	2,139.6	Si*, Ca*, S, K, Al*, Mg*	27,000

*—of equal importance; **—abundance of over 50 percent by weight.