subcarinata (d'Orbigny), *Melonis sp., Ehrenbergina glabra* Heron-Allen and Earland, *Cibicides grossepunctatus* Heron-Allen and Earland, *Cassidulinoides parkeriana* (Brady), *Globocassidulina crassa* (d'Orbigny), and *Trochoelphidiella onyxi* Webb. The latter three taxa dominate these faunas. Sponge spicules are again present throughout the interval.

Three samples from the 157- to 185-meter interval of hole 10 were examined. A sample at 163.7 meters contained a small fauna, with *Ehrenbergina glabra* Heron-Allen and Earland, *Globocassidulina crassa* (d'Orbigny), and *Cassidulinoides parkeriana* (Brady).

The foraminiferal results suggest that the 13- to 37-meter interval sediments are of marine origin. These microfaunas are similar to Taylor Formation microfaunas from other localities around McMurdo Sound (Speden, 1962). The 153- to 168-meter interval, the lowest sampled, is also marine. Faunas from the 153- to 155-meter interval are tentatively correlated with those of the Pecten gravels fauna of Wright Valley (Webb, 1972, 1974) and the Scallop Hill Formation of White Island (Speden, 1962). The diamicton succession that dominates the greatest part of the New Harbor holes is difficult to interpret. Preliminary investigations provide no convincing *in situ* assemblages; therefore environmental interpretation is not attempted at this time. Obviously reworked bioclastic debris in these diamictons will be examined in detail for traces of late Mesozoic-early Tertiary taxa. Webb and Neall (1972) reported reworked late Mesozoic from this general area of Taylor Valley.

Webb (1974) suggested that the Pecten gravels-Scallop Hill Formation microfaunas are in the region of 3.7 to 3.8 million years in age (i.e. early Pliocene) or slightly younger. This age is tentatively adopted for the hole 8 153- to 155-meter interval in which a similar fauna occurs. The age of the 13- to 38-meter interval is more problematical. The presence of *Adamussium colbecki* (Smith) has generally been taken to indicate a Pleistocene age. It was noted above that *Globocassidulina biora* (Crespin) occurs in these upper sediments in close association with the pectinid. Fillon (1974) has stated that *G. biora* is a major constituent of Gauss faunas (2.4 to 3.4 million years) and occurs only in the younger Bruhnes sediments (0 to 0.7 million years) as a result of reworking. If Fillon's observation on the stratigraphic range of this taxon is correct, this uppermost interval of hole 8 would be middle to late Pliocene rather than Pleistocene. These divergent paleontological interpretations have an important bearing on interpreting the glacial chronology of Taylor and Wright valleys. A considerable thickness of sediments lie below those penetrated during the drilling of hole 8. It seems reasonable to expect them to be Miocene or even earlier in age.

The authors acknowledge the laboratory assistance of Jody Devera. This research was supported by National Science Foundation grant OPP 74-22894.

References

Chapman-Smith, M., and P. G. Luckman. 1974. Late Cenozoic glacial sequence cored at New Harbor, Victoria Land (DVDP 8 and 9). In: *Dry Valley Drilling Project Bulletin 3.* DeKalb, Northern Illinois University. 120-135.

Fillon, R. H. 1974. Late Cenozoic foraminiferal paleoecology of the Ross Sea, Antarctica. *Micropaleontology,* 20(2): 129-151.

Speden, I. G. 1962. Fossiliferous Quaternary marine deposits in the McMurdo Sound region, Antarctica. (Includes an appendix on Polyzoa, by D. A. Brown). *N.Z. Journal of Geology and Geophysics,* 5(5): 746-777.

Webb, P. N. 1972. Wright Fjord, Pliocene marine invasion of an antarctic valley. *Antarctic Journal of the U.S.,* VII(6): 227-234.

Webb, P. N. 1974. Micropaleontology, paleoecology, and correlation of the Pectan gravels, Wright Valley, Antarctica, and description of *Trochoelphidiella onyxi* n. gen., n. sp. *Journal of Foraminiferal Research,* 4(4): 184-199.

Webb, P. N., and V. E. Neal. 1972. Cretaceous foraminifera in Quaternary deposits from Taylor Valley, Victoria Land. In: *Antarctic Geology and Geophysics* (R. J. Adie, editor). Oslo, Universitetsforlaget. 653-657.

Stratigraphy of DVDP sites 10 and 11, Taylor Valley

B. C. McKelvey
University of New England
New South Wales, Australia
and
Department of Geology
Northern Illinois University
DeKalb, Illinois 60115

Dry Valley Drilling Project (DVDP) sites 10 and 11 penetrated 185.47 and 327.96 meters of well-stratified flat-lying sediments mantled by less than 1 meter of ablated valley floor moraine. The altitude of site 11 is approximately 78.3 meters above that of site 10, and so the sequence recovered from the former includes horizons both younger and older than those penetrated in site 10. Neither hole reached crystalline basement.

Both cores show the same irregular sedimentary transition, with basal pebble diamictites and associated mudstones passing up to sandstones and pebbly sandstones, with minor pebble conglomer-

ates. The diamictites are indistinctly stratified marine tillites resulting from suspension current sedimentation combined with profuse glacial rafting. None appear to be mass movement deposits or alternatively terrestrial subglacial moraines. The sandstones, pebbly sandstones, and conglomerates are traction current marine and fluvioglacial deposits.

Sparse Neogene microfaunas (P. N. Webb, personal communication) occur within mudstones associated with the tillites, and scattered bivalve debris is present in some of the younger sandstones. Bioturbation, usually in the form of horizontal burrows, is common though never prolific in mudstones and fine sandstones. Diatom and sponge spicule debris is present, particularly in many of the younger sandstones.

Although both cores reflect the same transition from marine tillites to younger traction current deposits, and both contain the same sediment types, the stratigraphies of sites 10 and 11 differ considerably in detail. This suggests considerable local facies change between the two sites. The site 10 core contains five major lithostratigraphic units. Approximately 21.1 meters of unit I sandstones, pebbly sandstones, and minor pebble conglomerates overlie 13.96 meters of conglomerates that make up unit II. Units III and IV are strikingly varied, and consist of over 104 meters of diamictites and interbedded pebbly sandstones and sandstones with minor pebble conglomerates, breccias, and laminated sandy mudstones. The basal unit V consists of at least 36.6 meters of mudstones and diamictites.

Site 11 core contains eight major lithostratigraphic units. The youngest four, totaling 127.45 meters, consist of sandstones, pebbly sandstones and conglomerates. Units VII and VIII, totaling 139.5 meters, are predominantly diamictites and minor sandy mudstones. The intervening units V and VI, totaling 61 meters, comprise a transitional sequence with interbedding of all of the above rock types.

The petrography of the sand-grade and coarser sediments in both cores shows their derivation to be overwhelmingly from the surrounding lower Palaeozoic basement complex, and to a much less extent from the Jurassic Ferrar dolerites. Pebbles of the basement Vida granite and of the Beacon sandstone were not observed, although disaggregated detritus of the latter presumably contributes to sandstones within the cores. Neogene basaltic debris in very small amounts is present throughout both cores. In site 11 core, marine mudstones of unit VII contain, at approximately 205 meters, at least two basaltic tuffs each only a few centimeters thick. In both cores the younger sandstones also contain a small but persistent component of interformational mudstone debris.

Considerable lithification of both cores is apparent, especially in older units where the mudstones show increasingly better developed conchoidal fracture. At least partial carbonate cementation of sandstones is widespread and is particularly noticeable beneath 47 and 84 meters in cores 10 and 11, respectively.

Geology of DVDP holes 12 and 14

MICHAEL CHAPMAN-SMITH
Antarctic Division
N.Z. Department of Scientific and Industrial Research
Christchurch, New Zealand

While participating in the Dry Valley Drilling Project (DVDP) during 1974-1975, and with the assistance of Messrs J. Jackson, J. Kilbourne, and D. Read, all of the Department of Geology, Northern Illinois University, I geologically logged core from holes 12 and 14. The former was beside Lake Leon (unofficial name), Taylor Valley, and the latter was in the North Fork, upper Wright Valley.

Detailed drill logs and summary drill logs of the two holes have been prepared and are available from the DVDP Coordinating Office, Department of Geology, Northern Illinois University, DeKalb, Illinois 60115. Core from hole 12 was shipped frozen to the United States. Core from hole 14, which was completed late in the season, remains at McMurdo for shipment next summer.

Hole 12 (Lake Leon). This vertical hole was drilled to 184.65 meters; 165.02 meters of sediment were penetrated. Basement contact, which was the first ever intersected in Taylor Valley, was at 165.02 meters; it is sharp, nonstriated, and along a high-angle joint in unweathered granite. Both the contact and overlying till are believed to be the products of a wet-based, eroding glacier that gouged out the floor of Taylor Valley over 5 million years ago. Core recovery was 98.5 percent, with 181.80 meters of sediment and basement lithologies recovered.

Diamicton units comprise the bulk (58 percent) of the 165.02 meters of sediments. A wide variety of lacustrine, fluviatile, and terrestrial lithologies make up the remaining 42 percent of the sediments, which include graded beds, varved muds and silts, weathered iron-oxidized horizons and lenses, and a