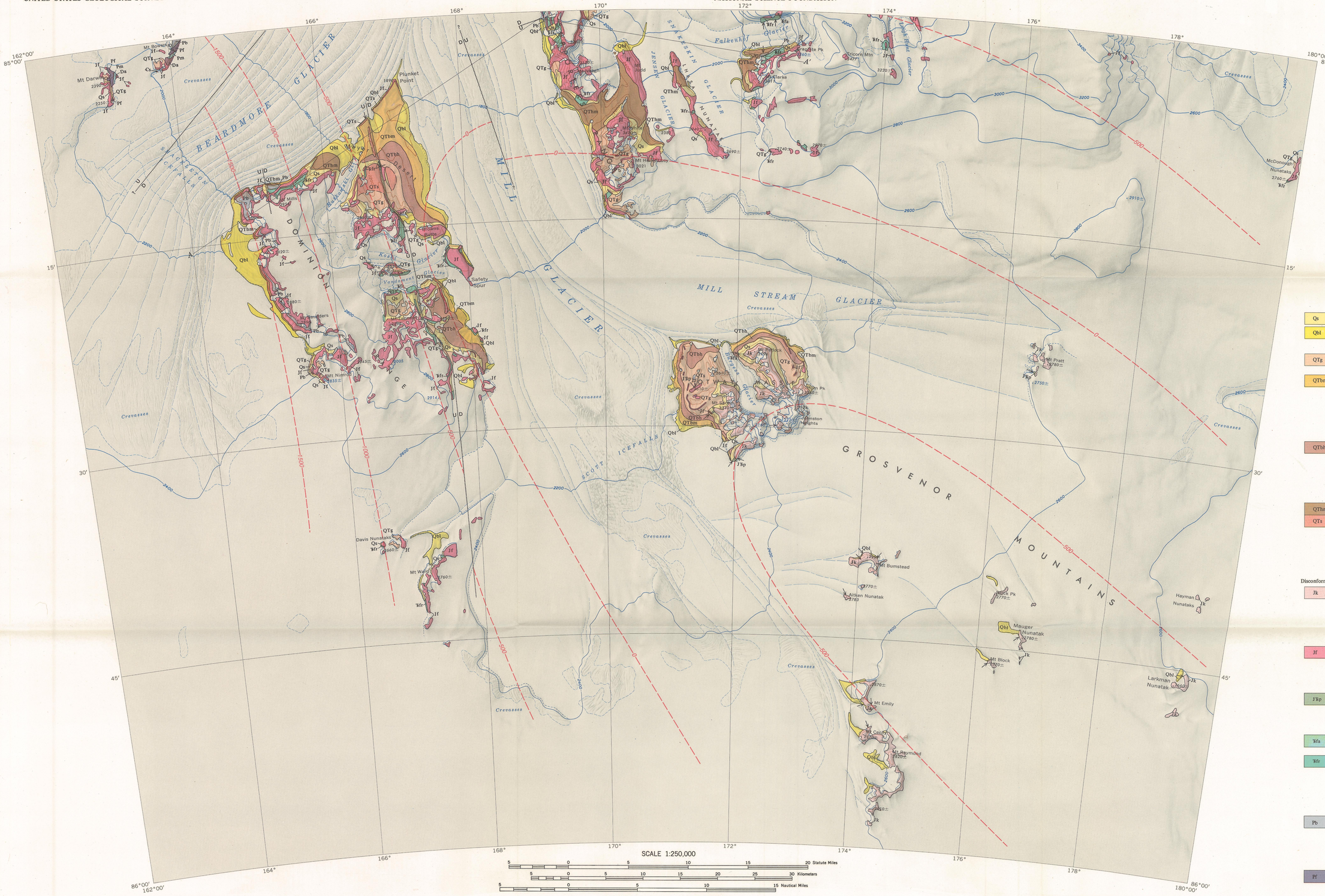
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared by the
INSTITUTE OF POLAR STUDIES, OHIO STATE UNIVERSITY
under the auspices of the
NATIONAL SCIENCE FOUNDATION

U.S. ANTARCTIC RESEARCH PROGRAM
PLUNKET POINT QUADRANGLE
ANTARCTIC GEOLOGIC MAP A–4



Base from U.S. Geological Survey, 1963

Polar Stereographic Projection — Standard Parallel 84°14′
CONTOUR INTERVAL 200 METERS—DATUM IS MEAN SEA LEVEL
Elevations and ice thickness in meters

CORRELATION OF MAP UNITS

Qs, Qbl			QUATERNARY
QTbm, QTbh, QTs	QTbm, QTbh → QThm; QThm → QTg		QUATERNARY AND TERTIARY
Disconformity			
Jk	Ferrar Group		JURASSIC
Jf			
J'Rp	Victoria Group	Beacon upergroup	JURASSIC AND TRIASSIC
Rfa			TRIASSIC
Rfr			
Pb, Pf, Pm	Victoria Group; Pb, Pf, Pm → P		PERMIAN
Disconformity			
Da	Taylor Group		DEVONIAN
Angular unconformity - Kukri erosion surface			
Ꞓs			CAMBRIAN

DESCRIPTION OF MAP UNITS

Qs SCREE – May also include solifluction deposits, weathered bedrock, and other surficial deposits

Qbl BEARDMORE LOW MORAINE SYSTEM – Supraglacial debris up to 20 cm thick overlying bot active and stagnant ice adjacent to the active ice. The debris is characterized by angular to subrounded clasts of Beacon sediments and angular clasts of Ferrar Dolerite

QTg GLACIAL DEPOSITS, UNDIVIDED – Includes undivided Qbl, QTbm and QTbh, and deposits derived from "local ice" expansion (the platform south of Meyer Desert). On elevated flat surfaces may include weathered bedrock

QTbm BEARDMORE MIDDLE MORAINE SYSTEM – Supraglacial debris deposited by an ice cover more extensive than that which deposited Qbl. The entire deposit is ice-cemented below 0.5 to 1.5 m depths. The debris is characterized by clasts of cavernously weathered and disintegrated Beacon sediments, and of slightly rounded fine-grained Ferrar Dolerite and disintegrated coarse-grained Ferrar Dolerite. The weathered pebbles and boulders form a lag concentrate on the surface and overlie silt to sand size particles that are intermixed with fresher clasts of similar lithologies. Series of continuous boulder ridges (most notable in Meyer Desert) outline the recessional positions of former ice termini

QTbh BEARDMORE HIGH MORAINE SYSTEM – Supraglacial debris deposited by an ice cover more extensive than that which deposited QTbm. The entire deposit is ice-cemented below 1 to 2 m depths. The debris is characterized by clasts of rounded to cavernously weathered fine- to medium-grained Ferrar Dolerite and a few clasts of Beacon sediments and coarse-grained Ferrar Dolerite. Below 5–10 cm clasts of Beacon sediments and coarse-grained Ferrar Dolerite increase in abundance and all lithologies exhibit weathering characteristics similar to Qbl. The upper limit of the deposit can often be differentiated, as on Otway Massif, by faint ridges and/or erratics

QThm BEARDMORE HIGH AND/OR MIDDLE MORAINE SYSTEM, UNDIVIDED

QTs SIRIUS FORMATION – Grayish-green semi-lithified till and stratified lenses. The stratified lenses contain sorted and unsorted layers of clasts ranging from gravel to silt size. The sediments occur as 1–2 m thick (Mt. Black and Otway Massif) deposits of till or as a basal till overlain by interstratified till and stratified lenses with a maximum measured thickness of 85 m (Meyer Desert). Striated and faceted clasts up to boulder size occur in the basal till and all local bedrock lithologies are represented. Where the contact is exposed the basal till overlies unweathered surfaces and slopes of Ferrar Dolerite or Premouw Formation

Disconformity

Jk KIRKPATRICK BASALT – Tholeiitic flows and ponded lavas from 2 to at least 200 m thick. Includes sparse, thin acidic tuff beds and lacustrine deposits with conchostracans. Many of the thicker lavas have zones of medium-grained diabase. Amygdules of quartz, chalcedony, calcite and zeolites, principally heulandite and stilbite, in basal and upper contact zones of lavas. Locally upper surfaces have weathering profiles, and at Johnston Heights one is a paleosoil. A few lavas enclose tree stumps and wood fragments. K/Ar ages from Mt. Bumstead of 161±3 m.y., Mt. Cecily of 171±7 m.y. and Mt. Spohn of 172±8 m.y. Thickness 500+ m

Jf FERRAR DOLERITE – Tholeiitic diabase sills intruded into the Beacon Supergroup and possibly along the Kukri erosion surface separating the Taylor Group and underlying rocks; rare dikes: one extensive intrusive mass in the Supporters Range. Measured sills as thick as 150 m; thicker sills observed. Large rafts of sedimentary strata "floating" in diabase may have an apparent structural dip as at Graphite Peak. Flat areas of diabase may include weathered bedrock

J'Rp PREBBLE FORMATION – Light-brown, greenish-brown or reddish-brown massive poorly sorted lahar debris, pyroclastic breccia, tuff and minor tuffaceous sandstone, all containing acidic volcanic debris and zeolite. Sparse tuff beds with accretionary lapilli. Lahar debris locally contains boulders as much as 60 cm across of diabase, basalt, tuff, sandstone, siltstone, shale and coal. Diabase boulder in lahar debris has K/Ar age of 179±10 m.y. Thickness up to 460 m

Rfa FALLA FORMATION – Very light gray quartzose sandstone. Exposed only as a raft of sedimentary strata in diabase on north side of Falkenhof Glacier and as an isolated outcrop at the base of Mt. Petlock. Thickness 30+ m

Rfr FREMOUW FORMATION –
Upper part: Mainly light greenish-gray laumontized volcanic sandstone with some carbonaceous shale. Stems (*Neocalamites*?), roots and logs common. A little coal, *Dicroidium*. About 400 m thick
Middle part: Greenish-gray mudstone with thin beds of light gray volcanic sandstone. A few stems and roots. About 250 m thick
Lower part: Cyclic light reddish-brown quartzose sandstone and greenish-gray mudstone. *Lystrosaurus*-zone fauna present at Graphite Peak. About 80 m thick

Pb BUCKLEY FORMATION – Cyclic light-colored crossbedded sandstone, carbonaceous shale and high-rank, high-ash coal. Log, stems and glossopterid leaves common. Sandstone beds normally have erosion surfaces at base and shale fragments in lower part. Sandstone is subarkosic to arkosic low in formation but volcanic fragments become abundant between 100 and 300 m above base. Volcanic sandstone, which commonly is laumontized, dominates upper part. No complete sections exposed in this quadrangle. Thickness a minimum of 300 m and probably 600+ m

Pf FAIRCHILD FORMATION – Exposed only northwest of Beardmore Glacier. Upper part: interbedded quartz sandstone and micaceous siltstone with carbonaceous siltstone near top. Thickness about 90 m
Lower part: White quartz sandstone with well-developed crossbedding, interbedded with minor carbonaceous shale. Thickness about 170 m

Pm MACKELLAR FORMATION – Exposed only northwest of Beardmore Glacier. Fissile well-bedded mudstone and siltstone with interbedded minor white sandstone and carbonaceous siltstone. Ripple marks and flow casts present. Thickness 125 m

P PERMIAN STRATA, UNDIVIDED – Shown only on the cross section. May include the Pagoda, Mackellar, Fairchild, and Buckley Formations, and Ferrar Dolerite sills. The Pagoda Formation, a unit of tillite, sandstone and shale which underlies the Mackellar Formation, is not exposed in this quadrangle

Disconformity

Da ALEXANDRA FORMATION – Exposed only northwest of Beardmore Glacier. White, medium- to coarse-grained micaceous quartzose sandstone, quartzite, minor pebbly beds, interbedded micaceous siltstone. Soft sediment folding associated with thin diamictite. Top of formation at Mt. Bowers has glacial(?) striae. Thickness about 90 m

Angular unconformity

Ꞓs SHACKLETON LIMESTONE – Dense, light gray, very fine grained limestone, limestone breccia, dark gray well-bedded limestone, and calcareous siltstone in small isolated outcrops south of Mt. Bowers. Light gray limestone contains archeocyathids. Thickness 300+ m

Contact – Dashed where approximately located

Fault – Dotted where concealed. U, upthrown side; D, downthrown side

Strike and dip of beds

Structure contour – Approximately located. Drawn on base of Beacon Supergroup. Datum is mean sea level. Contour interval 500 meters

Base of measured stratigraphic section

Geology mapped in 1965–66 by D.J. Young and R.J. Ryburn assisted by A.C. Bibby and A.C. Rayment; in 1967–68 by Ralph J. Baillie, Peter J. Barrett, David H. Elliot, and David Johnston; in 1969–70 by Donald A. Coates, David H. Elliot, John H. Mercer and assisted by Jon S. Powell; in 1970–71 by James W. Collinson, David H. Elliot, Paul A. Mayewski, Vaughn P. Wendland and assisted by Stephen D. Etter and John Ruben

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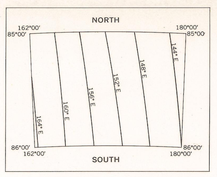
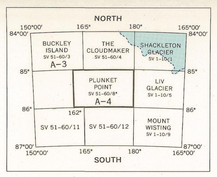
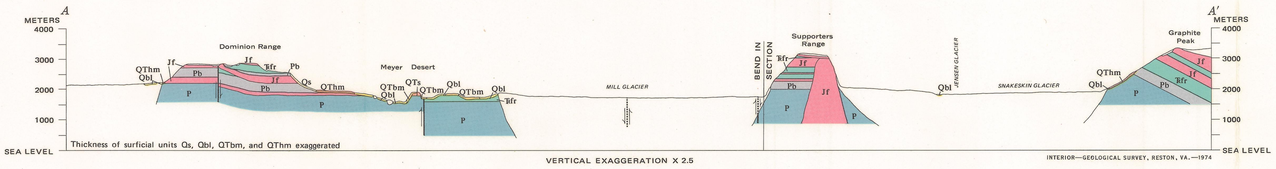


Compiled from U.S.N.O.O. chart 1706 S, 1960
ISOGONIC LINE DIAGRAM



Sheet numbering system based on International Map of the World
INDEX TO ADJOINING SHEETS



VERTICAL EXAGGERATION X 2.5

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1974

RECONNAISSANCE GEOLOGIC MAP OF THE PLUNKET POINT QUADRANGLE, TRANSANTARCTIC MOUNTAINS, ANTARCTICA

By
David H. Elliot, Peter J. Barrett, and Paul A. Mayewski

1974

For sale by U.S. Geological Survey, Reston, Va. 22092, price $1.00