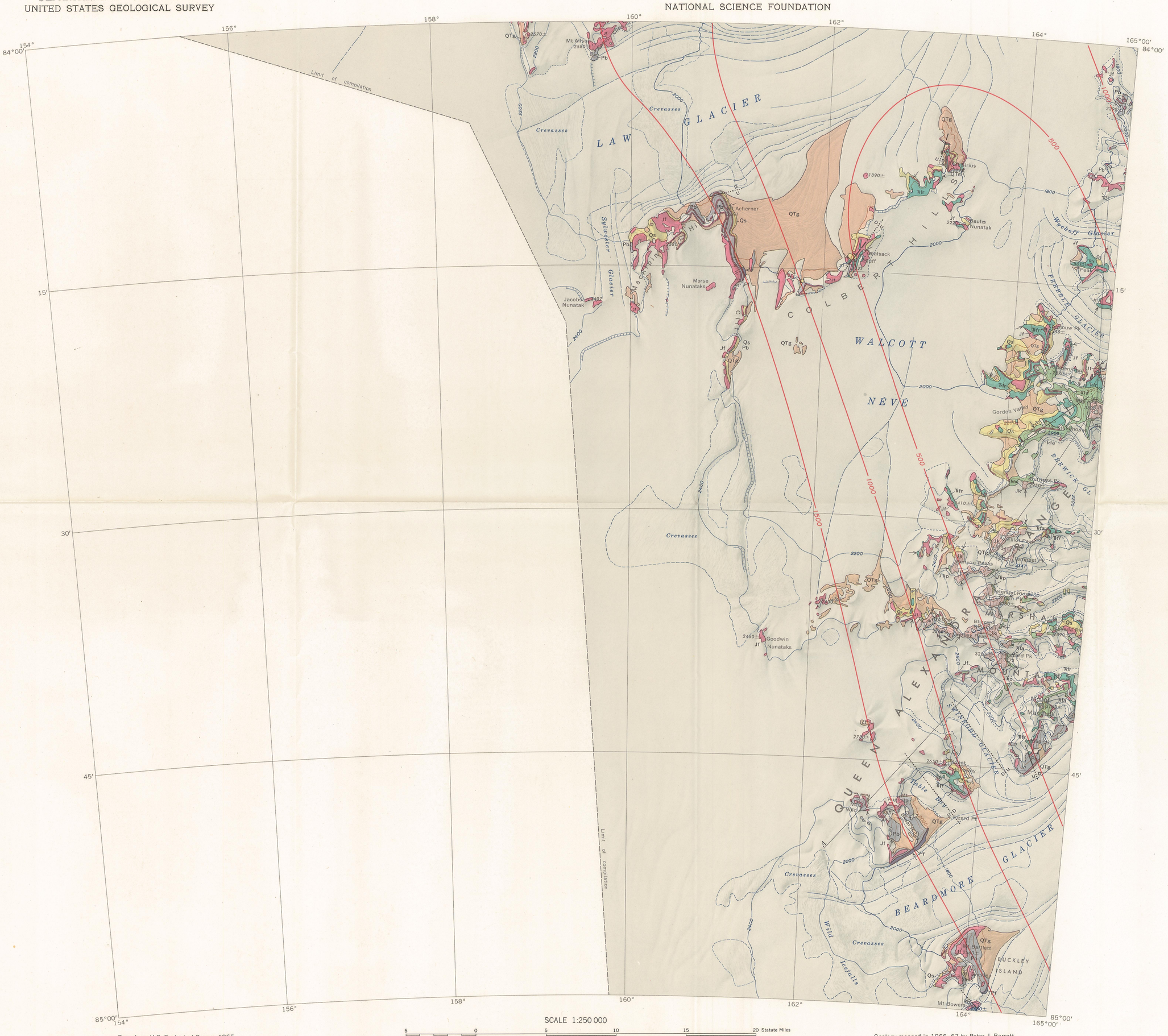
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED BY THE
INSTITUTE OF POLAR STUDIES, OHIO STATE UNIVERSITY
UNDER THE AUSPICES OF THE
NATIONAL SCIENCE FOUNDATION

U.S. ANTARCTIC RESEARCH PROGRAM
BUCKLEY ISLAND QUADRANGLE
ANTARCTIC GEOLOGIC MAP A-3



SCALE 1:250 000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

Polar Stereographic Projection—Standard Parallel 84°14′

CONTOUR INTERVAL 200 METERS—DATUM IS MEAN SEA LEVEL

Base from U.S. Geological Survey, 1965

Geology mapped in 1966–67 by Peter J. Barrett, David H. Elliot, John F. Lindsay, and D. Kenyon King; geology mapped in 1969–70 by David H. Elliot, Donald A. Coates, James W. Collinson, William J. Gealy, and John H. Mercer assisted by Henry H. Brecher, John Gunner, John Pavlik, Donald N. Peterson, Jon S. Powell, Izak C. Rust, and John F. Splettstoesser

E X P L A N A T I O N

QUATERNARY

Qs — Scree
In places may include solifluction deposits, weathered bedrock, till, or other surficial deposits

TERTIARY (?) AND QUATERNARY

QTg — Glacial drift
Includes glacial drift on bedrock, stranded ice-cored glacial drift, and glacial drift on moving ice. In isolated outcrops and on elevated flat surfaces may include weathered bedrock

QTs — Sirius Formation
Gray to light-brown compact till, varying from friable to semi-lithified with sandy, waterlaid lenses and bands up to 3 m thick. In places, rests on a striated pavement. Boulder-size clasts are of dolerite. Present only on Mt. Sirius where it is 100 m thick

JURASSIC

Ferrar Group

Jk — Kirkpatrick Basalt
Tholeiitic flows and ponded lavas from 1.5 to about 170 m thick. Many 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 of lavas have weathering profiles. A few lavas enclose tree stumps and wood fragments. Sparse, thin, acidic tuff beds and lacustrine deposits with holostean fish, conchostracans, ostracodes and plant remains. Thickness 500+ m. K/Ar ages from Storm Peak of 179±7, 170±7, and 163±10 m.y.

Jf — Ferrar Dolerite
Tholeiitic diabase sills intruded into Permian and Triassic strata; rare dikes. Measured sills as thick as 150 m; thicker sills observed. May include large rafts of sedimentary strata. K/Ar ages from Coalsack Bluff of 178±4.5, 178±3.0, and 167.5±4.0 m.y. Flat areas of diabase may include weathered bedrock

TRIASSIC – JURASSIC

Beacon Supergroup, Victoria Group

J̄Ŧp — 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 80 cm across of diabase, basalt, sandstone, siltstone, and tuff. Volcanic neck composed of acidic breccia east of Kenyon Peaks. Thickness 3–148 m

TRIASSIC

Ŧfa — Falla Formation
Cyclic light reddish-brown bluff-forming sandstone and shale in lower part; partly zeolitized rhyolitic tuff dominates upper part. Sandstones low in formation are quartzose and contain white quartz pebbles; volcanic fragments common in sandstone higher in formation. Shale in Mount Falla area carbonaceous and contains Dicroidium. *Tuff near top of formation includes black-rimmed accretionary lapilli up to 1 cm across. Rb/Sr isochron on tuffs of upper part gives age of 203±12 m.y. Thickness 150–530 m*

Ŧfr — 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. *Silicified peat at Fremouw Peak. About 300 m thick.*
Middle part greenish-gray mudstone with thin beds of light gray volcanic sandstone. A few stems and roots. About 200 m thick.
Lower part cyclic light reddish-brown quartzose sandstone and greenish-gray mudstone. At Coalsack Bluff sandstones have yielded remains of Lystrosaurus, *thecodont and therapsid reptiles, labyrinthodont amphibians. About 100 m thick*

PERMIAN

Pb — Buckley Formation
Cyclic light-colored sandstone, carbonaceous shale, and high-rank high-ash coal. Lower contact is normally marked by the appearance of white, rounded quartz pebbles or by a coarsening of the sandstone or both. Quartz pebbles occur at higher levels also. Sandstone is subarkosic to arkosic low in formation but volcanic fragments become abundant 100–300 m above base; volcanic sandstone dominates upper part. Logs, stems, and Glossopteris *leaves common; silicified peat, equivalent to coal balls, southeast of Mount Augusta. Crossbedding, erosion surfaces, and shale fragments normally present in and near the base of sandstone units. Extensive laumontization in the volcanic sandstone. Thickness about 750 m*

Pf — Fairchild Formation
Light-colored massive subarkosic to arkosic sandstone with well-developed crossbedding and parting lineation. Some plant fragments and dark shale stringers. Thickness about 220 m

SYMBOLS

Contact

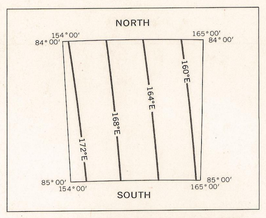
Fault
U, *upthrown side;* D, *downthrown side. Dashed where approximately located; dotted where concealed*

Monocline

20
Strike and dip of beds

500
Structure contour, approximately located
Drawn on base of Beacon Supergroup; base not exposed in quadrangle. Datum is mean sea level. Contour interval 500 meters

Base of measured stratigraphic section



Compiled from U.S.N.O.O. Chart 1706 S, 1960

ISOGONIC LINE DIAGRAM

R E F E R E N C E S

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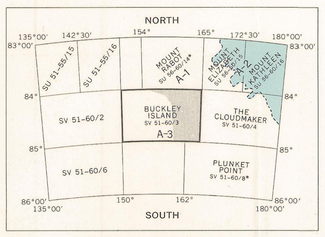

Sheet numbering system based on International Map of the World

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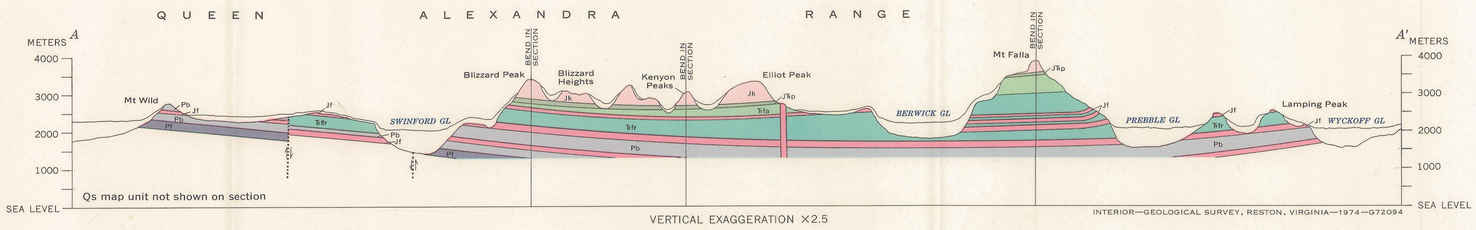

VERTICAL EXAGGERATION ×2.5

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1974—G72094

RECONNAISSANCE GEOLOGIC MAP OF THE BUCKLEY ISLAND QUADRANGLE, TRANSANTARCTIC MOUNTAINS, ANTARCTICA

By
Peter J. Barrett and David H. Elliot

1973

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