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GIGAMAP
GERMAN-ITALIAN GEOLOGICAL ANTARCTIC MAP PROGRAM
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Museo Nazionale dell'Antartide
Sezione di Scienze della Terra - Siena (Italy)

ANTARCTIC GEOLOGICAL 1:250,000 MAP SERIES
MOUNT MURCHISON QUADRANGLE
(VICTORIA LAND)

1997

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EXPLANATION

m — Scree, glacial debris and moraine (m). Quaternary.

CENOZOIC MAGMATISM AT THE ROSS SEA MARGIN

McMURDO IGNEOUS COMPLEX

Mev — MELBOURNE ALKALI-BASANITE TO TRACHYTE-RHYOLITE (Mev)
Highly differentiated alkali-volcanic suite forming major and composite strato-volcanoes (Mt. Overlord, Mt. Rittmann, Vulcan Hills, Berlin Dome) and other minor centres. The radiometric ages range from 3.9 Ma at Mt. Rittmann to 0.3-7 Ma at Mt. Overlord and 14.5 Ma at Parasite Cone.

Mg — MEANDER ALKALI-GRANITE AND SYENITE (Mg)
Alkali-feldspar granite and granophyre, alkali-granite and alkali-syenite with local transitions to volcanic-subvolcanic types. In several cases gabbroic rocks occur in close association. The age of these rocks spans from 22 to 8 Ma.

POST-ROSS MAGMATISM AND SEDIMENTATION

FERRAR VOLCANIC SUITE

Kb — KIRKPATRICK BASALT (Kb)
Subaerial lavas, a few metres up to several ten metres thick, randomly separated by thinner sedimentary volcaneogenic interlayers and pillow lavas. Blue lines (omitted in the cross sections): local beds and lenses of whitish marly siltstones, fine grained sandstones and minor black shales, with flora relics mostly in the lower portion of the volcanic sequence. The Mesa Range type locality is about 1000 m thick.

Fd — FERRAR DOLERITE (Fd)
Tholeiitic dolerite sills and minor dykes, usually intruded in the sedimentary sequence of the Beacon Supergroup, immediately above the pre-Beacon peneplain. Black lines (omitted in the cross sections): major lenses and seams (mostly some ten meters thick) of Section Peak Formation sandstones forming xenoliths-type interlayers within the Ferrar Dolerite sills. A K/Ar age of 174±10 Ma has recently been reported from Archambault Ridge.

BEACON SUPERGROUP

St — SECTION PEAK FORMATION (St)
Mainly fluviatile, cross-bedded, coarse- to medium-grained sandstone with a feldspathic to quartzose composition. Minor intercalations of conglomerate, black shale, carbonaceous or noncarbonaceous silty mudrock and minor coals occur as well. A Middle to Late Triassic age is testified by the presence of *Dicroidium odontopteroides* at Vulcan Hills.

ADMIRALTY IGNEOUS COMPLEX

Agr — ADMIRALTY GRANODIORITE SUITE (Agr)
High level I-type granitoid suite ranging in composition from tonalite to monzogranite, with major granodiorite. The emplacement took place between 385 and 400 Ma, and cooling ages generally fall before 350 Ma.

Go — GALLIPOLI ANDESITE-RHYOLITE SEQUENCE (Go)
Andesite, rhyolite and rhyolitic porphyries with minor olivine basalt, basaltic andesite, pyroxene-hornblende feldspar-phyric andesite or dacite. These rocks form a layered sequence of flows, sills and volcanoclastics, in the area of the Gallipoli and Aviator Glaciers, Mount Murchison and Mount Rittmann. Recent age determinations on samples from Mt. Montreuil produced a Rb/Sr isochron of 356±16 Ma and K/Ar values on biotite of 356±2 Ma.

TERRANES AND UNITS OF THE ROSS OROGEN

WILSON TERRANE

GRANITE HARBOUR IGNEOUS COMPLEX

Ghgr, Ghbg, Ghtg — GRANITE HARBOUR GRANODIORITE AND GRANITE (Ghgr)
Syn- to post-kinematic biotite granite, granodiorite and tonalite intruded in the Wilson metamorphic complex before 480±20 Ma (cooling ages). At the southern end of the Aviator Gl. intrusive breccia (a), made up of migmatite gneiss blocks and pods in a granitoid matrix, forms large and thick bodies.

Ghgb — GRANITE HARBOUR GABBRO AND ULTRAMAFITE (Ghgb)
Norite, gabbro, pyroxenite and serpentinite, affected by amphibolite facies re-equilibration followed by a greenschist facies overprint. In places, the severe deformation linked to the greenschist event caused a complete transformation in chlorite-actinolite schist. No radiometric age data is available.

Ght — GRANITE HARBOUR TONALITE (Ght)
Gabbro, tonalite, diorite and granodiorite suite affected by a more developed foliation. An age of 505.0±8.3 Ma has been obtained from samples south of Whitcomb Ridge.

WILSON METAMORPHIC COMPLEX

Ws — GREENSCHIST FACIES METASEDIMENTS (Ws)
Metasandstone, slate, phyllite and metalimestone, often contact metamorphosed. The age is unknown, but a Precambrian to Cambrian age is commonly inferred. Local name: Priestley Formation.

Wa — AMPHIBOLITE FACIES METASEDIMENTS (Wa)
Fine- to medium-grained biotite schist with minor intercalations of quartz-biotite metasandstone. Biotite cooling ages indicate that metamorphism is older than 480 Ma. Local name: Retreat Hills Schist, Priestley Schist.

Wmg, Wmg 1, Wmg 2 — MIGMATITE GNEISS (Wmg)
Stromatic migmatite with minor agmatitic varieties, hornblende gneiss including some small and irregular amphibolite layers, and calc-silicate horizons alternating with fine-grained biotite gneiss. Biotite cooling ages fall around 475-480 Ma. Local name: Murchison Formation.

DESSENT RIDGE UNIT

Dm — DESSENT METASEDIMENTARY SUITE (Dm)
Amphibolite facies metasediments derived from siliceous, carbonatic, pelitic and basic protoliths. Phyllonites with retrogressive imprint to greenschist facies are present along main shear zones. The metamorphic conditions are T = 520-600°C and P = 6-8 kb. Biotite ages range from 485±5 Ma (Rb/Sr) to 475-477 (40Ar/39Ar, single grain).

BOWERS TERRANE

Sbs — BLACK SPIDER GREENSCHIST (Sbs)
Grey-greenish schist, black shale and phyllite, mafic metavolcanites, with major metaconglomerate bodies formed by dominant mafic and acid volcanic clasts in a green quartz-chlorite matrix. Occasional interbeds of psammitic and calc-silicate types also occur. The metamorphic grade is referrable to the biotite zone of the greenschist facies.

BOWERS SUPERGROUP

Bly — LEAP YEAR GROUP (Bly)
Thickly-bedded, whitish to reddish, fluvial to deltaic quartz-pebble conglomerate and quartzite, with minor intercalations of red silty mudstone. In the map the most common variety comprises a sequence of middle rose-coloured quartzite, pebble conglomerate and pebbly sandstone. A Late Cambrian age is hypothesized.

Bmy — SLEDGERS GROUP
This group is formed by two units which partly interfinger, the sedimentary Molar Formation and the Glasgow Spilite.

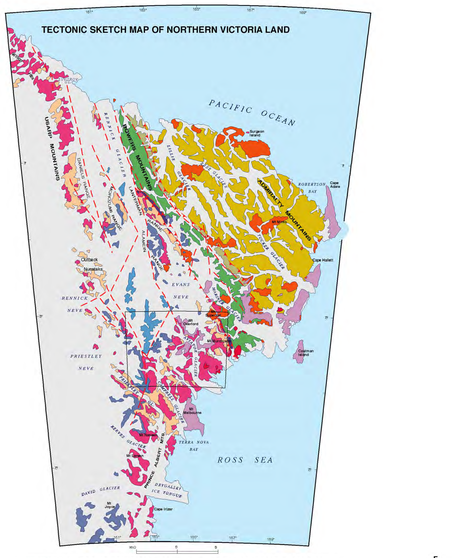
Bmy — MOLAR FORMATION (Bmy) - This formation consists of a well bedded graywacke-mudstone sequence with volcanioclastic detrital lenses and minor siltstone interbeds. The age was established as Middle Cambrian or older, on the basis of the fossil content found north of this quadrangle (at Neall Massif, Freyberg Mountains quadrangle).

Bgy — GLASGOW SPILITE, VOLCANIC BRECCIA and TUFF (Bgl) - Submarine volcanic sequence constituted by massive and banded lava flows, pillow lava, volcanic breccia, tuff and tuffite layers, with subordinate interbeds of siltstone, tuffitic graywacke and minor quartzite, chert and limestone. The interfingering relations with the Molar Formation indicate a similar age (Middle Cambrian or older).

SYMBOLS

- Geological boundary.
- Bedding, (a) inclined, (b) vertical.
- Regional schistosity and cleavage, (a) inclined, (b) vertical.
- Mineral and stretching lineation, (a) inclined, (b) horizontal.
- Axial plane trace, (a) anticline, (b) syncline.
- Fold axis, (a) inclined, (b) horizontal.
- Thrust; teeth on overthrust side.
- Fault; tick (on the downthrown side) or arrows where the sense of motion is known.
- Crater, sink-hole, caldera rim.
- Spatter and cinder cone.
- Active volcano (fumarolic activity).
- Fossils plants.

TECTONIC SKETCH MAP OF NORTHERN VICTORIA LAND


PACIFIC OCEAN
ROSS SEA
Cape Adare
Cape Hallett
Gerlache Str.
Robertson Bay
Coulman Isl.
Cape Hallett
Bay of Victoria
Terra Nova Bay
David Glacier
Tucker Glacier
Cape Washington
Cape Phillips
Cape Adams
Cape Williams
Cape Hunter
Cape Adare
Cape Colbeck
Cape Christian
Cape Hallett
Cape Bernacchi
Cape Ross
Cape Wheeler
Cape Archer
Cape Roberts
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Cape Phillips
Cape Williams
Cape Hunter
Cape Christian
Cape Colbeck
Cape Washington
Cape Adams
Cape Adare
Cape Hallett