# PETROGRAPHY OF SOME ROCKS FROM THE SOUTH ORKNEY ISLANDS AND THE ANTARCTIC ARCHIPELAGO

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CONTENTS



## INTRODUCTION AND ACKNOWLEDGMENTS

There are 294 specimens of Antarctic rocks and minerals in the collections of the University of Michigan. By the Spring of 1935, 178 specimens from six of the eight Antarctic expeditions represented, had been studied petrographically and the results published. There remained 116 rocks and minerals, collected by the Scottish National Antarctic, 1902–1904, and the Swedish Antarctic, 1901–1903, Expeditions to be examined microscopically. A project grant from The Geological Society of America and a grant-in-aid from the Society of the Sigma Xi have made this research possible. Grateful acknowledgments are due to Professors Laurence M. Gould, William H. Hobbs, Walter F. Hunt, and Chester B. Slawson, and Mr. W. L. G. Joerg for their interest shown in this investigation.

Dr. R. N. Rudmose Brown, of the University, Sheffield, England, furnished, through exchange of material with the University, nine duplicate specimens obtained from the South Orkney Islands by the Scottish Expedition. Dr. Gregori Aminoff, of the Mineralogical Department, Riksmuseet, Sweden, contributed, also through exchange, 107 duplicate specimens collected from the Antarctic Archipelago by the Swedish Expedition.

Figure 1 is a sketch map of Antarctica showing the location of the South Orkney Islands and the Antarctic Archipelago. Figures 2 and 3 are sketch maps of the South Orkney Islands, and of the northern region of the Antarctic Archipelago.

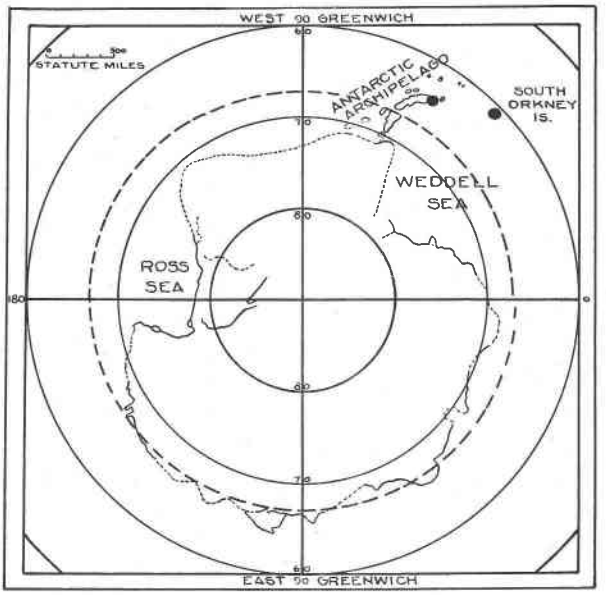


FIG. 1. Sketch map of Antarctica showing locations where specimens were collected.

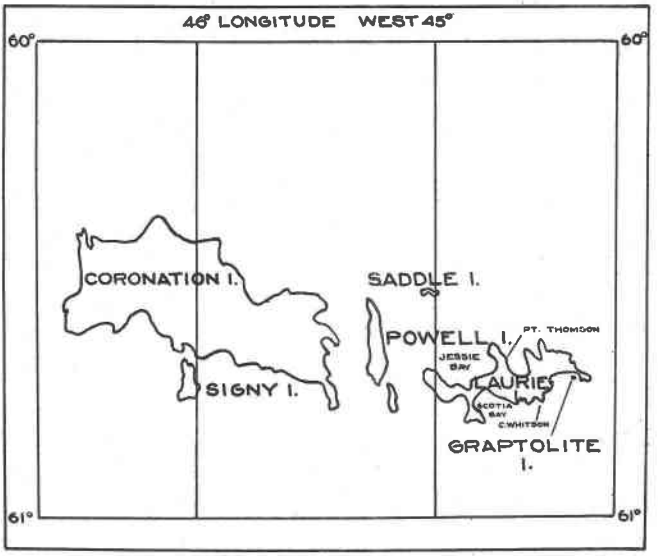


FIG. 2. Sketch map of the South Orkney Islands (after Sörlle).

Nineteen of the 114 thin sections examined had their constituents determined quantitatively. In traversing each thin section on an average of 16 times, with the improved Wentworth recording micrometer, an aggregate distance of 42,889 units was measured. The qualitative results of the study of the thin sections of the South Orkney rocks are recorded in Table I. The qualitative and quantitative results of the examinations of the specimens from the Antarctic Archipelago are recorded in Tables II, III, and IV.

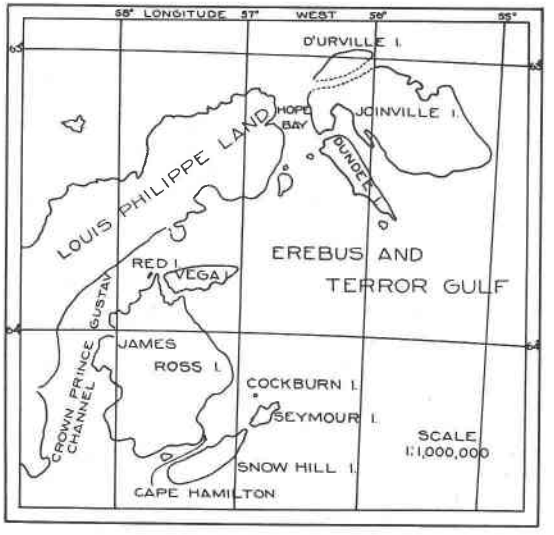


FIG. 3. Sketch map of the northern region of the Antarctic Archipelago (after Nordenskjöld).

## SOUTH ORKNEY ISLANDS

The South Orkney Islands are located in about Latitude 61° South, Longitude 45° West, and are composed of two large islands, Coronation and Laurie; two smaller islands, Powell and Signy; and a large number of very small islands and rocks. Bruce[1] made an accurate and detailed map of Laurie Island in 1903. A recent map of the South Orkney Islands has been prepared by Sörlle.[2] John[3] reports that a complete survey of the

[1] Bruce, W. S., Outline map of Laurie Island: *Scottish National Antarctic Expedition*, Report of the Scientific Results of the Voyage of S. Y. "Scotia" during the years 1902, 1903, and 1904, Physics, vol. **2**, 1907.

[2] Holtedahl, Olaf, On the geology and physiography of some Antarctic and Sub-Antarctic Islands: Scientific Results of the Norwegian Antarctic Expeditions, 1927–1928 and 1928–1929, *Det Norske Videnskaps-Akademi i Oslo*, No. **3**, p. 100, 1929.

[3] John, D. D., The Second Antarctic Commission of the R. R. S. Discovery II: *Geogr. Journ.*, vol. **83**, p. 392, 1934.

islands, other than Laurie Island, was made by the *Discovery II* Expedition in January, 1933.

According to Pirie,[4] these islands are composed entirely of ancient sedimentary rocks, chiefly greywackes and conglomerates. He states[5]

TABLE I. MINERALOGICAL COMPOSITION OF SOME ROCKS FROM THE SOUTH ORKNEY ISLANDS

| Mineral | Specimen | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 6 | 4 | 9 | 5 | 7 | 8 | 3 |
| Quartz | p | p | p | p | p | p | p | p | — |
| Orthoclase | p | p | p | p | p | p | p | — | — |
| Microcline | — | — | — | p | — | — | — | — | — |
| Plagioclase | p | p | p | p | p | p | p | — | p |
| Biotite | p | p | p | p | p | p | p | — | — |
| Pennine | p | p | p | p | p | p | p | p | p |
| Muscovite | p | p | p | p | p | p | p | — | — |
| Hornblende | — | p | p | p | — | p | p | — | — |
| Garnet | p | — | — | p | p | p | — | — | — |
| Apatite | p | p | p | p | p | p | p | — | — |
| Zircon | p | p | p | p | p | p | p | — | — |
| Epidote | p | p | p | p | p | p | p | ? | — |
| Sphene | p | p | p | p | p | p | p | — | — |
| Rutile | ? | p | p | p | p | p | p | ? | — |
| Magnetite | p | p | p | p | p | p | p | — | p |
| Ilmenite | p | p | p | p | p | p | p | — | — |
| Pyrite | p | p | — | p | p | p | — | p | p |
| Limonite | — | p | p | p | — | p | — | p | p |
| Calcite | — | — | — | p | p | p | p | p | p |
| Leucoxene | p | p | p | p | p | p | p | — | — |
| Kaolin | p | p | p | p | p | p | p | — | p |
| Sericite | p | p | p | p | p | p | p | p | — |

p=present in thin section.

1. Quartzite. Laurie I.
2. Quartzite. Laurie I.
6. Quartzite. Scotia Bay, Laurie I.
4. Conglomerite. Coronation I.
9. Conglomerite. Pt. Thomson, Laurie I.
5. Conglomerite. Pt. Thomson, Laurie I.
7. Arkosic conglomerite. Cape Whitson, Laurie I.
8. Slate. Graptolite I.
3. Altered diabase?. Jessie Bay, Laurie I.

[4] Pirie, J. H. H., First Antarctic voyage of the "Scotia," V. Note on the geology of the South Orkneys: *Scot. Geogr. Mag.*, vol. **20,** p. 130, 1904.

[5] Pirie, J. H. H., On the graptolite-bearing rocks of the South Orkneys, With a note by Dr. Peach on specimens from the South Orkneys: *Proc. Roy. Soc. Edinb.*, 1904–1905, vol. **25,** pp. 463–465 1906.

that the Scottish Expedition collected rock specimens mainly on Laurie Island, although single landings were made on Saddle and Coronation Islands. Included in his paper are brief descriptions of the Laurie specimens, which he divides into greywacke, greywacke-slate, and greywacke showing gneissic banding and folding. Holtedahl[6] examined some of the specimens in Pirie's collection and noted that in several, considerable deformational effects such as crushing of the mineral and rock fragments were common.

Nine thin sections of rocks from the South Orkney Islands were examined. Of these seven came from Laurie Island and consist of three quartzites, two conglomerites, an arkosic conglomerite, and an altered diabase?. The one specimen from Coronation Island is a conglomerite, and the one from Graptolite Island, a slate. A few fragments of micrographic intergrowths were noted in one of the conglomerites from Laurie Island. Deformational effects, as described by Holtedahl, may be seen in the bent and faulted plagioclase twinning lamellae.

## Antarctic Archipelago

### General Statement

Fifteen papers on the geological and paleontological results of the Swedish Expedition have been published.[7] Andersson[8] has written a résumé of the geology of the northern area of the Antarctic Archipelago. The petrography of many of the rocks collected has been discussed by Nordenskjöld.[9] Hennig[10] has contributed to the petrography of the rocks of Cockburn Island. Petrographical analyses of 25 specimens, of which 20 were analyzed chemically, have been recorded by Bodman.[11]

Nordenskjöld[12] divides the Antarctic Archipelago into "die Zone der Gebirgskette" and "die Ostliche Zone (Zone der Erguss- und Sedimentgesteine)." The topography of the mountain chain zone is that of a high, almost wholly ice-free land, the western coast being strongly idented by

[6] Holtedahl, Olaf, *op. cit.*, p. 99.

[7] Nordenskjöld, Otto, Wissenschaftliche Ergebnisse der Schwedischen Südpolar-Expedition 1901–1903: *Geologie und Paläontologie*, Band **3**, 765 pp., 1916.

[8] Andersson, J. G., On the geology of Graham Land: *Upsala Univ., Geol. Inst. Bull.*, 1904–1905, vol. **7**, pp. 19–71, 1906.

[9] Nordenskjöld, Otto, Petrographische Untersuchungen aus dem westantarktischen Gebiete: *Upsala Univ., Geol. Inst. Bull.*, 1902–1903, vol. **6**, pp. 234–246, 1905.

[10] Hennig, Anders, Le conglomérat pleistocène à Pecten de l'île Cockburn, Wissenschaftliche Ergebnisse der Schwedischen Südpolar-Expedition 1901–1903: *Geologie und Paläontologie*, Band **3**, Lief. 10, pp. 6–9, 1916.

[11] Bodman, Gösta, Petrographische Studien über einige antarktische Gesteine, Wissenschaftliche Ergebnisse der Schwedischen Südpolar-Expedition 1901–1903: *Geologie und Paläontologie*, Band **3**, Lief. 15, pp. 1–100, 1916.

[12] Nordenskjöld, Otto, *op. cit.*,p. 235.

fjords. A number of expeditions have visited the islands of the western coast, outstanding among which have been those of Arctowski and Charcot. The petrography of the rocks collected by the Expédition Antarctique Belge has been recorded by Pelikan[13] and Sistek.[14] The petrographical results of the two Expéditions Antarctique Française have been monographed by Gourdon.[15] Intrusives are the principal rocks of the islands of the western area of the Antarctic Archipelago. The islands of the eastern zone are plateau-like with coast lines formed by vertical cliffs (as James Ross Island), composed of tuffs and basalts, with an elevation of approximately 2,000 meters, and low-lying islands, made up mainly of soft sedimentary rocks (Seymour Island), whose elevations above sea level are in the neighborhood of 200 meters.

The specimens examined came from the northern area of the Archipelago—Cockburn, Snow Hill, Seymour, James Ross, and Red Islands, and Hope Bay, Louis Philippe Land.

## Cockburn Island

Cockburn Island is located in approximately Latitude 64°13′ South, Longitude 56°50′ West. Fossiliferous Cretaceous strata (Snow Hill series), intruded by basalt dikes, outcrop here and there through the talus that covers the steep sides of the island. Overlying these beds are basalts alternating with basic tuffs, upon which rests a localized deposit of post-Miocene Pecten-conglomerate. This conglomerate contains numerous blocks of basalt and basaltic tuff, many of which are of considerable dimensions, and a few pebbles of foreign crystalline rocks.

Thin sections of the following Cockburn rocks were examined: Glauconitic calcareous sandstone (Snow Hill series) from the northeastern part of the island; basic tuff, basalt, and olivine basalt from the steep sides of the island; vesicular and olivine basalts from the summit; olivine basalt dike intruding the Snow Hill series; basic tuff (Pecten-conglomerate formation); and a quartzite erratic.

Fragments of rocks and a piece of micrographic intergrowth are present in the sandstone. Basaltic glass, noted in some of the basic rocks, has an average index of refraction of 1.590.

[13] Pelikan, A., Geologie, Petrographische Untersuchung der Gesteinsproben, Expédition Antarctique Belge, Résultats du Voyage du S. Y. *Belgica* en 1897–1898–1899: *Rapports Scientifiques*, Teil **1**, 49 pp., 1909.

[14] Sistek, Dragomir, Geologie, Petrographische Untersuchung der Gesteinsproben, Expédition Antarctique Belge, Résultats du Voyage du S. Y. *Belgica* en 1897–1898–1899: *Rapports Scientifiques*, Teil **2**, 29 pp., 1912.

[15] Gourdon, E., Géographie physique, glaciologie, pétrographie, Charcot, Expédition Antarctique Française 1903–05, Troisième partie, pp. 141–208, **1908.** Minéralogie-géologie, Deuxième Expédition Antarctique Française 1908–10, 10 pp., **1917.**

## Snow Hill Island

Snow Hill Island, which is built up chiefly of gently dipping fossiliferous Cretaceous fine-grained, soft sandstones, is located approximately in Latitude 64°27′ South, Longitude 57°15′ West. A large basalt dike and numerous other smaller basic ones intrude these strata. Concretions of harder sandstone, more or less rich in glauconite, occur in the beds. The Snow Hill series is stratigraphically below the Older Seymour beds.

Thirty-seven sections of Snow Hill rocks were examined. The specimens were practically all gathered in the vicinity of the winter station, about in Latitude 64°22′ South, Longitude 57° West, in the northern part of the island. The collection is made up of 14 specimens of limestones, including one erratic, four of which contain over one per cent glauconite, nine being arenaceous; six sandstones, three of which contain over one per cent glauconite; an arenaceous shale erratic; one diorite; an olivine basalt; four antigorite basalts, one of which is an erratic; an olivine analcitite; one antigorite analcitite; a quartz schist; five quartzites, including one erratic; and two marbles.

Chert, quartzite, diabase?, and other rock fragments occur in 13 sections, and pieces of micrographic intergrowths are noted in six sections of the sedimentary rocks. The igneous rocks, with one exception, exhibit zoned plagioclase feldspars.

## Seymour Island

Seymour Island is located in about Latitude 64°17′ South, Longitude 56°47′ West. Seymour may be divided into two parts on the basis of the ages of the sedimentary rocks. In the southwestern area are marine fossiliferous Cretaceous (Older Seymour Island) beds, cut by a large basalt dike, a probable continuation of the Snow Hill basalt; the northeastern part consists of fossiliferous marine upper Oligocene or lower Miocene (Younger Seymour Island) beds. The Tertiary rocks are sandstones, as are also the Cretaceous beds, cemented by calcite, and tuff containing fragments of augite porphyrite.

Nineteen of the 23 slides of Seymour Island rocks are of erratics—half of them having been collected from the northern area, and half from the southwestern part. The erratics include examples of all three classes of rocks. Two specimens of limestones were examined occurring in situ in the "Tvärdalen," and sections of quartzite and rhyolite, likewise occurring in situ on the island, were analyzed petrographically.

Prominent zoning of the plagioclase was noted in four of the nine sections of igneous rocks. Micrographic intergrowths occurred in four of the igneous specimens, and as a fragment in one of the limestones. Chert, quartzite, diabase, basalt, basic glass, shale, and schist fragments were recorded in four of the seven thin sections of sedimentary rocks.

### James Ross Island

James Ross Island is a relatively large island whose central portion is in approximately Latitude 64°9′ South, Longitude 57°30′ West. It is built up almost exclusively of basalt tuff, which rests upon Cretaceous (Snow Hill series) beds.

The specimens examined were collected mainly in the vicinity of Cape Hamilton, in the southeastern part of the island. The seven thin sections studied include granodiorite, diabasic olivine gabbro (erratic), olivine basalt, basic tuff, limonitic limestone, and mica schist.

The plagioclase of the granodiorite and gabbro is zoned. Micrographic intergrowths are present in the granodiorite. The limestone contains fragments of quartzite and basic glass.

### Hope Bay, Louis Philippe Land

Hope Bay is located in approximately Latitude 63°15′ South, Longitude 56°50′ West. Jurassic plant-bearing strata, the oldest known sedimentary rocks in the northern region of the Antarctic Archipelago, are exposed here. The plant remains are in a hard, dark, slaty rock which forms the lower part of Mount Flora, to the south of Hope Bay. A series of volcanic tuffs occur above the fossiliferous beds. Between the time of the deposition of the Older and Younger Seymour Island beds orogenic movements took place in the Archipelago and the plant-bearing series was involved in the folding, Nordenskjöld[16] remarks that the whole ice-free area north of Mount Flora is built up of sedimentary rocks, the principal type being greywacke, associated with a black slaty rock and light-colored, crossbedded sandstones. The underlying bedded rocks are conglomerates oftentimes containing good-sized boulders. Aside from the sedimentary rocks there is an important series of granite-diorite-gabbro eruptives.

Twenty-eight thin sections of rocks from the Hope Bay area were examined. Fifteen, including three erratics, are conglomerites and arkosic conglomerites, nine being from Mount Flora. In the collection there are examples of gabbro, trachyte, and quartz basalt erratics. Other rocks, collected in situ, include granite, gabbro, basalt, quartzite, arkosite, slate, and shale. Specimens of chert and schorlite were also examined.

Zoning of the plagioclase feldspars was noted in five of the seven sections of igneous rocks. Fragments of micrographic intergrowths are present in six of the metamorphosed sedimentaries. Limestone, chert, shale or slate, basic glass, basalt?, diabase?, and a micaceous rock occur as fragments in the metamorphic specimens. Bent and faulted plagio-

[16] Nordenskjöld, Otto, *op. cit.*, p. 239.

clase twinning lamellae are prominent features in ten sections of the conglomerites.

## The Age of the Intrusives

Referring to the age of the intrusive rocks Andersson[17] remarks that the age of the eruptives cannot be settled by means of field observations, but that it is probable, though not actually proved, that they are younger than the Jurassic beds of Hope Bay, as no fragments of the intrusive rocks were found in the conglomerates and tuffs of the Jurassic series. On the other hand no intrusions or metamorphic effects were noticed although they lie very close to one another. There is a considerable similarity between the intrusive rocks of the Patagonian Cordilleras of South America and those of the Archipelago, and judging from the probable age of the Andine eruptives, young Cretaceous or older Tertiary, Andersson considers it possible that those of the Antarctic Archipelago are of the same age. According to Nordenskjöld,[18] the plagioclase feldspars of the intrusives of the Hope Bay area exhibit zoning, and at times micropegmatitic intergrowths of orthoclase and quartz. These two features are apparently rather characteristic of the series.

As recorded above, micrographic intergrowths are present in five of the intrusives examined, and occur as fragments in 14 sedimentary and metamorphosed sedimentary rocks, which suggests that the sedimentary materials were derived from some of the intrusives of the granite-diorite-gabbro series. Taking into consideration the petrographical characteristics of the rocks of the northern region of the Archipelago, it is here suggested that some of the intrusives, at least, are older than the Jurassic sedimentary series of the Hope Bay area, and that the sediments were derived, in part, from the granite-diorite-gabbro series.

## Summary

A study was made of 114 thin sections of duplicate specimens collected by the Scottish National Antarctic, 1902–1904, and the Swedish Antarctic, 1901–1903, expeditions. The Scottish collections were gathered from the South Orkney Islands, and the Swedish from Cockburn, Snow Hill, Seymour, James Ross, and Red Islands, and Hope Bay, Louis Philippe Land, Antarctic Archipelago. It is suggested that the series of granite-diorite-gabbro eruptives of the northern region of the Archipelago were the source of, at least, some of the sediments of the Jurassic strata of the area, and, therefore, of greater age than that previously suggested—late Cretaceous or early Tertiary.

[17] Andersson, J. G., *op. cit.*, pp. 59–60.

[18] Nordenskjöld, Otto, *op. cit.* p 237.

TABLE II. MINERALOGICAL COMPOSITION OF SOME IGNEOUS ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 200289 | 200260 | 200376 | 200319 | 200329 | 200388 | 200199 | 200345 | 200373 |
| Glass | — | — | — | — | — | — | — | — | — |
| Quartz | 35.97 | p | 30.46 | 19.41 | 26.78 | 10.57 | — | 1.11 | 3.44 |
| Feldspar | — | — | — | — | — | — | — | — | — |
| Orthoclase | 28.39 | p | 30.84 | 8.92 | 15.08 | 7.11 | — | — | — |
| Microcline | | — | — | — | — | — | — | — | — |
| Microperthite | — | — | — | — | — | — | — | — | — |
| Plagioclase | — | — | — | — | — | — | 63.39 | — | — |
| Albite | — | — | — | — | — | — | p | — | — |
| Oligoclase | 27.62 | p | — | 54.46 | — | — | — | — | — |
| Andesine | — | — | 30.11 | — | 51.49 | 66.28 | p | — | — |
| Labradorite | — | — | — | — | — | — | — | 69.60 | 61.49 |
| Bytownite | — | — | — | — | — | — | — | — | — |
| Pennine | — | — | 3.90 | — | — | | 2.99 | | p |
| Biotite | 0.96 | p | | 7.51 | 4.72 | 11.89 | — | 6.86 | p |
| Chlorite | | p | — | | | | — | | p |
| Hornblende | — | — | 3.23 | 7.55 | p | | 26.43 | 18.04 | 10.73 |
| Augite | — | — | — | — | — | — | — | | 15.31 |
| Olivine | — | — | — | — | — | — | — | — | — |
| Antigorite | — | — | — | — | — | — | — | — | — |
| Chrysotile | — | — | — | — | — | — | — | — | — |
| Talc | — | — | — | — | — | — | — | — | — |
| Sphene | — | p | | — | — | | | — | — |
| Tourmaline | ? | ? | | | ? | ? | abs | — | — |
| Apatite | p | p | 0.43 | 0.21 | | 2.28* | 0.26 | 0.57 | 0.37 |
| Zircon | p | p | | | | | abs | p | p |
| Muscovite | 6.73 | p | | — | 0.81 | abs | | p | 4.41 |
| Epidote | — | — | | — | | | 6.35 | — | — |
| Zoisite | — | — | — | — | | — | — | — | — |
| Garnet | 0.34 | — | — | — | — | — | — | — | — |
| Clinozoisite | — | — | — | — | — | — | — | — | — |
| Zeolite | — | — | — | — | — | — | — | — | — |
| Stilbite | — | — | — | — | — | — | — | — | — |
| Analcime | — | — | — | — | — | — | — | — | — |
| Tridymite | — | — | — | — | — | — | — | — | — |
| Chalcedony | — | — | — | — | — | — | — | — | — |
| Pyrite | — | — | — | — | — | — | — | 3.83 | — |
| Magnetite | p | p | 1.03 | 1.93 | 1.12 | 1.87 | 0.58 | | 1.29 |
| Ilmenite | — | p | | — | — | | | — | — |
| Hematite | — | — | — | — | — | — | — | — | — |
| Limonite | p | — | — | p | p | — | p | — | — |
| Calcite | — | p | — | — | — | — | — | p | p |
| Dolomite | — | — | — | — | — | — | — | — | — |
| Leucoxene | — | p | p | — | — | p | p | — | — |
| Kaolin | p | p | p | — | p | p | p | — | — |
| Sericite | p | p | p | p | p | p | p | p | p |
| | 100.01 | — | 100.00 | 99.99 | 100.00 | 100.00 | 100.00 | 100.01 | 100.00 |

* Mainly sphene and apatite. p = present in thin section.

200289. Leucogranite. Erratic. Seymour I.
200260. Biotite granite. Erratic. Seymour I.
200376. Granite. Hope Bay, Louis Philippe Land.
200319. Granodiorite. Erratic. Seymour I.
200329. Granodiorite. Erratic. Seymour I.
200388. Granodiorite. James Ross I.
200199. Diorite. Snow Hill I.
200345. Gabbro. Erratic. Hope Bay, Louis Philippe Land.
200373. Gabbro. Hope Bay, Louis Philippe Land.

TABLE II. MINERALOGICAL COMPOSITION OF SOME IGNEOUS ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 200402 | 200258 | 200336 | 200273 | 200267 | 200324 | 200344 | 200351 | 16563 |
| Glass | — | — | — | — | — | — | — | — | p |
| Quartz | — | p | p | p | p | p | — | p | p |
| Feldspar | — | — | p | — | — | — | — | — | — |
| Orthoclase | — | p | — | p | p | p | p | — | — |
| Microcline | — | — | — | — | — | — | — | — | — |
| Microperthite | — | p | — | p | p | — | — | — | — |
| Plagioclase | — | — | — | p | — | p | p | — | — |
| Albite | — | p | — | — | p | — | — | — | — |
| Oligoclase | — | — | — | — | — | — | — | — | — |
| Andesine | — | — | — | — | — | — | — | — | — |
| Labradorite | — | — | — | — | — | — | — | p | p |
| Bytownite | 58.45 | — | — | — | — | — | — | — | — |
| Pennine | — | p | — | p | — | — | p | — | — |
| Biotite | — | p | p | p | p | — | p | — | — |
| Chlorite | — | p | p | p | p | — | — | p | — |
| Hornblende | — | — | — | — | — | — | p | p | — |
| Augite | 15.39 | — | — | — | — | — | — | p | — |
| Olivine | 21.94 | — | — | — | — | — | — | — | p |
| Antigorite | — | — | — | — | — | — | — | — | p |
| Chrysotile | — | — | — | — | — | — | — | — | — |
| Talc | — | — | — | — | — | — | — | — | — |
| Sphene | — | p | — | p | p | — | p | p | — |
| Tourmaline | — | — | — | — | — | — | — | — | — |
| Apatite | p | p | p | p | p | — | p | p | — |
| Zircon | — | p | p | — | — | — | — | — | — |
| Muscovite | — | p | p | — | p | — | p | — | — |
| Epidote | — | p | — | p | — | — | p | — | — |
| Zoisite | — | — | — | — | — | — | — | — | — |
| Garnet | — | — | — | — | — | — | — | — | — |
| Clinozoisite | — | — | p | — | — | — | — | — | — |
| Zeolite | — | — | — | — | — | — | — | — | — |
| Stilbite | — | — | — | — | — | — | — | — | — |
| Analcime | — | — | — | — | — | — | — | — | — |
| Tridymite | — | — | — | — | — | — | — | — | — |
| Chalcedony | — | — | — | — | — | — | — | — | — |
| Pyrite | — | p | — | — | — | — | p | p | — |
| Magnetite | 4.21 | — | p | p | — | p | p | p | — |
| Ilmenite | — | — | — | — | p | — | — | — | — |
| Hematite | — | — | — | p | — | — | — | — | — |
| Limonite | p | p | — | p | p | — | p | — | p |
| Calcite | — | p | — | — | p | — | p | p | p |
| Dolomite | — | — | — | — | — | — | — | — | — |
| Leucoxene | — | p | — | — | p | — | p | — | — |
| Kaolin | — | p | p | p | p | — | p | — | — |
| Sericite | — | p | p | — | p | — | p | — | — |
| | 99.99 | — | — | — | — | — | — | — | — |

p = present in thin section.

200402. Diabasic olivine gabbro. Erratic. James Ross I.
200258. Granophyre. Erratic. Seymour I.
200336. Granophyre. Erratic. Seymour I.
200273. Pegmatophyre. Erratic. Seymour I.
200267. Rhyolite. Seymour I.
200324. Rhyolite. Erratic. Seymour I.
200344. Trachyte. Erratic. Hope Bay, Louis Philippe Land.
200351. Quartz basalt. Erratic. Hope Bay, Louis Philippe Land.
16563. Basalt. Cockburn I.

TABLE II. MINERALOGICAL COMPOSITION OF SOME IGNEOUS ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 16564 | 200370 | 200374 | 16565 | 16567 | 16568 | 200203 | 200390 | 200205 |
| Glass | p | — | — | — | — | p | — | p | — |
| Quartz | — | — | — | — | — | — | — | — | — |
| Feldspar | — | — | — | — | — | — | — | — | — |
| Orthoclase | — | — | — | — | — | — | — | — | — |
| Microcline | — | — | — | — | — | — | — | — | — |
| Microperthite | — | — | — | — | — | — | — | — | — |
| Plagioclase | — | — | — | — | — | — | — | — | — |
| Albite | — | — | — | — | — | — | — | — | — |
| Oligoclase | — | — | — | — | — | — | — | — | — |
| Andesine | — | — | — | p | — | — | — | — | — |
| Labradorite | — | p | p | — | p | 54.62 | p | p | p |
| Bytownite | p | — | — | — | — | — | — | — | — |
| Pennine | — | — | — | — | — | — | — | — | — |
| Biotite | — | p | p | — | — | — | — | — | — |
| Chlorite | — | — | p | — | — | — | ? | p | — |
| Hornblende | — | — | — | — | — | — | — | — | — |
| Augite | — | p | p | — | p | 14.96 | p | — | — |
| Olivine | p | — | — | p | p | 3.55 | p | p | — |
| Antigorite | — | — | — | p | — | p | p | — | p |
| Chrysotile | — | — | — | p | — | — | — | p | — |
| Talc | — | — | — | — | — | — | — | — | — |
| Sphene | — | — | — | — | — | — | — | — | — |
| Tourmaline | p | — | — | — | — | — | — | — | — |
| Apatite | — | — | p | — | p | — | p | — | — |
| Zircon | — | — | — | — | — | — | — | — | — |
| Muscovite | — | — | — | — | — | — | — | — | — |
| Epidote | — | — | — | — | — | — | — | — | — |
| Zoisite | — | — | — | — | — | — | — | — | — |
| Garnet | — | — | — | — | — | — | — | — | — |
| Clinozoisite | — | — | — | — | — | — | — | — | — |
| Zeolite | — | — | — | — | — | — | — | p | — |
| Stilbite | — | — | ? | — | — | — | — | — | — |
| Analcime | — | — | — | — | — | 2.87 | — | — | — |
| Tridymite | — | — | — | — | — | — | — | — | — |
| Chalcedony | — | — | — | — | — | — | — | — | — |
| Pyrite | — | — | — | — | — | — | — | — | p |
| Magnetite | p | p | p | — | p | 3.26 | p | p | p |
| Ilmenite | — | — | — | — | — | — | — | — | — |
| Hematite | — | — | — | p | p | — | — | — | p |
| Limonite | p | p | p | p | — | p | p | p | p |
| Calcite | p | p | — | p | p | 20.74 | p | p | — |
| Dolomite | — | — | — | — | — | — | — | — | p |
| Leucoxene | — | — | — | — | — | — | — | — | — |
| Kaolin | — | — | — | — | — | — | — | — | — |
| Sericite | — | — | — | — | — | — | p | — | — |
| | — | — | — | — | — | 100.00 | — | — | — |

p = present in thin section.

16564. Basalt. Cockburn I.
200370. Basalt. Hope Bay, Louis Philippe Land.
200374. Basalt. Hope Bay, Louis Philippe Land.
16565. Vesicular basalt. Cockburn I.
16567. Olivine basalt. Cockburn I.
16568. Olivine basalt. Cockburn I.
200203. Olivine basalt. Snow Hill I.
200390. Olivine basalt. James Ross I.
200205. Antigorite basalt. Snow Hill I.

TABLE II. MINERALOGICAL COMPOSITION OF SOME IGNEOUS ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 200215 | 200222 | 200247 | 200221 | 200243 | 16561 | 200411 | 200389 | 200408 |
| Glass | — | p | — | — | — | p | p | p | p |
| Quartz | — | p | p | — | p | p | p | p | p |
| Feldspar | — | — | — | — | — | — | — | — | — |
| Orthoclase | — | — | — | — | — | — | — | — | — |
| Microcline | — | — | — | — | — | — | — | — | — |
| Microperthite | — | — | — | — | — | — | — | — | — |
| Plagioclase | — | — | — | — | — | — | — | p | — |
| Albite | — | — | — | — | — | — | — | — | — |
| Oligoclase | — | — | — | — | — | — | — | — | — |
| Andesine | — | — | — | — | — | — | — | — | — |
| Labradorite | — | p | p | p | p | — | p | — | p |
| Bytownite | p | — | — | — | — | p | — | — | — |
| Pennine | — | — | — | — | — | — | — | — | — |
| Biotite | — | — | — | — | — | — | — | — | — |
| Chlorite | — | — | — | — | — | p | p | p | p |
| Hornblende | — | — | — | — | — | — | — | — | — |
| Augite | p | — | — | p | — | p | p | — | — |
| Olivine | — | — | — | p | p | p | p | p | p |
| Antigorite | p | p | p | p | p | p | — | — | — |
| Chrysotile | p | — | — | — | p | — | — | — | p |
| Talc | — | — | — | — | — | p | — | — | p |
| Sphene | p | — | — | — | — | — | — | — | — |
| Tourmaline | — | — | — | — | — | — | p | — | — |
| Apatite | — | — | — | — | — | — | — | — | — |
| Zircon | — | — | — | — | — | — | — | — | — |
| Muscovite | — | — | — | — | — | — | — | — | — |
| Epidote | — | — | — | — | — | — | — | — | — |
| Zoisite | — | — | — | — | — | — | — | — | — |
| Garnet | — | — | — | — | — | — | — | — | — |
| Clinozoisite | — | — | — | — | — | — | — | — | — |
| Zeolite | — | — | — | — | — | — | — | — | — |
| Stilbite | — | — | — | — | — | — | — | — | ? |
| Analcime | — | — | p | p | p | — | — | p | — |
| Tridymite | — | — | — | — | — | ? | — | — | — |
| Chalcedony | — | — | — | — | — | — | — | ? | — |
| Pyrite | — | p | — | — | — | p | — | — | — |
| Magnetite | — | p | p | p | p | p | p | p | p |
| Ilmenite | p | p | — | — | — | — | — | — | — |
| Hematite | — | p | p | p | p | — | p | — | — |
| Limonite | p | p | p | p | p | p | p | p | p |
| Calcite | p | p | p | p | p | p | p | p | — |
| Dolomite | — | — | — | — | — | — | — | — | — |
| Leucoxene | p | — | p | — | p | — | — | — | — |
| Kaolin | — | — | — | — | — | — | p | — | — |
| Sericite | — | — | — | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — |

p = present in thin section.

200215. Antigorite basalt. Snow Hill I.
200222. Antigorite basalt. Snow Hill I.
200247. Antigorite basalt. Snow Hill I.
200221. Olivine analcitite. Snow Hill I.
200243. Antigorite analcitite. Snow Hill I.
16561. Basic tuff. Cockburn I.
200411. Basic tuff. Cockburn I.
200389. Basic tuff. James Ross I.
200408. Basic tuff. James Ross I.

TABLE III. MINERALOGICAL COMPOSITION OF SEDIMENTARY ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 200256 | 200291 | 200386 | 200248 | 200177 | 200220 | 200226 | 200242 | 200308 | 200179 | 200211 | 200228 | 200241 | 200244 | 200311 |
| Quartz | p | p | p | p | — | — | p | — | p | p | p | p | 30.44 | p | 11.78 |
| Microcline | — | — | — | — | — | — | — | — | — | p | p | p | | p | |
| Orthoclase | — | — | — | p | — | — | — | — | — | p | p | p | 14.42 | p | 3.29 |
| Plagioclase | — | p | p | — | — | — | p | — | p | p | p | p | | p | |
| Enstatite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | ? |
| Augite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hornblende | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Glauconite | — | — | — | — | — | — | — | — | p | p | p | p | 0.36 | p | 0.32 |
| Tourmaline | p | — | p | — | — | — | — | — | — | — | — | — | | — | |
| Chlorite | p | — | p | p | — | — | — | — | — | — | p | p | | p | |
| Apatite | p | — | p | — | — | — | — | — | — | — | p | — | | p | |
| Biotite | — | — | p | p | — | — | — | — | p | p | p | p | | p | |
| Muscovite | p | p | p | — | — | — | — | — | p | p | p | p | | p | |
| Garnet | — | — | — | — | — | — | — | — | — | p | p | — | 1.76 | p | |
| Zircon | p | p | p | p | — | — | p | — | p | — | p | — | | p | 0.74 |
| Rutile | — | — | — | — | — | — | p | — | — | — | p | — | | p | |
| Magnetite | p | — | p | p | — | — | p | — | p | p | p | p | | p | |
| Limonite | p | p | — | — | — | — | p | p | p | p | p | p | | p | |
| Ilmenite | p | p | — | p | — | — | — | — | — | p | p | — | | p | |
| Leucoxene | p | p | — | p | — | — | — | — | p | p | p | p | | p | |
| Sphene | p | — | — | — | — | — | — | — | p | — | p | p | — | p | |
| Pyrite | p | p | — | — | — | — | p | — | p | p | — | p | — | — | — |
| Epidote | p | — | — | — | — | — | — | — | p | — | — | — | — | — | — |
| Zeolite | — | — | — | ? | — | — | — | — | — | — | — | — | — | — | — |
| Calcite | — | — | — | p | p | p | p | p | p | p | p | p | 53.01 | p | 83.88 |
| Pennine | p | p | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Clinozoisite | — | p | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hematite | p | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Kaolin | p | — | — | p | — | — | — | — | — | p | p | p | p | p | p |
| Sericite | p | p | p | p | — | — | — | — | p | p | p | p | p | p | p |
| | — | — | — | — | — | — | — | — | — | — | — | — | 99.99 | — | 100.01 |

* Mainly glass and rock fragments.

200256. Shale. Erratic. Seymour I.
200291. Shale. Erratic. Seymour I.
200386. Shale. Hope Bay, Louis Philippe Land.
200248. Arenaceous shale. Erratic. Snow Hill I.
200177. Limestone. Snow Hill I.
200220. Limestone. Snow Hill I.
200226. Limestone. Snow Hill I.
200242. Limestone. Snow Hill I.
200308. Limestone. Seymour I.
200179. Arenaceous limestone. Snow Hill I.

p = present in thin section.

200211. Arenaceous limestone. Snow Hill I.
200228. Arenaceous limestone. Snow Hill I.
200241. Arenaceous limestone. Snow Hill I.
200244. Arenaceous limestone. Erratic. Snow Hill I.
200311. Arenaceous limestone. Erratic. Seymour I.

TABLE III. MINERALOGICAL COMPOSITION OF SOME SEDIMENTARY ROCKS FROM THE NORTHEASTERN AREA OF THE NORTHERN ARCHIPELAGO

| Mineral | Specimen | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 200189 | 200208 | 200236 | 200240 | 200406 | 200209 | 200312 | 200207 | 16560 | 200182 | 200235 | 200192 | 200229 | 200181 | 200287 |
| Quartz | 24.26 | 17.97 | 17.76 | p | p | p | 1.92 | p | 36.36 | p | p | p | p | 16.52 | p |
| Microcline | 13.43 | 9.58 | 8.78 | p | — | p | 4.95 | p | 5.07 | p | p | p | p | 15.69 | — |
| Orthoclase | | | | p | — | p | | p | | p | p | p | p | | — |
| Plagioclase | | | | p | p | p | | p | | p | p | p | p | | p |
| Enstatite | — | — | — | — | — | — | ? | — | ? | — | — | — | — | — | — |
| Augite | — | — | — | — | — | — | ? | — | — | — | — | — | — | — | — |
| Hornblende | — | — | — | — | — | — | | — | — | — | — | — | — | — | — |
| Glauconite | 3.57 | 1.41 | 2.07 | p | p | p | | — | 4.68 | p | p | p | p | 23.52 | — |
| Tourmaline | — | — | — | — | — | — | abs | p | | p | p | p | — | — | — |
| Chlorite | | | | p | — | — | | — | | p | p | p | p | — | p |
| Apatite | | abs | | p | — | — | | — | | p | p | — | — | | p |
| Biotite | | | | p | — | p | | p | | p | p | p | p | | p |
| Muscovite | | | | p | p | p | | — | | p | p | p | p | | p |
| Garnet | | | | p | — | — | 14.91* | p | | — | p | p | p | | — |
| Zircon | 1.06 | 1.36 | 3.62 | p | — | — | | p | 5.72 | p | p | p | p | | p |
| Rutile | | | | p | p | p | | p | | p | p | p | — | | — |
| Magnetite | | | | p | p | p | | p | | p | p | p | p | 2.39 | p |
| Limonite | | | | p | p | p | | p | | p | p | p | p | | p |
| Ilmenite | | | | p | — | — | abs | p | | p | p | — | — | | p |
| Leucoxene | | | | p | p | p | abs | p | | p | p | p | p | | p |
| Sphene | | | — | — | p | p | abs | p | | p | p | p | p | | p |
| Pyrite | — | — | — | p | p | p | | — | | p | — | — | — | abs | — |
| Epidote | — | — | — | — | — | — | | — | — | p | — | — | — | | — |
| Zeolite | — | — | — | — | — | — | | — | — | — | — | — | p | | — |
| Calcite | 57.68 | 69.68 | 67.78 | p | p | p | 78.22 | — | 48.17 | p | p | p | p | 41.19 | p |
| Pennine | — | — | — | — | — | — | — | — | — | — | — | — | p | — | — |
| Clinozoisite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hematite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Kaolin | p | p | p | p | p | p | p | p | p | p | p | p | — | p | p |
| Sericite | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |

* Mainly glass and rock fragments.

200189. Glauconitic arenaceous limestone. Snow Hill I.
200208. Glauconitic arenaceous limestone. Snow Hill I.
200236. Glauconitic arenaceous limestone. Snow Hill I.
200240. Glauconitic arenaceous limestone. Snow Hill I.
200406. Limonitic limestone. James Ross I.
200209. Limonitic arenaceous limestone. Snow Hill I.
200312. Impure limestone. Seymour I.
200207. Calcareous sandstone. Snow Hill I.
16560. Glauconitic calcareous sandstone. Cockburn I.
200182. Glauconitic limonitic sandstone. Snow Hill I
p = present in thin section.
200235. Glauconitic limonitic sandstone. Snow Hill I.
200192. Limonitic sandstone. Snow Hill I.
200229. Limonitic sandstone. Snow Hill I.
200181. Glauconitic calcareous arkose. Snow Hill I.
200287. Conglomerite. Erratic. Seymour I.

TABLE IV. MINERALOGICAL COMPOSITION OF SOME METAMORPHIC ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 200202 | 200223 | 200231 | 200232 | 200301 | 200334 | 200380 | 200414 | 200206 | 200362 | 200186 | 200259 | 200274 | 200293 | 200393 | 200285 | 200363 | 200423 | 200227 |
| Quartz | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Feldspar | | | | | | | | | | | | | | | | | | | |
| Orthoclase | p | p | p | p | | p | p | p | | p | p | | p | | | | | p | |
| Microcline | | p | | | | | | | | | | | | | | | | | |
| Microperthite | | p | | | | | | | | | | | | | | | | | |
| Plagioclase | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Biotite | | p | | p | p | p | | p | | p | | p | p | | | | p | | |
| Chlorite | p | p | | p | p | p | | p | | p | | p | p | | | | | | |
| Pennine | | | | | | | | | | | | | | | | | | | |
| Hornblende | | p | | | | | | | | | | | | | | | | | |
| Actinolite | | p | | | | | | | | | | | | | | | | | |
| Diopside | | | | | | | | | | | | | | | | | | | |
| Muscovite | p | | | | p | p | p | p | | p | p | p | p | p | p | p | | p | p |
| Rutile | | | | | | | | | | | | | | | | | | ? | |
| Tourmaline | | | | | | | | | | | | | | | | | | p | |
| Garnet | | | p | | p | | | | | p | | | | | | | | | |
| Corundum | | | | | | | | | | | | | | | | | | | |
| Apatite | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Zircon | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Epidote | | | | | | | | | | | | | | | | | | | |
| Clinozoisite | | | | | | | | | | | | | | | | | | | |
| Sphene | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Magnetite | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Ilmenite | | | | | | | | | | | | | | | | | | | |
| Pyrite | | | | | | | | | | | | | | | | | | | |
| Hematite | | p | p | p | p | p | p | p | p | | p | p | p | p | | | | | |
| Limonite | p | p | p | p | p | p | p | p | | p | | p | p | p | | | | | |
| Calcite | | p | | | | | | | | | | | | | | | | | |
| Leucoxene | | | | | | | | | | | | | | | | | | | |
| Kaolin | p | p | p | p | p | p | p | p | | p | p | p | p | p | p | p | p | p | p |
| Sericite | | | | | | | | | | | | | | | | | | | |

p = present in thin sections.

200202. Quartzite. Snow Hill I.
200223. Quartzite. Snow Hill I.
200231. Quartzite. Snow Hill I.
200232. Quartzite. Snow Hill I.
200301. Quartzite Seymour I.
200334. Quartzite. Seymour I.
200380. Quartzite. Hope Bay, Louis Philippe Land.
200414. Quartzite. Erratic. Cockburn I.
200206. Calcareous quartzite. Erratic. Snow Hill I.
200362. Arkosite. Hope Bay, Louis Philippe Land.
200186. Quartz schist. Snow Hill I.
200259. Quartz schist. Erratic. Seymour I.
200274. Quartz schist. Erratic. Seymour I.
200293. Micaceous quartz schist. Erratic. Seymour I.
200393. Mica schist. James Ross I.
200285. Slate. Erratic. Seymour I.
200363. Slate. Hope Bay, Louis Philippe Land.
200423. Biotite gneiss. Erratic. Red I.
200227. Marble. Snow Hill I.

TABLE IV. MINERALOGICAL COMPOSITION OF SOME METAMORPHIC ROCKS FROM THE NORTHEASTERN AREA OF THE ANTARCTIC ARCHIPELAGO

| Mineral | Specimen | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 200238 | 200275 | 200281 | 200343 | 200356 | 200357 | 200361 | 200365 | 200366 | 200372 | 200378 | 200381 | 200387 | 200368 | 020369 | 200375 | 200379 | 200383 |
| Quartz | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Feldspar | — | — | — | — | — | — | p | — | p | — | p | p | p | p | p | p | p | p |
| Orthoclase | — | — | — | — | — | p | p | — | p | — | p | p | — | p | p | — | p | — |
| Microcline | — | — | — | — | — | p | p | — | p | — | p | p | — | p | p | — | p | — |
| Microperthite | — | p | — | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Plagioclase | — | — | — | — | p | p | — | — | — | — | p | — | — | — | p | — | — | — |
| Biotite | — | p | — | p | p | p | — | p | — | p | p | p | p | p | p | p | p | p |
| Chlorite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Pennine | — | — | p | — | — | — | — | — | — | — | p | — | — | — | — | — | — | — |
| Hornblende | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Actinolite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Diopside | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Muscovite | — | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Rutile | — | — | ? | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Tourmaline | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Garnet | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Corundum | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Apatite | — | — | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Zircon | — | p | p | p | p | p | — | p | — | p | p | p | p | — | p | p | p | p |
| Epidote | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Clinozoisite | — | p | p | — | — | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Sphene | — | p | p | p | p | — | — | p | — | — | p | — | p | p | p | p | — | — |
| Magnetite | — | — | — | — | — | p | p | p | p | p | p | — | p | p | p | — | p | p |
| Ilmenite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Pyrite | p | — | — | — | — | p | — | p | p | — | p | — | p | p | p | p | — | p |
| Hematite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Limonite | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p | p |
| Calcite | p | — | p | p | p | p | p | p | p | p | p | — | p | p | p | p | p | p |
| Leucoxene | — | p | p | p | p | p | p | p | p | p | p | — | p | p | p | p | p | p |
| Kaolin | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sericite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

p = present in thin section.

200238. Marble. Snow Hill I.
200275. Conglomerite. Erratic. Seymour I.
200281. Conglomerite. Erratic. Seymour I.
200343. Conglomerite. Erratic. Hope Bay, Louis Philippe Land.
200356. Conglomerite. Hope Bay, Louis Philippe Land.
200357. Conglomerite. Erratic. Hope Bay, Louis Philippe Land.
200361. Conglomerite. Hope Bay, Louis Philippe Land.
200365. Conglomerite. Hope Bay, Louis Philippe Land.
200366. Conglomerite. Hope Bay, Louis Philippe Land.
200372. Conglomerite. Hope Bay, Louis Philippe Land.
200378. Conglomerite. Erratic. Hope Bay, Louis Philippe Land.
200381. Conglomerite. Hope Bay, Louis Philippe Land.
200387. Conglomerite. Hope Bay, Louis Philippe Land.
200368. Arkosic conglomerite. Hope Bay, Louis Philippe Land.
200369. Arkosic conglomerite. Hope Bay, Louis Philippe Land.
200375. Arkosic conglomerite. Hope Bay, Louis Philippe Land.
200379. Arkosic conglomerite. Hope Bay, Louis Philippe Land.
200383. Arkosic conglomerite. Hope Bay, Louis Philippe Land.