FALKLAND ISLANDS DEPENDENCIES SURVEY SCIENTIFIC REPORTS

No. 25. D. H. MATTHEWS and D. H. MALING. The geology of the South Orkney Islands: I. Signy Island. 1967. 32 pp. 24*s.* 0*d.*

THIS is the first in a series of reports on the geology of the South Orkney Islands. It is based on independent field work by D. H. Maling (1948–50) and D. H. Matthews (1955–57) but additional information was obtained from collections made by G. de Q. Robin (1947) and A. G. Tritton (1953). The main theme of the report is a discussion of the stratigraphy and structure of Signy Island and there is only a short account of the petrology.

In the introductory section there is a description of the physiography and glaciation of the island (excellent panoramic photographs are provided as illustrations) and a general review of the geology of the South Orkney Islands. The detailed stratigraphy of Signy Island, which is composed entirely of Basement Complex rocks of (?) Precambrian age, is discussed in the following section, but owing to the difficulty of the terrain and the complex folding and faulting, the overall stratigraphy of the island is still not altogether clear. However, the authors have put forward the following succession for the south-western part of the island, based on 15 stratigraphical sections studied in that area:

Moe Island Series ($>$ 1,000 ft.; $>$ 305 m.)
Amphibolite Series (440 ft.; 134 m.)
Marble Series ($\gg$ 300 ft.; $\gg$ 91 m.)

Although relatively little is known of the Marble Series, it has been subdivided into lower and upper parts, and the detailed succession of the upper part for three different localities is given in table form. The Amphibolite Series is a well-defined unit of south-westerly dipping beds containing two mappable horizons. These are the hornblende-epidote rocks at the base of the succession and a calc-amphibolite group (a sequence of *hornblendegarbenschiefer*, garnetiferous amphibolites, micaceous quartzites and lenticles of calcite with greenschists as the predominant rock type) at the top. The thickness of the Amphibolite Series is fairly uniform but that of the underlying Marble Series apparently varies from one locality to another. Possible reasons for these variations are: repetition by folding, low-angle faulting and the presence of an unconformity or a pre-metamorphic thrust plane separating the two series. The Moe Island Series is a thick sequence of quartz-mica-schists with a thin amphibolite bed at the base. It occurs typically on Moe Island, situated off the south-western tip of Signy Island, but it has been correlated provisionally with some of the rocks of Signy Island. The distribution of the stratigraphical units and rock types is shown on the colour geological map accompanying the report. However, it should be noted that there are some inaccuracies in the topographical base map on which the geology has been plotted and therefore the positioning of some of the geological boundaries may be incorrect.

Macro-fabrics show that the main folding on Signy and Moe Islands is homo-axial about a north–south axis. Gourlay Peninsula is structurally anomalous, since there are no major or minor folds about these axes and the rocks there are dominantly flat-lying. However, there are open folds or warps developed about two horizontal axes trending 225° and 310° true, and similar axes have been recorded sporadically in the folded rocks over the rest of the island. Both major and minor recumbent folds are present on Signy Island and faulting is widespread. The faults trend north–south and west–east but because of the terrain none of them can be traced continuously for more than a few yards. Minor thrusting is evident at a number of localities on the island but no major thrusts have been proved. The evidence for a major dislocation separating Signy Island from Coronation Island (the present position of Normanna Strait) includes comparisons of the rock types on the adjacent coasts of the two islands.

The structural interpretation of the field evidence is admitted to be controversial, since the authors disagree between themselves. Maling concludes that Signy Island comprises three distinct structural units:

i. The folded Marble Series forming the core of the island.
ii. The overlying comparatively undisturbed Amphibolite and Moe Island Series.
iii. The area in the north of the island where the structures are similar to those of the Moe Island Series but the lithologies are more characteristic of the Marble Series.

However, Matthews believes that Signy Island is a single structural unit in which the metamorphosed pelitic and psammitic sediments overlie (probably unconformably) a pelitic and calcareous sequence.

The authors conclude that the Basement Complex rocks represent a regionally metamorphosed sequence of sedimentary rocks ranging in composition from pure carbonate to argillaceous types. *Ortho*gneisses were originally recorded in south-western Signy Island but these are now described as *para*gneisses which have been altered by intense folding and faulting. Several types of veins are present in the schists but as there is no sign of magmatic action on the island these veins probably formed *in situ* by chemical re-arrangement of the constituents of the schists. The schists belong to the albite-epidote-amphibolite facies of regional metamorphism and they are similar in metamorphic grade to those of Coronation Island. Differences between the Basement Complex rocks of the two islands are briefly mentioned.

Additional information on nomenclature and map symbols, reliability of topographic mapping and a list of place-names (with their coordinates) is included in the three appendices to the report.

BRITISH ANTARCTIC SURVEY SCIENTIFIC REPORTS

No. 47. G. J. Hobbs. The geology of the South Shetland Islands: IV. The geology of Livingston Island. 1968. 34 pp. 27*s*. 6*d*.

Livingston Island is the second largest of the South Shetland Islands. Previous reports in this series (*Falkland Islands Dependencies Survey Scientific Reports*, Nos. 26 and 27, and *British Antarctic Survey Scientific Reports*, No. 44) have described the geology of Deception and King George Islands.

A stratigraphical succession is given and the rocks range in age from (?) Precambrian to Recent. The stratigraphy of Livingston Island is compared with that of the main islands of the Scotia arc and the Antarctic Peninsula.

The oldest rocks are the False Bay schists, which consist of hornblende-schists with subordinate hornblende-biotite-schists and trend in a north–south direction. They have suffered both regional and contact metamorphism, and schlieren and xenoliths occur within the adjacent Andean tonalite. The petrography of the schists is described in detail.

To the north-west, Hurd Peninsula is formed entirely of (?) Carboniferous sediments of the Miers Bluff Series. They consist mainly of shales, siltstones, arkosic greywackes and sandstones, with interbedded conglomerates, intraformational conglomerates and tilloids. In the hinterland north-west of the peninsula, poorly bedded volcanic rocks are interbedded with the sandstones, and these rocks are intensely deformed. The sediments are typically eugeosynclinal with the source of material to the north-west. The development of coarse-grained rocks indicates that the geosyncline was unstable. The unfossiliferous Miers Bluff Series is about 10,000 ft. (3,050 m.) thick and lithologically it resembles the Trinity Peninsula Series of Graham Land, although volcanic rocks have not been described previously from the latter area.

Well-preserved Lower to Middle Triassic plants have recently been described from fragmental conglomerate boulders included in the Younger Volcanic Group. These rocks are thought to have originated from a landmass which formed during the Lower to Middle Triassic, and which was associated with the Upper Triassic to Lower Jurassic orogeny.

The Older Volcanic Group post-dates the Miers Bluff Series and forms much of the mountainous areas. These rocks resemble those of the Upper Jurassic Volcanic Group of the Antarctic Peninsula. Isolated exposures of indurated rhyodacites, andesites and agglomerates occur at several localities in the Mount Bowles area, and the agglomerates are described in detail. At Renier Point the lavas are altered porphyritic basalts and fine-grained green trachytic rocks. The latter contain abundant mafic amygdales. A similar exposure occurs on the south-east coast of Livingston Island.

The Andean Intrusive Suite is represented by a tonalite pluton (forming the Barnard Point peninsula) and by a small tonalite apophysis (just north of Johnsons Dock) which intrudes the Miers Bluff Series. At Williams Point, abundant quartz-diorite blocks are present in the volcanic rocks, which suggests that the Andean Intrusive Suite is far more extensive than the surface exposures indicate. The diorites form only a limited part of the plutonic intrusion and they appear to have been part of an initial phase injected along the foliation of the hornblende-schists. They were subsequently intruded and disrupted by the more acid tonalite. The tonalites, foliated tonalites and diorites are described in detail, and there are modal analyses of representative rocks.

The Younger Volcanic Group, which crops out over large areas of western and northern Livingston Island, includes andesites, basalts, tuffs and agglomerates with interbedded sediments, suggesting a shallow submarine environment. The exposures at Hannah Point, Williams Point and Byers Peninsula are described. The age of these rocks has not yet been determined, although they have been considered by previous authors to range between Oligocene and Miocene. The conglomerates at Williams Point are possibly Pliocene in age.

Several volcanic plugs are described, including a spectacular example at Edinburgh Hill consisting of olivine-basalt. Four of the columnar-jointed plugs exhibit pronounced vertical jointing, and in two of them the vertical columns gradually curve outwards near their exposed bases. In contrast to this, the columns at Mount Plymouth (Greenwich Island) are essentially horizontal for 400 ft. (122 m.) and this is thought to be due to a great difference between vertical and horizontal cooling rates.

Three major faults, possibly post-Pliocene in age, are inferred to occur parallel to the strike of the Miers Bluff Series; two of them affect Tertiary rocks and some of the volcanic centres can be related to them.

Numerous raised beaches indicate recent uplift, whilst glacial recession is a conspicuous phenomenon.

No. 53. J. S. Bibby. The stratigraphy of part of north-east Graham Land and the James Ross Island group. 1966. 37 pp. 30*s*. 9*d*.

The rocks in the area discussed in this report range in age from (?) Carboniferous to Pliocene, and the geology is reflected directly in the physiography. On Trinity Peninsula, the sharp-pointed peaks formed by the metamorphosed greywackes contrast markedly with the buttes and mesas of the weathered volcanic rocks of James Ross Island. Prince Gustav Channel is the boundary between the two geologically distinct areas and it is considered to be the location of a major fault zone, east of which there was considerable downthrow in pre-Miocene times.

The isoclinally folded Trinity Peninsula Series has been examined cursorily at Hope Bay and Bald Head, and the greatest disturbance of the metamorphosed greywackes, siltstones and shales was found to occur in the vicinity of Prince Gustav Channel. These sediments represent the first traceable stage of a geosynclinal trough which apparently migrated eastwards from early (?) Carboniferous to Miocene times.

Middle Jurassic lacustrine sediments occur at Mount Flora, Hope Bay, where they rest unconformably on the Trinity Peninsula Series and contain a wide variety of well-preserved terrestrial plants. They grade from conglomerates to lenticular and laminated shales, and the conglomeratic material is clearly derived from the underlying Trinity Peninsula Series. In the upper volcanic horizons, tuffs are interbedded with plant-bearing mudstones and shales, and they are similar to specimens from the vicinity of Camp Hill, Botany Bay. In general, the Botany Bay sequence contains more coarse clastic material. The sediments near Longing Gap are tentatively assigned to the Upper Jurassic.

The earliest eruptions of the Upper Jurassic volcanic rocks were rhyolitic in composition. At Hope Bay rhyolites are conformable with the Middle Jurassic sediments, and similar rocks also occur at Camp Hill and Crystal Hill. Previously, andesites had not been reported from this area, but they are associated with the Camp Hill rhyolite and rest unconformably on the Trinity Peninsula Series at Bald Head. Rounded phenoclasts of sedimentary origin are described from agglomerates at Camp Hill. The author suggests that these rocks formed by the shattering of Middle Jurassic conglomerates by explosive volcanism. Lava flows and tuffs were

later disrupted by the explosions. On the north side of Crystal Hill, similar rocks are presumed to have formed in the same way from the Trinity Peninsula Series.

The greater part of this report is concerned with the Lower to Middle Campanian sediments of James Ross, Vega, Snow Hill, Seymour, Cockburn and Humps Islands. In addition to those previously known, large exposures of Cretaceous sediments have been discovered near Rink Point and Rabot Point on James Ross Island, and at Cape Lamb on Vega Island. The west coast of James Ross Island forms one limb of an asymmetrical syncline with the axis in the vicinity of The Naze at the east end of Herbert Sound.

The lowest beds exposed are a vertical sequence of conglomerates (Lagrelius Point Conglomerate) occurring in the cliffs south of Lagrelius Point and extending almost to Matkah Point. Immediately to the south are the Kotick Point Beds which are two-fold in their lithology. The Lower Kotick Point Beds consist of sandstones, mudstones and shales, and they reflect a slackening in the rate of sedimentation. The conglomerates and coarse sandstones of the Upper Kotick Point Beds indicate a return to more turbulent conditions, and the lowermost beds are cyclic in their formation. The extensive Stoneley Point Conglomerates are exposed to the east of these rocks, and they also occur in the sea cliffs south of Brandy Bay and form the northern part of Tumbledown Cliffs. Grading from conglomerates to coarse grits and sandstones is well developed. Tuff fragments and large blocks of green glauconitic sediments are characteristic of these rocks. To the south-east, the overlying fossiliferous Hidden Lake Beds are exposed in five separated areas. A detailed section from the exposure near Hidden Lake indicates that basal sandstones gradually give way to shales with thin sandy bands. No discernible break separates these rocks from the Snow Hill Island Series. These are the youngest Cretaceous rocks encountered in this area and they are about 11,750 ft. (3,580 m.) thick. The sediments are mainly uncemented sands and gravels, and further lithological subdivision has been impossible.

Comprehensive faunal lists, mainly of ammonites and lamellibranchs, are given. The calcarinate worm *Rotularia* is also a characteristic form.

The unconformity between the Cretaceous rocks and the overlying James Ross Island Volcanic Group has been studied in detail. The rocks resting on this irregular and subaerially eroded surface are marine in origin and it is suggested that rapid subsidence and accumulation occurred throughout this area.

The report is illustrated by detailed colour and black-and-white geological maps, sections and photographs.

No. 60. D. M. MOORE. The vascular flora of the Falkland Islands. 1968. 202 pp. £3 15*s*. 0*d*.

ALTHOUGH outside the Antarctic and sub-Antarctic regions, the Falkland Islands, situated some 325 miles (525 km.) east of the Straits of Magellan, have long interested Antarctic biologists since they constitute a link between southern South America and the land areas farther south and east. Knowledge of their flora is of considerable importance to studies of plant distributions in southern temperate regions and there is a long history of botanical studies in the archipelago, dating from the observations of Pernetty in 1764, when he accompanied the expedition of Admiral Bougainville. Almost three-quarters of the native flora was described during the first half of the nineteenth century by the Frenchmen, Charles Gaudichaud-Beaupré and Dumont D'Urville, and by Sir Joseph Hooker, who was able to use his wide knowledge and experience of the circum-Antarctic regions to outline its phytogeographical affinities. The subsequent major contribution was that of Carl Skottsberg, who travelled extensively within the archipelago in 1907–08 and was able to describe the ecology of the flora and to give a more precise definition of its relationships. As with so many austral areas, Skottsberg's work is of fundamental importance and his "A botanical survey of the Falkland Islands", published in 1913, is still basic to all subsequent studies. However, despite all the earlier work, there has been no descriptive treatment of all the plants occurring in the Falkland Islands and the present *Flora* is intended to remedy this omission. This is not to decry the beautifully produced *Illustrations of the flowering plants and ferns of the Falkland Islands* (1921), based on Mrs. E. F. Vallentin's coloured plates, but it considers less than half the native flora and virtually no introduced species.

"The vascular flora of the Falkland Islands" follows the standard arrangement of most regional floras, with the systematic treatment being preceded by four introductory sections. These sections describe the main features of the environment, outline the history of botanical exploration in the archipelago, indicate the characteristics of the principal plant communities and give some consideration to the phytogeographical relationships of the flora.

The known collections of vascular plants from the islands are listed chronologically in a table which gives available information on the numbers of species and specimens they contain, the collecting localities and dates, and the herbaria where they are currently housed. Brief biographical details of the collectors are provided, together with references to published accounts relating to the collections. The first collection known was made during Capt. Malaspina's expedition by Luis Née at Port Egmont, West Falkland, in 1789, and between that year and 1965 a further 60 collections are listed, varying in size from one to over 400 specimens and spread throughout at least 21 herbaria.

The description of the vegetation is based largely on Skottsberg's observations, although some modifications in treatment have been necessitated by more recent concepts and information. Much detailed work, particularly quantitative ecological studies, is needed for a satisfactory modern treatment of the Falkland Islands vegetation, since the predominating plant associations are closely related and many of the more conspicuous species have a high ecological amplitude so that community differentiation is difficult. The associations are arranged in seven groups, five of which are structural units, or formations, while the others contain assemblages of littoral and fresh-water communities. The Falkland Islands are almost completely devoid of arborescent vegetation, which is represented only by a very localized bush formation comprising the *Hebe elliptica* association, restricted to a few coastal areas in West Falkland, and the *Chiliotrichum diffusum* association, which is typically developed as a fringe along rivers and streams but is now much reduced by pasture-improvement schemes. Herbs or dwarf shrubs dominate the vegetation and most of the archipelago supports some part of the oceanic heath formation, a complex in which dwarf shrub heath, usually dominated by *Empetrum rubrum*, favours the better-drained ground, while poorer drainage tends to result in *Cortaderia pilosa* grassland which, under conditions of more severely impeded drainage, grades into the fen and bog formation containing associations dominated by such species as *Rostkovia magellanica*, *Astelia pumila* and *Juncus scheuzerioides*. A feldmark formation is developed at the highest elevations and locally in exposed areas near sea-level, while the maritime tussock grassland, which is so typical of coastal areas in the sub-Antarctic and southern cool temperate zones, is here dominated by *Poa flabellata*, as in Fuegia, South Georgia and Gough Island.

Since the work of Hooker it has been well known that the flora of the Falkland Islands represents an extension of that of southern South America. Considerable information on the distribution of individual species has accrued since Skottsberg analysed the phytogeographical relationships of the flora and these data are used to provide a brief survey which describes the floristic affinities of, and phytogeographical elements within, the flora of the Falkland Islands. 89 per cent of the species occur on the mainland south of lat. 40°S., principally in the southern Andes and in Tierra del Fuego, where 78 per cent are present, a figure which may well increase with further studies of that area. A small group of species is centred in the milder climate of southern Chile and there are interesting links with the flora of the north temperate zone via the Andes and with that of Australia and New Zealand via the circum-Antarctic islands. 14 species, 8·6 per cent of the flora, are considered to be endemic in the archipelago. There is little detailed information on the distribution of species within the Falkland Islands but a number of representative distribution maps, based on the 10 km. Universal Transverse Mercator (UTM) grid, draw attention to the more obvious types of distribution. Thus, some species are confined or almost confined to either East or West Falkland, while climatic gradients, which are shown to occur within the archipelago, may be responsible for the restriction of some species to the milder north-westernmost parts of West Falkland, but the need for more detailed study is amply demonstrated.

The bulk of this work is taken up with a systematic account of all the flowering plants and vascular cryptogams occurring in the Falkland Islands, of which 163 species are considered to be native and a further 92 species have been reported as introduced. A brief introductory explanation of the concepts and format used for the species descriptions is followed by an

artificial key for identifying the genera. Since most families are represented in the Falkland Islands by only one or two genera, a family key has been omitted, and for the same reason the family name is not followed by a description, although notes on the important characters are given for such well-represented families as Compositae, Cruciferae and Gramineae in order to minimize undue repetition in the generic descriptions. When necessary, keys are provided for identifying species within a genus. The species descriptions are as concise as is consistent with accuracy and apply to Falkland Islands material, as do the data on flowering period, altitudinal range and breeding system given for all native species. The chromosome number is given for species when known from Falkland Islands material. A brief note on the habitats favoured by the species in the archipelago is followed, when appropriate, by a summary of its distribution outside the Falkland Islands, and information on the type specimen is then given for native species. Each species description is concluded by a list of all the specimens examined, giving the collector and location, and grouped according to the UTM grid squares in which they occur. This serves to show the amount of material available in the world's herbaria and provides a basis for future detailed mapping within the islands. All names appearing in the botanical literature of the Falkland Islands, or in revisions treating Falkland Islands species, are included in the account, together with their authorities and places of publication. Basionyms are given for all native species. The descriptions are usefully supplemented by a number of good illustrations and an illustrated glossary is also provided. The list of references which concludes the main body of the *Flora*, contains some 150 entries and constitutes a comprehensive guide to the botanical literature of the Falkland Islands. Two appendices give explanations of the abbreviations used for authors' names and the titles of books and periodicals, while a third appendix constitutes a complete index to all plant names, scientific or popular, cited in any form in the *Flora*.

The volume is extremely well produced and the choice of type face and size has been particularly fortunate in allowing the user ready access to the information. The half-tone plates grouped at the end of the work, which illustrate the vegetation types and *Carex* inflorescences, are well chosen and excellently reproduced, while the two maps provided in an end pocket permit ready reference to all localities mentioned and the superimposed UTM grid permits addition of further distributional data by users in the Falkland Islands.

This *Flora*, published after slightly more than 200 years of botanical observation and studies in the Falkland Islands, not only provides a summary of that which has gone before but acts as a firm basis for future experimental and analytical work on the flora of the archipelago and related regions. In conclusion, it is worth mentioning that, in addition to its purely scientific importance, the appearance of "The vascular flora of the Falkland Islands" is particularly timely in view of the great interest of the islands' farmers in improving the grazing potential of their land, a process which requires, amongst other things, the accurate identification of the native and introduced species already available to the stock upon which the prosperity of the Falkland Islands depends.

No. 62. JANET W. THOMSON. The geology of the South Orkney Islands: II. The petrology of Signy Island. 1968. 30 pp. 25*s*. 10*d*.

THIS, the second report on the geology of the South Orkney Islands, is mainly a petrographical description of rock specimens collected from Signy Island between 1947 and 1956. The greater part of this rock collection was contributed by D. H. Matthews and D. H. Maling, the co-authors of *Falkland Islands Dependencies Survey Scientific Reports*, No. 25, and the present report is to some extent a laboratory study of their field collections.

The introductory sections of the report describe briefly the physiography of Signy Island and the general geology of the South Orkney Islands, including their stratigraphy, tectonic setting and general structural features. Signy Island itself is composed of a regionally metamorphosed sequence of marbles, *para*-amphibolites and quartz-mica-schists, and these rocks form the Basement Complex of the South Orkney Islands. Unmetamorphosed sediments and dolerite dykes, which crop out on some of the other islands in the group, are unknown on Signy Island.

The main section of the report deals with the petrology of Signy Island and this includes sub-

sections on petrography, mineralogy, petrogenesis, and veins and mineralization. Although the stratigraphical succession in the Basement Complex has already been established by earlier workers, the author has used her own sub-divisions (pertaining to rock types) to facilitate the grouping of petrographic descriptions and also to avoid repetition of information. Mineralogical and textural variations within each rock type are described and sometimes illustrated by either photomicrographs or camera lucida drawings, and several rocks which are transitional between two rock types have been noted, e.g. small-scale interbanding of marble and quartz-mica-schist. The descriptive mineralogy of the rocks indicates that most of the minerals crystallized post-kinematically; plagioclase crystals are usually untwinned and some include trails of small crystals aligned parallel to the schistosity of the rock; muscovite, biotite and hornblende have crystallized mimetically around the crests of micro-folds and garnet porphyroblasts contain relict trails of helicitic inclusions, indicating the form of the schistosity prior to garnet crystallization. However, the quartz crystals in most rocks have an undulose extinction and the author suggests that a shearing stress, although waning in strength, was still operative during its crystallization.

Plagioclase and garnet are described in detail in the sub-section on mineralogy. The exact composition of the plagioclase has not been determined, since there is a lack of twinned plagioclase crystals in all of the Signy Island rocks, but refractive index measurements indicate an acid plagioclase in the range albite-oligoclase; random measurements on albite-twinned crystals give similar results. The description of garnets (all almandine-rich) includes a study of their crystal-size distribution in the various rock types. The results of the study are plotted as histograms, which show that there is a preferred crystal radius for each rock type and that the crystal radius increases from very small (regular) crystals in the quartzites to large (irregular) porphyroblasts in the mica-garnet-schists and *hornblendegarbenschiefer*. Other textural features of the garnets are discussed (with illustrations) and these indicate that they were one of the last minerals to crystallize. Sphene is the commonest of the accessory minerals but tourmaline is also widespread, and in one rock it forms an unusual vein of almost igneous character. However, there is no other evidence of igneous activity on Signy Island.

The Basement Complex schists of Signy Island belong to the albite-epidote-amphibolite facies of regional metamorphism and they are considered to be the metamorphic equivalents of a group of sediments ranging in composition from limestone, through marls and argillaceous rocks to sandy deposits. The metamorphism was essentially progressive and there are only local instances of retrograde metamorphism, often associated with faulting. The Basement Complex of Signy Island differs from that of Coronation Island, situated immediately to the north, since marbles and amphibolites are much commoner on Signy Island and the texture and mineralogy of the quartz-mica-schists from the two islands are quite different. Distinctly garnetiferous rocks are uncommon on Coronation Island and the author suggests that the lack of garnet could be due to differences in the grade of metamorphism between the two islands. Variations in the abundance of rock types may be the result of a plunging structure in the South Orkney Islands, with Coronation Island situated at a higher structural and stratigraphical level than Signy Island.

Similar *para*schists have been recorded in the Inaccessible Islands and also in the Elephant and Clarence Islands group of the South Shetland Islands, but the Basement Complex rocks from the south-western Antarctic Peninsula are mostly *ortho*gneisses associated with relatively uncommon *para*schists and *para*gneisses.

The age of the Basement Complex rocks is uncertain but K-Ar determinations on quartz-mica-schists from Signy and Coronation Islands give an average age of 185 ± 7 m. yr. However, this is thought to be the age of the orogeny which folded the overlying Greywacke-Shale Series of the South Orkney Islands, and it is not the age of the regional metamorphism which caused the crystallization of the Basement Complex rocks. Therefore, the Signy Island schists are tentatively referred to as Precambrian.