ABSTRACTS OF SCIENTIFIC REPORTS

Abstracts of British Antarctic Survey *Scientific Reports* will, in future, be included in BAS *Bulletin* as soon as possible after publication. To start the series, abstracts of all published *Scientific Reports* from No. 101 onwards are given below. (Numbers 100, 103, 104 and 105 are still in preparation.) Scientific Reports can be purchased from The Distribution Centre (see address inside the front cover of this *Bulletin*) who will also supply a current price list on request.

British Antarctic Survey Scientific Report No. 101
A history of place-names in the Falkland Islands Dependencies (*South Georgia and the South Sandwich Islands*) by G. Hattersley-Smith
1980. 112 pp. with 2 maps. ISBN 0 85665 060 9

THERE are 770 officially accepted place-names in the Falkland Islands Dependencies and a further 178 unofficial or redundant names, together with nearly 3000 synonyms for these names in various languages. Since 1945 the Antarctic Place-names Committee, of the Foreign and Commonwealth Office, has been responsible to the Governor of the Falkland Islands for place-name decisions in the region. The principles on which the Committee operates are outlined, and a review is given of the evolution of the place-names as a result of voyages of discovery, sealing and whaling operations, and scientific and other expeditions, from the time of James Cook's voyage 1772–75, to the present. The place-names are then treated systematically according to prescribed rules and listed alphabetically. Each entry gives the latitude and longitude of the feature, the locality with reference to features named on the included maps, and in chronological order details of discovery, mapping and naming, and references to first publication of the name and of any synonyms. Cross-references link the synonyms to these main entries. More than 400 published sources in eight main languages are listed in the references.

British Antarctic Survey Scientific Report No. 102
The geology of the central Black Coast, Palmer Land by D. G. Singleton
1980. 50 pp. ISBN 0 85665 082 X

PREVIOUS exploration and geological investigations in areas adjacent to and including the central Black Coast, Palmer Land, are summarized.

Several rock groups have been established from field, petrographic and geochemical evidence and these are compared with similar rocks from other areas in the Antarctic Peninsula as well as elsewhere in the circum-Pacific orogenic belt.

The metamorphic complex, which probably represents the oldest rocks, is discussed by areas and subdivided into homogeneous and heterogeneous varieties. Particularly in the Welch Mountains, these rocks are inferred as being *ortho*gneisses and *para*gneisses, respectively. In the latter, metamorphism has proceeded towards the amphibolite facies and local retrograde effects have been recognized. It is noted that the lithological units of the metamorphic complex resemble those of the 'Basement Complex' (Adie, 1954) exposed elsewhere in the Antarctic Peninsula and therefore they may be of similar age.

A sequence of metavolcanic and metasedimentary rocks termed the Mount Hill Formation is critically compared with the Upper Jurassic Latady Formation of the Lassiter Coast and the (?) Carboniferous Trinity Peninsula Series. The structural, lithological and metamorphic features of the Mount Hill Formation seem to show similarities closer to those of the Latady Formation. The dominantly metapelitic rocks

and associated metavolcanic rocks have been subjected to an early low-grade regional or possible dynamic metamorphism and a later thermal metamorphism during and after which further deformation occurred.

Minor sheared, coarse, unstratified (?) epiclastic rocks associated with similarly unstratified vitric tuffs and dacitic lavas are cut by gabbroic hypabyssal rocks and probably by a gabbro thought to belong to the intrusive rock group. These rocks are correlated with the Upper Jurassic Volcanic Group by comparison with previous observations.

The intrusive plutonic rocks which cut all the major stratigraphical units are further subdivided into five lithological types; an apparently older metagabbroic suite of rocks in the upper Murrish Glacier area intrudes the Mount Hill Formation but it is cut by the youngest member of the intrusive rock group (the main granodiorite). A highly variable gabbro containing olivine appears to intrude Upper Jurassic volcanic rocks and represents the only occurrence of this rock type in the central Black Coast. The diorite at Marshall Peak has no observed relationship with other intrusive rocks or major stratigraphical units in the central Black Coast but it has petrographic and some geochemical affinities with similar rocks described from Cape Bryant (Ad[illegible] 1955). A garnetiferous tonalite at the head of Lamplugh Inlet is also isolated but it is chemically similar to the main granodiorite which was intruded in Lower Cretaceous times. Geochemical differences between the metagabbroic and main granodioritic suites are thought to reflect their possible derivation from different sources.

Five groups of hypabyssal rocks, ranging in composition from basic to acidic, are noted but they also include granodioritic and aplitic apophyses. Some basic and acidic dykes cut the main granodiorite and therefore represent the youngest rocks on the central Black Coast. It is thought that the acidic dykes were genetically related to the main granodiorite at some stage in their evolution.

The conclusions and regional correlations include suggestions for the genesis of each stratigraphical unit in terms of rigid plate tectonics.

British Antarctic Survey Scientific Report No. 106
Diffuse reflections of radio waves from the ionospheric F-layer (Spread-F) over Argentine Islands, Antarctica by A. S. Rodger
1982. 26 pp. ISBN 0 85665 097 8

Spread-*F* is the term which denotes the presence of diffuse radio reflections from the *F*-region of the ionosphere either superposed upon or replacing the specular reflection from the *F*-layer, normally displayed on ionograms. The theory and phenology of Spread-*F* are briefly reviewed separately for equatorial, middle and high magnetic latitudes, and a short description of the various techniques used to investigate Spread[illegible] is included. The occurrence of Spread-*F* over Argentine Islands, Antarctica (lat. 65° S, long. 64° W) is analysed in detail. A new method for quantifying the variations in Spread-*F* observed on ionograms is described. This technique is used to determine the diurnal, seasonal and solar-cycle variations of the phenomenon using Argentine Islands data for a continuous two-year period from March 1973 and for selected months over one and a half solar cycles. A further development of this quantifying method is used to establish the relationship between variations in the occurrence of Spread-*F* and magnetic activity.

A comparison of Spread-*F* as observed by an ionosonde and by a co-sited experiment employing the Doppler principle is presented. The simultaneous occurrence of Spread-*F* at magnetically conjugate points is also examined, and shown to be highly likely.

These analyses demonstrate several new and important results for an observatory

at middle magnetic latitudes. It is suggested that at least four types of irregularities in the *F*-layer are required to explain the phenology of Spread-*F* observed at Argentine Islands. The variations of electron temperature and plasma concentration are shown to have many similarities to the variations in the occurrence of Spread-*F*, suggesting that plasma instabilities may be an important mechanism for the production and maintenance of irregularities causing Spread-*F* at Argentine Islands.

British Antarctic Survey Scientific Report No. 107
The geology of South Georgia: V. Drygalski Fjord Complex by B. C. Storey
1983. 88 pp. ISBN 0 85665 099 4

THE Drygalski Fjord Complex represents a fragment of pre-Jurassic continental crust that was intruded by a wide variety of basic and acidic plutonic rocks during the early stages of the formation of the Upper Mesozoic island-arc–back-arc basin system of South Georgia.

Sedimentary and metasedimentary country rocks are divided into three spatially distinct formations: the Salomon Glacier, Cooper Island and Novosilski Glacier Formations. The Salomon Glacier Formation comprises siliceous *para*gneisses and layered migmatites regionally metamorphosed up to amphibolite facies. The Cooper Island and Novosilski Glacier Formations are deformed low-grade quartz-rich clastic sediments. Porphyritic felsites are tentatively assigned to the Novosilski Glacier Formation. Subsequent to deformation and metamorphism, magmatic activity commenced in the early Jurassic with emplacement of a sub-alkaline tholeiitic magma. Differentiation of this magma produced a wide variety of layered gabbros, intermediate and granitoid rocks. Some granitoid rocks, however, show calc-alkaline trends. Continued emplacement of basic magma formed basic dyke suites with chilled margins cutting the cumulate gabbro and acidic rocks.

As a result of the magmatic activity, a heterogeneous migmatite aureole surrounds the plutonic rocks. The basic, granitoid and metasedimentary country rocks are broken up, injected and net-veined by anatectic granitoid veins, and by emplacement of acid-base intrusive breccias. The migmatite complex is cut by aplites, pegmatites and occasional basic dykes. Subsequent retrogression has resulted in widespread secondary and disequilibrium mineral assemblages.

A zone of intensely mylonitized rocks up to 1 km wide (the Cooper Bay dislocation zone), formed by both pure and simple shear, separates the complex on the north-eastern side from deformed volcaniclastic sediments of the Cooper Bay Formation.

It is concluded that the sediments and metasediments were probably deformed during the Gondwanian orogeny and that the magmatic activity of the Drygalski Fjord Complex may be the precursor of the basic magma which formed the floor of the Upper Jurassic–Lower Cretaceous island-arc–back-arc basin of South Georgia.

British Antarctic Survey Scientific Report No. 108
Rissoaform gastropods from the Antarctic and sub-Antarctic by W. F. Ponder
1983. 96 pp. ISBN 0 85665 100 1

THE Eatoniellidae, Rissoidae, Barleeidae, Cingulopsidae, Rissoellidae and Orbitestellidae of the Antarctic and sub-Antarctic (excluding the New Zealand sub-Antarctic and southern South America) are reviewed. The species of Signy Island, South Orkney Islands and Macquarie Island are described in detail. There are 15 valid species of Eatoniellidae from the Antarctic–sub-Antarctic, one of which has two geographic subspecies. Two additional taxa are of uncertain status. Five species of *Eatoniella* are recorded from Signy Island, two being new. Two additional new species are described,

one from the Falkland Islands and one from off Enderby Land, Antarctica. Five species of *Onoba* and one of *Powellisetia* are recorded from Signy Island and an additional 20 species of Rissoidae in two genera (*Onoba* and *Powellisetia*) are listed for the rest of the Antarctic–sub-Antarctic, four of these species being new. One new species of *Onoba* is described from South Georgia and the Falkland Islands, and another is known only from Marion Island and off Enderby Land. Two new species of *Powellisetia* are described from Îles Kerguelen. Two genera, including three species, of the Barleeidae (subfamily Anabathrinae) are found at Île St Paul and Île Amsterdam. A third genus, *Fictonoba*, is tentatively recognized from the Burdwood Bank. A new genus and species of Cingulopsidae is described from Signy Island. *Eatoniopsis* is shown to be a junior synonym of *Skenella* and a new species of *Skenella* is described from Signy Island, the Antarctic Peninsula and Terre Adélie. Four additional named Antarctic and sub-Antarctic species of *Skenella* are recognized and two unnamed species are recorded. Two species of Orbitestellidae are known from the region, one from the South Orkney Islands and Macquarie Island and one from the Davis Sea. A new species of *Rissoella* is described from Signy Island and the two named sub-Antarctic species are reviewed. An analysis of the distribution of t[illegible] species taxa shows a high degree of endemism, particularly in the sub-Antarctic fauna.

British Antarctic Survey Scientific Report No. 109
The geology of the LeMay Group, Alexander Island, by R. W. Burn
1984. 65 pp. ISBN 0 85665 101 X

THE *LeMay Group* of Alexander Island consists of a thick sequence of predominantly unfossiliferous feldspathic sandstones, siltstones and mudstones, with subordinate conglomerates, basic lavas, tuffaceous sediments and cherts. The sandstones are mainly poorly sorted arkosic arenites and minor volcanic arenites, derived from an acid–intermediate plutonic and volcanic terrain with a subsidiary supply of metamorphic and sedimentary detritus. Sedimentary structures, together with the lack of fossils indicate that the bulk of the sediments were redeposited by turbidity currents or similar mechanisms, possibly in a deep-sea fan or trench environment. However, the presence of a Triassic neritic fauna, and abundant pyroclastic material in a volcanogenic sequence in the Lully Foothills of central Alexander Island suggest a different setting for the rocks in that area, for which the formal name *Lully Foothills Formation* is proposed.

Basic lavas, some of which show pillow structure, and basaltic/doleritic greenstones of uncertain origin are commonly associated with bedded chert-argillite, and appear to lie mostly in a north–south belt through the interior of the island. Although lavas in the Lully Foothills have depositional contacts with adjacent sediments, inte[illegible] deformation marginal to lavas and greenstones in northern Alexander Island may have been caused by tectonic emplacement, and some of these rocks could be oceanic in origin. The cataclasis and chaotic disruption of bedding seen in association with the lavas and greenstones constitute a north–south trending zone of broken formation and (?) tectonic mélange in northern Alexander Island, which possibly extends also through the central and southern parts of the island.

The rocks have undergone polyphase folding and at least four episodes of deformation have been recognized in parts of the sequence. West-north-west–east-south-east to north-north-west–south-south-east strikes, and steep south-westerly dips predominate in northern Alexander Island. Locally, areas of downward-facing rocks indicate that inverted limbs or recumbent folds have been refolded. North–south strikes appear to be dominant in central Alexander Island, but the situation in the south of the island is not well understood.

The metamorphic grade of the rocks in northern Alexander Island increases north-eastward from zeolite and prehnite-pumpellyite facies sandstones, through pumpellyite-actinolite facies semischists to coarsely recrystallized muscovite-garnet schists of the greenschist facies. Local development of lawsonite and blue amphibole in metabasic lithologies in central Alexander Island indicates an intermediate to high-pressure facies series. This may represent part of a paired metamorphic belt, the amphibolite-facies gneisses of the Antarctic Peninsula constituting the corresponding zone of low pressure metamorphism.

Lithology, deformation and metamorphism suggest that at least parts of the LeMay Group accumulated in a subduction complex formed by the underthrusting of the sediment prism as Pacific Ocean crust was subducted at a trench along the western margin of the Antarctic Peninsula. The LeMay Group therefore constitutes an important part of the evidence for a (?) late Palaeozoic–early Mesozoic arc-trench system along the Pacific margin of Gondwana. However the presence of radiolarians of probable mid-Cretaceous age in northern Alexander Island indicates that part of the LeMay Group may have accumulated during subduction later in the Mesozoic.

Erratum

Correction to: *The geochemistry and age of the Danger Islands pluton, Antarctic Peninsula* by R. D. Hamer and G. Hyden. *British Antarctic Survey Bulletin*, No. 64, August 1984.

Page 13, Table.
The eight entries on the first line of the section of Table III printed on page 13 should read:
50.29 51.09 52.38 58.03 58.53 64.72 50.60 70.40