V.—On the Innes Wilson Collection of Rocks and Minerals from the South Shetland Islands and Trinity Island.

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Mr J. INNES WILSON of Port Stanley, Falkland Islands, during the whaling-season of 1916–17 paid a visit to the South Shetland Islands and Palmer Archipelago. He collected specimens of rocks and minerals from Deception Island, Roberts Island, Trinity Island, and the coast bordering the Gerlache Channel, which were transmitted to the Colonial Office by the Governor, Sir WILLIAM DOUGLAS YOUNG. It is with the kind permission of the Under-Secretary of State for the Colonies that I am allowed to submit some account of Mr INNES WILSON'S interesting and important collection.

The specimens number 45 in all, of which 23 are from the inactive volcano of Deception Island; 12 from the neighbouring Roberts Island; and 10 from Trinity Island and Graham Land, mainly from the district of Mikkelsen Bay in Trinity Island. They are preserved in the collections of the Geological Survey and Museum, London. In the following pages the numbers quoted in round brackets are Mr INNES WILSON'S original collecting numbers, while those in square brackets are those of registered specimens in the Survey collections of sliced rocks.

I should like to take this opportunity of expressing my appreciation of the manner in which Mr INNES WILSON has collected his material, also of the value of his notes on the relative prevalence and mode of occurrence of the rock-types and minerals that came under his notice.

DECEPTION ISLAND.

The inactive volcano of which Deception Island forms the partially submerged remnant lies to the south of the main islands of the South Shetland group. It presents a different appearance from the others, and is one of the many volcanic centres in Antarctic regions.

Its volcanic nature was recognised by WEBSTER, who voyaged in the *Chanticleer* in 1829, but the first good account of the island was given by KENDALL* in 1831. Further references were made by JOHNSON in 1838, and SMILEY in 1842.

The chief scientific and clearest account, however, has been given in the published results of the French South Polar Expedition† that was carried out under the directorship of D'URVILLE.

The island is here described as a remarkable volcanic crater, rising at the rim from 800 to 1800 feet above sea-level. It is partially submerged, the sea breaching one side and being more than ten fathoms deep within the basin of the crater. The maximum diameter of the crater is stated to be about 8 miles at sea-level, and the rim to have an average width of about one and a half miles.

Passing reference is made to the volcanic character of the island in GUNNAR ANDERSSON'S

* *Proc. Roy. Geog. Soc. Lond.*, 1831, p. 62.

† *Voyage au Pole Sud et dans l'Océanie*, 1837–40: *Géologie, Minéralogie et Géographie physique du Voyage*, vols. xxii and xxii, Paris, 1848.

account of the geology of Graham Land, a report based upon the results of NORDENSKJÖLD'S Swedish Antarctic Expedition of 1902–03.*

The state of our knowledge in 1895 was summarised by Professor EDGWORTH DAVID † in an excellent paper, entitled "Notes on Antarctic Rocks."

From the specimens available it would appear that the volcanic pile composing the island consists mainly of andesites and andesitic tuffs, with a restricted occurrence of soda-trachytes, and still less frequent olivine-dolerites. The flows are mainly vitreous in character and may be conveniently grouped as hyalo-andesites. Pyroxenes are the dominant ferro-magnesian minerals, usually the monoclinic augite, but in some of the less glassy and apparently less basic rocks both monoclinic and orthorhombic pyroxenes are represented. The soda-trachytes described by Mr INNES WILSON as being prevalent at certain localities are possibly restricted to a definite eruptive period, but apart from their seemingly restricted occurrence within the lava-sequence there is no further evidence obtainable on this point.

The Hyalo-Andesites.—These rocks, black in colour and having the appearance of pitchstone, are the prevalent type to the north of the whaling station and to the south of Port Foster.

Specimens taken from the top of a hill about half a mile west of the whaling station are of a dark-grey to black vitreous, minutely vesicular, lava (No. 9) [F. 2356], which consists almost entirely of microlites and skeleton crystals of medium labradorite and skeleton crystals of yellowish-green augite in a glassy matrix rendered almost opaque by finely divided iron ore. There are a few ill-formed micro-porphyritic crystals of augite, but they are never abundant.

On the north of the whaling station the rocks stated to be the prevalent type (12) [F. 2357] are similar in character, but more definitely micro-porphyritic. The porphyritic constituents comprise moderately well-shaped elongated crystals of andesine (optically +, but with 2V nearly 90°) which are usually zoned and occasionally corroded by the ground-mass; and a somewhat deeply coloured greenish-yellow augite in moderately good crystals that are elongated parallel to the Y axis and flattened normal to the X axis. The matrix consists of microliths of oligoclase-andesine felspar, microliths of augite, and minute crystals of magnetite in a colourless glass.

From an extinct volcanic cone at the back of the whaling station, a spongy, vitreous black lava, almost identical with FERGUSON'S No. 67, was collected (14) [F. 2358]. In composition it is very similar to No. 9 [F. 2356] described above, but differs in the more basic character of the micro-porphyritic felspars, which approximate to anorthite (optically negative) in composition.

From a small moraine on the south side of Port Foster similar black, glassy, vesicular lavas have been obtained (20) [F. 2362]. Their micro-porphyritic felspars have a refractive index higher than Canada balsam, are optically negative, and approach anorthite in composition. Augite occurs as small, well-shaped pale-yellowish crystals, while the ground-mass consists of slender microliths of once twinned oligoclase-andesine felspar and minute microliths of augite in a colourless glass. A good fluxional arrangement of the microliths is a distinctive feature of this and other similar rocks.

From the above descriptions it may be inferred that there is considerable variation in the ultimate composition of these glassy rocks. Some, by virtue of their felspathic constituents, are obviously andesites; but others, for the same reason, might possibly

* *Bull. Geol. Inst., Upsala*, vol. vii, p. 19, 1906.

† *Jour. and Proc. Roy. Soc. N.S. Wales*, vol. xxix, p. 461, 1895.

approximate to basalts. No hard and fast line can, however, be drawn between them, and it would be unwise without chemical analyses, by which the composition of the residual glass could alone be inferred, to remove them from under the general heading of hyalo-andesites. It must be remembered that anorthite is a frequent micro-porphyritic constituent of lavas of indisputably andesitic composition.

The Tuffs.—Tuffs of various kinds and texture are evidently strongly represented amongst the lava-flows. In colour they may be either grey-green (10, 19), yellowish-grey (1, 11), buff (3, 4), dark brownish red (7), or brick red (6). In the size of their component lapilli and in the degree of coherence, they show considerable variation; some are distinctly calcareous (3, 6), the calcareous matter being collected into minute strings and patches. For the most part the tuffs are certainly connected with the eruptions of the hyalo-andesites, for almost all the lapilli are of that nature.

A pale yellowish-grey, moderately compact, but somewhat cavernous tuff (1) [F. 2352] from the foot of a crater-like ridge about half a mile to the west of the whaling station is composed of angular lapilli of hyalo-andesite which range up to one inch, but average half an inch, in greatest dimension. The cavities between the lapilli are lined with a black ferruginous incrustation.

The lapilli are mainly of one type, and consist of highly vesicular volcanic glass, through which stream microliths of acid labradorite. The colour and opacity of the glass vary considerably in different fragments from pale transparent brown, through deep brown, to black. Augite is represented here and there in the paler and more transparent fragments by small phenocrysts, by microliths, and by minute globular crystals between the felspars. No. 3 from the same locality is similar in character, yellow to buff in colour, but somewhat loosely compacted, and with lapilli of smaller dimensions—usually not larger than a pea.

The Pyroxene-Andesites and Soda-Trachytes.—A pale-grey compact rock from the foot of a crater-like ridge, about half a mile to the west of the whaling station (2) [F. 2353], and described as a common type at that locality, may be classed as an acid pyroxene-andesite. It is non-vesicular, as far as the specimen goes, and breaks with a splintery fracture. The freshly fractured surfaces show sparsely distributed small and lustrous felspars 2 to 3 mm. in length, small patches of greenish-brown pyroxene, and specks of magnetite. Porphyritic constituents are not well represented, but consist of somewhat badly formed crystals of greenish augite, moderately pleochroic hypersthene, and fresh plagioclase felspar of the composition of acid labradorite (Ab_1An_1). The felspars are well-shaped, repeatedly twinned, have a mean refractive index near to that of Canada balsam, and are optically positive in sign.

The ground-mass of the rock consists of microliths of greenish augite and rectangular elongated crystals of a plagioclase felspar of lower mean refractive index than Canada balsam. The felspar microliths give approximately straight extinction, and are presumably oligoclase. There is a fair amount of finely divided interstitial magnetite, but no glass; at the same time, the structure of the ground-mass suggests that it may have resulted, at any rate in part, from the devitrification of a glass of approximately oligoclase composition.

A somewhat similar rock (8) [F. 2355] occurs at the top of an extinct crater-ridge about a mile to the west of the whaling station. Microscopically it is practically identical with that described above, but differs mainly in its highly vesicular character and in the vesicular cavities being lined with perfect crystals and groups of crystals of tridymite, in association with minute tarnished crystals of iron pyrites and small crystals of what appears to be an

iron-olivine—a mineral assemblage similar to that described by IDDINGS * from the lithophysæ of Yellowstone Cliff, Yellowstone Park.

Of somewhat similar aspect, and therefore quite distinct from the dark hyalo-andesites, a fine-grained grey rock (5) [F. 2354], with a well-developed parallel platy structure, has been collected from the face of a ridge about 200 feet high, near to a small glacier. The locality is somewhat vague, but the type is interesting, as in its platy character and red-stained surfaces, it recalls the general features of the Mugearites. It contains small, regularly shaped porphyritic crystals of plagioclase, and subordinate small yellowish-green augites. The felspar phenocrysts are of high refractive index, negative sign, and appear to be anorthite in their central portions, but usually they are strongly zoned with less basic varieties. The ground-mass consists of microliths of acid labradorite, usually twinned, and with indefinite terminations; microliths and granules of augite; finely divided magnetite; and a small quantity of interstitial glass. There is a moderately well-developed flow-structure which has given rise to divisional planes parallel to the lines of fluxion, and which has allowed the crystallisation of tridymite on the divisional surfaces and in minute cavities in the body of the rock.

In these rocks the percentage of silica is certainly higher than is usual in normal andesites, and it is probable that in composition they would approximate more closely to the so-called dacites.

Still more acid, and therefore best classed with the soda-trachytes, is a rock collected from a ridge half a mile to the north of the whaling station, and stated to be a common type at that locality (15) [F. 2359]. It is a dove-grey, minutely vesicular rock of trachytic aspect similar in many respects to (No. 5), and, as before, the vesicles are lined with brilliant little crystals and groups of tridymite, and occasional crystals of iron olivine. The only micro-porphyritic constituent of note is an andesine felspar—optically positive, and with a mean refractive index equal to that of Canada balsam. A greenish augite also occurs, but only in subordinate amount.

The ground-mass consists of microliths of oligoclase and greenish augite, with finely divided magnetite and a small quantity of residual glass. The texture of the rock is trachytic, there being a good fluxion structure developed, and the rock is best described as an oligoclase-trachyte, although its relation to the pyroxene-andesites described above is distinctly close.

A somewhat different, and more basic, type, doubtfully classed with the trachytes rather than with the andesites, occurs plentifully at the back of the whaling station (16) [F. 2360]. It is a platy grey-green rock with a slight purple tinge, compact, and non-vesicular. The micro-porphyritic constituents are not abundant, but comprise anorthite, olivine, and occasional augite. The anorthite occurs as elongated, sharply terminated crystals; the olivine builds rounded, yellowish individuals, fresh for the most part, but showing marginal decomposition with the separation of iron oxide; the augite is in crystals of similar size to those of the olivine, and of similar colour.

The ground-mass is composed chiefly of microlithic oligoclase, granules and microliths of yellowish augite, and scattered crystals of magnetite. It has a well-marked fluidal arrangement of its constituents.

Generally speaking, these lavas are all in a fairly fresh condition, and there appears to be little evidence of widespread solfataric or propylitic action. One type of rock (17) [F. 2404], however, stated to occur on the side of an extinct volcanic cone at the back of

* *Seventh Annual Report U.S. Geol. Surv.*, pp. 265, 266, 1888.

the whaling station, and to be relatively rare, shows signs of considerable alteration of a propylitic nature. Originally the rock was an augite-andesite. Now the augite has been converted into a pale-green actinolitic hornblende, the larger felspars have been partly albitised and partly replaced by analcite, and the glassy matter of the base has been replaced largely by chlorite. Epidote of a deep-yellow colour, and rich in iron, has been developed as isolated crystals and as clots, while pyrites occurs scattered through the rock and collected in patches that occupy the position of original cavities.

Olivine-Dolerite.—On the ridge at the back of the whaling station a crystalline, moderately fine-grained, dark-grey rock, of which (18) [F. 2361] is representative, is stated to be of common occurrence. It is much more basic than any other rock collected from the island, and may be described as a normal olivine-dolerite. Olivine is fresh and abundant. Augite occurs in moderately large crystals, much interrupted by lath-shaped crystals of labradorite, and broken up by movement that has produced locally a fluidal arrangement of the smaller felspars. Ilmenite is fairly abundant in thin plates. This rock has characters that would suggest an intrusive rather than extrusive nature. It may, however, be a portion of a thick lava-flow.

The facies of all these rocks, with the exception of the olivine-dolerite (18), is andesitic, leaning in general towards the basalts rather than towards the more alkaline trachytes. In this respect the rocks of Deception Island contrast strongly with the basic flows of Roberts Island described below.

Roberts Island.

This small island, lying between Greenwich Island and Nelson Island of the South Shetland group, has been referred to in the journals of several Antarctic expeditions. It is well known to be composed mainly of volcanic rocks, although no crater, such as is the characteristic feature of Deception Island, seems to be preserved. Up to the present time no rock-specimens from this island had reached Europe, and thus no geological description of the island is available. Mr Innes Wilson's specimens, few though they be, are therefore of special interest.

The specimens were all collected from the shores of a bight called by the early American seal-hunters "Copper Mine Cove," by reason of the brick-red, copper-coloured, and even scarlet, superficial staining of the lavas and associated tuffs. Mr Innes Wilson searched for, and failed to detect, any trace of copper, and he can only suggest that the name applied to the cove originated solely from the suggestive coloration of the rocks that form the shores.

From the descriptions of the manner of occurrence of the specimens and an investigation of their nature, it would appear that the hill-sides bordering the cove are composed of olivine-basalts, highly vesicular in character, with lines of amygdales and layers of zeolitic minerals. Many of the amygdales are of considerable size, and are comparable to those which occur in the Tertiary basalts of our North-West Province. Tuffs of bright-red colour, indicative of subaerial deposition and weathering, are common associates of the flows.

An interesting feature recorded by Mr Innes Wilson is the high raised-beach that borders the bight, and on which occur many boulders of foreign rocks, mainly granites, transported from the south by glacial agency.

The Lavas.—Petrographically the lavas of Roberts Island are all basic in composition, and thus offer a striking contrast to the subacid and intermediate rocks of Deception Island.

They are all porphyritic olivine-basalts, but every one of the five specimens collected differs in some measure from the others, the differences lying mainly in the varying abundance of the porphyritic constituents and in the richness of the ground-mass in ferro-magnesian minerals.

A common type (35) [F. 2371], of which the hills around Copper Mine Cove are principally composed, is a dark brownish-grey, slightly vesicular olivine-basalt, with porphyritic crystals of augite which measure up to half an inch across. Olivine occurs as occasional well-formed crystals that are completely pseudomorphed by red oxide of iron. The rock is poor in olivine, but relatively rich in augite, which occurs abundantly, both as large simple crystals and as glomero-porphyritic groups.

In thin section the augite has a faint yellowish-green colour, but no marked pleochroism. The ground-mass is practically holo-crystalline, and consists of closely packed, broad rectangular to square crystals of zoned labradorite, granules of augite, and a small amount of interstitial glass. A few of the felspars are larger than the others, but, even so, felspar can hardly be regarded in this case as a micro-porphyritic constituent. From the same locality, and also described as common, is a finely crystalline, massive, dark grey-green olivine-basalt (36) [F. 2372], with large porphyritic crystals of augite, and in other ways similar to the type already described. It differs, however, in having labradorite as an important micro-porphyritic constituent, and in the greater abundance of interstitial glass. The large felspars show traces of albitisation, and a good deal of chlorite has been developed at the expense of the ferro-magnesian minerals and glass.

Another specimen (39) [F. 2375] from the same district, is a dark, grey-green massive rock of generally similar aspect, but contains smaller porphyritic crystals of augite and olivine. Augite is extremely abundant in the matrix, and labradorite is an important micro-porphyritic constituent. In general characters the rock recalls the olivine-basalts of *Dunsapie type*, so common amongst the Carboniferous Lavas of the South of Scotland.

From the hill-side above the cove, and stated to be very common, a red-stained decomposed porphyritic olivine-basalt (41) [F. 2376] was collected. It is a highly vesicular rock, the vesicles being filled with analcite. Augite and olivine are both porphyritic constituents, olivine being in larger crystals and more abundant than in any of the other specimens.

The ground-mass is exceedingly rich in augite, a labradorite felspar occurring in quite subordinate amount and being microlithic in character. There is a fair amount of residual glass, which is rendered almost opaque by finely divided iron ore. In composition the rock is extremely basic, but appears to be allied to the *Craiglockhart type* of olivine-basalts.

A decidedly different type is represented by a specimen of a grey-green crystalline rock, of which the surfaces are variously stained red, yellow, and brown (44) [F. 2379]. It is stated to be a common type, but its superficial similarity to, yet fundamental difference from, the types already described renders a field-statement as to its prevalence somewhat doubtful.

The porphyritic constituent, as before, is a green augite that occurs as single crystals and glomero-porphyritic groups of several millimetres in length. Augite is a prevalent constituent throughout the rock, and builds crystals of all sizes, from that of the porphyritic individuals to the granules of the ground-mass. It is yellowish green in colour, and slightly pleochroic.

The ground-mass of this rock presents the greatest difference from those of the other basalts of the island, for it is practically holo-crystalline, and consists of basic plagioclase microliths, augite, enstatite-hypersthene, and magnetite. The microlithic felspars are arranged with some approach to parallelism, and embrace the granules of augite and

rhombic pyroxene. The rock is decidedly basic in character, the ferro-magnesian minerals being far in excess of the felspathic constituents. The occurrence of rhombic pyroxene in rocks of basaltic composition is somewhat uncommon, and this fact is best expressed by referring to the rock in question as a hypersthene-basalt. It has, however, points that ally it to the more basic bandaites described above by Mr TYRRELL.

The Tuffs.—The tuffs call for little comment. They are just what would be expected to occur within such a series of basaltic lavas.

A brick-red ferruginous tuff (37) [F. 2373], evidently the prevalent type, is highly fragmental in character, the fragments being, for the most part, of vesicular and altered basalt highly charged with oxides of iron. A few fragments appear to be vesicular chloritised andesites.

A banded green silicified tuff from the hillside north of the cove, and stated to be the only specimen seen, is interesting on account of the secondary silicification it has undergone, and for the enclosure, within the crypto-crystalline silica, of well-formed parallel-sided crystals of *Heulandite.* These crystals are elongated parallel to the A axis, have rectangular cross-section, and a moderately large angle between the optic axes.

The Zeolites of the Amygdales, etc.—A white friable mineral-mass about half an inch in thickness (34), and described as occurring everywhere in layers between the rocks of the hill-side at Copper Mine Cove, is composed of minute pearly crystals of the lime zeolite *Laumontite.* The crystals measure 1 to 2 millimetres in length, have a mean refractive index near 1·52, positive elongation, optically negative sign, a moderately large axial angle, high bi-refringence, good cleavage parallel to the prism edges, and an oblique extinction between 20° and 30°.

From the north beach of the cove a mass of compact pure white material (40) proved to be composed of white secondary quartz and a silky fibrous zeolite with radiate structure. The zeolite appears to be *Scolecite*, and the mass is undoubtedly from a cavity in one of the basaltic lavas.

Stated to be common, are good crystals and groups of white or slightly iron-stained *Stilbite* (45) of characteristic habit. Some of the crystalline groups measure an inch or more in length, but the more perfect crystals are of smaller dimensions.

Boulders.—The boulders from the raised-beach are deserving of passing reference. One of a number of similar boulders (38) is a moderately fine-grained light-grey pegmatitic muscovite-biotite-granite, composed of orthoclase, perthite, albite-oligoclase, quartz, muscovite, chloritised biotite, and micro-pegmatitic matter. The felspars are mainly orthoclase and orthoclase-perthite—potash felspar predominating.

An interesting and somewhat unexpected type occurs as boulders on the beach, on the north side of the cove (43) [F. 2378]. Its source is unknown. It is a moderately coarsely crystalline, grey quartz-diorite composed of green hornblende, biotite, plagioclase, orthoclase, and quartz. Hornblende is more abundant than biotite, the plagioclase is mainly albite-oligoclase, and quartz is plentiful. The interesting feature of the rock is the occurrence in it of blue-brown tourmaline, together with sphene, as rosettes of acicular crystals within the chloritised biotite.

TRINITY ISLAND AND GRAHAM LAND.

The Innes Wilson collection is mainly from Trinity Island in the Palmer Archipelago, and from points on the Gerlache Channel, south-south-west of Trinity Island and east of Brabant Island.

Mr INNES WILSON collected a series of specimens from localities south of Tower Hill near Mikkelsen Bay, Trinity Island, more especially from the northern side of the bay. These indicate that much of the ground is occupied by zeolitised and otherwise altered olivine-basalt lavas.

A prevalent rock-type appears to be a pale greenish-grey micro-porphyritic olivine-basalt more or less completely albitised and chloritised (25) [F. 2366]. The porphyritic constituents are olivine, now represented by pseudomorphs in serpentine and calcite, and a moderately basic plagioclase felspar. The porphyritic felspars are almost completely converted into albite and locally replaced by chlorite, but a small amount of the original basic felspar usually remains. The ground-mass consists of interlocking and sub-variolitic laths of albite-oligoclase with much interstitial chlorite that represents the original ferro-magnesian minerals and residual glass. It is interesting to meet with such an excellent example of almost complete albitisation, such as is a common feature of many basaltic lavas in other less remote regions.

Other rocks from the same locality, which show a platy structure and dull-red staining on surfaces and joint-faces, are partly decomposed and analcitised olivine-basalts (28) [F. 2367]. Augite is present as small grains and ophitic patches. *Analcite* fills the vesicles, and also replaces in part the substance of the larger crystals of labradorite.

Specimens (30) and (31) [F. 2369] from the same locality are other examples of zeolitised basalt. The latter consists, now, entirely of granules of pale yellowish-brown augite, set in a matrix of zeolites, secondary albite-oligoclase, and a little secondary quartz. The zeolites appear from their elongated and radially arranged crystals, high refractive index, negative elongation, straight extinction, high birefringence, and strong dispersion of the optic axes, to belong to one species, namely *Prehnite.*

Some of the rocks appear to be traversed by veins of zeolite-minerals, amongst which *Scolecite* (27) occurs in association with secondary quartz. In other cases veins of calcite and quartz were noted (24), the calcite forming the central portion of the vein with quartz on either side.

As many of the rock-masses from which specimens were collected were projecting from the ice of glaciers, it is not always certain that they did not form portions of transported masses. That there is a mixed assemblage of rocks at this locality is obvious, for other specimens from the same locality are of distinctly hypabyssal nature, one in particular being a particularly interesting hybrid rock of the nature of a basified granophyre (29) [F. 2368]. This rock, according to the collector, appeared to be plentiful. It is grey-green in colour, moderately fine-grained, speckled, and contains somewhat indefinite darker patches. For the most part it consists of a moderately coarse graphic intergrowth of orthoclase-perthite, orthoclase, and quartz. Augite occurs sparingly as small idiomorphic crystals, occasionally replaced in part by calcite. Other crystals of augite are more irregular in form, and are partly converted into uralitic hornblende. These probably belong to the basic magma. The more basic portions, which are occasionally noticeable in the hand-specimens as darker patches, contain plentiful biotite-pseudomorphs after a rhombic pyroxene and a certain amount of plagioclase felspar. Yellow epidote and calcite occupy rather large patches, and radially grouped crystals of prehnite are frequent.

From a bare patch of rock projecting from the surrounding glaciers on the northern side of the bay, a pale pinkish-white rock (32) [F. 2370] occurs somewhat sparingly. It is moderately compact, and has small nests of bright yellow epidote. The rock is a beautiful granophyre, similar in many respects to what I regard as the unmodified granophyric portions of (29). Epidote is abundant, and plagioclase edged with orthoclase, and fringed with micro-pegmatitic

material, is a prevalent constituent. The main part of the rock consists of an intergrowth of orthoclase-perthite and quartz. The more basic plagioclase shows signs of albitisation, with the consequent separation of epidote.

One of the most interesting specimens brought back by Mr INNES WILSON is a moderately large mass of an exceedingly rich ore of copper (33). Unfortunately it was not *in situ*, being a boulder on the beach at the foot of a glacier near Port Lockroy, on the Neumayer Channel. It was the only specimen of its kind found, and consists mainly of the two basic carbonates of copper, *Malachite* and *Azurite*, with a subordinate amount of copper silicate.

The ore appears to be stalagmitic in character, and mainly botryoidal as regards structure. The bright-blue azurite occurs as streaks and patches in the emerald-green malachite and blue-green vitreous-lustred silicate.

So far as I am aware, this is the first record of any high-grade metallic ore from Antarctic regions.