A SYNOPTIC FLORA OF SOUTH GEORGIAN MOSSES: VI. *Cheilothela*, *Dicranella*, *Distichium*, *Myurella* AND *Catagonium*

By M. E. NEWTON*

ABSTRACT. Descriptions of the South Georgian species of *Cheilothela*, *Dicranella*, *Distichium*, *Myurella* and *Catagonium* are accompanied by habitat and distributional details, a key to species of the Dicranaceae, notes and taxonomic comments. The first three genera have been treated in the Dicranaceae. The most noteworthy taxonomic changes are a re-definition of the genus *Catagonium* and the return of *Anisothecium hookeri* (C. Muell.) Broth. to the genus *Dicranella*. Of the species considered, only *D. hookeri* and *Distichium capillaceum* (Hedw.) B.S.G. were previously known on South Georgia. *Cheilothela chilensis* (Mont.) Broth., *Dicranella cardotii* (R. Brown ter.) Dix., *Myurella julacea* (Schwaegr.) B.S.G. and *Catagonium politum* (Hook. f. et Wils.) Dus. are reported for the first time from the island, thus extending the known range of *M. julacea* to the Southern Hemisphere.

THE species considered in this paper are seldom abundant on South Georgia, although those of *Dicranella* and *Distichium* form a distinctive part of the flora. The species of *Cheilothela*, *Myurella* and *Catagonium*, in particular, appear to be extremely rare, being known only from a few specimens. Recognition of these five genera is not difficult but, in constructing a key for the identification of material of *Dicranella*, *Distichium* and *Cheilothela*, emphasis has been placed on characters that exclude the possibility of confusion with taxa of other genera such as *Ditrichum* and *Dicranoweisia*.

Species descriptions, illustrations, taxonomic notes and distributional data are arranged according to the principles adopted in earlier parts of this series (Greene, 1973; Bell, 1974). The bryophyte herbarium of the British Antarctic Survey is now housed in the Institute of Terrestrial Ecology's Bush Research Station, Penicuik, Midlothian, Scotland EH26 0QB.

DICRANACEAE

Several authors, e.g. Brotherus (1924), Grout (1936) and Nyholm (1954), have treated the Dicranaceae *sensu lato* as a number of smaller families, placing two of the genera considered here, *Cheilothela* and *Distichium*, in the Ditrichaceae and a third, *Dicranella*, in the Dicranaceae *sensu stricto*. The Ditrichaceae, with elongated perichaetial leaves, ± erect cylindrical capsules and peristome teeth divided to the base, are thus separated from the Dicranaceae *sensu stricto* in which the perichaetia are not conspicuously longer than the leaves, the capsules being ± inclined and the peristome teeth divided only to about half-way. Such distinctions are not absolute and, although Bryan (1956) presented cytological evidence supporting their separation as two families, studies by Smith and Newton (1968), whilst confirming the cytological heterogeneity of the Dicranaceae *sensu lato*, failed to corroborate Bryan's opinion in detail. Since there is no general agreement on the delimitation of families within the Dicranaceae *sensu lato* and because cyto-taxonomic correlations (Smith and Newton, 1968) differ from those suggested on morphological grounds, it is proposed to recognize only the Dicranaceae *sensu lato* in the present paper.

The South Georgian species of *Cheilothela*, *Dicranella* and *Distichium* may be identified as follows:

1. Leaves smooth throughout .. .. ***Dicranella hookeri***
   At least upper parts of leaves highly mamillose, often with double mamillae 2
2. Leaves non-sheathing, narrowly triangular to ovate-lanceolate, mamillose throughout, with intermittently recurved margins .. .. .. ***Cheilothela chilensis***

* Shaw Bank, 143 Mottram Old Road, Stalybridge, Cheshire SK15 2SZ.

Leaves differentiated into sheathing bases and long narrow subulae; mamillae confined to subulae, the margins plane throughout 3

3. Leaf arrangement distichous .. .. ***Distichium capillaceum***
Leaf arrangement spiral .. .. ***Dicranella cardotii***

Cheilothela (Lindb.) Broth.

The single species of *Cheilothela* is distinct among the island's flora in its triangular to ovate-lanceolate bi-stratose leaves with more or less recurved margins and densely mamillose cells, the mamillae being double and each composed of the prominent ends of adjacent cells separated by a depressed end wall.

Cheilothela chilensis (Mont.) Broth.

Syn. Trichostomum chilense Mont.
Cheilothela dubia Dus.
Cheilothela revoluta (Herz.) Thér.

Loosely caespitose to *c.* 2·5 cm. high, the young shoots bright yellowish green, becoming dark green or brownish below. Stems sympodially branched, leafless below but with sparse brown rhizoids. Leaves from middle of stem 1·1–2·4×0·4–0·7 mm., their length increasing conspicuously along annual increments, erecto-patent when wet, becoming incurved on drying, narrowly triangular to ovate-lanceolate, channelled above widest point, gradually tapering to obtuse or acute apices. Margin entire throughout or with occasional teeth at extreme tip, slightly and intermittently recurved in lower half. Nerve *c.* 130 μm. wide at base, strong and percurrent with five distinct cell groups in transverse section, the central guide cells being separated by incrassate cells from upper and lower layers. Lamina mainly bi-stratose, uni-stratose for only half of width towards base. Upper cells 6·0–15·5×6·0–9·5 μm., square or shortly rectangular, mamillose dorsally and ventrally, the basal cells larger, with less prominent mamillae. Sterile (Fig. 1).

Habitat and distribution (Fig. 2)

C. chilensis on South Georgia is known from south-, east- and north-facing cliff ledges and rock faces, embedded in fine gravel and silt, closely associated with *Andreaea regularis* C. Muell. and a species of *Dicranoweisia*. Altitude 30–305 m.

Notes

Although the mamillae of *C. chilensis* are of a type shared by the two South Georgian species of *Bartramia*, *Dicranella cardotii* and *Distichium capillaceum*, the only likelihood of microscopical confusion is with species of *Ceratodon* or *Barbula*, the leaves of which are sometimes of similar shape and structure. The completely smooth leaf cells of *Ceratodon* provide a reliable means of recognition, whereas the leaves of *Barbula* are papillose, i.e. the cell lumen does not extend into the wall ornamentation as in the case of mamillae. *C. chilensis* also bears some overall resemblance to small species of *Trichostomum* but the incurved leaf margin and papillose cells of the latter should dispel any doubt.

Taxonomy

This is the first South Georgian record of *C. chilensis*, a species originally described from South America as *Trichostomum chilense* Mont. (Montagne, 1845). Part of the holotype (Gay, PC, Provinces austr. Chili) has been examined and found to include a mixture of two

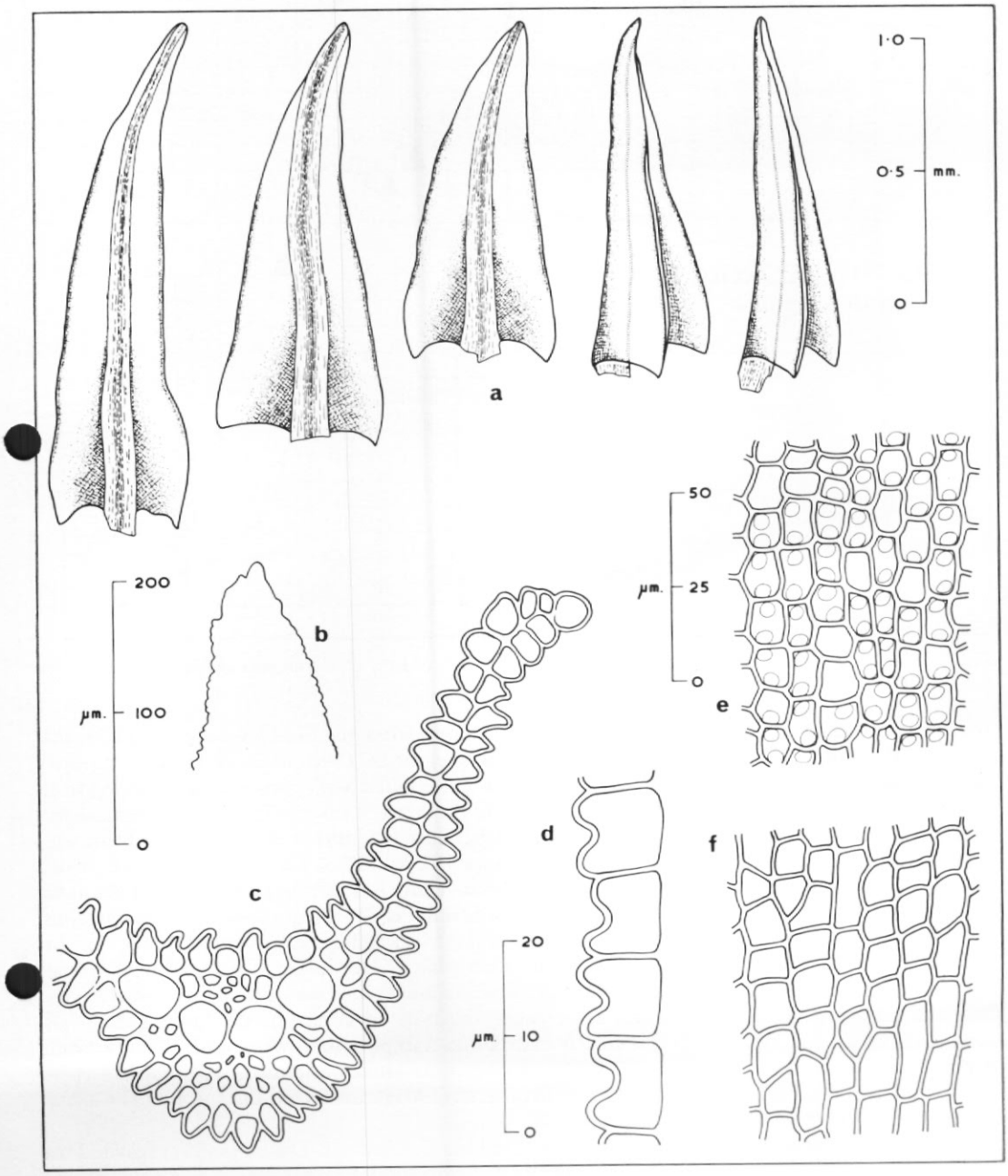

Fig. 1. *Cheilothela chilensis*.
a. Leaves; b. Leaf apex; c. Transverse section approximately half-way along leaf; d. Mamillae in profile; e. Upper leaf cells, with mamillae indicated by fine lines; f. Lower leaf cells.
Scales: uppermost for leaves, median left-hand for leaf apex, median right-hand for cells and transverse section, lowest for mamillae.

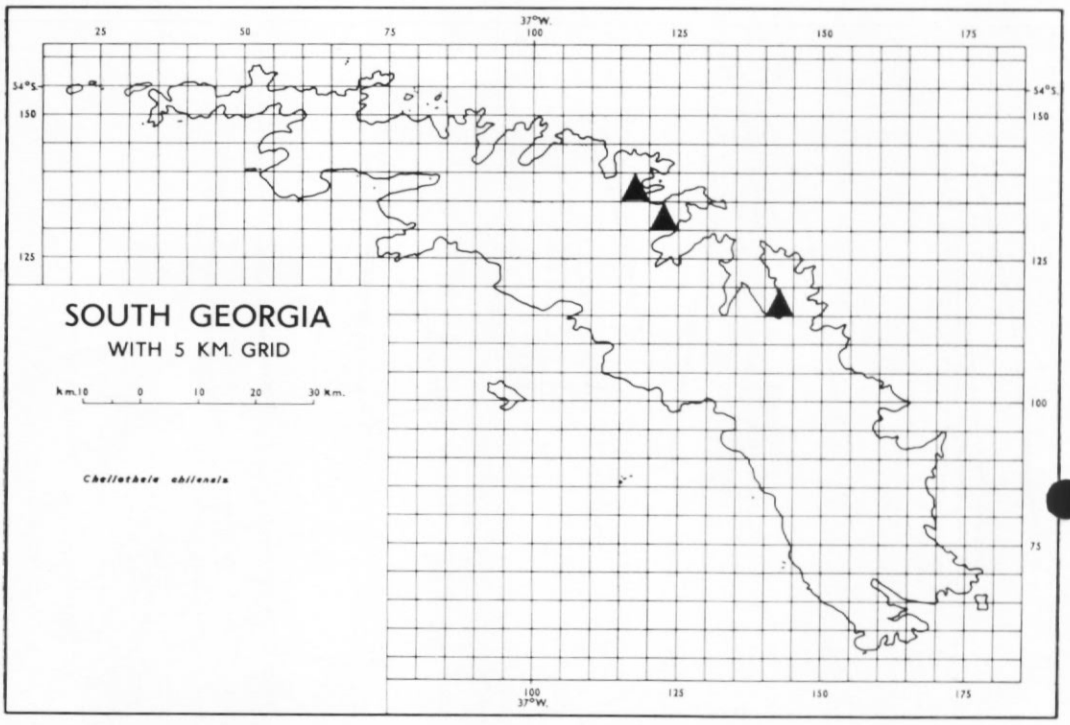

Fig. 2. The known distribution on South Georgia, by 5 km. squares, of *Cheilothela chilensis*, based on the specimens and field records given in the Appendix.

species, the one in the minority being indistinguishable from the South Georgian specimens, whereas the bulk of the material belonged to a species of *Ceratodon*. A similar impurity occurs amongst five probable isotypes, only the one catalogued as *Trichostomum chilense* Mont. (38, BM, Chile, 10, ex herb. Montagne) resembling the present taxon. Three of the remainder, labelled *Ceratodon chilensis* Mont. or *C. chilensis* Schimp. (38, BM, Chile, ex herb. Montagne; BM, Chile, ex herb. Montagne, ex herb. Schimper; Gay, BM, Chili, mss. in herb. Mus. Par. = *C. crassinervis*, Ltz. in Bot. Gaz., ex herb. Emil Bescherelle), belong to *Ceratodon* and the fourth (Gay, BM, Chili, ex herb. Emil Bescherelle) is probably a species of *Campylopus*. Although Montagne (1845) did not refer to mamillose leaf cells, it is possible to infer that his type description should in fact be applied to such plants. He distinguished his new species from *Cheilothela chloropus* (Brid.) Lindb. (as *Trichostomum strictum* Bruch) by the recurved leaf margin and exannulate capsule. Thus, since the type specimen of the latter species (B, Roma, in terra nuda, Aprilo 1818) is clearly mamillose, it implies that Montagne was describing a plant that was similar to *C. chloropus* in this respect. Direct attention was first drawn to the presence of double mamillae only when Brotherus (1901) transferred the species (as *Ceratodon chilensis*) to the genus *Cheilothela*.

Of the species described subsequently, two resemble *C. chilensis*. Dusén (1905) regarded the leaf margin of a specimen of *Cheilothela* as erect and, although he described it as a new species, *C. dubia*, it is apparent that he had been in some doubt about its isolation from *C. chilensis*. The type specimen from Dusén's herbarium (Dusén, S, Chili australis ad Puerto Montt opp. in terra arenosa, 19.xii.1896) has already been considered to be synonymous with *C. chilensis* (H. B. Schofield, *in scheda*), a view which is supported by the author after studying the type and three isotypes (P. Dusén 384, BM, 2 specimens, Chile australis ad Puerto Montt opp. in

terra, 19.xii.1896; Dusén 384, S, Chile austr. Puerto Montt opp. in terra, 19.xii.1896, ex herb. J. Froehlich), in all of which the leaf margins are very slightly revolute in part. It is therefore considered that specific status is unjustified and *C. dubia* is here reduced to synonymy with *C. chilensis*.

A second species, *Cheilothela revoluta* (Herz.) Thér., was described by Herzog (1916) in the genus *Chrysoblastella* despite his recognizing its similarity to species of *Cheilothela* (Reimers, 1926). Although its leaf margin is variable and sometimes quite markedly revolute, examination of the holotype (Herzog, 3466, JE, In der Quebrada de Pocona, *c.* 2,800 m., April, 1911) has failed to reveal any significant differences from *C. chilensis* and so it is here reduced to synonymy. Such a course is in agreement with the opinion of Robinson (1967), who did not, however, make the necessary reduction.

Dicranella (C. Muell.) Schimp.

The two South Georgian species of *Dicranella* are recognizable by their widely spaced vaginate leaves, the limbs of which are bi-stratose with plane and entire margins. The nerve is narrow and clearly defined in the base but indistinct in the limb. Mamillae, when present, are usually double as in *Cheilothela*.

The genus *Anisothecium*, as originally defined by Mitten (1869) on the basis of sporophyte characters, includes species with vaginate and non-vaginate leaves. Brotherus (1924), using alar cells, and Mönkemeyer (1927), using curvature of the leaves, recognized *Anisothecium* as a section or sub-genus of *Dicranella* composed almost exclusively of species with vaginate leaves. The South Georgian species undoubtedly belong to *Anisothecium*, thus defined, but its unsatisfactory delimitation is well known (Florschütz, 1964). The reluctance of many modern authors (e.g. Grout, 1936; Richards and Wallace, 1950; Nyholm, 1954; Schofield, 1970; Lawton, 1971) to accept it as a separate genus is followed in the present treatment.

Dicranella cardotii (R. Brown ter.) Dix.

Syn. Dicranum cardotii R. Brown ter.
Aongstroemia persquarrosa Dus.
Anisothecium persquarrosum (Dus.) Broth.

Forming dense turves (0·5–) 1·5–5·5 (–7·0) cm. high, bright or yellowish green above, light brown below. Stems with few lateral ascending branches but with abundant brown rhizoids bearing reddish brown, spherical, multicellular rhizoidal tubers *c.* 100–200 μm. in diameter. Leaves 1·2–3·0 (–3·5) mm. long, squarrose, becoming contorted on drying. Leaf base 0·4–1·0 (–1·2)×(at widest point) (0·3–) 0·4–0·9 (–1·1) mm., widest at shoulders, abruptly constricted above to channelled subulate limb 0·6–2·1 (–2·4)×(at base) 0·2–0·6 mm. Nerve with central guide cells and usually two stereid bands. Cells of limb of two types, those on the abaxial surface, towards the margin of the adaxial surface and, rarely, in mid-line (6·3–) 8·4–15·7 (–21·0)×6·3–11·5 μm., quadrate or shortly rectangular, mamillose, while those in the centre of the adaxial surface longer 10·5–54·6 (–81·9) μm., smooth, in the sheathing base (14·5–) 35·5–77·5 (–84·0)×5·5–15·5 (–21·0) μm., elongate, rectangular, uni-stratose though occasionally bi-stratose in scattered points, becoming shorter and rounded towards shoulders, smooth throughout base. Sterile (Fig. 3).

Habitat and distribution (Fig. 4)

This species occurs at low altitudes on wet rock ledges and in wet crevices, typically near streams and waterfalls, although it has also been reported from a steep east-facing scree slope. Altitude 0–152 m.

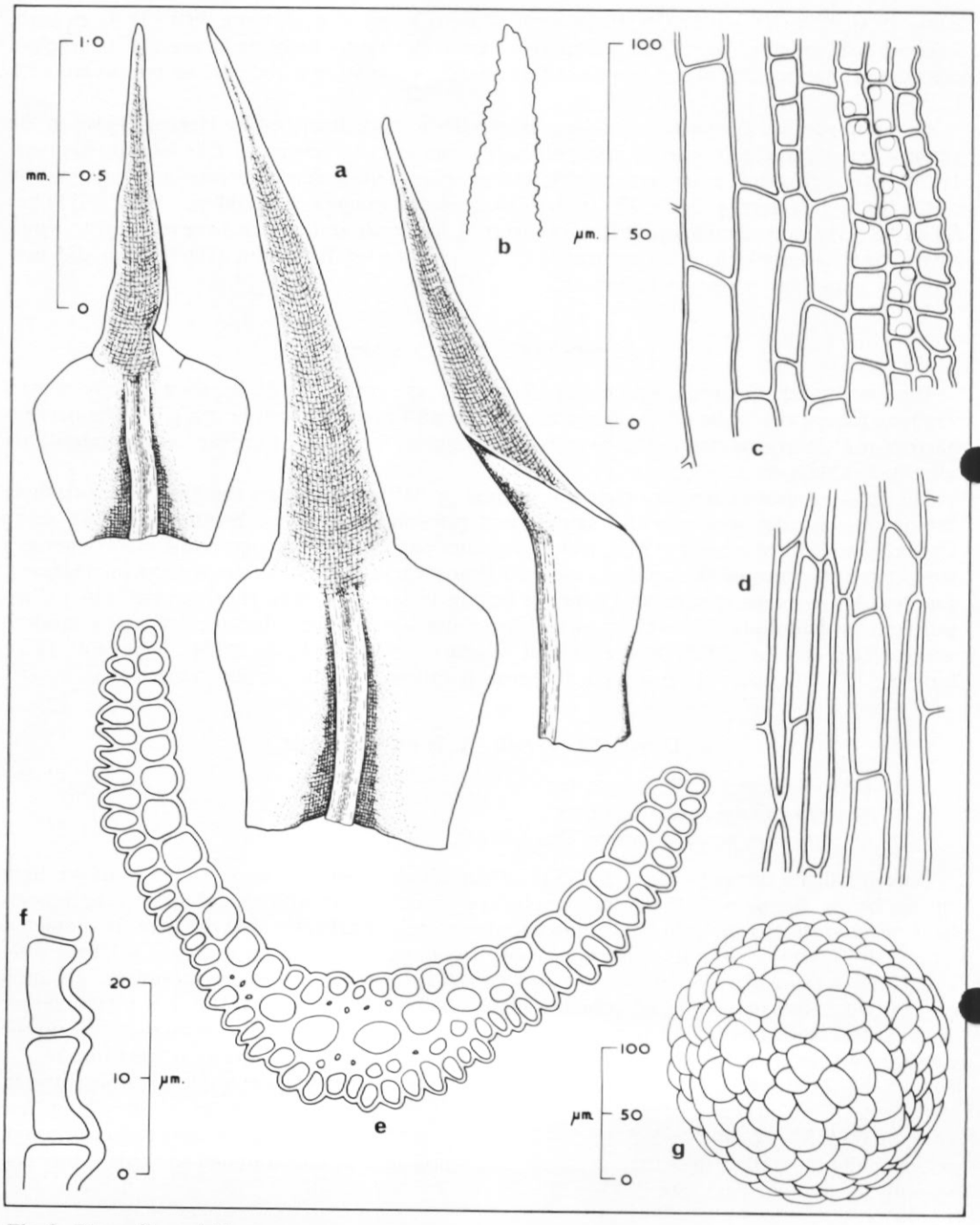

Fig. 3. *Dicranella cardotii.*
a. Leaves; b. Leaf apex; c. Upper adaxial leaf cells, with mamillae indicated by fine lines; d. Lower leaf cells; e. Transverse section approximately half-way along limb; f. Mamillae in profile; g. Rhizoidal tuber.
Scales: upper left-hand for leaves, upper right-hand for cells and transverse section, lower left-hand for mamillae, lower right-hand for tuber and leaf apex.

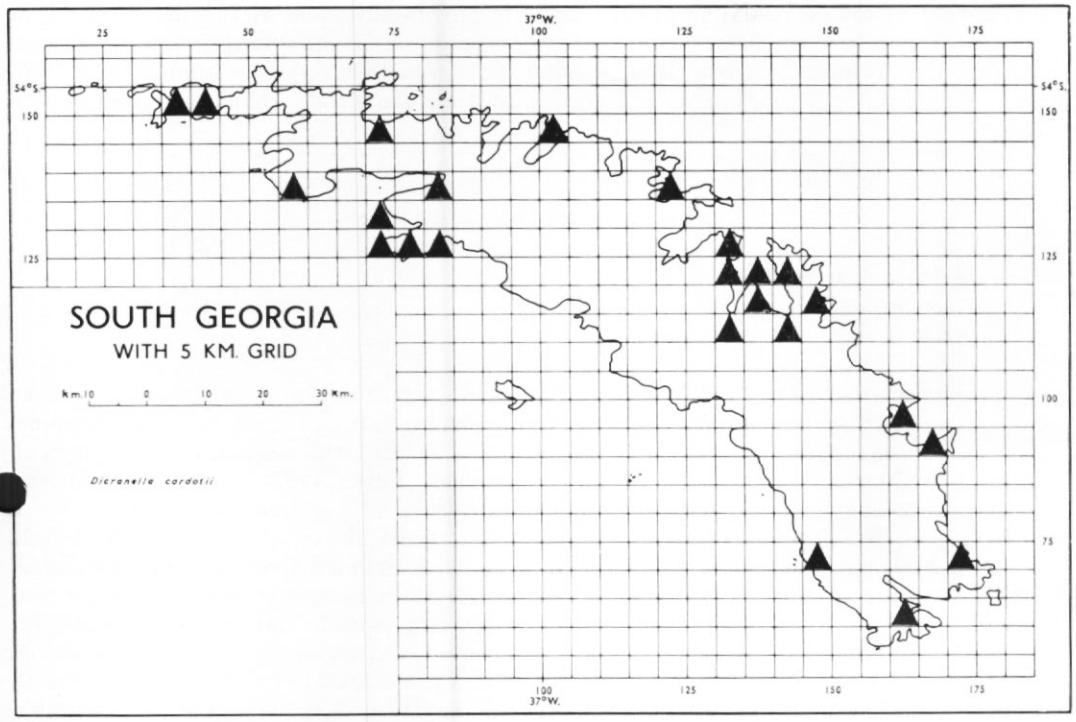

Fig. 4. The known distribution on South Georgia, by 5 km. squares, of *Dicranella cardotii* based on the specimens and field records given in the Appendix.

Notes

Confusion between *D. cardotii* and *D. hookeri* is likely to occur in the field, particularly as they are occasionally found in association. However, only a small number of depauperate and juvenile specimens of the former would fail to be recognized by the characteristically squarrose leaves, when the presence of mamillose leaf cells would provide a reliable microscopical character. It is also possible that separation of robust forms of *D. cardotii* from vegetative forms of *Bartramia patens* Brid. may present difficulties. In their leaf morphology and anatomy, the two species are similar but the serrate leaf margin of *B. patens* is quite distinct, while the lamina of the upper part of the leaf is tri-stratose for most of its width, unlike that of *D. cardotii* which is mainly bi-stratose. Moreover, the stem of the present species lacks the outer row of enlarged cells that typifies South Georgian species of *Bartramia* (Newton, 1973).

Taxonomy

D. cardotii, previously unknown from South Georgia, was first described as *Dicranum cardotii* R. Brown Ter. (Brown, 1903) from a New Zealand specimen. The type specimen (R. Brown ter., BM, R. Hapuka, Kaikoura, South I., New Zealand) differs from South Georgian material in that the elongated adaxial cells of the leaf limb are covered by small quadrate cells. Since the long cells are partially covered in some South Georgian specimens, it is considered to be only a difference of degree not incompatible with the recognition of a single taxon. The species was transferred to *Dicranella* by Dixon (1923).

It is proposed, as a result of an examination of isotypes, that *Anisothecium persquarrosum* (Dus.) Broth., which was first described from southern South America as *Aongstroemia*

persquarrosa by Dusén (1905) and later transferred to *Anisothecium* by Brotherus (1924), be reduced to synonymy with *D. cardotii*. These isotypes bear the manuscript name of *D. persquarrosa* Dus. (Dusén 542, BM, H, Patagonia occ.: in valle fl. Aysen in rupibus, 12.ii.1897) and resemble the type of *D. cardotii* in all respects, including the covered elongated cells of the nerve.

Dicranella hookeri (C. Muell.) Card.

Syn. Aongstroemia hookeri C. Muell.
Anisothecium hookeri (C. Muell.) Broth.
Anisothecium perpusillum Dus.

Forming dense turves 1·0–5·5 (–8·5) cm. high, yellowish or bright green above, pale brown below. Stems unbranched or, particularly in fertile plants, with 1 or 2 ascending sub-terminal branches, bearing copious brown or reddish brown tomentum with reddish brown, spherical, multicellular rhizoidal tubers *c.* 85–155 μm. in diameter. Leaves (1·2–) 1·4–2·6 (–3·4) mm. long, erecto-patent, widely spaced, becoming distorted on drying. Leaf base (0·4–) 0·5–1·0 (–1·1) × (0·3–) 0·5–0·9 (–1·0) mm., ± square, narrowed above to a channelled subula 0·7–1·6 (–2·3) × (at base) 0·2–0·6 mm., with an acute or rounded apex. Nerve ceasing below apex, its structure as seen in transverse section variable, resembling that of *D. cardotii* or consisting of small group of stereids interspersed between large adaxial and smaller abaxial cells. Abaxial cells of limb (8·5–) 13·5–28·5 (–38·5) × 8·5–15·0 μm., rectangular, the central adaxial cells (14·5–) 17·0–41·0 (–51·5) μm. long, the cells of the leaf base (19·0–) 23·0–63·0 (–86·0) × 5·0–17·5 (–27·5) μm., uni-stratose, elongate, rectangular to oval, varying in width within a leaf and generally shorter above, all cells smooth. Apparently dioecious, with terminal inflorescences, the male being gemmiform. Seta 7–12 mm., yellow or pale orange. Calyptra cucullate. Capsule 0·7–1·1 mm. long, globose to shortly oval, slightly asymmetrical, ± erect, urceolate when dry, dark brown. Operculum rostrate, erect, in length ± equal to capsule, exannulate. Peristome single of 16 broadly triangular teeth cleft to about mid-way, occasionally perforated, outer face finely papillose with vertical striations, inner face coarsely and irregularly papillose, basal membrane of 2–4 rows of cells. Exothecial cells ± rectangular with thicker longitudinal than transverse walls. Spores *c.* 27–32 μm., ± spherical, smooth (Fig. 5).

Habitat and distribution (Fig. 6)

Typically found in wet flushes dominated by *Rostkovia magellanica*, *Juncus scheuchzerioides* and *Tortula* spp., *D. hookeri* also occurs on wet rock ledges and by streams. Altitude 0–245 m.

Notes

Plants of *D. hookeri* are only likely to be mistaken for *D. cardotii* but the two species can be distinguished by the characters mentioned in the notes under *D. cardotii*. Newton (1972) reported a chromosome number of $n = 26$ for a plant collected between Grytviken and the head of Bore Valley and provisionally determined as *Dicranella* cf. *hookeri*. Its identity as *D. hookeri* was confirmed during the present work.

Taxonomy

D. hookeri was first reported from South Georgia by Cardot (1908), who made this new combination for *Aongstroemia hookeri* C. Muell., a species described by Müller (1851) on the basis of a specimen that Wilson (*in scheda*) had referred to *Dicranum vaginatum* Hook. South

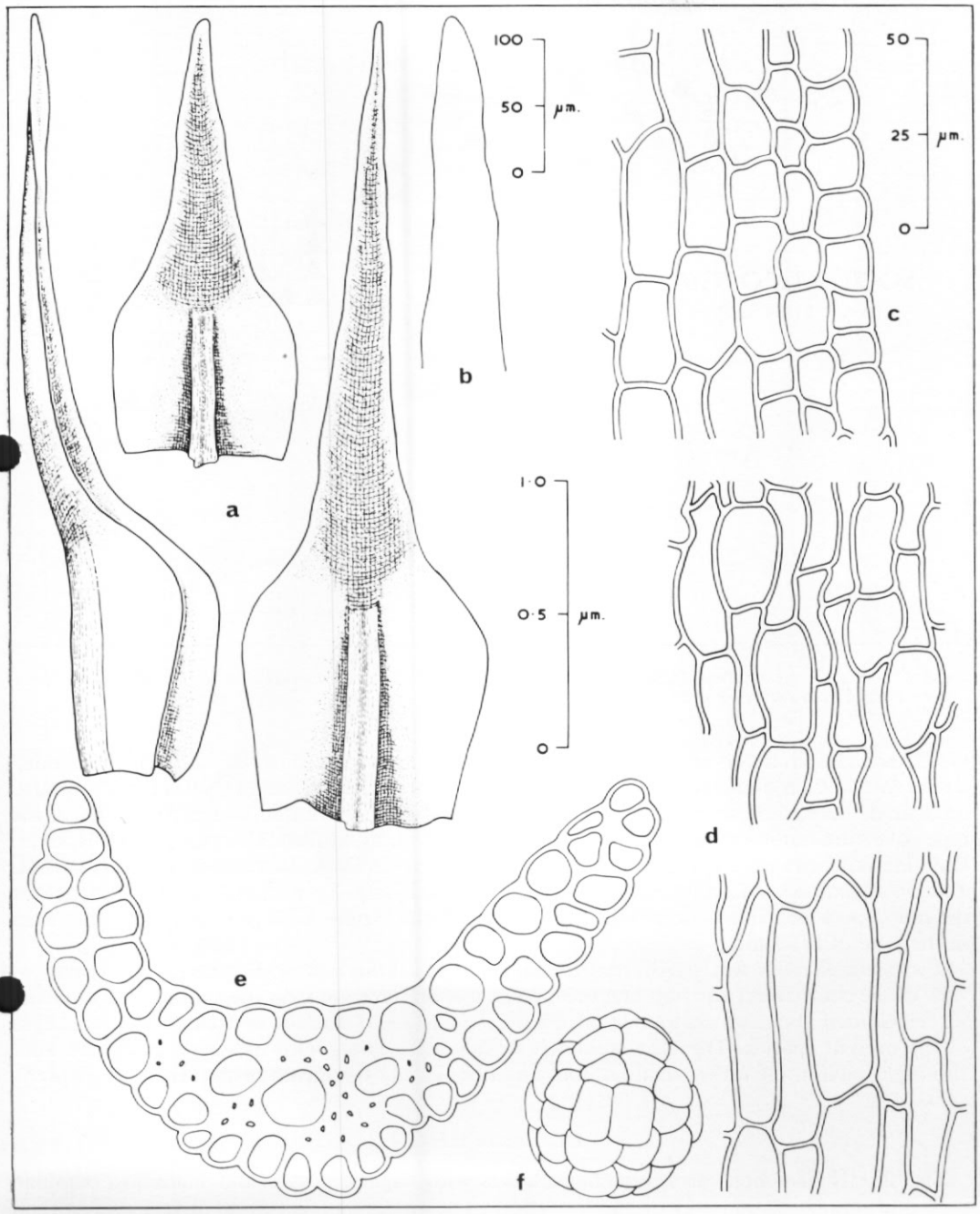

Fig. 5. *Dicranella hookeri*.
a. Leaves; b. Leaf apex; c. Upper adaxial leaf cells; d. Lower leaf cells; e. Transverse section approximately half-way along limb; f. Rhizoidal tuber.
Scales: upper left-hand for leaf apex and tuber, upper right-hand for cells and transverse section, lower for leaves.

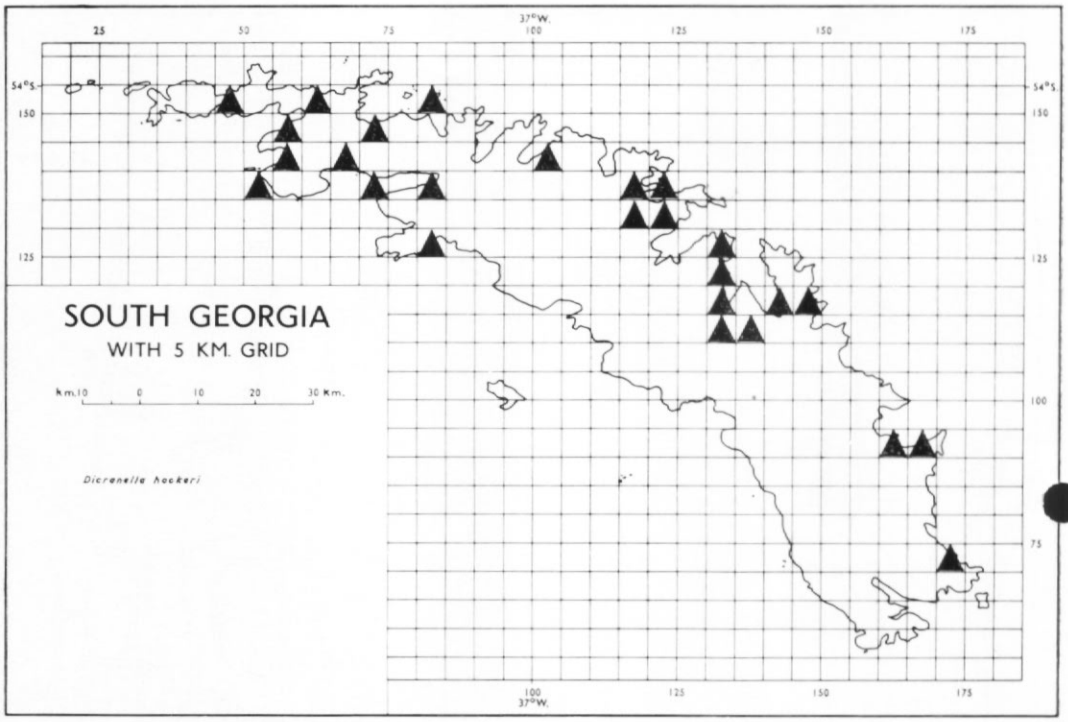

Fig. 6. The known distribution on South Georgia, by 5 km. squares, of *Dicranella hookeri* based on the specimens and field records given in the Appendix.

Georgian material differs in only one respect from the description of *A. hookeri*, which included a reference to dichotomous branching. Specimens in the British Museum (Nat. Hist.), arranged on a single herbarium sheet which was annotated by Wilson, are undoubtedly the bulk of the type collection but it appears that only part of it was seen by Müller. This piece (J. D. Hooker, BM, Hermite Island, Cape Horn, Antarct. Exp. 1839–1843. A *Dicr. vaginato* Hook. distat. *Dicran. vaginatum. Diobalon Hookeri* n. sp. ex herb. Hampe) can, therefore, be regarded as the holotype which shows no significant differences from South Georgian specimens, not even in the type of branching.

Dicranella hookeri was transferred to the genus *Anisothecium* by Brotherus (1924) but, in view of the controversy surrounding that genus, it is preferred to treat the species in *Dicranella*. *A. perpusillum* Dus., which was described by Dusén (1903), should be treated as a synonym of the present species. The type specimen (Hatcher, S, Patagonia) has been examined and, although found to be rather small, it does not differ in any significant respect from *D. hookeri*.

Distichium B.S.G.

The strictly distichous arrangement of leaves with vaginate bases and mamillose subulae is unique among the South Georgian moss flora. The basal laminae consist of very thin hyaline tissue that normally sheaths the stem closely but in detached leaves becomes narrowly involute. The mamillae are characteristic and frequently double of the type already described for the two species of *Dicranella*. Fruit is not uncommon, the capsule being erect and narrowly oval to cylindrical. Only a single species of the genus is known from the island.

Distichium capillaceum (Hedw.) B.S.G.

Syn. Cynontodium capillaceus Hedw.

Densely caespitose 1·0–4·5 (–13·0) cm. high, bright or dark green. Stems simple or with occasional ascending branches, frequently with dark reddish brown rhizoids. Leaves (1·3–) 1·6–4·4 (–5·3) mm. long, squarrose, often flexuose, or imbricated and erecto-patent. Leaf base 0·8–1·6 (–2·1) mm. long, hyaline, abruptly constricted to a narrowly subulate photosynthetic limb (0·4–) 0·5–2·6 (–3·8) mm. long. Margin plane throughout, with few teeth at extreme apex. Nerve well-defined in base but occupying entire width of limb. Surface cells of limb (6·3–) 7·3–14·7 (–23·1)×6·0–9·5 μm., square or shortly rectangular, mamillose, the basal cells (14·5–) 21·0–50·5 (–77·5)×(4·0–) 5·0–10·5 (–11·5) μm., uni-stratose, irregularly elongate, thin walled, smooth. Autoecious, male inflorescence below female or on separate branch. Seta 8–19 mm., light brown to orange. Capsule 1·0–2·1×0·4–0·7 mm., light brown. Operculum obtusely conical, with large annulus. Peristome single, of 16 lanceolate teeth irregularly cleft and/or perforated to base, each tooth of 8–14 articulations with faint diagonal striations on outer surface. Spores 17–27 μm., ± spherical, finely papillose (Fig. 7).

Habitat and distribution (Fig. 8)

This is a widespread species of a variety of rocky situations ranging from wet to dry, usually on ledges and in crevices but often in deep shade in caves and beneath overhangs. It also occurs less frequently on soil in flushed areas of *Festuca–Acaena* grassland. Altitude 0–150 (–610) m.

Notes

The distichous leaf arrangement and mamillose leaf subulae are quite unmistakable, although the leaf shape is very similar to that of a number of other small members of the Dicranaceae on South Georgia.

A specimen from the lower slopes of Mount Duse, tentatively identified as *D.* cf. *austro-georgicum*, was reported to have the haploid chromosome number of $n = 14+1m$ (Newton, 1972) but is now known not to be a species of *Distichium*.

Taxonomy

Dixon (*in scheda*) was the first to recognize *D. capillaceum* as South Georgian from a specimen collected by Sanders in 1927. The species was described by Hedwig (1801) as *Cynontodium capillaceus* Hedw. and European representatives, including two possible type specimens (G, *Cynontodium capillaceum* a M. Hedw. Scripsit: Schwaegrichen + qui in H. Hedwigii helv—* teste G. Colomb-Duplan; G, *Swartzia capillac.* Nb. Eon. Hedw. Scripsit: Schwaegrichen qui in Herbario Hedwigii habuit. teste G. Colomb-Duplan), have been examined from the Hedwig-Schwaegrichen herbarium. These two specimens were found to have relatively short leaf bases compared with the majority of South Georgian specimens but they fall within the limits shown by plants of *D. capillaceum* on the island and are inseparable even by means of sporophyte characters. Hedwig (1801) did not refer to the inflorescence but Bruch and others (1846) reported a modified form of autoecy, which has come to be regarded as a paroecious arrangement and a diagnostic character (e.g. Dixon, 1924; Lawton, 1971). Inflorescences have not been seen by the author in either of the two possible type specimens but, in common with most of the fertile material in the Hedwig–Schwaegrichen herbarium, South Georgian material of *Distichium* is autoecious. Only in a single specimen, which could not have been known to Hedwig (1801) (Gay 57, G, in Septentr. latere montis *la port de Benasque*, 26.viii.1823), does the arrangement coincide with the description of Bruch and others (1846).

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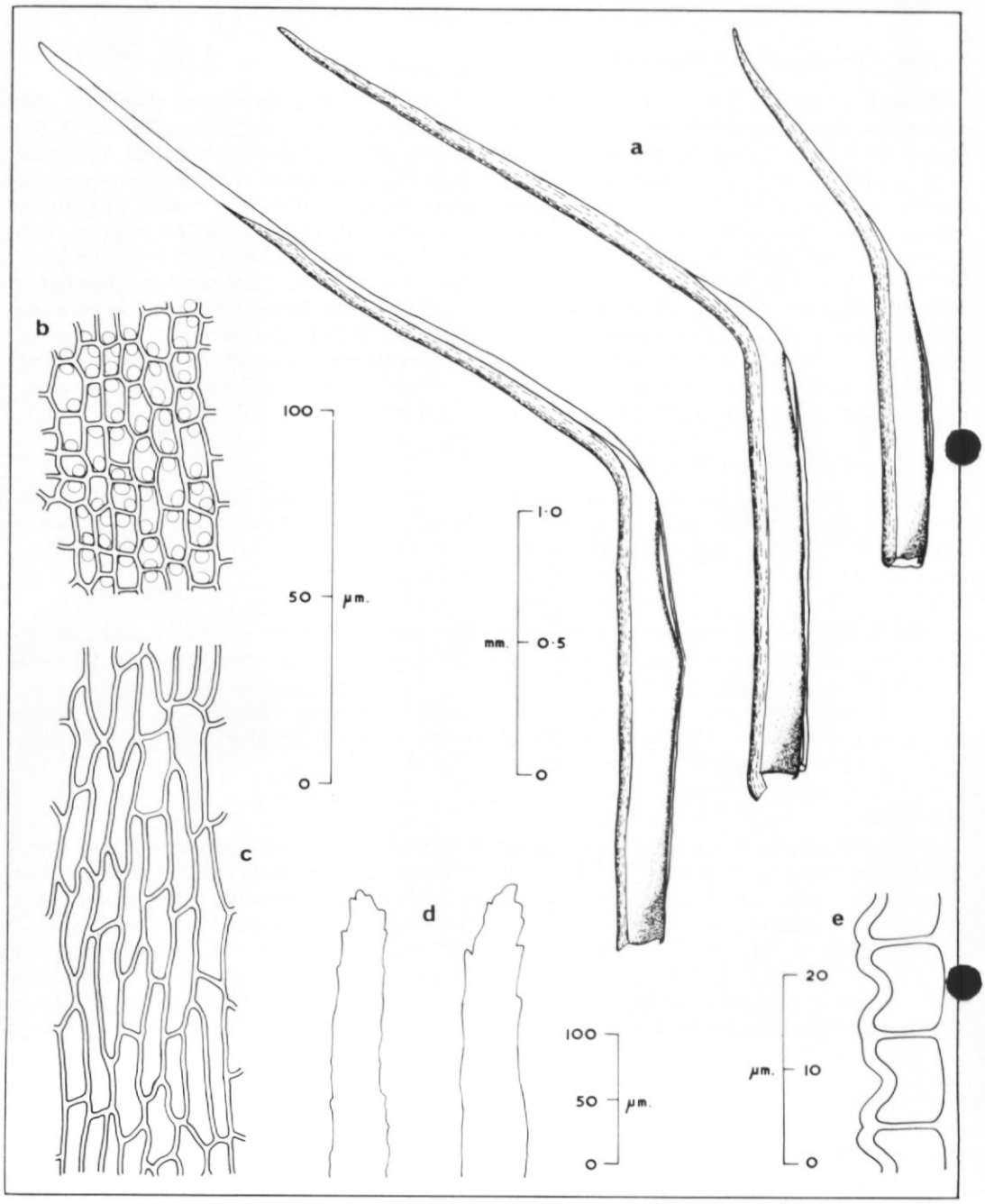

Fig. 7. *Distichium capillaceum.*
a. Leaves; b. Upper leaf cells, with mamillae indicated by fine lines; c. Lower leaf cells; d. Leaf apices; e. Mamillae in profile.
Scales: upper left-hand for cells, upper right-hand for leaves, lower left-hand for leaf apices, lower right-hand for mamillae.

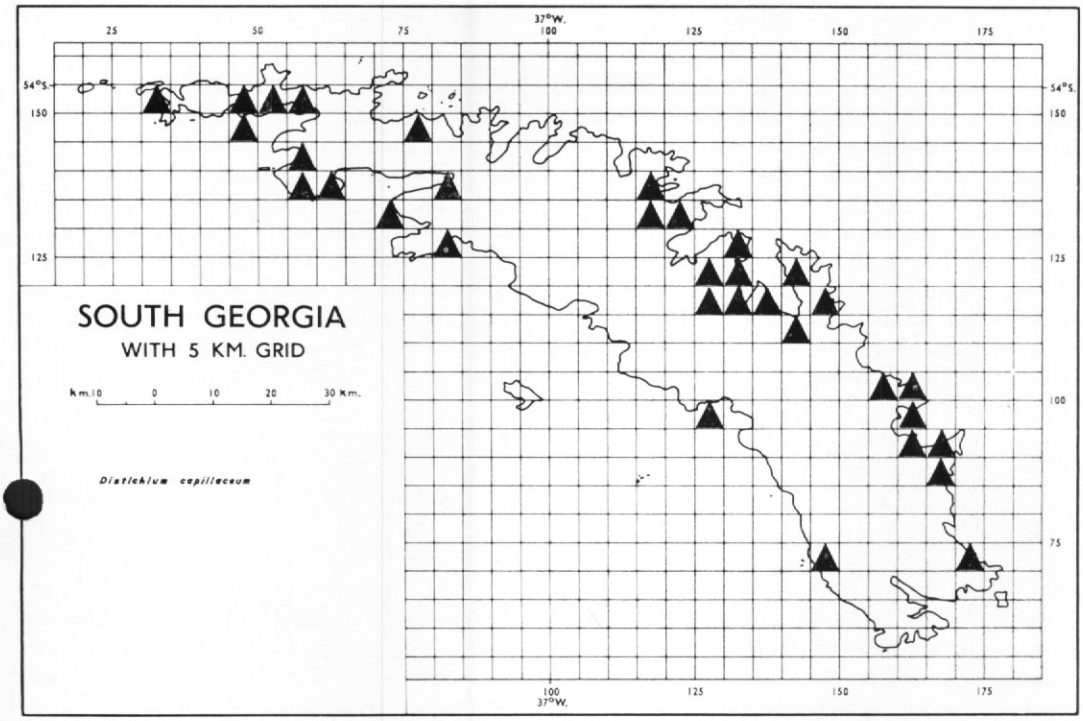

Fig. 8. The known distribution on South Georgia, by 5 km. squares, of *Distichium capillaceum* based on the specimens and field records given in the Appendix.

D. austro-georgicum C. Muell., the only other species of *Distichium* that has been reported from South Georgia, was described as a new species by Müller (1890) for a specimen collected on the island during the German International Polar-Year Expedition of 1882–83. However, subsequent authors have been unable to recognize it because the type description is inadequate and because the supporting specimen (in fissuris rupium des Hoch-Plateaus, Bartramiae et Hymenophyllo fragmentarie consociatum) has apparently been lost. Even the leaf arrangement is doubtful but its similarity to *D. capillaceum* var. *compactum* (Heub.) Torre et Sarnth. (as var. *brevifolium* B.S.G.) has been considered by Cardot (1901). Later, although he had not seen type material, Cardot (1905, 1908) suggested its possible synonymy with *Pseudodistichium austro-georgicum* Card., a species with spirally arranged leaves. Dixon (1932) made a further report of *D. austro-georgicum* from South Georgia, but the specimen (Tröim 1, BM, near sea level, Maiviken, South Georgia, 25.i.1929, comm. O. A. Höeg, ex herb. Dixon) is clearly not a species of *Distichium* since the leaf arrangement is not distichous. The only substantiated records of a *Distichium* for the island refer, therefore, to *D. capillaeceum.*

THELIACEAE

Myurella B.S.G.

The finely julaceous stems are intricately interwoven and rhizomatous below, forming dense pale green swollen mats in rock crevices. The leaves are cochleariform with narrow hyaline borders, more or less nerveless, and composed of thick-walled, shortly rhomboidal cells.

Myurella julacea (Schwaegr.) B.S.G.

Syn. Leskea julacea Schwaegr.

In thread-like mats up to *c.* 2·5 cm. high, pale glaucous or brownish green. Stems procumbent to ascending, fragile, irregularly branched, julaceous above, rhizomatous with dense brown rhizoids below. Upper leaves 0·3–0·6 × 0·3–0·7 mm., densely imbricate, cochleariform, round or broader than long, apex broadly rounded but sometimes surmounted by a short hyaline apiculus of two or three cells, the lower scale-like and scarcely concave, ovate, gradually tapering to acute apices. Margin ± entire above, irregularly dentate or spinous-dentate in lower half. Nerve absent or very short and double. Cells of main part of lamina 14·5–27·5 × 6·0–11·5 μm., rhomboidal, *c.* 2–3 times as long as broad but ± square in basal angles, the walls incrassate, becoming porose towards base of leaf, particularly in mid-line, papillose on back of leaf. Marginal row of cells thin-walled and hyaline. Female inflorescence axillary, fusiform, with narrowly triangular, acute perichaetial bracts. Male inflorescence unknown (Fig. 9).

Habitat and distribution (Fig. 10)

This is a very rare species of deep crevices in west- or north-west-facing rocks. Altitude 15–228 m.

Notes

The gross morphology of *M. julacea* is superficially similar to that of *Bryum argenteum* Hedw. but the julaceous stems of the former are clearly pleurocarpous, whereas those of the latter are acrocarpous. The leaf anatomy of the two species is also distinct, *B. argenteum* having a usually well-developed single nerve which contrasts strongly with the arrangement in *M. julacea*.

Taxonomy

M. julacea is a species of high northern latitudes and, until now, has not been reported from the Southern Hemisphere. South Georgian material agrees in all essential points with the specimen associated with Schwaegrichen's (1804) validation (as *Leskea julacea* Schwaegr.) of the pre-Hedwigian name (Schwaegrichen, G, Gösniz ang 800 fr. peristomii ciliae difformes, 1800), which has its leaves less consistently apiculate than those of one of the South Georgian specimens but the second specimen is indistinguishable from the type in this respect. It is considered that the less prominent cell walls of the South Georgian material does not preclude its identification with *M. julacea* because boreal representatives are known to be variable (Nyholm, 1960), Dixon (1924), for example, pointing out that the papillae are usually indistinct in British material.

PLAGIOTHECIACEAE

Catagonium C. Muell.

This genus is characterized by its strongly complanate shoots with spirally inserted leaves that are deeply concave, finely pointed or piliferous and ± nerveless. Leaf cells are long and vermicular, undifferentiated in the basal angles and not at all decurrent.

Catagonium politum (Hook. f. et Wils.) Dus. ex Broth.

Syn. Hypnum politum Hook. f. et Wils.

Densely caespitose *c.* 2·5 cm. high, bright glossy green. Stems erect or ascending, with few ascending branches, strongly complanate with one-eighth phyllotaxy. Leaves 1·0–1·4 × 0·3–0·4 mm., ovate-lanceolate to narrowly triangular, deeply concave, finely acuminate or

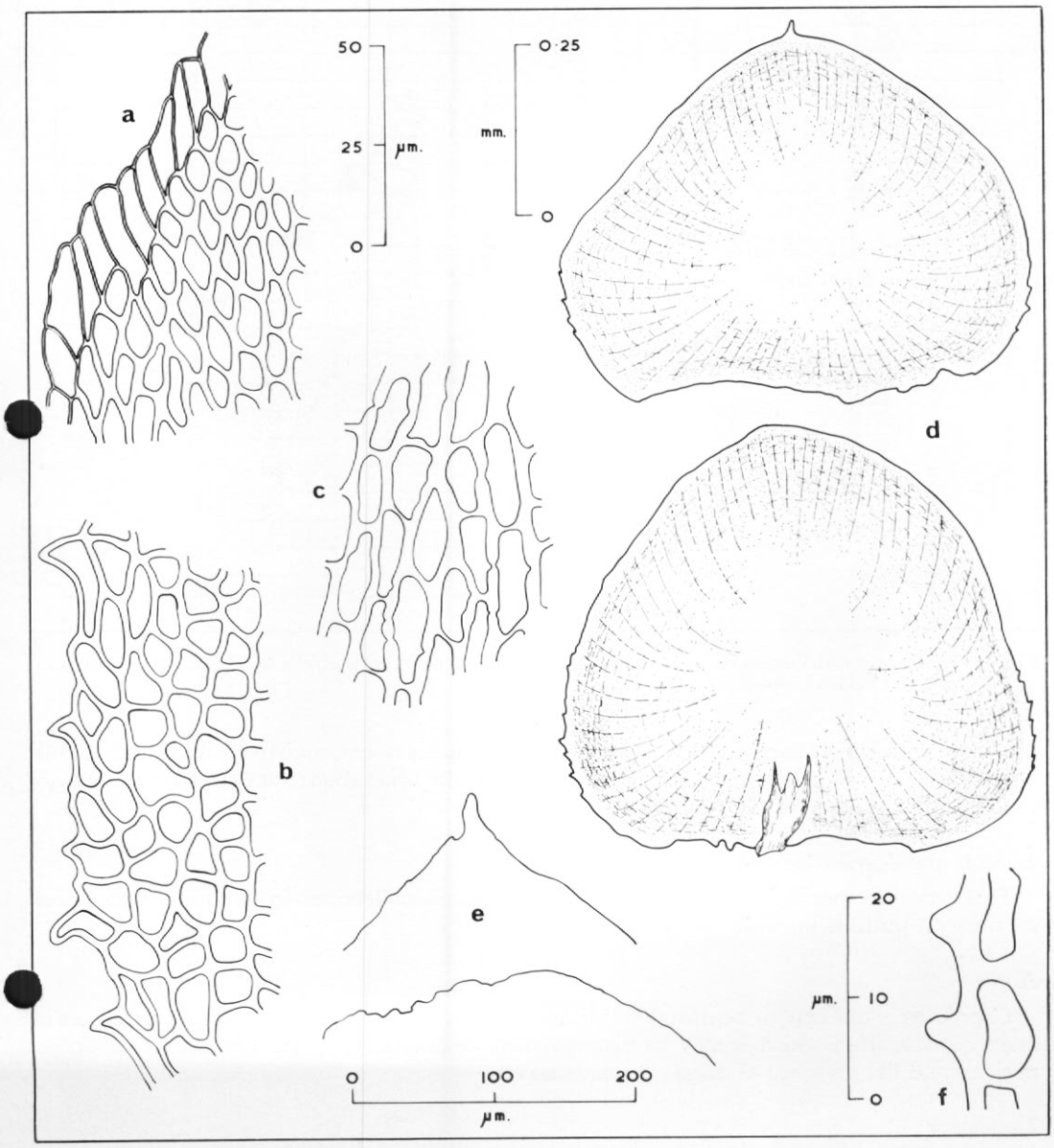

Fig. 9. *Myurella julacea*.
a. Leaves; b. Upper leaf cells; c. Lower leaf cells; d. Leaf cells beside the nerve; e. Leaf apices; f. Papillae in profile.
Scales: upper left-hand for cells, upper right-hand for leaves, lower left-hand for leaf apices; lower right-hand for papillae.

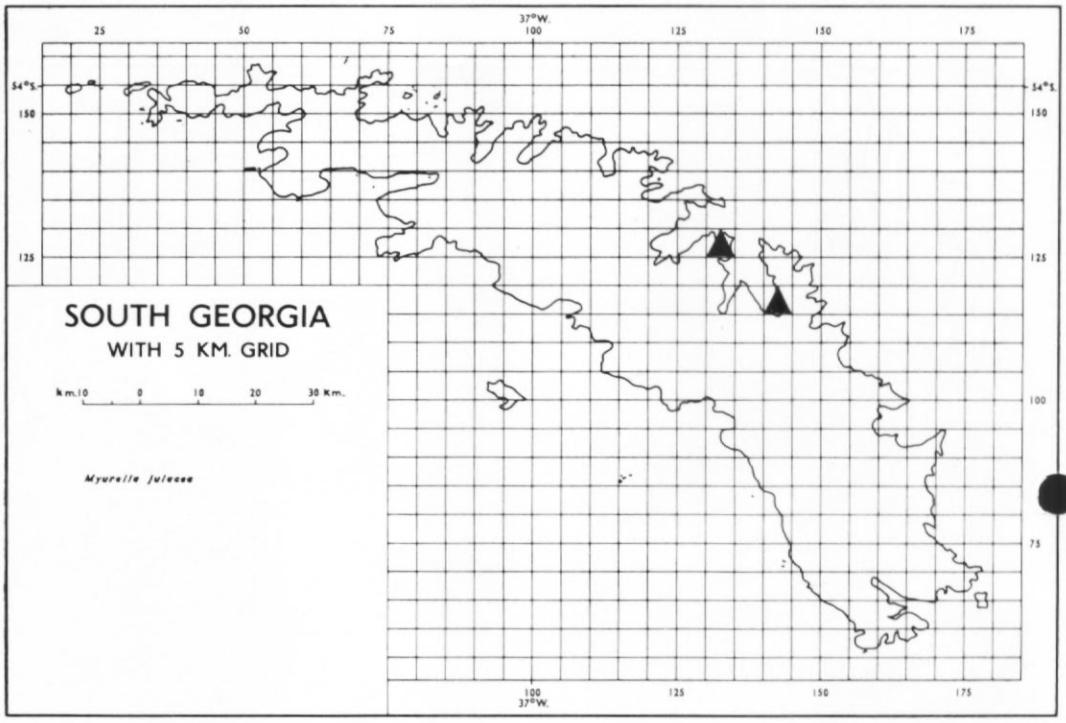

Fig. 10. The known distribution on South Georgia, by 5 km. squares, of *Myurella julacea* based on the specimens and field records given in the Appendix.

piliferous with entire margins. Nerve usually absent, when present, indistinct, short and double. Leaf cells 77·5–147·0 × 5·0–6·5 μm., vermicular, shorter and broader at extreme base but not clearly differentiated. Sterile (Fig. 11).

Habitat and distribution (Fig. 12)

This very rare species is known from South Georgia by collections from moist, shaded rock crevices in south-facing cliffs. Altitude 6–152 m.

Notes

C. politum is unlikely to be mistaken for anything other than a species of *Plagiothecium* or *Isopterygium*, from which it may be distinguished, respectively, by the absence of decurrent auricles and the presence of deeply concave leaves.

Taxonomy

This species, hitherto unknown from South Georgia, was first described as *Hypnum politum* Hook. f. et Wils. by Hooker and Wilson (1844). On examination of the type specimens (J. D. Hooker 158, BM, Hermite Island, Cape Horn, Antart. Exp. 1839–1843, ex herb. Hampe, with duplicate; J. D. Hooker 743, BM, Kerguelen's Land, Antart. Exp. 1839–1843, ex herb. Hampe, with duplicate), it was found that the South Georgian material agrees in every respect, including the leaf arrangement. The species was transferred to *Catagonium* by Brotherus (1908) and is the type species of the genus (van der Wijk and others, 1959).

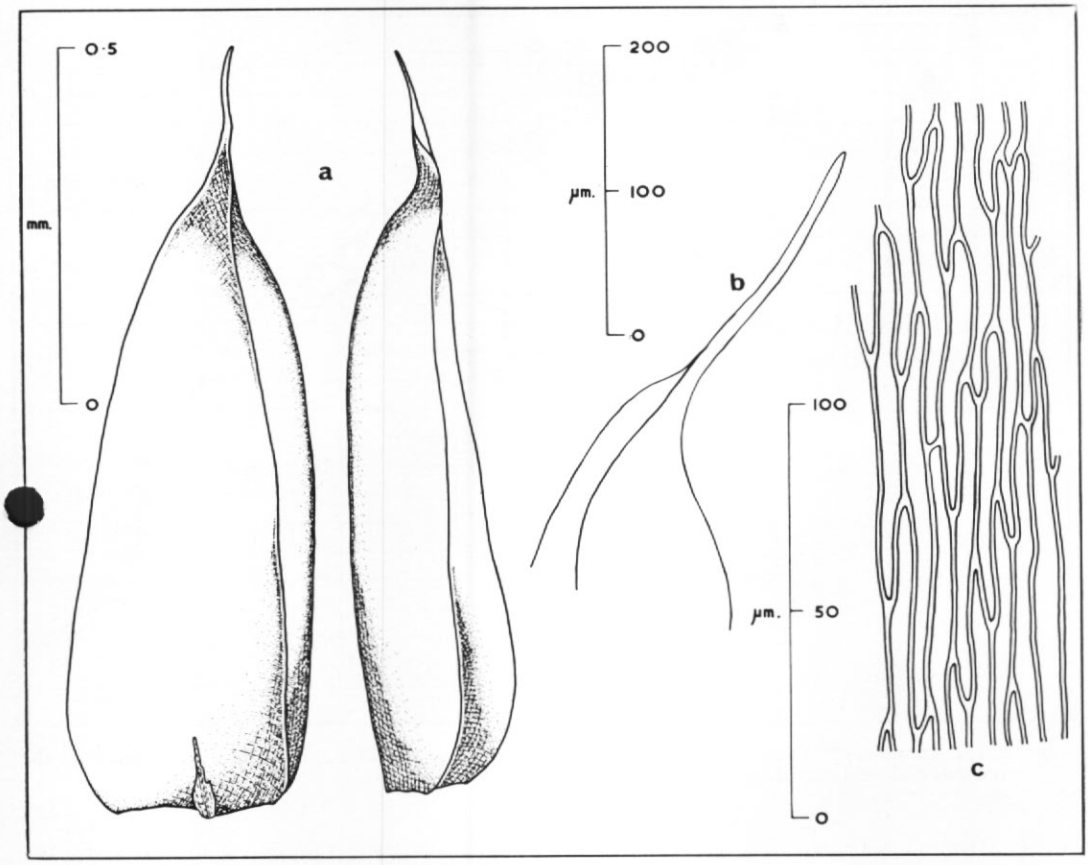

Fig. 11. *Catagonium politum*.
a. Leaves; b. Leaf apex; c. Upper leaf cells.
Scales: upper left-hand for leaves, upper right-hand for leaf apex, lower for cells.

In their original description, Hooker and Wilson (1844) emphasized the distichously arranged carinate leaves but, in fact, the leaves are neither keeled nor distichously arranged, having a one-eighth phyllotaxy and a deep concavity. Therefore, leaf arrangement in *Catagonium* must be recognized as spiral, albeit on strongly complanate stems. This raises important questions about taxonomic status that were touched upon by Mitten (1879) and Bartram (1933), who suggested the proximity of species of *Catagonium* to *Plagiothecium sensu lato*, or even their synonymy. While its affinities are unlikely to lie with *Plagiothecium sensu stricto*, since the leaves are not at all decurrent, only the pronounced concavity of its leaves distinguishes *Catagonium* vegetatively from *Isopterygium*. Despite this apparently slight difference, recognition of the genus is continued pending further information about its validity.

Acknowledgements

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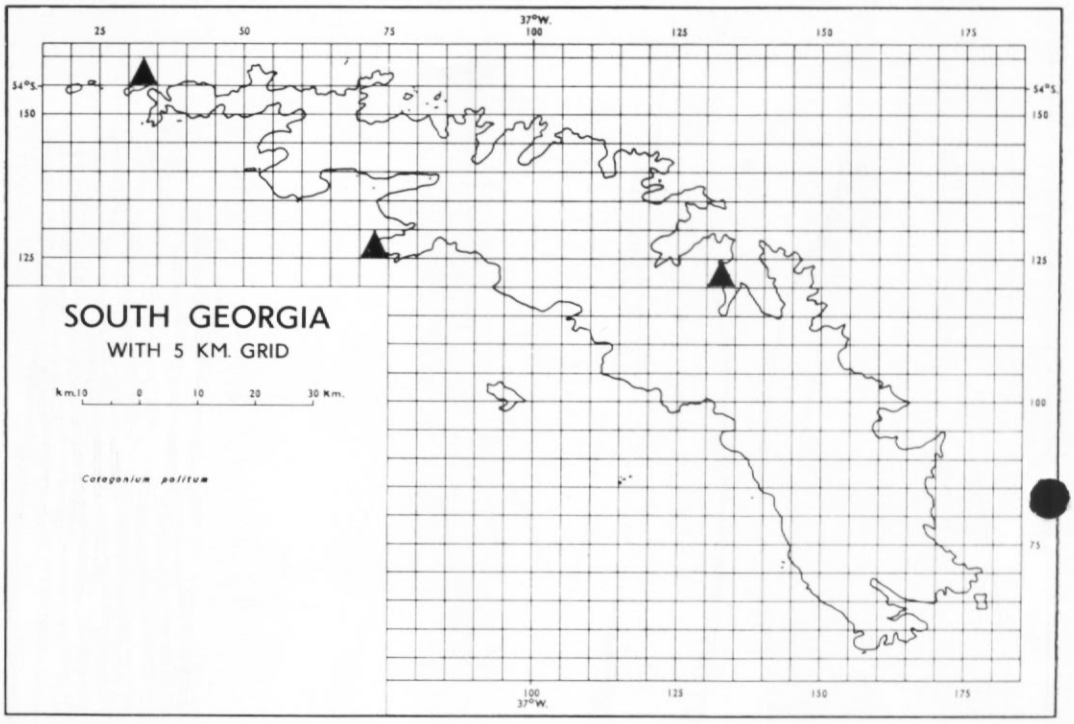

Fig. 12. The known distribution on South Georgia, by 5 km. squares, of *Catagonium politum* based on the specimens and field records given in the Appendix.

Jena; Muséum National d'Histoire Naturelle, Laboratoire de Cryptogamique, Paris and the Naturhistoriska riksmuseet, Stockholm.

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REFERENCES

BARTRAM, E. B. 1933. Manual of Hawaiian mosses. *Bull. Bernice P. Bishop. Mus.*, No. 101, 275 pp.

BELL, B. G. 1974. A synoptic flora of South Georgian mosses: V. *Willia* and *Racomitrium*. *British Antarctic Survey Bulletin*, No. 38, 73–101.

BROTHERUS, V. F. 1901. Musci (Laubmoose), Unterklass Bryales: II. Spezieller Teil, Gruppe I. Acrocarpi. (*In* ENGLER, A. *and* K. PRANTL. *Die näturlichen Pflanzenfamilien*. Leipzig, Wilhelm Engelmann, Teil 1, Abt. 3, Hälfte 1, Lief. 208, 289–336.)

———. 1908. Musci (Laubmoose), Unterklasse Bryales: II. Spezieller Teil, Gruppe II. Pleurocarpi. (*In* ENGLER, A. *and* K. PRANTL. *Die näturlichen Pflanzenfamilien*. Leipzig, Wilhelm Engelmann, Teil 1, Abt. 3, Hälfte 2, Lief, 232/33, 1057–152.)

———. 1924. Musci (Laubmoose), II. Unterklasse Andreaeales, III. Unterklasse Bryales: II. Spezieller Teil. (*In* ENGLER, A. *and* K. PRANTL. *Die näturlichen Pflanzenfamilien*. Leipzig, Wilhelm Engelmann, Aufl. 2, Bd. 10, Hälfte 1, 129–31, 143–487.)

BROWN, R. 1903. On the Musci of the calcareous districts of New Zealand, with descriptions of new species. *Trans. Proc. N.Z. Inst.*, **35**, [N.S., No. 18], 323–42.

BRUCH, P., SCHIMPER, W. P. *and* T. GÜMBEL. 1846. *Distichium. Bryologia europaea seu genera muscorum europaeorum, monographice illustrata.* Stuttgart, Librariae E. Schweizerbart, **2,** 1–5. [Fasc. 33–36, 17–20.)]

BRYAN, V. S. 1956. Chromosomes and systematic position of the inoperculate mosses, *Pleuridium* and *Bruchia. Am. J. Bot.*, **43,** No. 7, 460–68.

CARDOT, J. 1901. Mousses et coup d'oeil sur la flore bryologique des Terres Magellaniques. *Résult. Voyage S.Y. Belgica*, **6,** Botanique, 44 pp.

———. 1905. Notice préliminaire sur les mousses recueillies par l'Expédition Antarctique Suédoise. I. Espèces de la région magellanique. *Bull. Herb. Boissier*, 2ème sér., **5,** No. 11, 997–1011.

———. 1908. La flore bryologique des Terres Magellaniques, de la Géorgie du Sud et de l'Antarctide. *Wiss. Ergebn. schwed. Südpolarexped.*, Bd. 4, Lief, 8, 298 pp.

DIXON, H. N. 1923. Studies in the bryology of New Zealand, with special reference to the herbarium of Robert Brown of Christchurch, New Zealand. *Bull. N.Z. Inst.*, No. 3, Pt. 3, 75–152.

———. 1924. *The student's handbook of British mosses.* 3rd edition. Eastbourne, Sumfield and Day Ltd.

———. 1932. Some mosses from South Georgia. *K. norske Vidensk. Selsk. Forh.*, **4,** No. 47, 179–81.

DUSÉN, P. 1903. Patagonian and Fuegian mosses. *Rep. Princeton Univ. Exped. Patagonia*, **8,** Botany, No. 1, Pt. 3, 63–126.

———. 1905. Beiträge zur Bryologie der Magellansländer, von Westpatagonien und Südchile. Teil II. *Ark. Bot.*, **4,** No. 1, 1–45.

FLORSCHÜTZ, P. A. 1964. Musci. (*In* LANJOUW, J. *Flora of Suriname.* Leiden, E. J. Brill, **6,** Pt. 1, 1–271.)

GREENE, S. W. 1973. A synoptic flora of South Georgian mosses: I. *Dendroligotrichum, Polytrichum* and *Psilopilum. British Antarctic Survey Bulletin*, No. 36, 1–32.

GROUT, A. J. 1936. *Ditrichaceae* and *Dicranaceae* (*In* GROUT, A. J., *ed. Moss flora of North America, north of Mexico*, Newfane, Vermont, A. J. Grout, **1,** Pt. 1, 1–62.)

HEDWIG, J. 1801. *Species muscorum frondosorum. Descriptae et tabulis aeneis LXXVII coloratis illustratae.* Lipsiae, Joannis Ambrosii Barthii; Parisiis, Amand Koenig, [Reprinted: Species muscorum frondosorum. (*In* CRAMER, J. *and* H. K. SWANN, *ed. Historiae naturalis classica*, **16,** 1960. Weinheim/Bergstr., H. R. Engelmann (J. Cramer); Codicote/Herts., Wheldon & Wesley, Ltd., New York, Hafner Publishing Co.)]

HERZOG, T. 1916. Die Bryophyten meiner zweiten Reise durch Bolivia. Lief. 1. *Biblithca bot.*, Ht. 87, 1–168.

HOLMGREN, P. K. *and* W. KEUKEN. 1974. Index herbariorum. Pt. 1. The herbaria of the world. 6th edition *Regnum Veg.*, **92,** 1–397.

HOOKER, J. D. *and* W. WILSON. 1844. Musci Antarctici. *Lond. J. Bot.*, **3,** 533–56.

LAWTON, E. 1971. Moss flora of the Pacific Northwest. *J. Hattori bot. Lab.*, Suppl. 1, 362 pp.

MITTEN, G. 1869. Musci austro-americani. *J. Linn. Soc.*, Botany, **12,** 1–659.

———. 1879. Musci. (*In* An account of the petrological, botanical and zoological collections made in Kerguelen's Land and Rodriguez during the Transit of Venus Expeditions, carried out by order of Her Majesty's Government in the years 1874–75. *Phil. Trans. R. Soc.*, **168** (extra volume), 24–39.)

MÖNKEMEYER, W. 1927. Die Laubmoose Europas. (*In* RABENHORST, L., *ed. Kryptogamenflora von Deutschland, Osterrich und der Schweiz.* Bd. 4, Ergänzungsband. Leipzig, Akademische Verlagsgesellschaft m.b.H.)

MONTAGNE, C. 1845. De plantes cellulaires exotiques nouvelles. *Annls Sci. nat.*, 3ème Sér., Botanique, **4,** No. 2, 86–123.

MÜLLER, C. 1851. *Synopsis muscorum frondosorum. Vol. 2.* Berlin, alb. Foerstner.

———. 1890. Bryologia austro-georgiae. (*In* NEUMAYER, G. *Die Internationale Polarforschung 1882–83. Die Deutschen Expeditionen und ihre Ergebnisse.* Berlin, A. Asher and Co., Bd. 2, 279–322.)

NEWTON, M. E. 1972. Chromosome studies in some South Georgian bryophytes. *British Antarctic Survey Bulletin*, No. 30, 41–49.

———. 1973. A taxonomic assessment of *Bartramia, Breutelia* and *Exodokidium* on South Georgia. *British Antarctic Survey Bulletin*, No. 32, 1–14.

NYHOLM, E. 1954. Musci. (*In* BOTANICAL SOCIETY OF LUND, *ed. Illustrated moss flora of Fennoscandia: II.* Lund, CWK Gleerup, Fasc. 1, 1–87.)

———. 1960. Musci. (*In* BOTANICAL SOCIETY OF LUND, *ed. Illustrated moss flora of Fennoscandia: II.* Lund, CWK Gleerup, Fasc. 4, 288–408.)

REIMERS, H. 1926. Beiträge zur Bryophytenflora Südamerikas: I. Die von Pater A. Hollermayer in Chile 1918/1923 gesammelten Leber- und Laubmoose. *Hedwigia*, **66,** Ht. 1, 27–75.

RICHARDS, P. W. *and* E. C. WALLACE. 1950. An annotated list of British mosses. *Trans. Br. bryol. Soc.*, **1,** Pt. 4, i-xxxi.

ROBINSON, H. [E]. 1967. Preliminary studies on the bryophytes of Colombia. *Bryologist*, **70,** No. 1, 1–61.

SCHOFIELD, W. B. 1970. A new species of *Dicranella* endemic to western North America. *Bryologist*, **73,** No. 4, 702–06.

SCHWAEGRICHEN, A. D. 1804. Musci novi detecti et descripti. (*In* SCHULTES, J. A. *Reise auf dem Glockner, Theil 2.* Wien, J. V. Degen, Appendix, 362–66.)

SMITH, A. J. E. *and* M. E. NEWTON. 1968. Chromosome studies on some British and Irish mosses: III. *Trans. Br. bryol. Soc.*, **5,** Pt. 3, 463–522.

VAN DER WIJK, R., MARGADANT, W. D. *and* P. A. FLORSCHÜTZ. 1959. *Index muscorum*, **1.** Utrecht, International Bureau for Plant Taxonomy and Nomenclature. [*Regnum Veg.*, **17,** 1–548.]

APPENDIX

Details of the specimens and field records from which the distribution figures were compiled

The references to herbaria cited after each specimen follow those recommended by Holmgren and Keuken (1974). It should be noted that the British Antarctic Survey bryophyte herbarium is now housed at the Institute of Terrestrial Ecology's Bush Research Station, Penicuik, Midlothian, Scotland EH26 0QB. The six figures before the specimens of field records refer to the 5 km. squares of the distribution maps, eastings being cited before northings.

Field records have only been cited for those squares from which no permanent specimens exist, their numbers indicating their file order in the data bank associated with the Survey's herbarium. Field records were provided by the following people: B. G. Bell, 1971–72; T. V. Callaghan, 1967–68; C. M. Clapperton, 1967–68; G. C. S. Clarke, 1967–68; D. M. Greene, 1967–68; S. W. Greene, 1967–68.

A print-out from the data bank of the collecting details for the specimens cited in the Appendix is available on request from the British Antarctic Survey, Madingley Road, Cambridge CB3 0ET.

Cheilothela chilensis (Mont.) Broth.

115 135 Greene 3203 (AAS, LE, MSC, NY, O, PC, PRE, S, TNS), Greene 3321 (BM, CHR, H, MEL, NY, PC, S). 120 130 Greene 2956 (BA, BM, H).
140 115 R. Smith 1273a (AAS, B, CHR, MEL, SGO).

Dicranella cardotii (R. Brown ter.) Dix.

035 150 Greene 1098 (AAS). 040 150 BAS Misc. 48 (AAS, MEL).
055 135 R. Smith 1641 (BM). 070 125 R. Smith 1645 (BM). 070 130 R. Smith 1643 (BM). 070 145 Greene 1336b (AAS, CHR, LE, MSC, O, PRE, S, TNS).
075 125 R. Smith 1644 (AAS, TNS). 080 125 Greene 2641b (BM). 080 135 R. Smith 1642 (AAS).
100 145 R. Smith 1646 (AAS). 120 135 Clarke and Greene CG154 (AAS), Greene 3391 (AAS, PC, S).
130 110 Clarke and Greene CG234 (B, BM, CHR, H). 130 120 Clarke and Greene CG283 (BA, BM, S), Clarke and Greene CG 383 (AAS), Greene 1858b (AAS), R. Smith 1647 (BM, PRE). 130 125 R. Smith 1233 (BA, BM, LE, SGO). 135 115 Bell 1388 (BA, BM, H). 135 120 Bell 1387 (AAS, B). 140 110 Field record 1946. 140 120 Greene 552a (BM, NY), Greene 564 (AAS, MEL, MSC, NY, O, PC, S, TNS), Greene 1048b (BM, PC). 145 070 Greene 2761 (AAS, SGO), Greene 2763 (BA, BM, H, LE, MSC, O), Greene 2809 (AAS). 145 115 Greene 851 (BM).
160 060 Greene 2480 (BM), Greene 2485 (AAS, B, CHR, SGO), Greene 2828 (AAS), Greene 2860 (BM, MEL, NY). 160 095 Greene 2264 (BM, PRE). 165 090 Field record 1819. 170 070 Field record 5433.

Dicranella hookeri (C. Muell.) Card.

045 150 R. Smith 1657 (BM, S).
050 135 R. Smith 1662 (BM). 055 140 R. Smith 1651 (BM). 055 145 R. Smith 1654 (AAS). 060 150 R. Smith 1652 (AAS, B). 065 140 R. Smith 1650 (AAS). 070 135 R. Smith 1653 (BM). 070 145 Greene 1265 (BM, H, LE, MSC, O), Greene 1347 (B, BM, CHR, SGO).
080 125 Greene 2628 (AAS, PC, PRE, S, TNS). 080 135 R. Smith 1648 (AAS). 080 150 R. Smith 1649 (BM).
100 140 BAS Misc. 47 (AAS). 115 130 Bell 1386 (AAS). 115 135 Greene 1413 (AAS, B, CHR, MEL, NY, PC, S, SGO). 120 130 Greene 2988 (B, BA, BM, CHR, H, LE, MEL, MSC, NY, O, SGO). 120 135 R. Smith 1655 (BM, LE).
130 110 Clarke and Greene CG235 (BM, NY, O, PC, S). 130 115 Greene 190 (AAS, BA, LE, MSC, SGO). 130 120 Greene 138 (BM, MEL, PRE, TNS), Greene 776 (B, BM, CHR, H, PRE), Greene 797 (AAS, PC, S, TNS), R. Smith 1165 (AAS, CHR, H, NY, PC, S, SGO, TNS). 130 125 Greene 1912 (AAS, BA, H, MEL, NY), Greene 1952 (BA, BM). 135 110 Field record 1892. 140 115 R. Smith 1277 (BM). 145 115 R. Smith 1270 (BM).
160 090 Bell 1382 (AAS), Bell 1383 (BM, MSC, O, PRE). 165 090 Field record 1818. 170 070 Field record 5434.

Inadequately localized

Géorgie du Sud: Cumberland Bay, 1902, Skottsberg 266 (H, as *D. hookeri* f. *brevifolia*).

Distichium capillaceum (Hedw.) B.S.G.

030 150 Greene 363a (B, BA, BM, CHR, H, LE, MEL, MSC, NY, O, SGO), Greene 369 (AAS). 045 145 R. Smith 1667 (BM, NY, O). 045 150 BAS Misc. 65 (BM).
050 150 Bell 651b (BM), Bell 782 (AAS, MEL, PC, TNS). 055 135 R. Smith 1659 (BM). 055 140 R. Smith 1661 (AAS, S, TNS). 055 150 Clarke and Greene CG33 (AAS). 060 135 R. Smith 1664 (AAS). 070 130 R. Smith 1663 (BM, H, LE, SGO).
075 145 R. Smith 1658 (AAS, B). 080 125 Greene 2652 (B, BA, BM, CHR, H, LE, MEL, MSC, NY, O, SGO), Greene 2654a (BM). 080 135 R. Smith 1660 (AAS, BA, CHR).

115 130 Greene 3085 (B, BM, CHR, PRE, SGO). 115 135 Greene 1452 (B, BA, BM, H, LE, MSC, O, PRE, TNS), Greene 3279 (BM, CHR, MEL, NY, SGO). 120 130 Greene 2990 (AAS, BA, H, LE, MSC, PC, PRE, S, TNS).

125 095 Greene 2524 (BM). 125 115 R. Smith 1665 (BM, MEL), R. Smith 1666 (AAS, MSC). 125 120 Clarke and Greene CG351 (BA, BM, H, LE, MSC), Greene 1533a (AAS, BA, H, LE). 130 115 Bell 1393 (AAS, NY, PC, S), J. Smith M10 (BM, MEL, NY, PC). 130 120 Bell 725 (AAS), Bell 729 (BM, PRE, TNS), Bonolli-Cipoletti s.n. (AAS, ex herb. BA acc. no. 16999), Clarke and Greene CG324 (AAS, B, CHR, SGO), Greene 1854a (BM, MSC, O), R. Smith 1147a (AAS, B), R. Smith 1185 (AAS, NY, PC, S), R. Smith 1250 (BM). 130 125 Bell 1257 (BA, BM, H, LE, MSC, O), Clarke and Greene CG 428 (AAS, B, CHR, MEL, NY, PC, S, SGO, TNS), Greene 114 (BM, CHR, SGO), Greene 193 (AAS, LE, MEL, MSC, NY, O, PRE, TNS), Greene 1902 (B, BA, BM, CHR, H, PC, PRE, S, TNS), Greene 2028 (AAS, LE, MEL, MSC, NY, O, PC, PRE, S, SGO, TNS), Greene 3472 (AAS, PC, S), R. Smith 1149 (BM, O, PRE, S, TNS), R. Smith 1229 (B, BA, BM, CHR, H, MEL, SGO), R. Smith 1668 (AAS). 135 115 Field record 1916. 140 110 J. Smith M94c (BA, BM, H). 140 120 Greene 1003b (B, BM, NY, PC, PRE). 145 070 Greene 2760a (AAS). 145 115 Greene 903 (AAS, B, BA, CHR, H, LE, MEL, MSC, NY, O, PC, PRE, SGO), Longton 310 (AAS, LE, MSC, O, PRE, TNS).

155 100 Bell 1216 (AAS, B, CHR, MEL, NY, O, S, SGO). 160 090 Bell 1389 (BM). 160 095 Greene 2330 (AAS, PC, S), Greene 2331a (AAS, CHR, H, LE, MEL, MSC, NY, O, PC, PRE, S, SGO, TNS). 160 100 Bell 1228 (BA, BM, H, LE, MSC, PC, PRE, S, TNS). 165 085 Bell 1391 (AAS, MSC, O, PRE, TNS). 165 090 Field record 1822. 170 070 Bell 1392 (BM).

Inadequately localized

Walls of cave on beach, at sea-level, Royal Bay, 19.x.1957, Bonner 204 (AAS, BA, H, LE).
South Georgia, alt. 20 ft., 25.iv.1927, Sanders 9 (BM).

Myurella julacea (Schwaegr.) B.S.G.

130 125 Greene 2063 (B, BA, BM, CHR, PC, TNS). 140 115 R. Smith 1268 (AAS, S).

Catagonium politum (Hook. f. et Wils.) Dus. ex Broth.

030 155 Greene 438 (BA, BM, H, LE, O).
070 125 R. Smith 1656 (AAS).
130 120 Clarke and Greene CG384 (AAS, B, CHR, MEL, NY, PC, S, SGO, TNS).