THE HEPATICS OF THE SOUTH SANDWICH ISLANDS AND SOUTH GEORGIA

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ABSTRACT. This paper reports 11 species of hepatics and sterile material of a *Cephaloziella* from the South Sandwich Islands; all are represented on South Georgia.

A revised annotated list is given of 24 species of hepatics from South Georgia and reference is made to material of *Clasmatocolea*, *Plagiochila* and *Riccardia* which is not identified to the specific level. Lectotypes are designated for all the species from South Georgia described by Gottsche (1890).

A new combination *Clasmatocolea georgiensis* (Gottsche) Grolle is proposed and a new species, *Lophocolea willii* Grolle, is described.

A list of synonyms and excludenda is included.

DURING a biological survey of the South Sandwich Islands, which lie south-east of South Georgia, between lat. 56°10′ and 59°28′S., in 1962 and 1964 two members of the British Antarctic Survey, Drs. M. W. Holdgate and R. E. Longton, made collections of bryophytes, which included hepatics, a group previously unknown from these islands. A report of the survey, which gives a short summary of the rigorous climatic conditions on this group of islands, has been provided by Baker and others (1964).

During the study of the material it became evident that the hepatic flora of the South Sandwich Islands was most closely related to that of South Georgia. A check list of South Georgian hepatics was provided by Steere (1961), but as many of the taxa were in need of revision, an attempt has been made to verify all records. The results of this investigation are presented below in the form of an annotated list following an account of the specimens determined from the South Sandwich Islands.

SOUTH SANDWICH ISLANDS

A full set of specimens from the South Sandwich Islands has been deposited in the herbarium of the British Antarctic Survey, at present housed in the Department of Botany, University of Birmingham (BIRM*), with the first set of duplicates in the Herbarium Haussknecht, Jena (JE). The herbaria holding the remaining duplicates and the other specimens cited later in the text are indicated by the contractions recommended by Lanjouw and Stafleu (1964). An exclamation mark (!) following a geographical name indicates that a specimen from that location has been seen by the author.

Cephalozia badia (Gottsche) Steph.

Leskov Island. Summit ridge, Longton 501 (as f. *minor*, BIRM*, JE).
Candlemas Island. Western shore, Longton 634 (as f. *minor*, BIRM*, JE); north of western lagoon, *c. per.*, Longton 708 (BIRM*, BM, JE), Longton 709a (BIRM*), Longton 710 (BIRM*, JE); north of eastern lagoon, *c.* ♂, Longton 785 (BIRM*, JE).
Distribution. Tierra del Fuego, South Georgia !, South Shetland Islands !, Antarctic Peninsula.

Cephaloziella varians (Gottsche) Steph.

Leskov Island. Summit ridge, *c. gem.*, Longton 505 (BIRM*, JE), Longton 515a (BIRM*, JE).
Candlemas Island. Western end of eastern lagoon, Longton 597 (as f. *minor*, BIRM*, BM, JE); north of eastern lagoon, *c. per.*, Longton 787 (BIRM*, JE).
Bellingshausen Island. South slopes of main cone, Holdgate 416a (BIRM*, JE); southern lip of main crater, *c. per.*, Holdgate 425b (BIRM*, JE); south slopes, Holdgate 811b (BIRM*).
Distribution. South Georgia !, other records probably erroneous.

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Cephaloziella sp. (All material sterile)

Leskov Island. North slopes, Holdgate 837a (BIRM*).
Visokoi Island. Finger Point, Longton 763 (BIRM*).
Candlemas Island. Between lagoons and most southerly exposed lava ridge, Longton 569 (BIRM*); western shore, *c.* 0·25 mile [0·4 km.] south of lagoons, Longton 586 (BIRM*, BM); north of western lagoon, Longton 693b (BIRM*).
Bellingshausen Island. South slopes of cone, Holdgate 839b (BIRM*).

Clasmatocolea koeppensis (Gottsche) Grolle

Saunders Island. Northern end, Holdgate 434a (BIRM*).
Bellingshausen Island. South slopes of main cone, Holdgate 419b (BIRM*), Holdgate 420a (BIRM*, JE), Holdgate 421b (BIRM*); within main crater on west side, Holdgate 430a (BIRM*, JE), Holdgate 431a (BIRM*, JE), Holdgate 479 (BIRM*); south slopes, Holdgate 811c (BIRM*, JE); south flanks of cone, Holdgate 816c (BIRM*); within the crater, east end on rim, Holdgate 825b (BIRM, BM, JE).
Distribution. Patagonia !, Tierra del Fuego !, South Georgia !.

Cryptochila grandiflora (Lindenb. & Gottsche) Grolle (as f. *tenuiretis*)

Leskov Island. Summit ridge, Holdgate 834b (BIRM*), Longton 502a (BIRM*), Longton 506 (BIRM*, BM); slopes near northern end of island, Longton 517 (BIRM*).
Candlemas Island. Between lagoons and most southerly exposed lava ridge, Longton 574 (BIRM*, BM, JE), Longton 575 (BIRM*, BM), Longton 576 (BIRM*, BM); north of western lagoon, Longton 693a (BIRM*), Longton 694 (BIRM*, BM), Longton 695 (BIRM*, BM), Longton 711 (BIRM*, BM); north of eastern lagoon, Longton 783a (BIRM*); between western lagoon and active cone, Holdgate 441 (BIRM*, BM, JE), Holdgate 442b (BIRM*).
Bellingshausen Island. South slopes of main cone, Holdgate 405b (BIRM*), Holdgate 409a (BIRM*), Holdgate 410a (BIRM*, BM), Holdgate 413 (BIRM*, BM), Holdgate 414 (BIRM*, BM), Holdgate 416b (BIRM*); south slopes of cone, Holdgate 827b (BIRM*), Holdgate 828b (BIRM*, BM, JE), Holdgate 830b (BIRM*), Holdgate 839c (BIRM*), Holdgate 840a (BIRM*, BM), Holdgate 841a (BIRM*); south slopes, Holdgate 811d (BIRM*, BM), Holdgate 812d (BIRM*); south flanks of cone, Holdgate 816d (BIRM*), Holdgate 819 (BIRM*, BM), Holdgate 820c (BIRM*, BM); within main crater on western side, Holdgate 431b (BIRM*, BM); within crater at south-east rim, Holdgate 824b (BIRM*, BM); within crater on eastern rim, Holdgate 843 (BIRM*, BM); east end of crater rim, Holdgate 814c (BIRM*, BM).
Distribution. Andes, South Georgia !, widespread in the sub-Antarctic zone.

Lepidozia cuspidata Steph.

Candlemas Island. On western shore, Longton 635 (BIRM*, JE).
Distribution. Patagonia, Tierra del Fuego, South Georgia !.

Lophocolea secundifolia (H.f. & T.) Gottsche, Lindenb. & Nees.

Leskov Island. Summit ridge, Longton 483a (BIRM*), Longton 485c (BIRM*, JE), Longton 487b (BIRM*), Longton 490b (BIRM*, JE), Longton 498b (BIRM*), Longton 499 (BIRM, BM, JE), Longton 500b (BIRM*), Longton 507b (BIRM*, JE), Longton 515b (BIRM*).
Distribution. Falkland Islands !, South Georgia !.

Lophozia propagulifera (Gottsche) Steph.

Leskov Island. North slopes, Holdgate 837b (BIRM*).
Visokoi Island. Finger Point, Longton 753 (as f. *densa*, BIRM*, JE), Longton 765 (BIRM*, JE).
Candlemas Island. Between lagoons and most southerly exposed lava ridge, Longton 571

(BIRM*, JE); north of western lagoon, Longton 709b (BIRM*).
Bellingshausen Island. South slopes of cone, Holdgate 839a (BIRM*, JE).
Distribution. South Georgia !, other records erroneous.

Marchantia berteroana Lehm. & Lindenb.

Leskov Island. Summit ridge, Holdgate 832a (BIRM*), Longton 485a (BIRM*), Longton 498a (BIRM*, BM).
Candlemas Island. North of eastern lagoon, Longton 786 (BIRM*), Longton 790 (BIRM*, BM).
Bellingshausen Island. South slopes of main cone, Holdgate 411a (BIRM*), Holdgate 419a (BIRM*); south slopes of cone, Holdgate 821a (BIRM*, BM, JE), Holdgate 827a (BIRM); south slopes, Holdgate 815b (BIRM*); within the crater, at south-east rim, Holdgate 824c (BIRM*); east end of crater rim, Holdgate 814b (BIRM*).
Distribution. Widespread in the sub-Antarctic zone.

Pachyglossa dissitifolia Herz. & Grolle

Leskov Island. Summit ridge, Longton 483b (BIRM*, JE); south end of summit ridge, Holdgate 835b (BIRM*, JE).
Distribution. Tristan da Cunha !, Patagonia !, Tierra del Fuego !, South Georgia !.

Riccardia georgiensis (Steph.) Hässel

Visokoi Island. Finger Point, Longton 764, Det. Hässel de Menendez (BIRM*, JE).
Candlemas Island. North of eastern lagoon, Longton 783b, det. Hässel de Menendez (BIRM*, JE), Longton 784, det. Hässel de Menendez (BIRM*).
Distribution. Tierra del Fuego, South Georgia, Iles Crozet !.

Triandrophyllum subtrifidum (H.f. & T.) Fulf. & Hatch.

Leskov Island. Summit ridge, Longton 484 (BIRM*), Longton 485a (BIRM*), Longton 486 (BIRM*), Longton 487a (BIRM*), *c.* ♀, Longton 500a (BIRM*, BM, JE), Longton 502b (BIRM*, BM), Longton 503 (BIRM*, BM), *c.* ♀, Longton 504 (BIRM*, JE), Longton 507a (BIRM*), Longton 509a (BIRM*), Holdgate 832b (BIRM*, BM).
Distribution. Andes, Patagonia, South Georgia !, Australasia.

South Georgia

The first and most important work on South Georgian hepatics is that of Gottsche (1890) whose herbarium was destroyed by fire in 1943. Fortunately, duplicates of many of his South Georgian specimens are kept at Munich (M) with more at Geneva (G) and Jena (JE) so that lectotypes for all the taxa described by Gottsche (1890) have been available for examination. A specimen which the author has designated as a lectotype is indicated by *lect. nov.* Synonyms not previously recognized are designated *syn. nov.*

Anthelia juratzkana (Limpr.) Trev.

Specimens. Cumberland Bay, Moraine Fiord 1902, leg. Skottsberg (JE, S-PA as *Acolea crenulata*).
Distribution. Bipolar with, up to the present, two stations above 4,600 m. on high mountain ranges in the tropics in Bolivia ! and north-east New Guinea !.

Barbilophozia hatcheri (Evans) Loeske

Lophozia hatcheri Evans, Stephani, 1911, p. 23.
Jungermannia barbata B. *flörkii* auct., non (Web. & Mohr) Nees., quoad pl. Georg. Austr., Gottsche, 1890, p. 450.
Lophozia floerkei auct., non (Web. & Mohr) Schiffn., quoad pl. Georg. Austr., Stephani, 1905, p. 8; Stephani, 1911, p. 22.
Orthocaulis floerkei, non (Web. & Mohr) Buch, quoad pl. Georg. Austr., Steere, 1961, p. 45.

Specimens. Many preserved in G, M, S-PA and UPS, details of which will be found in Grolle (1960*a*, p, 564).
Distribution. Holarctic with disjunct populations in southernmost South America.

Cephalozia badia (Gottsche) Steph.

Stephani, 1908, p. 313; Schuster, 1964, p. 222.
Jungermannia badia Gottsche, Gottsche, 1890, p. 452.
Lophozia badia (Gottsche) Steph., Stephani, 1905, p. 8.
Cephalozia cucullifolia Steph., Stephani, 1905, p. 2, *syn. nov.*

Specimens. Köppenberg, 1883, leg. Will (M, *lect. nov.* of *Jungermannia badia* Gottsche; G, isotype, Schuster (1964, p. 223)).
Extra South Georgia. South Shetland Islands, Nelson Island, Skottsberg 400, Herb. No. 13202 (G, holotype of *Cephalozia cucullifolia* Steph.).
Distribution. Tierra del Fuego, South Sandwich Islands !, Antarctic Peninsula.

Cephalozia skottsbergii Steph.

Stephani, 1905, p. 3.

Specimens. Cumberland Bay, Skottsberg 28 (G, holotype of *Cephalozia skottsbergii* Steph., fide Bonner (1963, p. 588); UPS, isotype !).
Distribution. Endemic.

Cephaloziella varians (Gottsche) Steph.

Stephani, 1905, p. 4.
Jungermannia varians Gottsche, Gottsche, 1890, p. 452.
Cephalozia varians (Gottsche) Steph., Stephani, 1902, p. 5.

Specimens. Bachgrund oberhalb der Pinguinbay, Will 35 (M, *lect. nov.* of *Jungermannia varians* Gottsche).
Distribution. South Sandwich Islands !, other records probably erroneous.

Clasmatocolea georgiensis (Gottsche) Grolle **comb. nov.**

Basionym: *Lophocolea georgiensis* Gottsche, Gottsche, 1890, p. 453.

Specimens. In Felsspalten im Hintergrund des Thales rechts vom Ross-Gletscher, 1883, Will 11 (M as "*Lophocolea novo-georgiensis* G., original", *lect. nov.* of *Lophocolea georgiensis* Gottsche).
Distribution. West Patagonia !, Tierra del Fuego !.

Clasmatocolea koeppensis (Gottsche) Grolle

Grolle, 1960*b*, p. 72.
Lophocolea köppensis Gottsche, Gottsche, 1890, p. 453.
Lophocolea rigens, non (Hook. fil. & Tayl.) Evans, quoad pl. Georg. Austr., Stephani, 1911, p. 52.

Specimens. Köppenberg, leg. Will (M, *lect. nov.* of *Lophocolea köppensis* Gottsche); Cumberland Bay, Moränfjorden, leg. Skottsberg (UPS as *Lophocolea rigens*).
Distribution. Patagonia !, Tierra del Fuego !, South Sandwich Islands !.

Clasmatocolea vermicularis (Lehm.) Grolle

Grolle, 1960*b*, p. 78.
Lophocolea skottsbergii Steph., Stephani, 1911, p. 53, fide Grolle, 1960*b*, p. 79.
Lophocolea abnormis, non (Besch. & Mass.) Steph., quoad pl. Georg. Austr., pro parte, Stephani, 1911, p. 38.

Specimens. Cumberland Bay, leg. Skottsberg (S-PA; UPS as *Lophocolea abnormis* with *Leptoscyphus expansus*).
Distribution. Andes as far north as Costa Rica !, Chile !, Patagonia !, Tierra del Fuego !, Falkland Islands !, Tristan da Cunha !, Gough Island !, South Africa !, East African mountains (Burundi) !, Marion Island !.

Clasmatocolea sp. (Possibly *C. humilis* (H.f. & T.) Grolle)

Lophocolea otiphylla, non (Hook. fil. & Tayl.) Mitt., quoad pl. Georg. Austr., Stephani, 1911, p. 49.

Specimens. Bay of Isles, Rosita Harbour, leg. Skottsberg (UPS as *Lophocolea otiphylla*).

Cryptochila grandiflora (Lindenb. & Gottsche) Grolle

Grolle, 1971*a*, p. 19.
Jamesoniella oenops, non (Lindenb. & Gottsche) Steph., quoad pl. Georg. Austr., Stephani, 1911, p. 19.

Specimens. Cumberland Bay, Moränfjorden, leg. Skottsberg (UPS as *Jamesoniella oenops*).
Distribution. Andes as far north as Colombia !, South Sandwich Islands !, circum sub-Antarctic.

Herzogobryum erosum (Carringt. & Pears.) Grolle

Grolle, 1966, p. 231.
Acolea crenulata, non (Gottsche) Steph., quoad pl. Georg. Austr., Stephani, 1905, p. 1.
Gymnomitrium crenulatum, non Gottsche, quoad pl. Georg. Austr., Steere, 1961, p. 46.

Specimens. Cumberland Bay, Moraine Fiord, leg. Skottsberg (S-PA as *Acolea crenulata*).
Distribution. Circum sub-Antarctic.

Herzogobryum vermiculare (Schiffn.) Grolle

Grolle, 1965, p. 103.

Specimens. Cumberland Bay, leg. Skottsberg (JE, S-PA).
Distribution. West Patagonia !, Falkland Islands !, Marion Island !, Archipel de Kerguelen !.

Lepidozia cuspidata Steph.

Stephani, 1911, p. 61; Fulford, 1966, p. 208.
Lepidozia chordulifera, non Tayl., quoad pl. Georg. Austr., Stephani, 1905, p. 6.

Specimens. Royal Bay, Moltke Harbour, 1902, leg. Skottsberg (UPS as *Lepidozia chordulifera*); Cumberland Bay, May Harbour, 1902, leg. Skottsberg (UPS as *Lepidozia chordulifera*).
Distribution. Patagonia, Tierra del Fuego, South Sandwich Islands !.

Leptoscyphus expansus (Lehm.) Grolle

Grolle, 1962, p. 60.
Jungermannia elata Gottsche, Gottsche 1890, p. 450, *syn. nov.*
Lophocolea elata (Gottsche) Steph., Stephani, 1906, p. 59.
Chiloscyphus retroversus, non Schiffn., quoad pl. Georg. Austr., Stephani, 1911, p. 56.
Lophocolea abnormis, non (Besch. & Mass.) Steph., quoad pl. Georg. Austr., pro parte, Stephani, 1911, p. 38.
Lophocolea bisetula, non Steph., quoad pl. Georg. Austr., Stephani, 1911, p. 40.

Specimens. Sin. loc., leg. Dr. Will, Herb. No. 14103 (G, *lect. nov.* of *Jungermannia elata*; Cumberland Bay, Moränfjorden, leg. Skottsberg (UPS as *Chiloscyphus retroversus*);

Cumberland Bay, Moränfjorden, leg. Skottsberg (UPS as *Lophocolea abnormis*); Cumberland Bay, Moränfjorden, leg. Skottsberg (UPS as *Lophocolea bisetula*); Grytviken, Sladen JB 18/6 (UPS as *Lophocolea bisetula*).

Distribution. Bolivia !, Juan Fernandez !, central Chile !, Patagonia !, Tierra del Fuego !, Falkland Islands !, Tristan da Cunha !, Gough Island !, South Africa !.

Gottsche (1890) described *Leptoscyphus expansus* under the name of *Jungermannia elata* Gottsche, and plants referred below to *Lophocolea willii* Grolle as *Jungermannia köppensis* Gottsche, as is proved by his illustrations. While there is a specimen in G, leg. Will, from South Georgia named *Jungermannia elata* Gottsche which agrees well with the description and illustration given by Gottsche (1890), there is in M material from the Will collection subsequently named *Lophocolea willii* Grolle which has been erroneously labelled *Jungermannia elata* Gottsche. These incorrectly named specimens in M resulted in Grolle (1962, p. 72) previously mistaking *Lophocolea willii* Grolle for *Lophocolea elata* (Gottsche) Steph. and consequently establishing it as a synonym of *Leioscyphus setistipus* Steph. But the description and illustration of *Jungermannia elata* Gottsche given by Gottsche (1890) are, however, incompatible with *Lophocolea willii* Grolle.

The type specimen of *Chiloscyphus retroversus* Schiffn, was collected on Archipel de Kerguelen; it is a strongly hydromorphic plant which is very close to *Leptoscyphus expansus* and is perhaps identical to that species. In order to determine whether *Leptoscyphus expansus* is an indigenous species on Archipel de Kerguelen, it is necessary to examine more material from that archipelago. All the specimens from Patagonia and Tierra del Fuego of *Chiloscyphus retroversus* belong to *Leptoscyphus expansus*, or to other species of the Lophocolaceae.

Lophocolea secundifolia (H.f. & T.) Gottsche, Lindenb. & Nees.

Stephani, 1911, p. 53.

Specimens. Bay of Isles, Rosita Harbour, leg. Skottsberg (S-PA, UPS).
Distribution. Falkland Islands !, South Sandwich Islands !.

Lophocolea willii Grolle **sp. nov.**

Jungermannia köppensis Gottsche, Gottsche, 1890, p. 452 = *Chiloscyphus köppensis* (Gottsche) Steph., Stephani, 1908, p. 255; non *Lophocolea köppensis* Gottsche, Gottsche, 1890, p. 453 = *Clasmatocolea koeppensis* (Gottsche) Grolle.
Leioscyphus setistipus Steph., Stephani, 1901, p. 16 = *Leptoscyphus setistipus* (Steph.), Kühnemann, 1937, p. 177 = *Mylia setistipa* (Steph.), Kühnemann, 1949, p. 341, non *Lophocolea setistipa* Steph., Stephani, 1922, p. 292 = *L. minor* Nees.
Lophocolea elata auct., now (Grottsche) Steph., Grolle, 1960*c*, p. 49, Grolle, 1962, p. 72.

Clasmatocoleae vermiculari (Lehm.) Grolle *similis, sed differt: (i) Folia latiora quam longa* (*non longiora quam lata*). (*ii*) *Folia—a dorso visa—convexa* (*non concava*). (*iii*) *Amphigastria ad (1/3–) 1/2– 3/5 bilobata lobis magnis late lanceolatis* (*non ad 1/6–1/4 (–1/3) bilobata lobulis parva anguste lanceolatis*). (*iv*) *Statura plantae multo major, 3–5 cm. longa et 2·5–3·5 mm. lata* (*non 1–2 cm. longa et 1·5–2·5 mm. lata*). (*v*) *Antheridia bina* (*non solitaria*).

Dioecious. Usually forming a deep, spongy turf, in the dry state olive-green or mostly dirty blackish brown, often difficult or impossible to soak out in water. *Plants* up to 7 cm. long and up to 3·5 mm. wide, sparingly branched, branches terminal in origin, *Frullania* type, quickly resembling the main stems. *Stem* rather spongy, colourless to pale brown, cortical cells thin-walled, rectangular, those on the dorsal surface 50–65 × 18–20 μm; in section about 14 cells across, the cells throughout more or less thin-walled, in the cortex forming a single layer of slightly smaller and brown cells compared with the colourless cells of the medullar region. *Rhizoids* not seen. *Leaves* when young inclined towards the dorsal

side, when mature enlarged and spreading sideways, alternate, with no strip between them on the dorsal side of stem that is not associated with leaves, loosely covering each other; succubous, insertion very oblique its line almost straight on the dorsal side but in a short downward-pointing curve on the ventral side; lamina (seen from the dorsal side) more or less convex, particularly at the ventral margin which is often broadly rolled back, in outline always broader than long, asymmetrically reniform, the ventral margin very much curved and considerably widened, entire. *Leaf cells* with a tendency to arrangement in rows, throughout with thin, colourless walls lacking trigones and a smooth cuticle; in the apical region isodiametric 17–25 × 17–25 μm.; in the base almost isodiametric 35–50 × 30–45 μm. *Underleaves* always completely free, very large, at most ± the same width as the stem; several times longer than broad, (1/3–) 1/2–2/3 divided into two entire lobes, the sinus always acute, *in situ* mostly split; lobes erect or divergent, widely lanceolate with an awl-shaped apex composed of a single row of up to 5 cells, somewhat narrowed from the middle part to the base; at the side either with a projecting papilla cell or with a tooth of variable size bearing such a papilla cell; cells as in leaf. *Male inflorescence* terminal, later becoming intercalary, perigonal bracts in up to 5 pairs, similar in size to stem leaves and hardly differing, usually inclined to the dorsal surface, on dorsal side bearing a small, well-separated lobule of very variable form, occasionally the lobule is partly inserted on the leaf giving the leaf a shortly winged appearance; antheridia in the central parts of the male inflorescence, always in pairs, large in size, stalk of 2–4 rows of cells, walls of very numerous, small isodiametric cells. *Female inflorescence* not seen but described by Stephani (1901, p. 17, under *Leioscyphus setistipus* Steph.) as "Perianthia late compresso-cupulata, ore truncata bilabiato crebre dentato-ciliato, hyalino. Folia et amphigastria floralia caulinis multo majora, ceterum simillima." Fig. 1.

Habitat. In very damp places, mostly submerged in bogs and streams.

Typus. Tierra del Fuego, prope Rio Grande, in paludosis, Dusén 128 (S-PA as *Leioscyphus setistipus*, holotype; JE, isotype).

Specimens. Köppenberg, 1883, Will 11a (M, *lect. nov.* of *Jungermannia köppensis*; Bachgrund am Ausgang des Brockenthales, leg. Will (M as *Jungermannia köppensis*); Quelle auf dem Hochplateau, 1882, leg. Will (M as *Jungermannia elata*); Cumberland Bay, Jason Harbour, 1902, leg. Skottsberg (S-PA as *Lophocolea vasculosa*); Grytviken, wet river bank, 30 m., Bonner 78 (UPS as *Lophocolea vasculosa*).

Extra South Georgia. Falkland Islands, Westpoint Island, leg. Skottsberg (JE). Tierra del Fuego, Ushuaia, 1902, leg. Skottsberg, (S-PA as *Lophocolea leptantha*); ad rivulum in reg. alp., 900 m., supra lac. Fagnano, leg. Skottsberg (S-PA as *Lophocolea elata*); Rio Azopardo, Dusén 56 (G, *lect. nov.* of *Leioscyphus setistipus* Steph.; S-PA, isotype).

Distribution. Tierra del Fuego !, Falkland Islands !.

Lophozia propagulifera (Gottsche) Steph.

Stephani, 1911, p. 23.
Jungermannia propagulifera Gottsche, Gottsche, 1890, p. 451.

Specimens. Pinguin Bay, leg. Will (M, *lect. nov.* of *Jungermannia propagulifera*).

Distribution. South Sandwich Islands !, other records erroneous.

Marchantia berteroana Lehm. & Lindenb.

Marchantia polymorpha, non L., quoad, pl. Georg. Austr., Gottsche, 1890, p. 454, fide Steere, 1961, p. 47.
Marchantia cephaloscypha Steph., Stephani, 1905, p. 8, fide Evans, 1917, p. 246, Hässel de Menendez, 1963, p. 160.

Distribution. Widespread in the sub-Antarctic zone.

Pachyglossa dissitifolia Herz. & Grolle

Herzog and Grolle, 1958, p. 155.

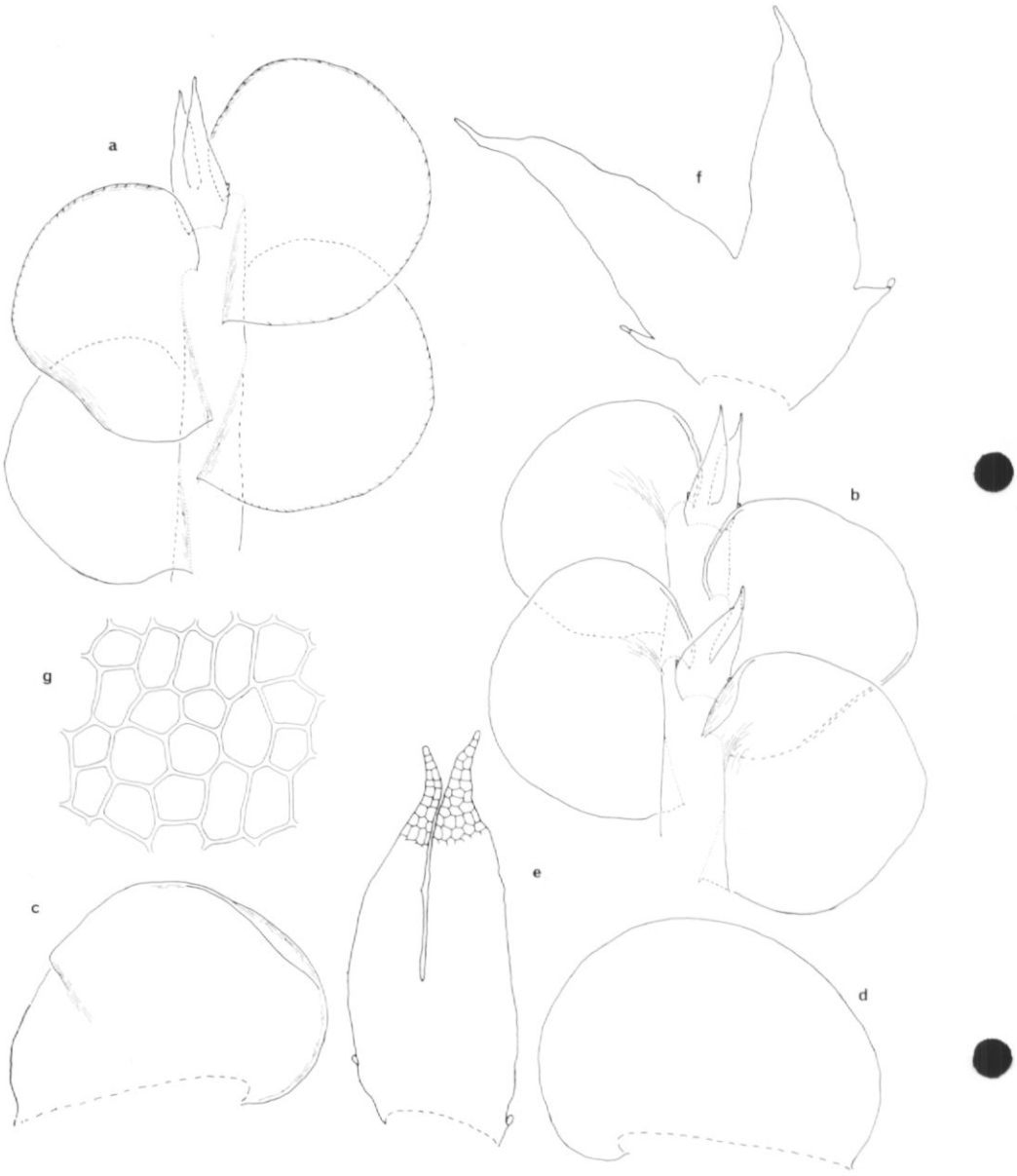

Fig. 1. *Lophocolea willii* Grolle. a. Portion of shoot seen in dorsal view, × 16; b. Portion of shoot seen in ventral view, × 16; c. Leaf, normal posture, × 21; d. Leaf, flattened out, × 21; e and f. Underleaves, × 63; g. Cells from the sub-apical region of the lamina, × 250. All drawn from the type specimen.

Specimens. Cumberland Bay, Mt. Duse, leg. Skottsberg (G, S-PA).
Distribution. Tristan da Cunha !, west Patagonia !, Tierra del Fuego !, South Sandwich Islands !.

Pachyglossa spegazziniana (Mass.) Herz. & Grolle

Herzog and Grolle, 1958, p. 159.
Lophocolea azoparàana Steph., Stephani, 1906, p. 54, fide Herzog and Grolle, 1958, p. 159.

Specimens. Ross-Gletscher, zwischen *Clasmatocolea georgiensis*, leg. Will (M).
Distribution. Tristan da Cunha !, Gough Island I, west Patagonia !, Tierra del Fuego !, Falkland Islands !.

Plagiochila sp.

Plagiochila allionii, non Steph., quoad pl. Georg. Austr., Stephani, 1911, p. 26.

Specimens. Cumberland Bay, Moraine Fiord, leg. Skottsberg (UPS as *Plagiochila allionii*).
The Skottsberg specimen referred by Stephani (1911) to *P. allionii nomen nudum* has entire leaves and leaf cells without trigones; it is completely different from the validly published *P. allionii* Steph. (Stephani, 1917, p, 120) from Equador. Since the number of species of *Plagiochila* described from Patagonia and Tierra del Fuego is so great, and in need of revision, I am refraining from naming the South Georgian species.

Pseudolepicolea quadrilaciniata (Sull.) Fulf. & J. Tayl.

Fulford and Taylor, 1960, p. 413.
Lepicolea georgica Steph., Stephani 1911, p. 73, fide Schuster, 1966, p. 102.
Lepicolea quadrilaciniata (Sull.) Steph., Stepahni, 1911, p. 74.
Pseudolepicolea georgica (Steph.) Fulf. & J. Tayl., Fulford and Taylor, 1960, p. 416.

Specimens. There is material in G and S-PA, cited by Fulford and Taylor (1960, p. 417).
Distribution. West Patagonia, Tierra del Fuego !.

Riccardia georgiensis (Steph.) Hässel

Grolle, 1971*b*, p. 80.
Aneura georgiensis Steph., Stephani, 1905, p. 2.
? *Aneura pinnatifida* var. *contexta*, non Nees ab Es., quoad, pl. Georg. Austr., Gottsche, 1890, p. 454.

Distribution. Tierra del Fuego, South Sandwich Islands !, Iles Crozet ! (all as personal communication from Dr. G. G. Hässel de Menendez). The true var. *contexta* Nees is a European plant and certainly does not occur on South Georgia.

Riccardia sp. (Possibly *R. crassicrispa* (Steph.) Evans)

Aneura cochleata Steph., non (H.f. & T.) Mit., quoad pl. Georg. Austr., Stephani, 1911, p. 6, fide Evans, 1921, p. 196.

Roivainenia jacquinotii (Mont.) Grolle.

Persson and Grolle, 1961, p. 44.
Leioscyphus skottsbergii Steph., Stephani, 1905, p. 5, fide Persson and Grolle, 1961, p. 44.
Mylia skottsbergii (Steph.) Schust., Schuster, 1959, p. 34.

Specimens. Cumberland Bay, leg. Skottsberg (G, holotype of *Leioscyphus skottsbergii* Steph.).
Distribution. Patagonia !, Tierra del Fuego !, Falkland Islands !.

Schistochila aberrans Steph.

Gottschea pachyphylla Nees ab Es., non (Lehm. & Lindenb.), quoad pl. Georg. Austr., Gottsche, 1890, p. 449.
Schistochila pachyphylla, non (Lehm. & Lindenb.) Steph., quoad, pl. Georg. Austr., Steere, 1961, p. 47.
Schistochila carnosa, non (Mitt.) Steph., quoad pl. Georg. Austr., Stephani, 1911, p. 78.

Specimens. Köppenberg, Ufer des Baches im NW, leg. Will. (JE as *Schistochila pachyphylla*); Cumberland Bay, Moränfjorden, leg Skottsberg (UPS as *Schistochila carnosa*).
Distribution. Endemic ?

Schistochila aberrans, *S. carnosa* and *S. pachyphylla* are near to each other, but much more material must be examined before they can be proved synonymous. The South Georgian material that has been referred to these three species belongs, in reality, to only one species and, at least provisionally, this material is best referred to *S. aberrans* since the type of that species is from South Georgia.

Triandrophyllum subtrifidum (H.f. & T.) Fulf. & Hatch.

Fulford and Hatcher, 1961, p. 350.
Isotachis georgiensis Steph., Stephani, 1905, p. 4, *syn. nov.*
Triandrophyllum georgiense (Steph.) Fulf. & Hatch., Fulford and Hatcher, 1961, p. 348.
Herpocladium antarcticum Steph., Stephani, 1911, p. 67, fide Fulford and Hatcher, 1961. p. 350.

Specimens. Cumberland Bay, leg. Skottsberg (G, type of *Herpocladium antarcticum*).
Distribution. Andes as far north as Guatemala, Patagonia !, Tierra del Fuego, Falkland Islands, Tristan da Cunha, South Sandwich Islands !, Australasia.
In the South Sandwich Islands, typical *T. subtrifidum* and *T. georgiense* exist in all intermediate forms so that their separation into two species can no longer be upheld.

Synonymy and Excludenda

In view of the number of misidentifications of South Georgian hepatic taxa, it has been thought worthwhile to summarize in the following list the relationship of the names used by earlier authors to those accepted in this paper.

Species	*Now referred to*	*Reason*
Acolea crenulata	*Herzogobryum erosum*	Misidentification
	Anthelia juratzkana	Misidentification
Aneura cochleata	*Riccardia* sp.	Misidentification
Aneura georgiensis	*Riccardia georgiensis*	Synonymy
Aneura pinnatifida var. *contexta*	*Riccardia georgiensis*	Misidentification
Barbilophozia floerkei	*Barbilophozia hatcheri*	Misidentification
Cephalozia cucullifolia	*Cephalozia badia*	Synonymy
Cephalozia varians	*Cephaloziella varians*	Synonymy
Chiloscyphus koeppensis	*Lophocolea willii*	Synonymy
Chiloscyphus retroversus	*Leptoscyphus expansus*	Misidentification
Gottschea pachyphylla	*Schistochila aberrans*	Misidentification
Gymnomitrium crenulatum	*Herzogobryum erosum*	Misidentification
Herpocladium antarcticum	*Triandrophyllum subtrifidum*	Synonymy
Isotachis georgiensis	*Triandrophyllum subtrifidum*	Synonymy
Jamesoniella oenops	*Cryptochila grandiflora*	Misidentification
Jungermannia badia	*Cephalozia badia*	Synonymy
Jungermannia barbata var. *floerkei*	*Barbilophozia hatcheri*	Misidentification
Jungermannia elata	*Leptoscyphus expansus*	Synonymy
Jungermannia köppensis	*Lophocolea willii*	Synonymy
Jungermannia propagulifera	*Lophozia propagulifera*	Synonymy
Jungermannia varians	*Cephaloziella varians*	Synonymy
Leioscyphus skottsbergii	*Roivainenia jacquinotii*	Synonymy
Lepicolea georgica	*Pseudolepicolea quadrilaciniata*	Synonymy
Lepicolea quadrilaciniata	*Pseudolepicolea quadrilaciniata*	Synonymy
Lepidozia chordulifera	*Lepidozia cuspidata*	Misidentification
Lophocolea abnormis	*Clasmatocolea vermicularis*	Misidentification
	Leptoscyphus expansus	Misidentification

Lophocolea azopardana	*Pachyglossa spegazziniana*	Synonymy
Lophocolea bisetula	*Leptoscyphus expansus*	Misidentification
Lophocolea elata	*Leptoscyphus expansus*	Synonymy
Lophocolea georgiensis	*Clasmatocolea georgiensis*	Synonymy
Lophocolea köppensis	*Clasmatocolea koeppensis*	Synonymy
Lophocolea otiphylla	*Clasmatocolea* sp. (aff. *C. humilis*)	Misidentification
Lophocolea rigens	*Clasmatocolea koeppensis*	Misidentification
Lophocolea skottsbergii	*Clasmatocolea vermicularis*	Synonymy
Lophocolea spegazziniana	*Pachyglossa spegazziniana*	Synonymy
Lophozia badia	*Cephalozia badia*	Synonymy
Lophozia cylindriformis	*Gymnocolea cylindriformis*	Synonymy
Lophozia floerkei	*Barbilophozia hatcheri*	Misidentification
Lophozia hatcheri	*Barbilophozia hatcheri*	Synonymy
Marchanita polymorpha	*Marchantia berteroana*	Misidentification
Marchantia cephaloscypha	*Marchantia berteroana*	Synonymy
Mylia skottsbergii	*Roivainenia jacquinotii*	Synonymy
Orthocaulis floerkei	*Barbilophozia hatcheri*	Misidentification
Plagiochila allionii	*Plagiochila* sp.	Misidentification
Pseudolepicolea georgica	*Pseudolepicolea quadrilaciniata*	Synonymy
Schistochila carnosa	*Schistochila aberrans*	Misidentification
Schistochila pachyphylla	*Schistochila aberrans*	Misidentification
Triandrophyllum georgiense	*Triandrophyllum subtrifidum*	Synonymy

One name not included in this list is *Gymnocolea cylindriformis* (Mitt.) Schust, which was cited by Steere (1961) but, according to Schuster (1967), it cannot be accepted as valid as it is an incomplete citation, and this contravenes Article 33 of the *International code of botanical nomenclature*. It is a synonym of *Lophozia cylindriformis* (Mitt.) Steph. (Stephani, 1911). The type specimen of this species is from Archipel de Kerguelen. I have not been able to obtain an authentic specimen for the South Georgian record and the specimens that I have examined from Patagonia and Tierra del Fuego, the majority determined by Stephani, have all been incorrectly named. The species must, therefore, be excluded from the South Georgian list, and that of South America, as well, until definite evidence of its existence is available.

Discussion

One of the most characteristic features of the hepatics of South Georgia, and particularly of the South Sandwich Islands, is the occurrence of the majority of species in depauperate *tenuiretis* forms, a phenomenon which may be linked with the high incidence of fog in these areas.

The hepatic floras of the South Sandwich Islands and South Georgia are very similar, although the more southerly South Sandwich Islands, with their more rigorous climate, show considerable impoverishment. The number of species known from the South Sandwich Islands is 11 (+ one indeterminable) as opposed to 24 (+ three indeterminable) from South Georgia; their phytogeographical groupings are shown in Table I.

The species recorded as endemic are probably only so because of present inadequate knowledge of their distribution and some may exist on Tierra del Fuego or the Falkland Islands. On the other hand, a characteristic feature of the floras of South Georgia and the South Sandwich Islands, as known at present, is the lack of species from families or genera characteristic of more temperate regions, e.g. Jubulaceae, Lepidolaenaceae, *Lepicolea* or *Blepharidophyllum* which are abundant in areas such as Tierra del Fuego or the Falkland Islands. Future collecting may reveal their presence in more southern latitudes.

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TABLE I. PHYTOGEOGRAPHICAL DISTRIBUTION OF HEPATICS FROM SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDS

Group	*South Georgia*	*South Sandwich Islands*
Endemic in the region comprising South Georgia and South Sandwich Islands, Patagonia, Tierra del Fuego, Falkland Islands	4	2
	12	6
Distributed ± widely in the sub-Antarctic, with stations in South America and also in South Africa or Australasia	6	3
Bipolar	2	0

Figures indicate number of species in each group.

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