

COLLEMBOLA OF SOUTH GEORGIA¹By K. A. J. Wise²

Abstract. Seventeen species of Collembola are now recorded from South Georgia. New species of *Xenylla*, *Friesea*, *Cryptopygus*, *Parafolsomia*, *Sorensia*, *Sminthurinus* are described; new records for the island are *Hypogastrura viatica*, *Sorensia subflava*, *Isotoma* sp., *Parisotoma octooculata* and *Sminthuridae* sp. *Setanodosa steineni* (Neanuridae: Brachystomellinae) is a new combination for *Anurida steineni* (Anuridae), and *Setocerura georgiana* for *Isotoma georgiana*. *Sorensia subflava* (= *S. dreuxi*, n. syn.) is found to be widespread in subantarctic islands. Distributions and relationships of other species are also discussed and some ecological associations are listed.

G. Pfeffer (1890) recorded the first Collembolan on South Georgia, as "Poduride" in the Order Thysanura, from material collected by the German expedition of 1882-1883. Schäffer (1891) recorded the same material describing 3 new species, *Isotoma georgiana*, *Tullbergia grisea*, and *Anurida steineni*. Schäffer (1897) discussed the same 3 species and they were the only Collembola species recorded for South Georgia in his list of the Apterygota of South America and South Georgia. Wahlgren (1906) reported on the Collembola of the Swedish South Polar Expedition of 1901-1903, and recorded 7 species from South Georgia—*Xenylla humicola*, *Friesea grisea*, *Anurida steineni*, *Tullbergia insularis*, *Cryptopygus antarcticus*, *Cryptopygus caecus* and *Isotoma georgiana*. Enderlein (1909) only recorded 5 of these in his section on the insect fauna of South Georgia, but all 7 were indicated in his Table of Antarctic Collembola. These records were repeated by Enderlein (1912) but one further species was indicated in the Table, in error. Later, Enderlein (1930) recorded the same 7 species as Wahlgren (1906).

This paper records specimens in the Bishop Museum collections but only a quarter of the specimen samples to hand have been determined so far. A small sample collection of British Antarctic Survey Biological Unit specimens (designated B. A. S. below) are also included and records of these by Tilbrook (1967) are discussed.

Except for the original reference, references in the synonymic lists are for South Georgia only, unless otherwise stated. General format is as in papers on Antarctic Collembola (Wise 1967 and in press).

Classification is based on that of Massoud (1967) and Salmon (1964) as discussed in a concurrent paper on Antarctic Collembola (Wise, in press).

KEY TO SPECIES OF SOUTH GEORGIA COLLEMBOLA

- | | | |
|--------|---|----------------------------|
| 1. | Thorax and abdomen elongate, segmented (Arthropleona)..... | 2 |
| | Thorax and most of abdomen 1 globular segment (Symphypleona)..... | 16 |
| 2 (1). | Th. I similar to II, III, dorsum setose (Poduromorpha)..... | 3 |
| | Th. I reduced, dorsum not setose (Entomobryomorpha: Isotomidae)..... | 8 |
| 3 (2). | Color white; pseudocelli present; 1 pair small lateral spines on Th. II, III (Onychiuridae: | |
| | <i>Tullbergiinae</i>) | Tullbergia bisetosa |
| | Pseudocelli absent; pigmented, at least dorsally..... | 4 |
| 4 (3). | Mandibles with molar area; color dark blue to black (Hypogastruridae)..... | 5 |
| | Mouthparts modified; mandibles without molar area, or absent; not dark in coloring | |

¹Results of fieldwork supported by grants (G-23720, GS-166) to Bishop Museum from the Office of Antarctic Programs, U. S. National Science Foundation.

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- (Neanuridae)6
- 5 (4). PAO and unguiculus absent.....**Xenylla claggi***
PAO and unguiculus present.....**Hypogastrura viatica**
- 6 (4). Mandibles, furcula, anal spines, absent (Brachystomellinae).....**Setanodosa steineni**
Mandibles, furcula, anal spines, present (Frieseinae).....7
- 7 (6). Ocelli 8 + 8; furcula vestigial, very short, 2-4 anal spines.....**Friesea grisea**
Ocelli 3 + 3; furcula reduced but obvious, 8-10 anal spines.....**Friesea tilbrooki***
- 8 (2). Furcula reduced; dens approx. equal to or shorter than manubrium (Anurophorinae &
Proisotominae)9
Furcula elongate; dens much longer than manubrium, with posterior face crenulate
(Isotominae)12
- 9 (8). Bluish species; ocelli 6 + 6; mucro with 2 teeth.....10
Pale yellow species; ocelli less than 6 + 6, mucro with 3 or more teeth.....11
- 10 (9). Setae short to medium; 2 tenant hairs on posterior tibiotarsi.....**Cryptopygus antarcticus**
Setae short to long; 2 strongly clavate tenant hairs and 2 other tenant hairs, 1 reaching to
apex of claw on posterior tibiotarsi.....**Cryptopygus subantarcticus***
- 11 (9). Ocelli absent; mucro with 5 teeth.....**Cryptopygus caecus**
Ocelli 2 + 2; mucro with 3 teeth.....**Parafolsomia quadrioculata***
- 12 (8). Ocelli 1 + 1 with large PAO.....13
Ocelli 8 + 8 or 4 + 4.....14
- 13(11). White with coarse pigment spots dorsally; PAO elongate; manubrium with median apical
anterior spines.....**Sorensia subflava**
Cream with fine pigment spots dorsally; PAO oval; manubrium without median apical
anterior spines.....**Sorensia atlantica***
- 14(12). Ocelli 8 + 8.....15
Ocelli 4 + 4.....**Parisotoma octooculata**
- 15(14). Long serrate setae on abdomen; dens with spines.....**Setocerura georgiana**
Short simple setae; dens without spines.....**Isotoma sp.**
- 16 (1). Pale; Ant. IV subdivided; 3 tenant hairs on tibiotarsi.....**Sminthuridae sp.**
Blue; Ant. IV entire; 1 tenant hair on tibiotarsi.....**Sminthurinus jonesi***

Family ONYCHIURIDAE Börner, 1913

Subfamily TULLBERGIIINAE Bagnall, 1935

Genus **Tullbergia** Lubbock, 1876**Tullbergia bisetosa** Börner, 1902

Tullbergia bisetosa Börn., 1902, *Zool. Anz.* **26**(689): 128.—Enderlein, 1903, *Wiss. Ergebn. Deutsche Tiefsee-Exped.* **3**: 242.—Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped.* (1901-1903) **5**(9): 3, 19.—Enderlein, 1909, *Deutsche Südpolar-Exped.* (1901-1903) **10**(4): 458, 461, 462, 473.—Bagnall, 1935, *Ann. Mag. Nat. Hist.* ser. 10, **15**: 237.—Womersley, 1935, *Trans. R. Soc. Sth. Austr.* **59**: 212, 1937, *Rep. B. A. N. Z. Antarc. Res. Exped.* 1929-1931 (B) **4**(1): 2.—Denis, 1947, *Mém. Mus. Hist. Nat. Paris* (N. S.) **21**: 41-42.—Salmon, 1949, *Cape Exped. Ser. Bull.* **4**: 17.—Brown, 1964, *ANARE Repts.* (B) **1**(73): 9-10.—Salmon, 1964, *R. Soc. N. Z. Bull.* **7**: 146.—Tilbrook, 1967, *Phil. Trans. R. Soc. Lond.* (B) **252**: 277, 278.—Wise, 1967, *Ant. Res. Ser.* **10**: 128.

Tullbergia insularis Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped.* (1901-1903) **5**(9): 3, 8, 19.—Enderlein, 1909, *Deutsche Südpolar-Exped.* (1901-1903) **10**(4): 461, 500; 1912, *Könl. Svenska Vet.-Akad. Handl.* **48**(3): 56, 125, 139, 157; 1930, *Ges. Naturf. Freunde Berlin*: 248. Bagnall, 1935, *Ann. Mag. Nat. Hist.* ser 10, **15**: 237.—Ringuélet, 1955, *Rev. Mus. Univer. La Plata* (N. S.) **6**(Zool.): 428.

*Described as new

SPECIMENS EXAMINED: SOUTH GEORGIA: 1, 1961, N. V. Jones 75A: 1, I.-III.1961, Jones 67-1A. Husvick: 1, moss on moss drier, 27.I.1961, Jones 54A. Moltke Hbr. area: 1, moss on drier, 7.III.1961, Jones 63A: 1, mosses on scree behind camp, 18.II.1961, Jones, 58A. West Cumberland Bay: 1, rock crevices & under stones, 2.II.1961, Jones 57A. Husvik & Bay of Isles: 2, moss on drier, I.1961, Jones 55A. Royal Bay: 1, Köppen Pt., giant petrel nest, 4.III.1964, H. B. Clagg 215A: 1, light-mantled sooty albatross nest, 1.III.1964, Clagg 216A: 1, Moltke Hbr lower valley, 0-150 m, tussock, 6.III.1964, Clagg 227A: 1, ditto, tussock, 11.III.1964, Clagg 231A. Grytviken Pen.: 1, Cumberland East Bay, light-mantled sooty albatross nest, 24.II.1964, Clagg 198A: 1, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 42A: 1, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 44A: 1, Cumberland East Bay, light-mantled sooty albatross nest, 24.II.1964, Clagg 206A. Busen Pen.: 2, Jasen Hbr., 0-150 m, tussock, 3.I.1964, Clagg 145A: 1, Carlita Bay Valley, 0-150 m, under rocks nr. pond, 31.XII.1963, Clagg 138A. Right Whale Bay: 1, 0-150 m, under moss & rocks, 6.XI.1963, Clagg 20A: 1, moss & moss on drier, 3.I.1961, Jones 7A. Stromness Pen.: 1, Husvik Valley, dominican gull nest, sample, 21.XII.1963, Clagg 45A: 1, Alert Cove, 0-150 m, under rocks on dirt slope, 20.XII.1963, Clagg 97A. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Willis Is.: 1, Main I., 84 m, moss amongst tussock, 23.I.1961, Jones 20A. Ocean Hbr. & Hound Bay: 1, moss on drier, 14.I.1961, Jones 12A. Hope Valley: 1, moss on drier, 3.I.1961, Jones 6A. 2, *Acaena*, Tilbrook (Brit. Antarc. Surv.)

DISTRIBUTION. South Georgia Is., Falkland Is., Tierra del Fuego, Marion I., Kerguelen Is., Heard I., Macquarie I.

Remarks. The synonymic list above contains a full reference list. The thoracic spines, lobes of PAO, and unguiculus, were checked on all the specimens recorded above.

The type locality for *T. bisetosa* is Kerguelen, and *T. insularis* was first recorded (Wahlgren 1906) from Tierra del Fuego, Falkland Is., and South Georgia. Womersley (1935, 1937) synonymized *insularis* with *bisetosa*, without explanation. As *T. bisetosa* is the only species of *Tullbergia* found in the South Georgia material, I have accepted the synonymy, although it is still possible that this does not hold true for Tierra del Fuego and Falkland Is. From specimens seen, I can confirm the presence of *T. bisetosa* on Macquarie I. and Heard I. (see concurrent paper on Heard I. Collembola).

Family HYPOGASTRURIDAE Börner, 1913

Genus *Xenylla* Tullberg, 1869

Xenylla claggi Wise, new species Fig. 1-11.

Color: Blue to blue-black.

Clothing: Short simple setae with longer setae on posterior angles of abdominal segments (Fig. 1).

Body: Length up to 1.2 mm. Antennal segments as in Fig. 2. Antenna IV with apical sense-cone and 4 bent senserods (Fig. 3). Sense-organ of Ant. III consisting of 2 straight elongate sense-rods with 2 short knobbed sense-clubs between them (Fig. 4). Postantennal organ absent. Ocelli 5 on each side (Fig. 5). Mandible with 4 apical teeth and molar area (Fig. 6). Head of maxilla with 2 teeth and several lamellae (Fig. 7). Rami of tenaculum each with 3 barbs. Two short narrow pointed anal spines (Fig. 8).

Legs (Fig. 9): Claw with 1 internal tooth at ca. 3/4. Empodium present with a medium length seta on each side. Unguiculus absent. Tibiotarsi with 2 outer clavate tenant hairs, 4 inner tenant hairs, on each leg.

Furcula (Fig. 10): Dens distinctly separated from manubrium, with 2 posterior setae. Mucro only distinctly separated from dens on anterior 1/2, a little more than 1/2 length of dens, bluntly pointed in lateral view, posterior lamella present, no anterior tooth (Fig. 11).

Claw: mucro: anal spine as ca. 26: 20: 6.

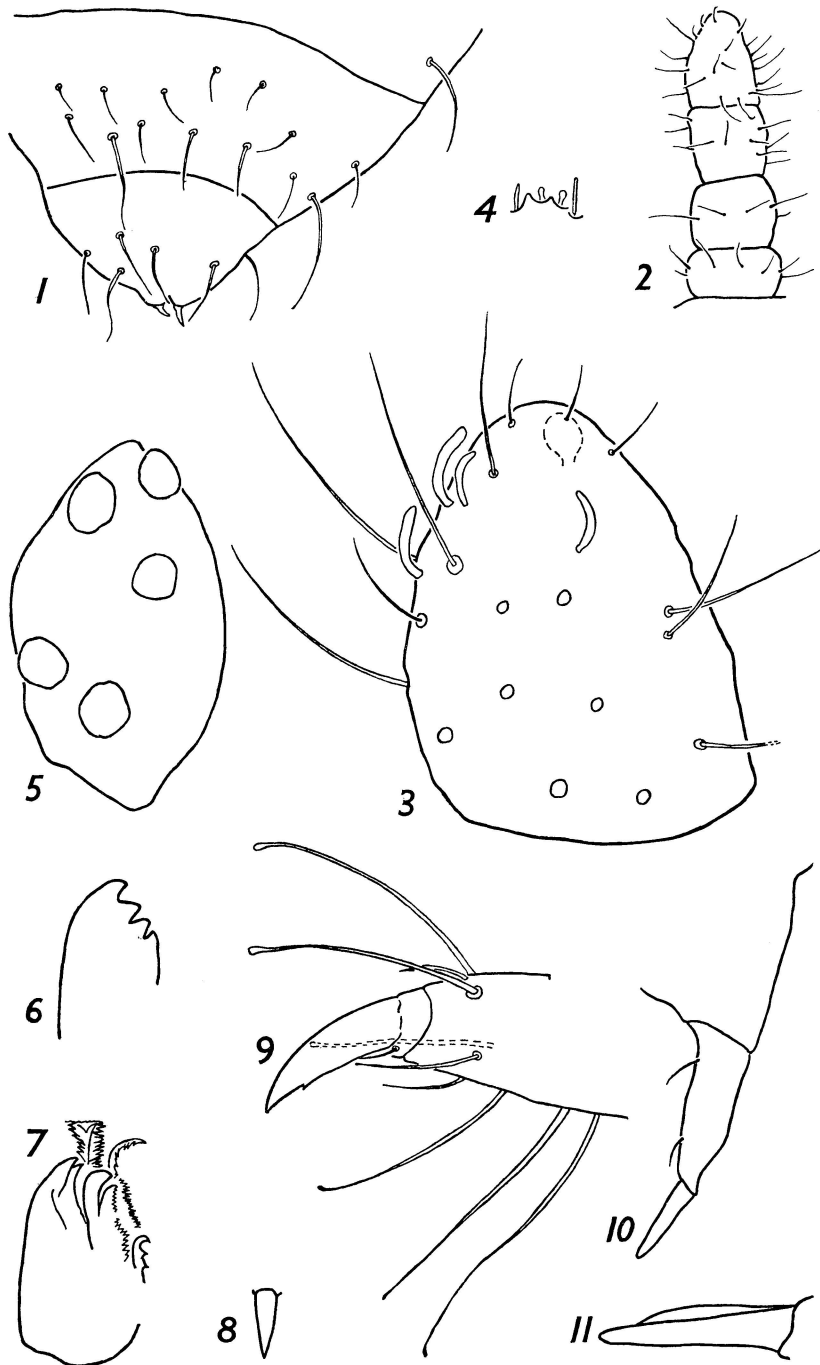


Fig. 1-11. *Xenylla claggi* n. sp. 1. Abd. V, VI, setation and anal spines. 2. Antenna. 3. Ant. IV
 4. Ant. III, apical sense-organ. 5. Ocelli. 6. Mandible. 7. Maxilla. 8. Anal spine. 9.
 Posterior foot. 10. Furcula. 11. Mucro.

SPECIMENS EXAMINED. Holotype (BISHOP 8849). Royal Bay: tussock on boulder at water's edge, 28.II.1964, Clagg 203A. Paratypes: Royal Bay: 7, same data as holotype: 2, rocks nr. beach, II.1964, Clagg 202. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Ocean Hbr.: 1, moss, 14.I.1961, Jones 14A. 1, 1961, Jones 76A.

DISTRIBUTION: South Georgia.

Remarks. This species has previously been recorded on South Georgia as *Xenylla humicola* (O. Fab. 1780) by Wahlgren (1906), Enderlein (1909, 1912, 1930) and Carpenter (1921). It appears to be close to *humicola* but is separated from that species by the presence of 4 inner tenant hairs, narrow anal spines, and possibly by characters of the mucro, although the mucro of *humicola* has been variously described by several authors.

I am grateful to Prof. J. T. Salmon for his opinion on specimens of this species.

The species is named for H. B. Clagg, who collected much of the material in the South Georgia collections.

Genus *Hypogastrura* Bourlet, 1839

Hypogastrura viatica (Tullberg)

Achorutes viaticus Tull., 1872, *Könl. Svensk. Vet.-Akad. Handl.* **10**(10): 50.

SPECIMENS EXAMINED. Grytviken: 2, random sample at whaling station, 7.III.1961, Jones 65A. Husvik & Bay of Isles: 2, moss on drier, I.1961, Jones 55A. Husvik Valley: 3, mosses & stones at edge of streams & lake, 27.I.1961, Jones 33A.

DISTRIBUTION. Cosmopolitan including Antarctica and South Georgia I (new record).

Family NEANURIDAE *sensu* Massoud, 1967

Subfamily BRACHYSTOMELLINAE *sensu* Massoud, 1967

Genus *Setanodosa* Salmon, 1942

Setanodosa steineni (Schäffer) n. comb. Fig. 12-18.

Anurida steineni Schäffer, 1891, *Jahrb. Hamb. Wiss. Anst.* **9**: 200-01; 1897, *Ergebn. Hamb. Magalh. Samm.* **2**: 8, 41.—Willem, 1902, *Rés. Voy. S. Y. Belgica*, 1897-1898-1899 Rapp. Sci. Zool.: 15.—Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped.* (1901-1903) **5**(9): 1, 19.—Enderlein, 1909, *Deutsche Südpolar-Exped.* (1901-1903) **10**(4): 461; 1912, *Könl. Svenska Vet.-Akad. Handl.* **48**(3): 158; 1930, *Ges. Naturf. Freunde Berlin*: 249.—Ringuelet, 1955, *Rev. Mus. Univer. Plata* (N. S.) **6**(Zool.): 428.—Salmon, 1964, *R. Soc. N. Z. Bull.* **7**: 259.—Massoud, 1967, *Biol. Amer. Aust.* **3**: 265.

Color: Pale blue dorsally, white beneath.

Clothing: Short plain setae with 1 longer dorsolateral and 1 longer lateral seta on each side of Abd. I-V (Fig. 12).

Body: Length 1.3 mm. Antennae as in Fig. 13. Ant. IV with large tri-lobed sense-organ and several sense-rods (Fig. 14). Sense-organ of Ant. III consisting of 2 short, stout sense-clubs with 2 lateral sense-rods (Fig. 15). Postantennal organ with 4 lobes, larger than each ocellus (Fig. 16). Ocelli 5 on each side. Mandibles absent. Maxilla head toothed and with basal rounded process (Fig. 17). Anal spines absent.

Legs (Fig. 18): Claw with 1 inner tooth before half way. Unguiculus absent. Tibiotarsi with a single non-clavate outer tenant hair.

Furcula: Absent.

SPECIMENS EXAMINED. SOUTH GEORGIA: 1, I.-III.1961, Jones 67-1A. Prince Olaf Hbr. & West Bay: 2, moss on drier, 2.II.1961, Jones 56A. Moltke Hbr. area: 2, old German camp, rotting wood, 19.II.1961, Jones 61A: 1, moss on drier, 7.III.1961, Jones 63A. Husvik: 1, moss on drier, 27.I.1961, Jones 54A: 1, side of outwash plain, 18.III.1961, Jones 73A. Maiviken: 1, moss on



Fig. 12-18. *Setanodosa steineri* (Schäffer, 1891). 12. Abd. IV, V, VI, setation. 13. Antenna. 14. Ant. IV. 15. Ant. III, apical sense-organ. 16. Postantennal organ and ocelli. 17. Maxillae, left and right. 18. Foot.

drier, 12.II.1961, Jones 43A. Grytviken Pen.: 2, Maiviken, 11.XII.1963, Clagg 80A: 1, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 42A: 2, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 44A: 1, Brown Mtn., 0-150 m, under rocks in patch of scree,

14.XI.1963, Clagg 34A: 1, Brown Mtn., 1–150 m, under rocks, 14.XI.1963, Clagg 33. Busen Pen.: 2, Jasen Hbr., 1–150 m, tussock, 3.I.1964, Clagg 145A. Grytviken: 1, Hestesletten, 1–150 m, under rocks, 12.XII.1963, Clagg 88A. Stromness Pen.: 1, Husvik, 1–150 m, moss sample, 29–30.XII.1963, Clagg 47A: 1, Husvik Valley: dominican gull nest, sample, 21.XII.1963, Clagg 45A. Royal Bay: 1, Moltke Hbr, lower valley, 150.3–300 m, under moss & rocks, 18.III.1964, Clagg 244A: 2, ditto, 0–150 m, tussock, 11.III.1964, Clagg 231A. Right Whale Bay: 1, moss & moss on drier, 3.I.1961, Jones 7A. Bay of Isles: 1, moss on shore of pools in corrie, 22.I.1961, Jones 32A. Ocean Hbr. & Hound Bay: 3, moss on drier, 14.I.1963, Jones 12A. Hope Valley: 1, moss on drier, 3.I.1961, Jones 6A: 1, mosses, 14.I.1961, Jones 9A. Ocean Hbr.: 1, mosses, 14.I.1961, Jones 14A. 4, *Acaena*, Tilbrook: 1, moss nr. light-mantled sooty albatross nest, Tilbrook (Brit. Antarc. Surv.)

DISTRIBUTION: South Georgia.

Remarks. Specimens fit the descriptions of *Anurida steineni* by Schäffer (1891, 1897), except for the tooth on the claw, and are obviously this species. From examination of the mouthparts the species was first traced by me as being close to *Salmonella decemocolata* Cass. & Rap., 1962 (Cassagnau & Rapoport, 1962) (of Argentina), in the family Brachystomellidae. The latter species is now *Setanodosa decemocolata* in the Neauridae: Brachystomellinae, following Massoud (1967), and *steineni* belongs in the same genus. *S. decemocolata* and *steineni* are separated from other species in the genus by the presence of 10 ocelli, and the presence of an inner tooth on the claw of *steineni* separates it from *decemocolata*. In his redescription of the genus *Setanodosa*, Massoud (1967) recorded “griffe sans dents” so this phrase now requires modification to read claw with or without inner tooth.

The B. A. S. specimens recorded above were determined by Tilbrook as “*Friesea* sp.?” and presumably are the ones recorded by him (Tilbrook, 1967) as “‘*Friesea*’ sp.” on South Georgia.

Wahlgren (1906) noted Schäffer’s record (1891) of this species on South Georgia but did not record the species in his main text. It is presumed, therefore, that the indication in his Table, of this species for Falkland Is., was in error for South Georgia. This probably gave rise to the Falkland Is. record by Ringuelet (1955) which is also not accepted here.

Subfamily FRIESEINAE Massoud, 1967

Genus *Friesea* Dalla Torre, 1895

Friesea grisea (Schäffer)

Tullbergia grisea Schäf., 1891, *Jahrb. Hamb. Wiss. Anst.* **9**: 198–200.

Pseudotullbergia grisea: Willem, 1902, *Rés. Voy. S. Y. Belgica* 1897–1898–1899, *Rapp. Sci. Zool.*: 15.

Achorutoides antarcticus: Carl, 1907, *Expéd. Antarct. Franc.* (1903–1905) *Sci. Nat.: Doc. Sci. Arthr.*: 3.

Friesea grisea: Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Expéd.* (1901–1903) **5**(9): 6.—Enderlein, 1912, *Küngl. Svenska Vet.-Akad. Handl.* **48**(3): 158; 1930, *Ges. Naturf. Freunde Berlin*: 249 (*Frisia*).—Stach, 1949, *Apt. Fauna Poland.* Neogastruridae & Brachystomellidae. *Acta Mon. Mus. Hist. Nat.*: 271.—Gressitt & Weber, 1959, *Pacif. Ins.* **1**(4): 445.—Gressitt, 1967, *Antarc. Res. Ser.* **10**: 14.—Wise, 1967, *Antarc. Res. Ser.* **10**: 125–26.

SPECIMENS EXAMINED. SOUTH GEORGIA: 1, I.–III.1961, Jones 67-2A: 3, 1961, Jones 76A. Moltke Hbr.: 1, old German camp, rotting wood, 19.II.1961, Jones 61A. Hestesletten: 1, nr. shore, 3.IV.1961, Jones 71A. Husvik & Bay of Isles: 1, moss on drier, I.1961, Jones 55A. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Maiviken: 1, moss on drier, 12.II.1961, Jones 53A. Stromness Pen.: 2, Husvik Valley, edge of reservoir, 21.XII.1963, Clagg 106A. Willis Is.: Main I., 84 m, moss amongst tussock, 23.I.1961, Jones 20A. Right Whale Bay: 1, Black Pt. moss sample, 2.I.1961, Jones 30A. Bay of Isles: 1, Paul Beach, moss amongst tussock, 22.I.1961, Jones 30A.

DISTRIBUTION. South Georgia I and Antarctica.

Remarks. Full synonymic lists and discussion have been given in papers on Antarctic Collembola (Wise 1967; in press).

The "Friesea' sp." of Tilbrook (1967) has been found to be *Setanodosa steineni* (see above) and is neither this nor the following species.

Distribution of this species has been discussed under *Friesea grisea* and *Friesea* sp. by Wise (1967; in press).

Friesea tilbrookii Wise, new species Fig. 19–25.

Color: Pale blue dorsally, white beneath.

Clothing: Short simple setae.

Body: Length up to 2.2 mm. Ant. IV with 3 curved sense-rods and large sub-apical sense-organ (Fig. 19). Mandible present, as in Fig. 20. Maxilla head of *Friesea* form but lamellae not seen (Fig. 21). PAO absent. Ocelli 3 on each side (Fig. 22). Abd. VI with 10 spines (Fig. 23) (only 8 seen on specimens in lateral view.

Legs (Fig. 24): No clavate tenant hairs. No tooth seen on claw.

Furcula (Fig. 25): Dens and mucro as figured, dens with 3 setae.

SPECIMENS EXAMINED. Holotype (BISHOP 8850), Busen Pen.: Enten Bay, under rocks on beach, 7.XI.1963, Clagg 28A. Paratypes. Busen Pen.: 2, same data as holotype.

DISTRIBUTION: South Georgia.

Remarks. This species is very close to *Friesea multispinosa* Denis, 1947 (of Kerguelen Is.), in the 6 ocelli and form of the furcula. It is separated from that species by the presence of 3 sense-rods on Ant. IV, a smaller number of abdominal spines, and lack of an internal tooth on the claw. Further specimens are required for a complete description.

The species is named for P. J. Tilbrook who has carried out invertebrate collecting and research in Antarctic and Subantarctic islands, including South Georgia.

Family ISOTOMIDAE Börner, 1901

Subfamily ANUROPHORINAE Börner, 1901

Genus **Cryptopygus** Willem, 1902

Cryptopygus antarcticus Willem, 1901

Cryptopygus antarcticus Wil., 1901, *Ann. Soc. Ent. Belge* **45**: 261.—Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped.* (1901–1903) **5**(9): 10.—Carpenter, 1907, *Proc. R. Soc. Edinburgh* **26**: 476; 1909, *Rep. Sci. Res. Voy. S. Y. Scotia* 1902, 1903, 1904: 56.—Enderlein, 1912, *Küngl. Svenska Vet.-Akad. Handl.* **48**(3): 139, 158; 1930, *Ges. Naturf. Freund Berlin*: 249.—Davies, 1935, *In Marr, Discovery Repts.* **10**: 379.—Womersley, 1937, *Rep. B. A. N. Z. Antarc. Res. Exped.* (1929–1931) (B) **4**(1): 3, 4.—Gressitt & Weber, 1959, *Pacif. Ins.* **1**(4): 45.—Brown, 1964, *ANARE Repts.* (B) **1**(73): 10.—Tilbrook, 1967, *Phil. Trans. R. Soc. Lond.* (B) **252**: 263–78.—Gressitt, 1967, *Antarc. Res. Ser.* **10**: 14.—Wise, 1967, *Antarc. Res. Ser.* 130–34.

SPECIMENS EXAMINED. SOUTH GEORGIA: 1, 1961, Jones 76A: 2, I.–III.1961, Jones 67-1A. Prince Olaf Hbr. & West Bay: 2, moss on drier, 2.II.1961, Jones 56A. Husvik: 1, White City, glacial outwash plain, 27.5 m from snout of glacier, 18.III.1961, Jones 69A: 2, moss on drier, 27.I.1961, Jones 54A. Moltke Hbr. area: 1, moss on drier, 7.III.1961, Jones 63A. Kelpbugten: 1, old gull's nest, sample, 15.I.1961, Jones 45A: 1, mosses & rocks nr. waterfall, dry & moist environment, 15.I.1961, Jones 23A. Husvik & Bay of Isles: 1, moss on drier, I.1961, Jones 55A. Maiviken: 1, under stones, 31.I.1961, Jones 39A: 2, moss on drier, 12.II.1961, Jones 43A: 2, moss on drier, 12.II.1961, Jones 53A. Grytviken Pen.: 1, King Edward Pt., shoemaker nest, sample, 12–14.XII.1963, Clagg 42A: 2, King Edward Pt., shoemaker nest, sample, 12–14.XII.1963, Clagg 44A: 3, Cumberland West Bay, gentoo penguin nest, sample, 17–21.XI.1963, Clagg 41A. Stromness Pen.: 2, Husvik Valley, dominican gull nest, sample, 21.XII.1963, Clagg 45A: 1, Husvik, 0–150 m, moss sample, 29–30.

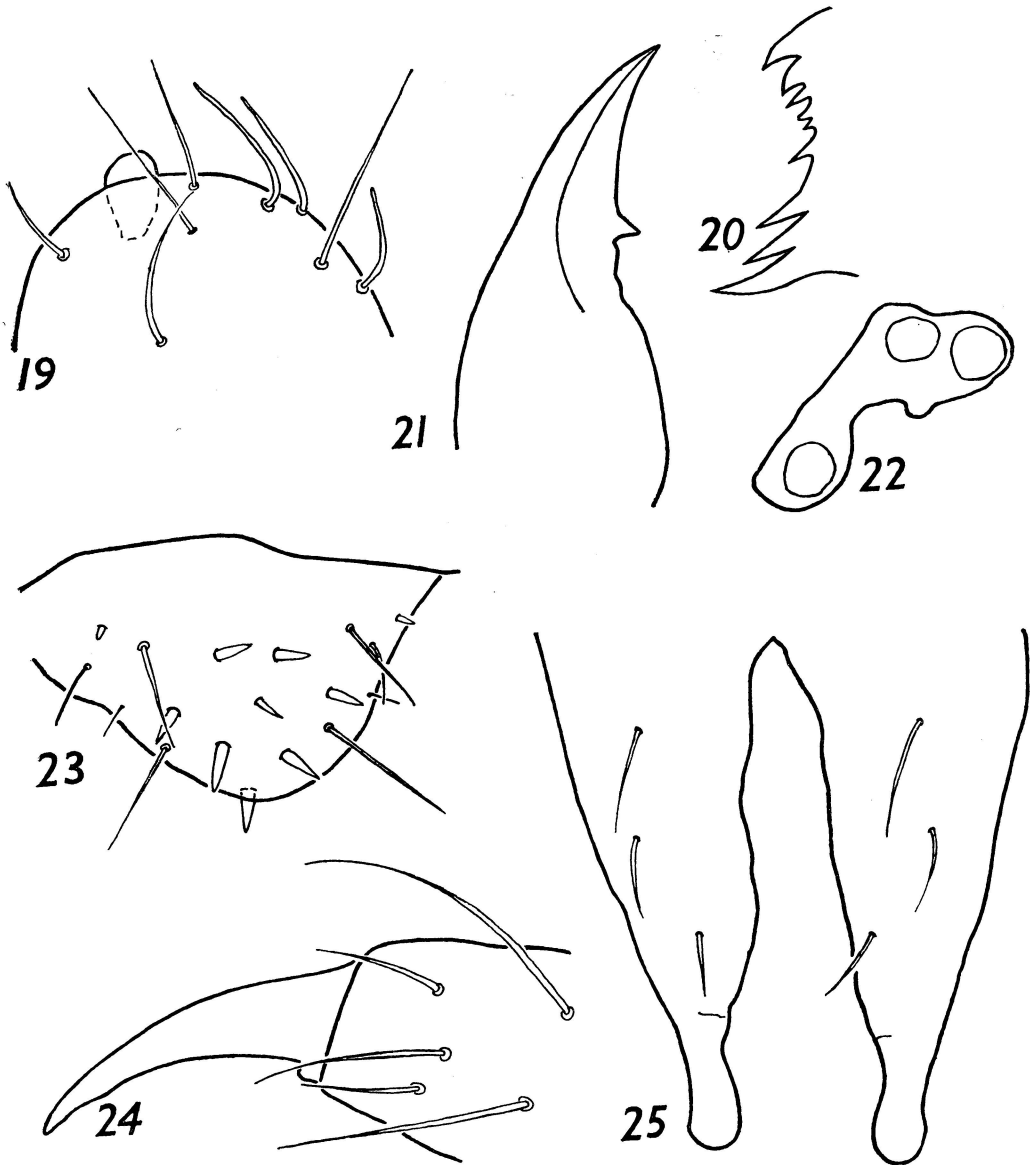


Fig. 19–25. *Friesea tilbrookii* n. sp. 19. Ant. IV. 20. Mandible. 21. Maxilla. 22. Ocelli. 23. Abd. VI, dorsal. 24. Foot. 25. Furcula.

XII.1963, Clagg 47A. Leith & Stromness: 2, moss on drier, III.1961, Jones 75A. Husvik Valley: 1, moss & stones at edge of streams & lake, 27.I.1961, Jones 33A. Right Whale Bay: 1, moss & moss on drier, 3.I.1961, Jones 7A: 1, Black Pt., moss sample, 2.I.1961, Jones 1A. Ocean Hbr. & Hound Bay: 2, moss on drier, 14.I.1961, Jones 12A. Hope Valley, 1, moss on drier, 3.I.1961, Jones 6A. 4, moss, etc., Tilbrook (Brit. Antarc. Surv.)

DISTRIBUTION. Antarctica, S. Orkney Is., S. Sandwich Is., South Georgia Is., Kerguelen Is., Heard I., Macquarie I., Bouvetøya, (? Tasmania).

Remarks. Full synonymic lists and discussion have been given in papers on Antarctic Collembola (Wise 1967; in press).

Cryptopygus subantarcticus Wise, new species Fig. 26–33.

Color: Blue to blue-purple.

Clothing: Short to long setae on head, thorax, and Abd. IV, V (Fig. 26).

Body: Length up to 4 mm. Antennae as in Fig. 26. Sense-organ of Ant. III consisting of 1 sense-rod, 2 sense-clubs (Fig. 27). Postantennal organ elongate-oval (Fig. 28). Ocelli 6 on each side (Fig. 28). Rami of tenaculum each with 4 barbs (Fig. 29).

Legs (Figs. 30, 31): Claw with 2 external lateral teeth, without internal teeth. Unguiculus narrow, more than 1/2 length of claw. Tibiotarsi with 2 strong clavate outer tenant hairs, 1 weak non-tapering non-clavate outer hair, 1 long inner lateral non-clavate tenant hair reaching almost to apex of claw.

Furcula (Fig. 32): Reduced. Dens with 1 anterior, 3 posterior setae. Mucro with 2 teeth (Fig. 33).

SPECIMENS EXAMINED. Holotype (BISHOP 8851), Johan Bay: 23.I.1961, Jones 21A. Paratypes. Moltke Hbr. area: 2, moss on drier, 7.III.1961, Jones 63A: 1, Köppen Pt., rock crevices, 19. II.1961, Jones 62A: 1, The Sphinx, rock crevices nr. beach, 26.II.1961, Jones 60A. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Right Whale Bay: 1, 0–150 m, moss & rocks, 6.XI.1963, Clagg 15. Hope Valley: 2, moss on drier, 3.I.1961, Jones 6A. 1, moss etc., Tilbrook (Brit. Antarct. Surv.)

DISTRIBUTION: South Georgia.

Remarks. This species is characterised by the long setae, particularly the long lateral tenant hair which reaches almost to the tip of the claw. The setation of the dens is similar to that of *C. tasmaniensis* Womersley, 1942, and *C. campbellensis* Wise, 1964, but the tenant hairs of the foot and the shorter mucro distinguishes *subantarcticus* from those two species.

Another species of *Cryptopygus*, *C. cinctus* Wahlgren, 1906, was probably recorded for South Georgia in error (Enderlein, 1912, in Table only; Ringuelet, 1955) but, as it was originally described (Wahlgren, 1906) as a species with long setae on the abdomen, it may have been recorded for specimens of the present species. The shape of the PAO, and the lack of tenant hairs in *cinctus*, clearly separate the 2 species. *C. cinctus* has not been found in the S. Georgia collections so far, and is consequently presumed not to occur in this island group.

Cryptopygus caecus Wahlgren, 1906

Cryptopygus caecus Wahl., 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped.* (1901–1903) 5(9): 3, 12.—Enderlein, 1909, *Deuts. Südpolar-Exped.* (1901–1903) 10(4): 459, 461, 500; 1912, *Küngl. Svensk. Vet.-Akad. Handl.* 48(3): 139, 158; 1930, *Ges. Naturf. Freunde Berlin*: 250.—Davies, 1935, *In Marr, Discovery Repts.* 10: 380.—Tilbrook, 1967, *Phil. Trans. R. Soc. Lond.* (B) 252: 266, 277.—Gressitt, 1967, *Antarc. Res. Ser.* 10: 14.—Wise, 1967, *Antarc. Res. Ser.* 10: 337.

SPECIMENS EXAMINED. SOUTH GEORGIA: Prince Olaf. Hbr. & West Bay: 1, moss on drier, 2.II.1961, Jones 56A. Hestesletten: 1, nr. shore, 3.IV.1961, Jones 71A. Stromness: 1, rotting wood, 21.III.1961, Jones 72A. Grytviken Pen.: 1, King Edward Pt., shoemaker nest, sample, 12–14. XII.1963, Clagg 44A: 1, Cumberland West Bay, gentoo penguin nest, sample 17–21.XI.1963, Clagg 41A. Stromness Pen.: 2, Husvik, 0–150 m, moss sample, 29–30.XII.1963, Clagg 47A: 1, Husvik Hbr., under rocks on beach, 20.XII.1963, Clagg 99A. 1, *Acaena*, Tilbrook (Brit. Antarct. Surv.)

DISTRIBUTION. South Georgia Is., S. Shetland Is., Kerguelen Is., (? South Africa).

Remarks. Full synonymic lists and discussion on distribution have been given in papers on Antarctic Collembola (Wise 1967; in press).

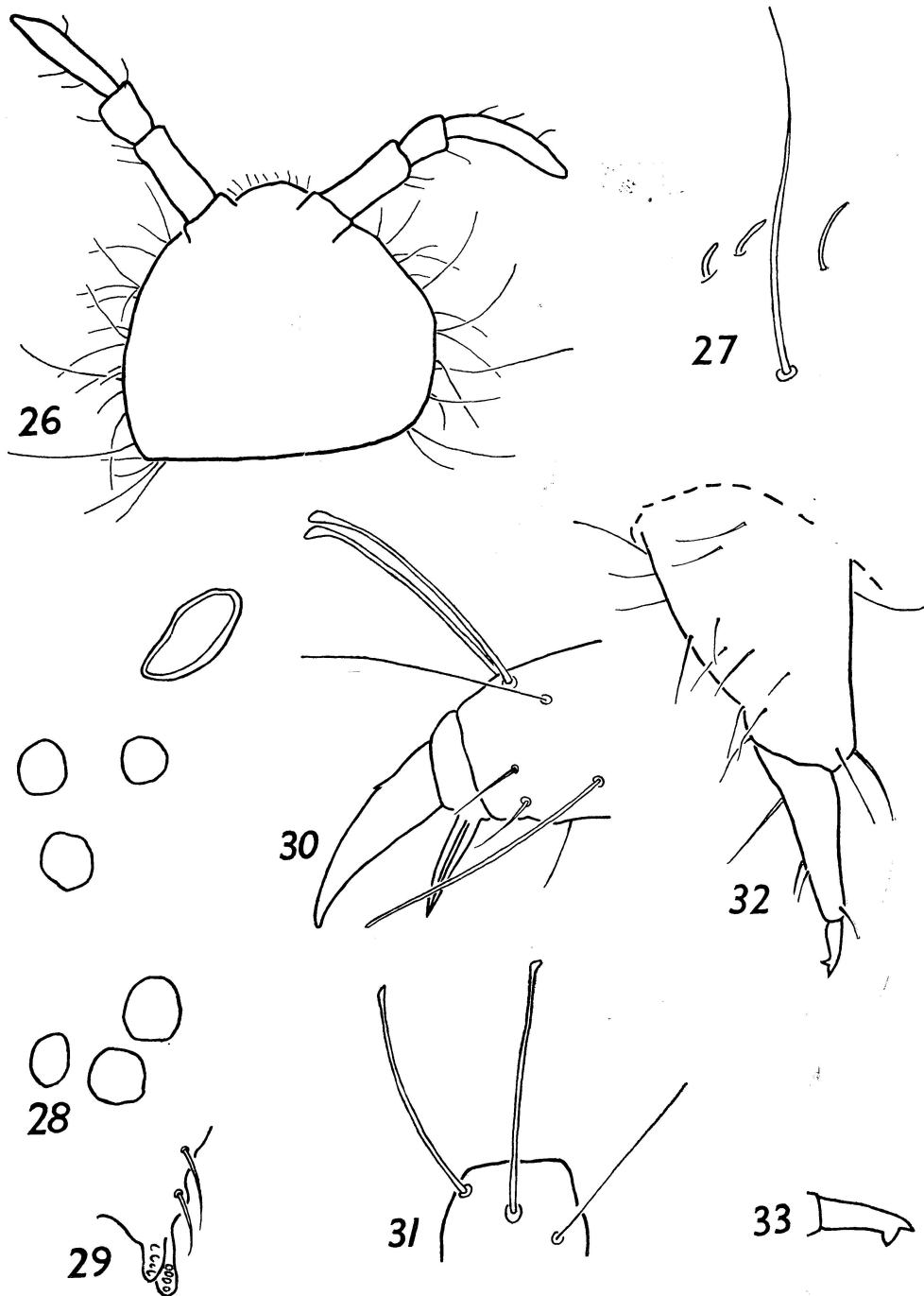


Fig. 26-33. *Cryptopygus subantarcticus* n. sp. 26. Head. 27. Ant. III, apical sense-organ. 28. Post-antennal organ and ocelli. 29. Tenaculum. 30. Posterior foot. 31. Tibiotarsus, outer tenent hairs. 32. Furcula. 33. Mucro.

Subfamily PROISOTOMINAE Stach, 1947

Genus **Parafolsomia** Salmon, 1949**Parafolsomia quadrioculata** Wise, new species Fig. 34-40.

Color: Pale yellow with gray pigmented pattern dorsally.

Clothing: Short simple setae, longer on terminal segment; a distinct posterior transverse row of setae on Th. II, III, Abd. I-IV

Body: Length up to 1.1 mm. Antennae as in Fig. 34. Ant. IV with several sense-rods and apical sense-dome (Fig. 35). Sense-organ of Ant. III with 2 bent sense-clubs and 2 sense-rods (Fig. 36). Postantennal organ large, elongate (Fig. 34, 37). Ocelli 2 on each side (Fig. 37). Rami of tenaculum each with 4 barbs (Fig. 38).

Legs (Fig. 39): Claw without teeth. Unguiculus lanceolate, reaching beyond 1/2 length of claw.

Furcula (Fig. 40): Short, reaching to Abd. II. Dens with some crenulations posteriorly, setae as figured. Mucro with 3 teeth.

SPECIMENS EXAMINED. Holotype (BISHOP 8852), Stromness Pen.: Husvik Valley, dominican gull nest, sample, 21.XII.1963, Clagg 45A. Paratypes: Stromness Pen.: 2, same data as holotype. Moltke Hbr. area: 1, moss on drier, 7.III.1961, Jones 63A. Kelpbugten: 2, old gull's nest, sample, 15.I.1961, Jones 45A. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Ocean Hbr. & Hound Bay: 1, moss on drier, 14.I.1961, Jones 12A.

DISTRIBUTION: South Georgia.

Remarks. This species is distinguished from others in the genus by the presence of 4 ocelli, and 3 teeth on the mucro.

Subfamily ISOTOMINAE Schäffer, 1896

Genus **Sorensia** Salmon, 1949**Sorensia subflava** Salmon, 1949 Fig. 41-48.

Sorensia subflava Sal., 1949, *Cape Exped. Ser. Bull.* **4**: 22-24; 1964, *R. Soc. N. Z. Bull.* **7**: 381. Wise, 1964, *Pacif. Ins. Monogr.* **7**: 191.—Delamare Deboutteville & Massoud, 1966, *CNFRA* **15**(7): 67 (*flava*).

Sorensia dreuxi Delamare Deboutteville & Massoud, 1966, *CNFRA* **15**(7): 67-69. **New synonymy.**

The description and figures of *S. dreuxi* (Delamare Deboutteville & Massoud, 1966) are sufficient to recognize this species but the following are noted for S. Georgia Is., Heard I., and Campbell I. specimens.

Color: White with scattered blue pigment granules dorsally.

Clothing: Short plain setae and long serrate setae on abdominal segments.

Body: Postantennal organ large, elongate (Fig. 41). Ocelli 1 on each side (Fig. 41). Tenaculum with 5 anterior setae (Fig. 42). ♂, ♀ genitalia as in Fig. 43, 44.

Furcula (Fig. 45-48): Long, reaches forward beyond ventral tube. Manubrium with anterior apical spines and toothed chitinized processes as figured, and with 8 or 9 anterior central spines as figured.

SPECIMENS EXAMINED. SOUTH GEORGIA: Prince Olaf Hbr. & West Bay: 1, moss on drier, 2.II.1961, Jones 56A. Husvik: 2, moss on drier, 27.I.1961, Jones 54A. Grytviken Pen.: 1, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 42A: 2, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 44A. Royal Bay: 1, 17.III.1964, Clagg 235A: 1, lower valley, 0-150 m, tussock, 18.III.1964, Clagg 229A. Right Whale Bay: 2, moss & moss on drier, 3.I.1961, Jones 7A. Hope Valley: 3, moss on drier, 3.I.1961, Jones 6A. Bay of Isles: 1, Paul Beach, moss amongst tussock, 22.I.1961, Clagg 30A. 2, moss, Tilbrook: 2, Hestesletten, *Acaena*, Tilbrook. (Brit. Antarc. Surv.),

DISTRIBUTION. South Georgia I (new record), Crozet Is. (new record), Heard I. (new

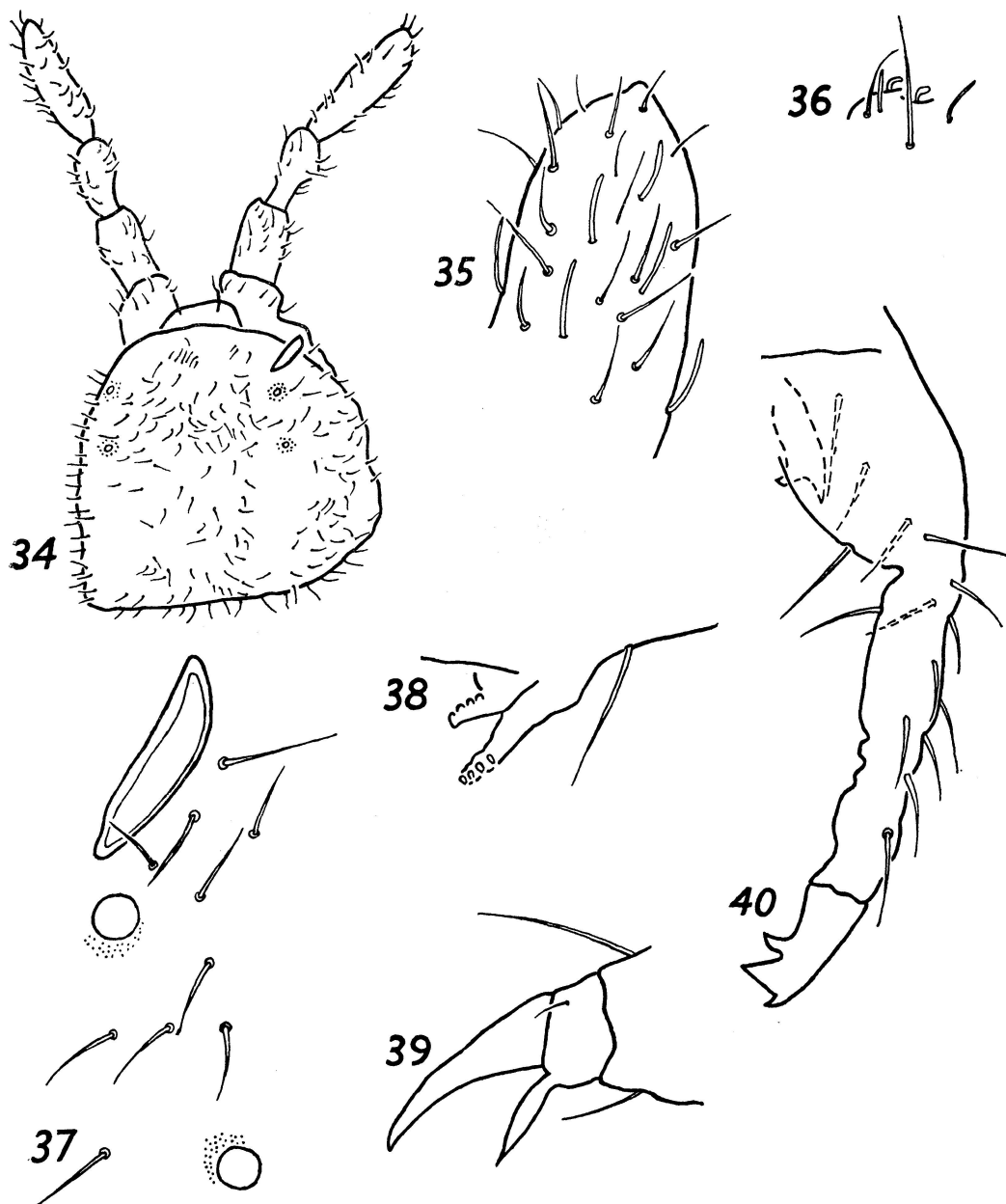


Fig. 34-40. *Parafolsomia quadrioculata* n. sp. 34. Head. 35. Ant. IV. 36. Ant. III, apical sense organ. 37. Postantennal organ and ocelli. 38. Tenaculum. 39. Foot. 40. Dens and mucro.

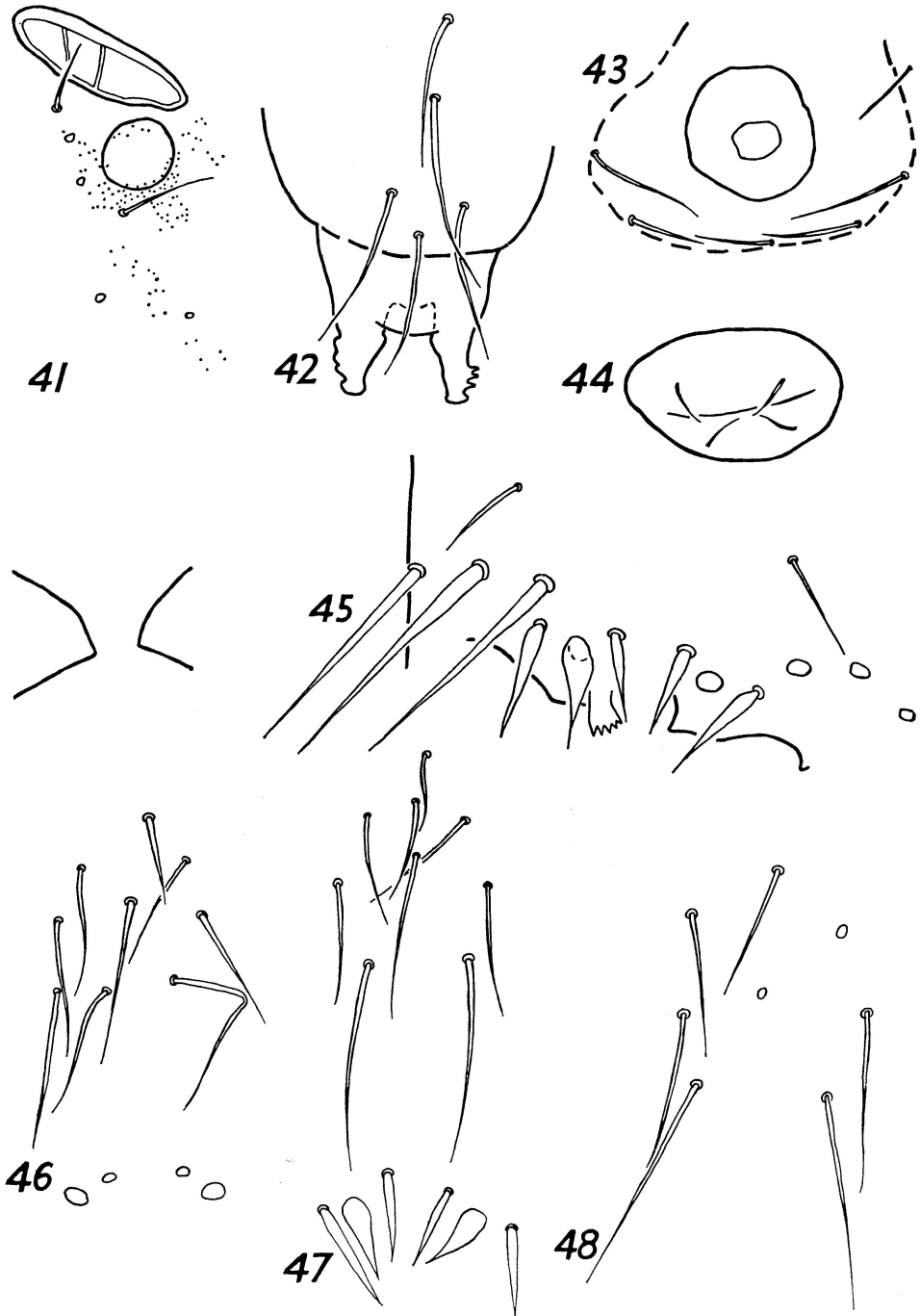


Fig. 41-48. *Sorensia subflava* Salmon, 1949. 41. Postantennal organ and ocellus (South Georgia). 42. Tenaculum (Campbell I.). 43. Genitalia, ♂ (Campbell I.). 44. Genitalia, ♀ (Campbell I.). 45. Apex of manubrium, median and lateral anterior spines (South Georgia). 46. Manubrium, pattern of median apical and 9 central anterior spines (South Georgia). 47. Manubrium, median apical and 9 central anterior spines (Campbell I.). 48. Manubrium, pattern of 8 central anterior spines (Campbell I.).

record), Campbell I., Auckland Is. and also Macquarie I. (new record).

Remarks. The synonymic list above contains a full reference list.

Following the description of *Sorensia dreuxi*, by Delamare Deboutteville & Massoud (1966), from Crozet Is., I have carefully compared their description and figures with specimens of *Sorensia* from South Georgia Is., Heard I. (see concurrent paper on Heard I. Collembola, Wise, in press), and Campbell I. I am certain that the 1 species occurs in all 4 subantarctic island groups.

Neither Salmon (1949) nor Delamare Deboutteville & Massoud (1966) recorded the length of the furcula but in a key by Salmon (1964) *Sorensia* is traced through the part of 1 couplet referring to the furcula only reaching forward to posterior margin of Abd. II. The furcula is actually longer.

The central anterior spines on the manubrium vary between 8 and 9 in ♀ specimens (so the variation is not a secondary sexual character). Most specimens seen, including ♂♂, ♀♀, and a very small immature (1st instar?) have 8 central spines and apical spines as recorded above. This is in contrast to the next species recorded below.

The Brit. Antarc. Surv. specimens were determined by Tilbrook as "White *Isotoma*". Tilbrook determined some other isotomids as "White *Isotoma*?", which have proved to be the following species (see below) and *Parisotoma octooculata*. Presumably, records of "*Isotoma*" sp." on South Georgia (Tilbrook, 1967) include all three species, *Sorensia subflava*, *S. atlantica* n. sp. and *Parisotoma octooculata*.

The species was originally described from Campbell and Auckland Is. (Salmon 1949) and I have seen specimens from Macquarie Island.

***Sorensia atlantica* Wise, new species** Fig. 49-55.

Color: Cream with blue-gray pigmented pattern dorsally.

Clothing: Short to medium length simple setae.

Body: Length up to 1.1 mm. Ant. IV with apical sense-dome and 5 sense-rods (Fig. 49). Sense-organ of Ant. III consisting of 2 sense-clubs (Fig. 50). Postantennal organ large, oval with a cross-connection (Fig. 51). Ocelli 1 each side (Fig. 51). Rami of tenaculum each with 4 barbs, corpus with 2 setae. ♂ genitalia as in Fig. 52. Abd. V, VI, fused.

Legs (Fig. 53): Claw without inner teeth. Unguiculus broad, reaching beyond 1/2 claw. A long lateral lobe on empodium and a strong seta on each side.

Furcula: Manubrium & dens with spines. Manubrium with lateral apical anterior spines but without median apical anterior spines; 15 central anterior spines present (Fig. 54). Mucro with long apical tooth, 1 lateral subapical tooth (Fig. 55).

SPECIMENS EXAMINED. Holotype (BISHOP 8853), Leith & Stromness: 1, moss on drier, III.1961, Jones 75A (Bishop Museum). Paratypes. Husvik & Bay of Isles: 1, moss on drier, I.1961, Jones 55A. Maiviken: 1, moss on drier, 12.II.1961, Jones 53A. Busen Pen.: 1, Jasen Hbr., 0-150 m, tussock, 3.I.1964, Clagg 145A. Grytviken Pen.: 1, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 42A: 1, Cumberland West Bay, gentoo penguin nest, sample, 17-21.XI.1963, Clagg 41A. Stromness Pen.: 1, Husvik, 0-150 m, moss sample, 29-30.XII.1963, Clagg 47A. Other specimens. Husvik & Bay of Isles: 1, moss on drier, I.1961, Jones 55A. Maiviken: 1, moss on drier, 12.II.1961, Jones 53A. Paratypes (Brit. Antarc. Surv.). 3, moss nr. light-mantled sooty albatross nest, Tilbrook.

DISTRIBUTION: South Georgia I.

Remarks. This species is *Sorensia*-like but is without the long serrate setae on abdomen and median apical anterior spines on manubrium, which occur in *S. subflava* Salmon. There appear to be only 2 ocelli and the species is neither *S. minuta* Salmon, 1949, nor *S. anomala* Salmon, 1948, although the PAO is somewhat similar to that of *anomala*.

Together with some specimens of *Parisotoma octooculata*, recorded below, the B. A. S. specimens

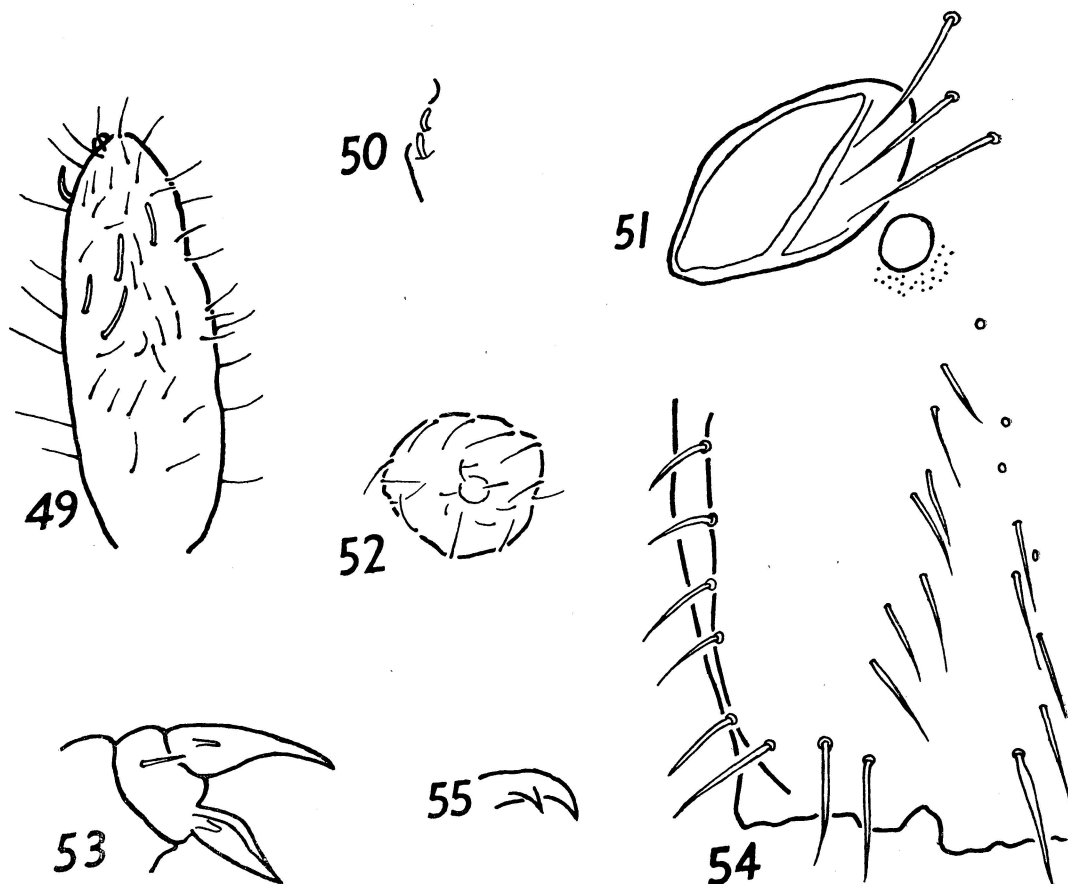


Fig. 49–55. *Sorensia atlantica* n. sp. 49. Ant. IV. 50. Ant. III, apical sense-organ. 51. Postantennal organ and ocellus. 52. Genitalia, ♂. 53. Foot. 54. Manubrium, anterior spines (median and one side). 55. Mucro.

were determined by Tilbrook as “White *Isotoma*?”. Together with *Sorensia subflava* (see above), these two species are presumably included in records of “*Isotoma*’ sp.” by Tilbrook (1967).

Genus *Setocerura* Salmon, 1949

Setocerura georgiana (Schäffer) n. comb. Fig. 56–62.

Isotoma georgiana Schäf., 1891, *Jahrb. Hamb. Wiss. Anst.* **9**: 197–98; 1897, *Ergebn. Hamb. Magalh. Samm.* **2**: 16–18, 41.—Willem, 1902, *Rés. Voy. S. Y. Belgica 1897–1898–1899*, *Rapp. Sci. Zool.*: 15.—Wahlgren, 1906, *Wiss. Ergebn. Schwed. Südpolar-Exped. (1901–1903)* **5**(9): 1, 12, 19.—Enderlein, 1909, *Deuts. Südpolar-Exped. (1901–1903)* **10**(4): 461, 500; 1912, *Küngl. Svenska Vet.-Akad. Handl.* **48**(3): 127, 139, 158.—Schaeffer, Chas., 1914, *Mus. Brooklyn Inst. Arts Sci.; Sci. Bull.* **2**(4): 90.—Enderlein, 1930, *Ges. Naturf. Freunde Berlin*: 250 (*georgiana*).—Tilbrook, 1967, *Phil. Trans. R. Soc. Lond. (B)* **252**: 272, 277, 278.—Wise, 1967, *Antarc. Res. Ser.* **10**: 137.

Color: Gray-blue to blue-black; head, legs, furcula, pale brown.

Clothing: Short and medium length simple setae with much longer serrate setae on abdominal segments.

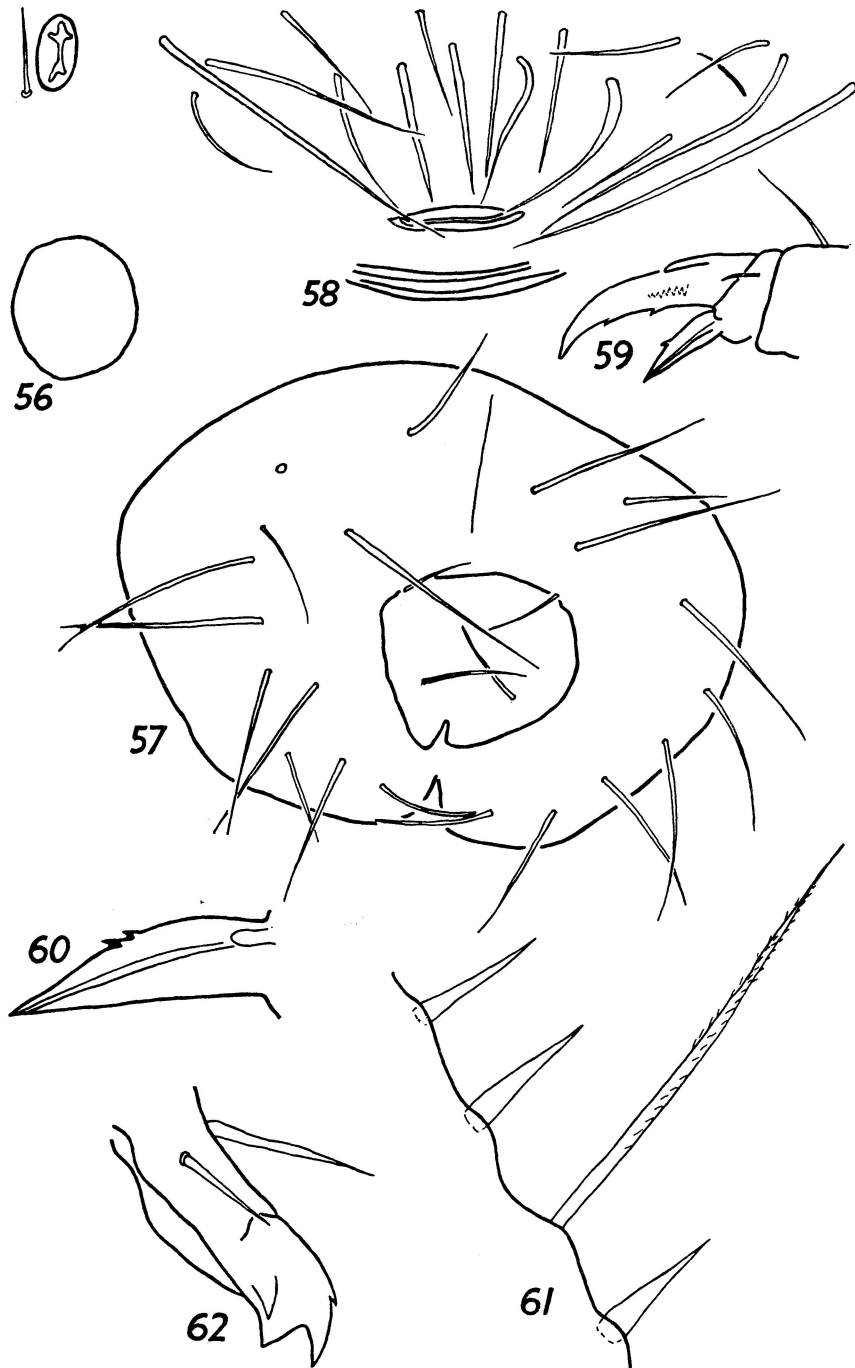


Fig. 56-62. *Setocerura georgiana* (Schäffer, 1891). 56. Postantennal organ and anterior ocellus. 57. Genitalia, ♂. 58. Genitalia, ♀. 59. Foot. 60. Unguiculus. 61. Dens, spines and seta. 62. Mucro and apex of dens.

Body: Length up to 4 mm. Postantennal organ present, oval, with a thick folded or wavy lip (Fig. 56). Ocelli 8. ♂, ♀, genitalia as figured (Fig. 57, 58).

Legs (Fig. 59): Claw with 2 outer lateral teeth, 2 inner teeth, and interior ridging. Unguiculus narrow, with 1 internal tooth, sometimes 2 on posterior feet (Fig. 59, 60); it is possible that ♀♀ have 1 tooth, ♂♂ 2.

Furcula: Dens with long ciliate setae and 2 rows of spines (Fig. 61). Mucro with 4 teeth as figured (Fig. 62).

SPECIMENS EXAMINED. SOUTH GEORGIA: 1, III.1961, Jones 67-2A: 4, 1961, Jones 76A: 3, I.-III.1961, Jones 67-1A. Prince Olaf Hbr. & West Bay: 3, moss on drier, 2.II.1961, Jones 56A. Moltke Hbr.: 1, old German camp, rotting wood, 19.II.1961, Jones 61A: 1, The Sphinx, rock crevices nr. beach, 26.II.1961, Jones 60A. Kelpbugten: 1, old gull's nest, sample, 15.I.1961, Jones 45A: tussock, 14.I.1961, Jones 17A: 1, scree, 15.I.1961, Jones 18A: mosses & rocks nr. waterfall, dry & moist environment, 15.I.1961, Jones 23A. West Cumberland Bay: 1, rock crevices & under stones, 2.II.1961, Jones 57A. Royal Bay: 1, Mt. Krokisius, 366 m, rock crevices, 21.II.1961, Jones 59A: 1, upper valley, 150-300 m, under moss & rocks, 18.III.1964, Clagg 246A: 2, lower valley, 0-150 m, under moss & rocks, 11.III.1964, Clagg 221A: 1, lower valley, stream bank nr. 0 m, *Acaena*, 6.III.1964, Clagg 219A: 17.III.1964, Clagg 235A: 1, lower valley, 0-150 m, tussock, 18.III.1964, Clagg 229A: 1, Recession Valley, 330-450 m, under rocks, 18.III.1964, Clagg 245A: lower valley, 0-150 m, tussock, 6.III.1964, Clagg 227A: 1, lower valley, 150-300 m, under moss & rocks, 18.III.1964, Clagg 238A: Lower valley, 180 m, rotting tussock, grass, 18.III.1964, Clagg 241A. Hestesletten: 1, nr. shore, 3.IV.1961, Jones 71A: 2, under stones on dry ground, 3.IV.1961, Jones 70A. Husvik & Bay of Isles: 2, moss on drier, I.1961, Jones 55A. Maiviken: 1, under stones, 31.I.1961, Jones 39A: 2, moss on drier, 12.II.1961, Jones 43A. Leith & Stromness: 1, moss on drier, III.1961, Jones 75A. Stromness: 1, rotting wood, 21.III.1961, Jones 72A. Stromness Pen.: 1, Husvik Valley, 0-150 m, moss, 21.XII.1963, Clagg 115A: 1, Husvik Valley, 0-150 m, under rocks above reservoir, 21.XII.1963, Clagg 101A: 1, Husvik Hbr., tussock nr. beach, 7.I.1964, Clagg 156A: 1, Husvik, 0-150 m, moss sample, 29-30.XII.1963, Clagg 47A: 1, Husvik Valley, 0-150 m, under rocks in grass, 21.XII.1963, Clagg 95A: 4, Husvik Valley, dominican gull nest, sample, 21.XII.1963, Clagg 45A: 1, Husvik Valley, 0-150 m, pond, hand net trawl, 21.XII.1963, Clagg 98A. Welcome Bay: 1, 0-150 m, moss, 6.XI.1963, Clagg 16. Grytviken Pen.: 1, King Edward Pt.: shoemaker nest, sample, 12-14.XII.1963, Clagg 44A: 2, King Edward Cove, under rocks on beach, 14.XI.1963, Clagg 8A: Cumberland West Bay, 0-150 m, under rocks, 19.XI.1963, Clagg 58: 1, King Edward Cove, rock crevices nr. beach, XI.1963, Clagg 12: Maiviken, tussock nr. beach, 11.XII.1963, Clagg 78A: 1, Cumberland East Bay, light-mantled sooty albatross nest, 24.II.1964, Jones 206A: Brown Mtn., 0-150 m, under rocks in patch of scree, 14.XI.1963, Clagg 34A: King Edward Cove, under rocks nr. beach beneath *Acaena* bank, 14.XI.1963, Clagg 10A: 1, Brown Mtn., 0-150 m, under rocks, 14.XI.1963, Clagg 33. Busen Pen.: 1, Carlita Bay Valley, 0-150 m, under rocks nr. pond, 31.III.1963, Clagg 138A: 1, Jasen Hbr., 240 m, small cave, 1.I.1964, Clagg 142A: Allen Bay Valley, 0-150 m, scree patch, under rocks, 3.I.1964, Clagg 148A. Fortuna Bay: 1, edge of small stream nr. 0 m, moss & *Acaena*, 7.XI.1963, Clagg 23A. Barff Pen.: 1, Ocean Hbr. Valley, 150-300 m, under moss & rocks surrounded by snow, 16.I.1964, Clagg 176A: 1, St. Andrews Bay, 230 m, under rocks on scree next to reindeer trail below Reindeer Pass, 8.II.1964, Clagg 192A: Ocean Hbr. Beach, 0-150m, under moss & rocks, 16.I.1964, Clagg 178A: Jorobihaan, trapnets behind beach, 28.I.1964, Clagg 187A. Right Whale Bay: 1, moss & moss on drier, 3.I.1961, Jones 7A: 1, Black Pt., moss sample, 2.I.1961, Jones 1A. Bay of Isles: moss on shores of pools in corrie, 22.I.1961, Jones 32A: Murphy Wall, moss on scree, 22.I.1961, Jones 31A: 1, Collewick Hubs, mosses, 2.I.1961, Jones 8A: Murphy Wall, moss & rock faces, 22.I.1961, Jones 29A: moss amongst tussock, 22.I.1961, 30A. Husvik: 1, moss banks under

stones & streamsides, 27.I.1961, Jones 37A. Ocean Hbr. & Hound Bay: moss on drier, 14.I.1961, Jones 12A. Ocean Hbr.: mosses, 14.I.1961, Jones 8A. Johan Bay: moss, 23.I.1961, Jones 21A. Bird I.: 1, Clagg BI-45A. 4, *Acaena*, Tilbrook (Brit. Antarc. Surv.)

DISTRIBUTION: South Georgia Is., Tierra del Fuego.

Remarks. This species was recorded in the original description by Schäffer (1891) as being without PAO and with bristles (or setae, "borsten") on the dens but he recorded a PAO later (Schäffer 1897). The PAO is present and there are spines, as well as setae, on the dens. The species is now removed from the genus *Isotoma* and placed in *Setocerura* on account of these two characters. It is separated from New Zealand and Australian species of *Setocerura* by the presence of 2 inner teeth on the claw and the form of the PAO. In other characters it is much like the type species *S. rubenota* (Salmon 1941) and the other New Zealand species *S. maruensis* (Salmon 1941).

Womersley (1934, 1935, 1939) recorded *Isotoma georgiana* from Australia but noted differences in the antennae and PAO between Australian and South Georgia specimens. As Womersley did not record spines on the dens, his specimens are here considered to be *Isotoma* sp. and not *georgiana*.

A full list of references is given in the synonymic list above. Pfeffer (1890) recorded some results from the German expedition, 1882/83. In a list of the Thysanura fauna of South Georgia, he mentioned a blue-black to gray-blue Podurid which springs quickly and high. Pfeffer's color description could refer to all 3 species, *Isotoma georgiana*, *Tullbergia grisea*, and *Anurida steineri*, described by Schäffer (1891) from the same material, but the note concerning springing, which came from the original label, refers to the isotomid, *I. georgiana*, as noted by Schäffer.

Genus **Isotoma** Bourlet, 1839

Isotoma sp. Fig. 63-66.

Color: Gray.

Clothing: Short, simple setae.

Body: Length up to 3 mm. Sense-organ of Ant. III with 2 sense-clubs bent in the same direction (Fig. 63). PAO elongate-oval, longer than diameter of anterior ocellus (Fig. 64). Ocelli 8 on each side.

Legs (Fig. 65): Claw with 2 outer lateral teeth, 1 inner. Unguiculus as figured, 2 inner teeth present.

Furcula: Elongate, with simple setae. Mucro with 4 teeth and basal seta (Fig. 66).

SPECIMENS EXAMINED. Grytviken Pen.: 1, Gull Lake, 0-150 m, under rocks, 4.XII.1963, Clagg 79A: 1, King Edward Pt., nr. 0 m, under paper sack on rotting tussock, 24.II.1964, Clagg 199A: 1, King Edward Cove, under rocks on beach, 14.XI.1963, Clagg 8A.

Remarks. I am not certain of the generic position of this species on account of the form of the mucro. However, lasiotrichia have not been found and there are no spines on the furcula so the species is placed in *Isotoma* for present record purposes.

Genus **Parisotoma** Bagnall, 1940

Parisotoma octooculata (Willem)

Isotoma octo-oculata Will., 1901, *Ann. Soc. Ent. Belge* 45: 262.

SPECIMENS EXAMINED. SOUTH GEORGIA: Grytviken: 1, random sample at whaling station, 7.III.1961, Jones 65A. Maiviken: 1, moss on drier, 12.II.1961, Jones 53A. Royal Bay: 2, Mt. Krokisius, 510 m, under moss & rocks, 2.III.1964, Clagg 212A: 1, Lower valley, 150-300 m, 13.III.1964, Clagg 236A: 1, Lower valley, 0-150 m, under moss & rocks, 11.III.1964, Clagg 221A: 1, 17.III.1964, Clagg 235A. Grytviken Pen.: 3, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 44A: 1, Brown Mtn., 0-150 m, under rocks, 14.XI.1963, Clagg 33. Busen Pen.: 1, Jasen

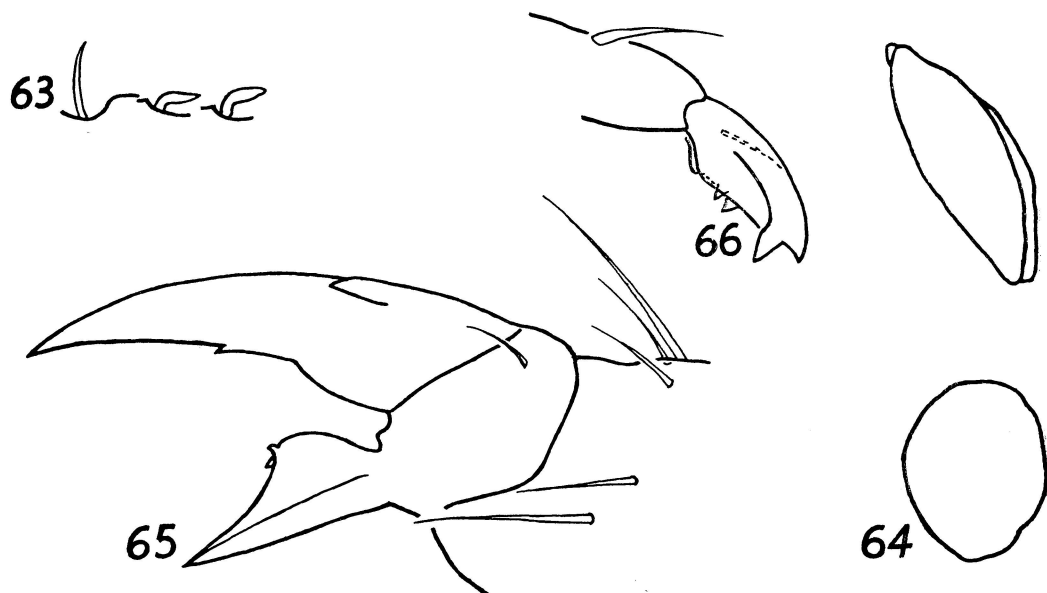


Fig. 63-66. *Isotoma* sp. 63. Ant. III, apical sense-organ. 64. Postantennal organ and anterior ocellus. 65. Foot. 66. Mucro.

Hbr., 240 m, small cave, 1.I.1964, Clagg 142A. Right Whale Bay: 1, moss & moss on drier, 3.I.1961, Jones 7A. Husvik Valley: 1, under stones & rock crevices by stream, 27.I.1961, Jones 35A. Ocean Hbr. & Hound Bay: 1, moss on drier, 14.I.1961, Jones 12A. 3, moss nr. light-mantled sooty albatross nest, Tilbrook. (Brit. Antarc. Surv.)

DISTRIBUTION. South Georgia Is. (new record), Antarctica, S. Orkney Is., Kerguelen Is., Heard I., Macquarie I., Auckland Is., Campbell I.

Remarks. Full synonymic lists and discussion have been given in papers on Antarctic Collembola (Wise 1967; in press). Together with some specimens of *Sorensia atlantica*, recorded above, the B.A.S. specimens were determined by Tilbrook as "White *Isotoma*?". Together with *Sorensia subflava* (see above), these two species were presumably included in records of "*Isotoma*' sp." by Tilbrook (1967).

Family SMINTHURIDAE Lubbock, 1862

species Fig. 67-69.

Color: Pale (not blue).

Clothing: Medium to long simple setae; 3 bothriotrichia on each side of anterior 1/2 of globular body segment.

Body: Ant. IV with 7 subdivisions (Fig. 67). Ant. III without basal sense-organ (Fig. 67).

Legs (Fig. 68): Claw with inner tooth. Unguiculus narrow. Tibiotarsi with 3 clavate tenant hairs.

Furcula: Dens with 26 simple setae; 7 anterior, 19 posterior & lateral. Mucro with similar crenulate lamellae; no basal setae (Fig. 69).

SPECIMENS EXAMINED. Bay of Isles: 1, Collewick Hubs, mosses, 2.I.1961, Jones 8A.

Remarks. This specimen has not yet been determined but it is obviously of a species distinct from the following species (see below).

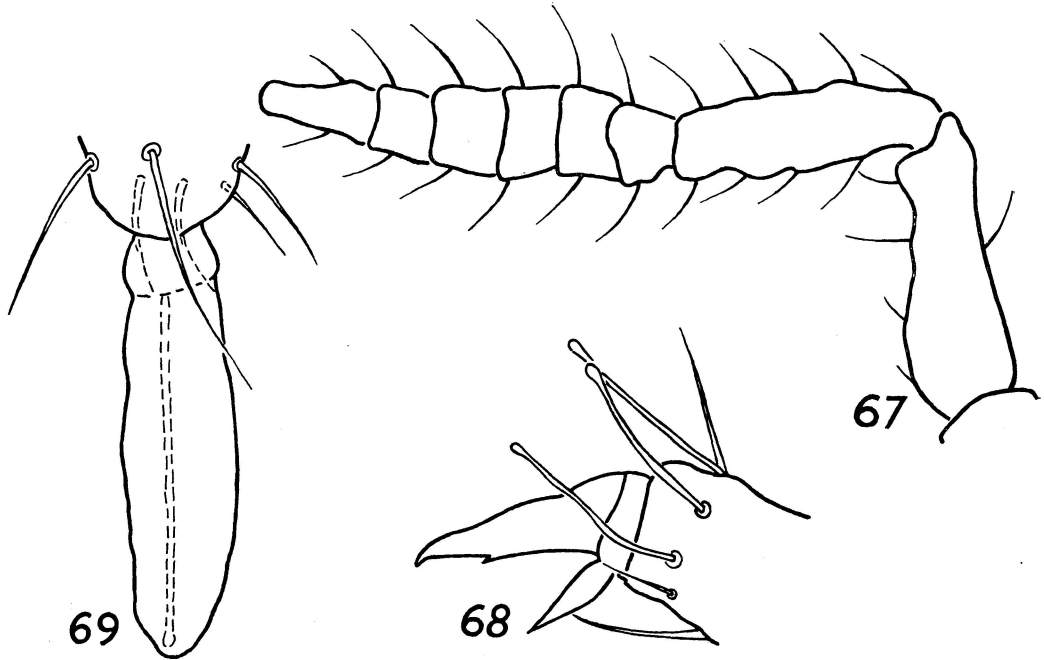


Fig. 67-69. Sminthuridae sp. 67. Ant. III, IV. 68. Foot. 69. Mucro and apex of dens.

Subfamily SMINTHURINAE Börner, 1906

Tribe *Katiainini* Börner, 1913

Genus **Sminthurinus** Börner, 1901

Sminthurinus jonesi Wise, new species Fig. 70-77.

Color: Blue.

Clothing: Short simple setae.

Body: Length up to 1.5 mm. Ant. IV with apical lobe and senserods (Fig. 70). Ant. III with 2 apical sense-rods and basal peg-like sense-organ (Fig. 71). Mandible and maxilla as figured (Fig. 72-73). Ocular area as figured (Fig. 74).

Legs (Fig. 75): Claw with inner tooth a little beyond 1/2; 1 pair of outer lateral teeth at 1/4. Unguiculus with 1 tooth and elongate apical appendage. Tibiotarsi with 1 clavate tenant hair.

Furcula: Dens with 11 spines, each strongly dilate basally, and a few simple setae as in Fig. 76. Mucro with 1 lamella crenulate (Fig. 77).

SPECIMENS EXAMINED. Holotype (BISHOP 8854), Busen Pen.: The Crutch, 0-150 m, under rocks on scree patch, 3.I.1964, Clagg 140A (Bishop Museum). Paratypes. Moltke Hbr.: 2, old German camp, rotting wood, 19.II.1961, Jones 61A: 1, Köppen Pt., rock crevices, 19.II.1961, Jones 62A. Olsen Valley: 1, scree slope E. side, under rocks amongst vegetation, 17.III.1961, Jones 68A. Grytviken Pen.: 1, Brown Mtn., 0-150 m, under rocks in scree patch, 14.XI.1963, Jones 34A. Husvik Valley: 1, under stones & in rock crevices by stream, 27.I.1961, Jones 35A. Bay of Isles: 1, Collewick Hubs, mosses, 2.I.1961, Jones 8A. Other specimens. 1, I.-III.1961, Jones 67-2A. Prince Olaf Hbr. & West Bay: 1, moss on drier, 2.II.1961, Jones 56A. Husvik: 1, moss on drier, 27.I.1961, Jones 54A: 1, above Husvik reservoir stream, 79 m, under stones on barren soil & scree, 27.I.1961, Jones 36A.

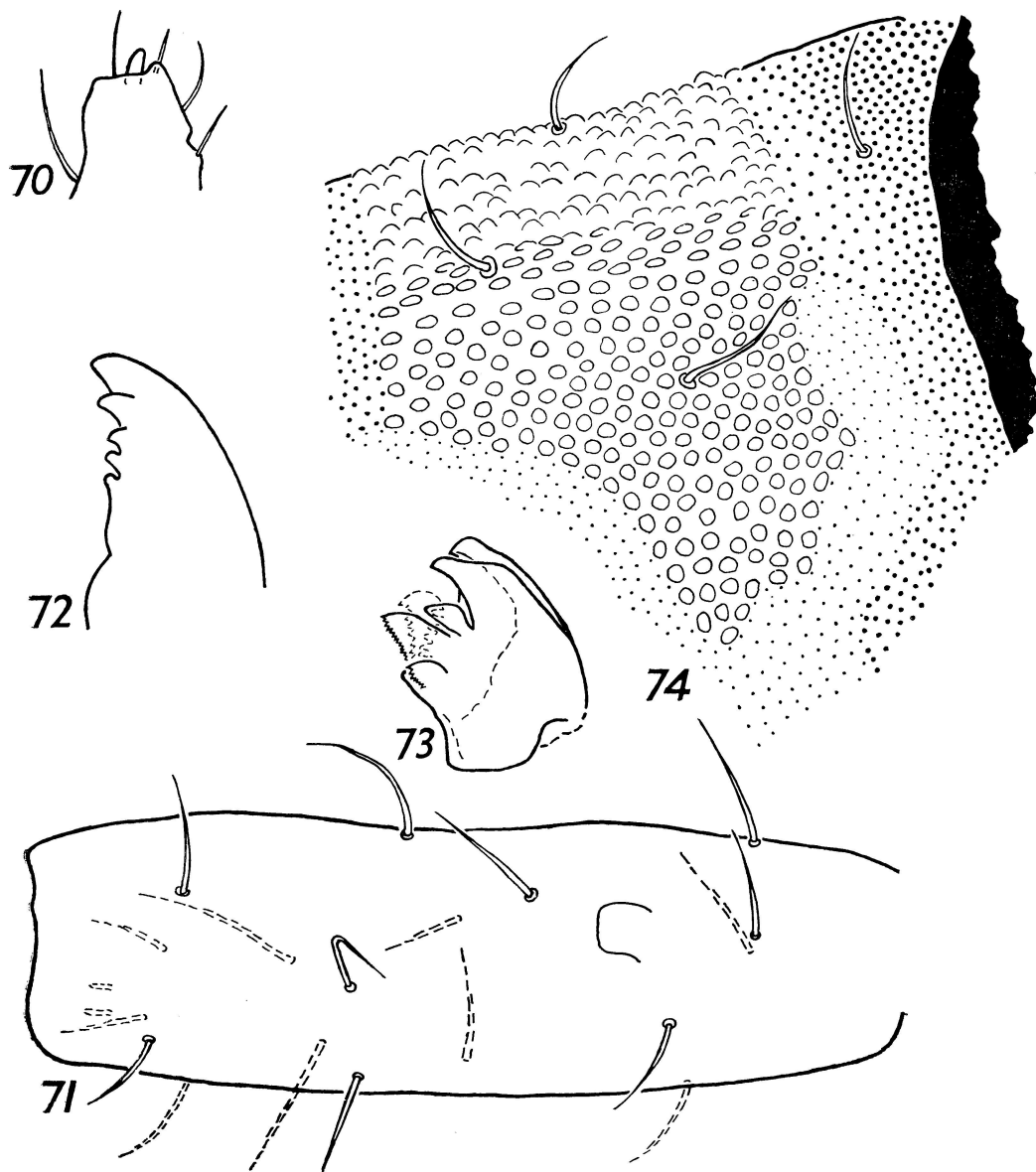


Fig. 70-74. *Sminthurinus jonesi* n. sp. 70. Ant. IV. 71. Ant. III. 72. Mandible. 73. Maxilla. 74. Ocular area.

Hestesletten: 1, under stones on dry ground, 3.IV.1961, Jones 70A. Maiviken: 2, moss on drier, 12. II.1961, Jones 53A. Grytviken Pen.: 2, King Edward Pt., shoemaker nest, sample, 12-14.XII.1963, Clagg 42A: Brown Mtn., 0-150 m, under rocks, 14.XI.1963, Jones 33. Stromness Pen.: 1, Husvik, 0-150 m, moss sample, 29-30.XII.1963, Clagg 47A: Husvik Hbr., under rocks on beach, 20.XII. 1963, Clagg 99A: Husvik Valley, dominican gull nest, sample, 21.XII.1963, Clagg 45A. Busen Pen.:

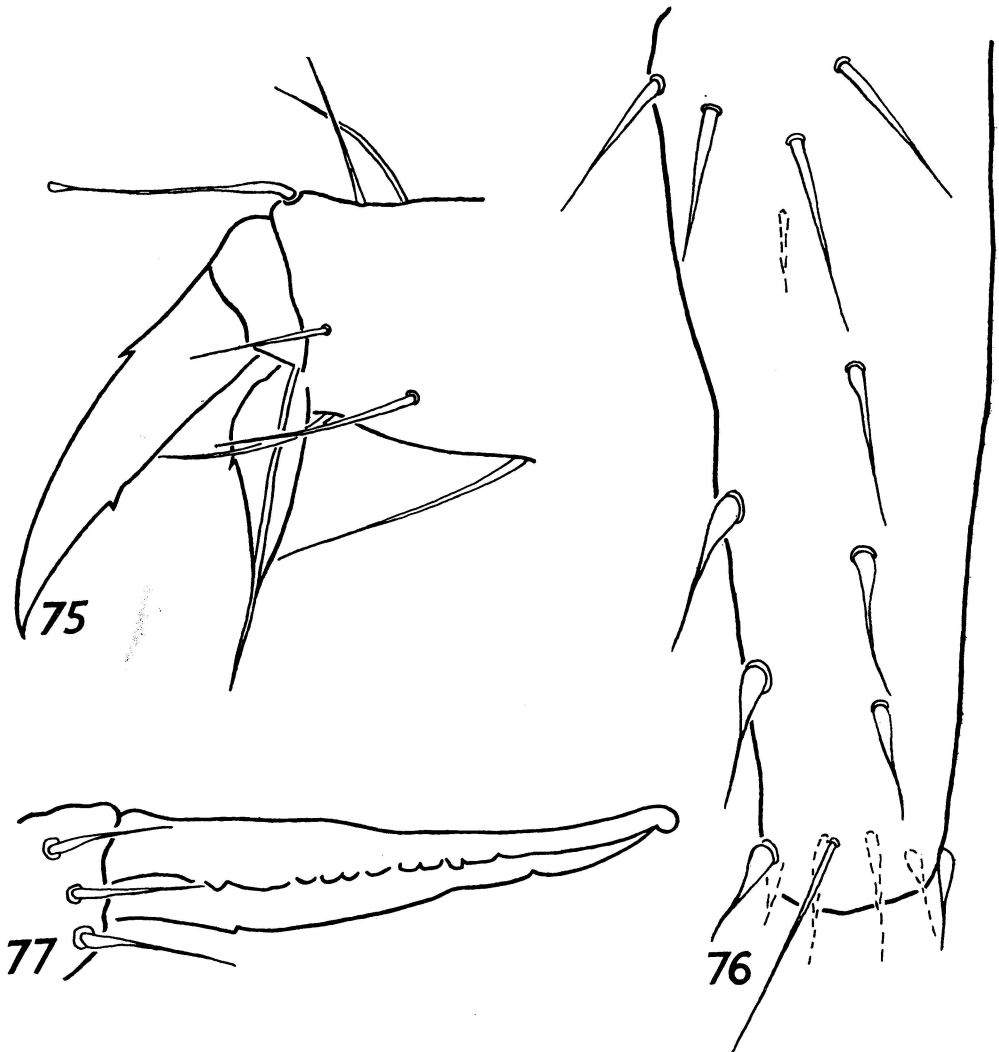


Fig. 75-77. *Sminthurinus jonesi* n. sp. 75. Foot. 76. Dens. 77. Mucro.

Olsen Valley, 180-210 m, under rocks on scree, 21.XII.1963, Clagg 103A. Paratype. 1, Hestesletten, *Acaena*, Tilbrook. Other specimens. 1, Hestesletten, *Acaena*, Tilbrook (Brit. Antarc. Surv.)

DISTRIBUTION: South Georgia.

Remarks. This species appears to be closest to *S. tuberculatus* Delamare DeBoutteville & Massoud, 1963 (of Argentina), particularly in the setation of the dens; but it is separated from that species by the presence of only 1 clavate tenant hair on each foot and a tooth on the unguiculus.

Tilbrook (1967) recorded this species for South Georgia as "*Sminthuridae* gen. et sp." and "*Sminthuridae* sp."

The species is named for N. V. Jones who collected much of the material in the South Georgia collections.

DISCUSSION

There are now 17 species, of 13 genera, known from South Georgia Is. Endemic species are *Xenylla claggi* n. sp., *Setanodosa steineni*, *Friesea tilbrooki* n. sp., *Cryptopygus subantarcticus* n. sp., *Parafolsomia quadrioculata* n. sp., *Sorensia atlantica* n. sp., *Isotoma* sp. (?), *Sminthuridae* sp. (?), *Sminthurinus jonesi* n. sp.

Hypogastrura viatica is cosmopolitan and *Xenylla claggi* is closely related to the widespread northern hemisphere species *X. humicola*. *Tullbergia bisetosa* and *Sorensia subflava* are widespread in the subantarctic islands; *Cryptopygus antarcticus*, *Cryptopygus caecus*, *Parisotoma octooculata*, *Hypogastrura viatica*, are widespread in subantarctic islands and Antarctica; *Friesea grisea* is widespread in Antarctica. *Friesea tilbrooki* and *Cryptopygus subantarcticus* are closely related to other subantarctic species. *Tullbergia bisetosa* and *Setocerura georgiana* are recorded from Tierra del Fuego. *Setanodosa steineni* and *Sminthurinus jonesi* are both clearly related to species recorded in Argentina but which, as far as I can make out from the records, occur in the Andes Mtns., so there could be an ecological relationship (cold climate), such as there is between species of subantarctic islands including Tierra del Fuego.

It is possible that some of the fauna of South Georgia Is. results from drift from South America and Tierra del Fuego either direct or via Falkland Is. and from Antarctica either direct or via South Orkney—S. Sandwich Is. Thorough collection and revision of the Falkland Is. fauna is needed for further information on South America—South Georgia relationships.

ECOLOGY

There have been whaling stations on South Georgia for many years but it is not known to me whether they, or other habitation, have had any influence on the fauna, such as has been suggested for Macquarie I. (Womersley 1937) and Campbell I. (Wise, 1964).

The Collembola examined so far are associated as follows.

Beaches and shore rocks: *Friesea tilbrooki*, *Xenylla claggi*, *Cryptopygus caecus*, *Sminthurinus jonesi*. 0–150 m (including collections where altitude not stated): Moss. *Tullbergia bisetosa*, *Xenylla claggi*, *Hypogastrura viatica*, *Setanodosa steineni*, *Friesea grisea*, *Cryptopygus antarcticus*, *C. subantarcticus*, *C. caecus*, *Parafolsomia quadrioculata*, *Sorensia subflava*, *Sorensia atlantica*, *Setocerura georgiana*, *Parisotoma octooculata*, *Sminthuridae* sp., *Sminthurinus jonesi*. Tussock & Acaena. *Tullbergia bisetosa*, *Xenylla claggi*, *Setanodosa steineni*, *Cryptopygus caecus*, *Sorensia subflava*, *S. atlantica*, *Setocerura georgiana*, *Isotoma* sp., *Sminthurinus jonesi*. Rotting wood. *Setanodosa steineni*, *Friesea grisea*, *Cryptopygus caecus*, *Setocerura georgiana*, *Sminthurinus jonesi*. Under stones & rocks and in rock crevices. *Tullbergia bisetosa*, *Xenylla claggi*, *Hypogastrura viatica*, *Setanodosa steineni*, *Cryptopygus antarcticus*, *C. subantarcticus*, *C. caecus*, *Setocerura georgiana*, *Isotoma* sp., *Parisotoma octooculata*, *Sminthurinus jonesi*. On pond and reservoir. *Friesea grisea*, *Setocerura georgiana*. Shoemaker nest (*Procellaria aequinoctialis*). *Tullbergia bisetosa*, *Setanodosa steineni*, *Cryptopygus antarcticus*, *C. caecus*, *Sorensia subflava*, *S. atlantica*, *Setocerura georgiana*, *Parisotoma octooculata*, *Sminthurinus jonesi*. Dominican gull nest (*Larus dominicanus*). *Tullbergia bisetosa*, *Setanodosa steineni*, *Cryptopygus antarcticus*, *Parafolsomia quadrioculata*, *Setocerura georgiana*, *Sminthurinus jonesi*. Light-mantled sooty albatross nest (*Phoebetria palpebrata*). *Tullbergia bisetosa*, *Setocerura georgiana*. Gentoo penguin nest (*Pygoscelis papua*). *Cryptopygus antarcticus*, *Cryptopygus caecus*, *Sorensia atlantica*. Giant petrel nest (*Macronectes giganteus*). *Tullbergia bisetosa*.

Above 150 m: Under moss & rocks 150–300 m. *Setanodosa steineni*, *Setocerura georgiana*, *Parisotoma octooculata*. Tussock 180 m. *Setocerura georgiana*, Under rocks on scree 180–230 m. *Setocerura georgiana*, *Sminthurinus jonesi*. Small cave 240 m. *Setocerura georgiana*, *Parisotoma octooculata*. Under rocks 300–450 m. *Setocerura georgiana*. Rock crevices 366 m. *Setocerura georgiana*. Under moss &

rocks 510 m. *Parisotoma octooculata*.

Friesea tilbrooki is the only species confined to the supralittoral but *Xenylla claggi* appears to have been collected on or near the beach. There are no semiaquatic species, and no species confined to bird's nests. Although not confined to one habitat, *Isotoma* sp. has only been taken from Grytviken Pen. *Setocerura georgiana* is the most common springtail in the collections, it has been taken in almost all habitats above the shore and is the most common species taken above 150 m, but its large size and active habits may account to some extent for it being taken more frequently than other species. *S. georgiana* and *Parisotoma octooculata* were the only species taken above 300 m.

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