

# Pteridophyta of the Southern Cook Group<sup>1</sup>

G. BROWNIE<sup>2</sup> AND W. R. PHILIPSON<sup>2</sup>

THE FERN FLORA of Rarotonga was exhaustively collected as long ago as 1899 by the New Zealand botanist T. F. Cheeseman (1903). A second comprehensive account appeared almost 30 years later (Wilder, 1931), and a less complete collection of ferns by Harold E. and Susan Thew Parks was reported on by Copeland (1931). Several other visitors to the island have collected ferns, Armstrong (date unknown), B. B. Given, and Mrs. Hynes each twice during the 1960s and Stoddart in 1969. The most recent collection is that made by one of us (W. R. Philipson, 1969) on the expedition organized by the Royal Society of New Zealand to commemorate Captain Cook's early explorations.

Taxonomic and nomenclatural changes since Cheeseman's period require several modifications to his list, but it is a tribute to his thoroughness that few Pteridophytes have subsequently been added to the flora of Rarotonga. This statement is in direct conflict with that of Wilder, who claimed to have added 36 ferns to the island's flora. This discrepancy is due to his failure to correlate the names applied to his collection with those used by Cheeseman. The list published by Copeland was to have been mainly additions, but in fact most of these can be matched with Cheeseman's names.

The purpose of the present list, therefore, is twofold. First, all published records are correlated and unified into a comprehensive list. Second, records from several of the other islands of the Southern Cook Group are added. The collections on which these records are based are as follows:

Aitutaki—Ramsay, 1965; Stoddart, 1969  
Atiu—Ramsay, 1965; Philipson, 1969;  
Katu, 1970  
Mangaia—Graham (date unknown, but

probably between 1910 and 1920);  
Ramsay, 1965  
Manuae—Ramsay, 1965  
Mauke—Katu, 1970  
Mitiaro—Ramsay, 1965  
Palmerston—Ramsay, 1965

No attempt has been made to write a definitive work, some of the species which are obviously South Pacific complexes in need of revision being listed under the most familiar names in quotation marks. Many of the collectors concerned did not use any collection numbers, and these specimens are listed with the accession numbers of the herbaria in which they are located.<sup>3</sup>

## SPECIES LIST

### PSILOACEAE

*Psilotum nudum* (L.) P.B.; *Psilotum triquetrum* Sw. Cheesem. 312, 1903; *Psilotum complanatum* auct. Cheesem. 312, 1903 (non Sw.)

Aitutaki—Stoddart 2332 (CHR)  
Atiu—Ramsay (CHR 170609-10)  
Manuae—Ramsay (CHR 170606-8)  
Mauke—Katu 0010 (CHR)  
Mitiaro—Ramsay (CHR 170611-3)  
Palmerston—Ramsay (CHR 170614)  
Rarotonga—Cheeseman (AK 111175-81, 1111221), Given (CHR 193194), Philipson 10135, 10139, 10291, 10449 (CHR).

The specimen identified by Cheeseman as *P. complanatum* is not at all flattened, and is simply *P. nudum* less branched than the most common form.

### LYCOPODIACEAE

*Lycopodium carinatum* Desv.

Rarotonga—Given (CHR 205422), Wilder 1093 (BISH)

<sup>1</sup> Manuscript received February 26, 1970.

<sup>2</sup> University of Canterbury, Botany Department, Christchurch, New Zealand.

<sup>3</sup> Abbreviations of herbaria are taken from "Index Herbariorum," Part 1, *The Herbaria of the World*, 5th ed., compiled by J. Lanjouw and F. A. Stafleu (Utrecht, Netherlands, 1964).

*Lycopodium cernuum* L.

Rarotonga—Cheeseman (AK 110829-30, 110832), Hynes (AK 116186, CHR 177613), Philipson 10292 (CHR), Wilder 1102 (BISH)

*Lycopodium phlegmaria* L.

Rarotonga—Cheeseman (AK 111087-9), Hynes (AK 107128), Philipson 10283 (CHR), Wilder 1100 (BISH)

*Lycopodium squarrosus* Forst.

Rarotonga—Cheeseman (AK 111112-20), Given (CHR 205441), Hynes (AK 107163, CHR 177615 A, B), Philipson 10270 (CHR), Wilder 1095, 1099 (BISH)

## OPHIOGLOSSACEAE

*Ophioglossum pendulum* L. subsp. *falcatum* (Pr.) Clausen; *Ophioglossum pendulum* L. Cheesem. 312, 1903; Wilder 7, 1931

Atiu—Katu 0018 (CHR)

Rarotonga—Cheeseman (AK 111300-2), Given (CHR 205419), Philipson 10125 (CHR), Wilder 1107 (BISH)

*Ophioglossum nudicaule* L.

Rarotonga—Cheeseman (AK 111312-3)

## MARATTIACEAE

*Angiopteris longifolia* Grev. et Hk.; *Angiopteris evecta* auct. Cheesem. 311, 1903 non (Forst.) Hoffm.

Mangaia—Graham 18 (BISH)

Rarotonga—Cheeseman (AK 111241 p.p., 111242-4), Given (CHR 205401, 205444), Hynes (AK 107169, CHR 177899), Wilder 1077 (BISH)

*Marattia salicina* J. Sm.

Rarotonga—Cheeseman (AK 111241 p.p.), Given (CHR 205425), Philipson 10211 (CHR)

## SCHIZAEACEAE

*Schizaea dichotoma* (L.) J. Sm.

Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 111360-1), Given

(CHR 205423), Hynes (AK 107143-4, CHR 177608 A, B), Parks 22118 (BISH), Philipson 10138 (CHR), Ramsay (CHR 170655), Wilder 1103 (BISH)

## GLEICHENIACEAE

*Dicranopteris linearis* (Burm.) Und.; *Gleichenia dichotoma* Sw. in Cheesem. 306, 1903; *Gleichenia linearis* (Burm.) Clarke in Wilder 7, 1931

Atiu—Katu 0116 (CHR), Ramsay (CHR 170601-2)

Mangaia—Graham 1 (BISH)

Manuae—Ramsay (CHR 170603-5)

Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 111610-2), Given (CHR 205416), Hynes (AK 116214, CHR 177893), Philipson 10436 (CHR), Wilder 1122 (BISH)

## CYATHEACEAE

*Cyathea affinis* (Forst.) Sw.; *Cyathea* sp. Cheesem. 306, 1903; Wilder 8, 1931

Rarotonga—Cheeseman (AK 112388-9), Philipson 10431, 10434 (CHR), Wilder 1087 (BISH)

*Cyathea decurrens* (Hk.) Copel.; *Alsophila decurrens* Hk. in Cheesem. 306, 1903

Rarotonga—Cheeseman (AK 112357-8), Given (CHR 193196 A, B), Parks 22328 (BISH), Philipson 10182 (CHR), Wilder 1088 (BISH)

*Cyathea parksiae* Copel.; *Cyathea milnei* auct. Cheesem. 306, 1903 (non Hk.)

Rarotonga—Cheeseman (AK 112357-8), Philipson 10277, 10433 (CHR), Wilder 1089 (BISH)

## HYMENOPHYLLACEAE

*Hymenophyllum involucreatum* Copel.; *Hymenophyllum polyanthos* auct. Cheesem. 306, 1903 (non Sw.)

Rarotonga—Cheeseman (AK 111462-3), Hynes (AK 116208-9), Parks 22134 (BISH), Philipson 10265, 10295, 10296, 10377, 10378, 10426 (CHR)

Despite Copeland's claim that this may be a

relative of *H. rarum* R. Br., it appears to be probably no more than a local form of the widespread *H. polyanthos*. It is the only species of the genus so far noted in Rarotonga, and all collections are uniform in character.

*Trichomanes apiifolium* Pr.; *Trichomanes bauerianum* auct. Wilder 8, 1931 (non Endl.)

Rarotonga—Cheeseman (AK 111502-4, 111508-9, 111511-2, 111514, 111517-8), Parks 22032 (BISH)

*Trichomanes bipunctatum* Poir.; *Trichomanes filicaule* Bory in Cheesem. 306, 1903

Rarotonga—Cheeseman (AK 111405-7), Given (CHR 205439), Hynes (AK 116205-7), Philipson 10195, 10285 (CHR), Tilden (AK 111461, 114293)

*Trichomanes dentatum* v.d.B.; *Trichomanes rigidum* auct. Cheesem. 306, 1903 (non Sw.)

Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 111481-5), Given (CHR 205438), Hynes (AK 107131-2, CHR 177614 A, B), Parks 22237 (BISH), Philipson 10127, 10428 (CHR), Wilder 1121 (BISH)

*Trichomanes humile* Forst.

Rarotonga—Given (CHR 205437), Parks 22199 (BISH), Philipson 10286 (CHR), Tilden (AK 111410)

*Trichomanes taeniatum* Copel.; *Trichomanes digitatum* auct. Cheesem. 306, 1903 (non Sw.)

Rarotonga—Cheeseman (AK 111457)

This species has apparently been recorded only once, and Cheeseman's specimen accords competely with *T. taeniatum* of the Society Islands (Copel. 161, 1933)

*Trichomanes tabitense* Nad.; *Trichomanes omphalodes* (Vieill.) C. Chr. in Copel. 375, 1931

Rarotonga—Parks 22516 (BISH)

#### DENNSTAEDTIACEAE

*Microlepia speluncae* (L.) Moore; *Davallia speluncae* Baker in Cheesem. 307, 1901

Rarotonga—Cheeseman (AK 111703-4), Given (CHR 205410, 205449-50), Parks 22229 (BISH), Wilder 1118 (BISH)

*Histiopteris incisa* (Thbg.) Sm.; *Pteris incisa* Thunb. in Cheesem. 307, 1903

Rarotonga—Cheeseman (AK 111793-7), Philipson 10297 (CHR)

*Hypolepis tenuifolia* (Forst.) Bernh.

Rarotonga—Cheeseman (AK 111832-5), Parks 22572 (BISH)

#### LINDSAEACEAE

*Sphenomeris chinensis* (L.) Maxon; *Davallia tenuifolia* Sw. in Cheesem. 307, 1903; *Sphenomeris chusana* (L.) Copel. in Wilder 13, 1931

Rarotonga—Cheeseman (AK 112136-7), Given (CHR 205432), Hynes (AK 107134-5, 117481), Parks 22236 (BISH), Philipson 10108, 10263, 10446 (CHR)

*Lindsaea propinqua* Hk.; *Lindsaea lobata* auct. Cheesem. 307, 1903 (non Poir); *Lindsaea decomposita* auct. Wilder 12, 1931 (non Willd.)

Rarotonga—Cheeseman (AK 111658-9), Parks 22296 (BISH), Philipson 10430 (CHR), Wilder 1127 (BISH)

*Lindsaea repens* (Bory) Thwaites var. *marquesensis* E. Brown; *Davallia repens* Desv. in Cheesem. 307, 1903; *Lindsaea macraeana* auct. Wilder 12, 1931 (non Hk. and Arn.) Copel.)

Rarotonga—Cheeseman (AK 111647-9), Parks 22306, 22538 (BISH), Philipson 10375 (CHR), Wilder 1097 (BISH)

#### DAVALLIACEAE

*Davallia epiphylla* (Forst.) Spr.; *Davallia elegans* Sw. in Cheesem. 307, 1903

Atiu—Philipson 10496 (CHR), Ramsay (CHR 170656, 170661-2)

Rarotonga—Cheeseman (AK 112142-3, 112145-6, 112153, 112163), Given (CHR 205412), Philipson 10455 (CHR)

*Davallia solida* (Forst.) Sw.

- Atiu—Philipson 10494 (CHR), Ramsay (CHR 170615-9)  
 Mangaia—Graham 6 (BISH), Ramsay (CHR 170625-6)  
 Manuae—Ramsay (CHR 170621-4)  
 Mauke—Katu 0018, 0045 (CHR)  
 Mitiaro—Ramsay (CHR 170620)  
 Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 112188-94), Given (CHR 205408, 205420), Hynes (AK 107175), Parks 22198 (BISH), Philipson 10261, 10357 (CHR), Stoddart 2119-20, 2167 (CHR), Wilder s.n., 1086 (BISH)

*Humata banksii* Alston; *Davallia pectinata* auct. Cheesem. 307, 1903 (non J. Sm.); *Humata pectinata* auct. Wilder 11, 1931 (non [Desv.] J. Sm.)

- Mangaia—Graham 3 (BISH)  
 Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 112319-21, 112324), Given (CHR 205426), Hynes (AK 107141-2, CHR 177607), Parks 22131 (BISH), Philipson 10272 (CHR), Wilder 1094 (BISH)

*Arthropteris palisotii* (Desv.) Alston; *Nephrolepis ramosa* T. Moore in Cheesem. 310, 1903; *Arthropteris obliterated* (R. Br.) J. Sm. in Wilder 8, 1931.

- Rarotonga—Cheeseman (AK 112279-82), Given (CHR 205407), Hynes (AK 107140, CHR 177610), Parks 22511 (BISH), Philipson 10133 (CHR), Wilder 1081 (BISH)

*Nephrolepis biserrata* (Sw.) Schott.

- Atiu—Ramsay (CHR 170724-5, 170727)  
 Mangaia—Graham 18 (BISH)  
 Rarotonga—Hynes (AK 116200-1, CHR 177896), Parks 22009 (BISH), Wilder 1116 (BISH)

## "Nephrolepis hirsutula"

- Aitutaki—Ramsay (CHR 170641, 170644, 170649, 170652), Stoddart 2230, 2266 (CHR)

- Atiu—Katu 0112, 0114 (CHR), Philipson 10492 (CHR), Ramsay (CHR 170646)  
 Mangaia—Graham 12, 14, 24 (BISH), Ramsay (CHR 170650-1, 170707)  
 Manuae—Ramsay (CHR 170648)  
 Mitiaro—Ramsay (CHR 170640, 170642-3, 170645, 170647, 170653-4, 170708-9)  
 Rarotonga—Armstrong s.n. (BISH), Given (CHR 205414), Hynes (AK 116189-90), Philipson 10407 (CHR), Stoddart 2169 (CHR), Wilder 1124 (BISH)

## VITTARIACEAE

*Vaginularia angustissima* (Brack.) Mett.; *Monogramme junghubnii* Hk. in Cheesem. 311, 1903

- Rarotonga—Cheeseman (AK 114222-3)

"*Vittaria rigida*"; *Vittaria elongata* Sw. in Cheesem. 311, 1903

- Mangaia—Ramsay (CHR 170694)  
 Rarotonga—Cheeseman (AK 114238-40), Given (CHR 205440), Parks 22125 (BISH), Philipson 10284, 10379 (CHR), Wilder 1096 (BISH)

*Vittaria scolopendrina* (Bory) Thwaites

- Rarotonga—Cheeseman (AK 127095)

## ADIANTACEAE

*Acrostichum aureum* L.

- Mangaia—Graham 15 (BISH)

*Adiantum capillus-veneris* L.

- Mangaia—Graham 4 (BISH)

Unknown elsewhere in the group, it seems possible that this may have come from a cultivated plant.

*Adiantum hispidulum* Sw.

- Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 112029-35, 112039-40), Given (CHR 205443), Hynes (AK 107129-30, CHR 177611), Parks 22128 (BISH), Philipson 10236 (CHR), Wilder 1082 (BISH)

*Pteris comans* Forst.

- Mangaia—Graham 4 (BISH)  
 Rarotonga — Armstrong s.n. (BISH),

Cheeseman (AK 111763-4), Hynes (AK 107145-6), Given (CHR 205405-6), Philipson 10287 (CHR), Tilden (AK 111766), Wilder 1115 (BISH)

"*Pteris tripartita*," *Pteris marginata* Bory in Cheesem. 307, 1903

Rarotonga—Cheeseman (AK 111905), Parks 22494 (BISH)

#### ASPLENIACEAE

*Asplenium falcatum* Lam.

Mitiaro—Ramsay (CHR 170627-8, 170630)

*Asplenium horridum* Klf.

Rarotonga—Cheeseman (AK 113305-10), Given (CHR 193195), Parks 22124 (BISH), Philipson 10386, 10467, 10469 (CHR), Wilder 1079 (BISH)

"*Asplenium laserpitiiifolium*"

Atiu—Ramsay (CHR 170697-702)  
Mangaia—Graham s.n., 20 (BISH)

*Asplenium nidus* L.

Atiu—Katu 0119 (CHR), Ramsay (170705)

Mangaia—Graham 25 (BISH)

Mauke—Katu 0051 (CHR)

Mitiaro—Ramsay (CHR 170704)

Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 113896-9) Hynes (AK 107139, CHR 173716), Philipson 10105 (CHR), Stoddart 2118, 2154 (CHR)

*Asplenium parksii* Copel.; *Asplenium cuneatum* auct. Cheesem. 308, 1903 (non Lam.); *Asplenium affine* auct. Wilder 9, 1931 (non Sw.)

Rarotonga—Cheeseman (AK 113350-4), 113358-9), Hynes (AK 116132-3), Given (CHR 205403), Parks 22023 p.p. (UC), Philipson 10441, 10461 (CHR), Wilder 1080 (BISH)

This is the local representative of the unresolved Pacific complex to which the specific names *cuneatum*, *affine*, *insiticium*, and *parksii* have been almost indiscriminately applied. A

detailed comparison of material from all the larger Pacific Islands with specimens from New Guinea, Malaysia, and Ceylon is necessary before these Rarotongan examples can be named with any certainty.

*Asplenium schizotrichum* Copel.; *Asplenium falcatum* auct. Cheesem. 308, 1903 (non Lam.)

Rarotonga—Cheeseman (AK 113405-6), Parks 22023 p.p. (UC)

This is a local derivative of *A. falcatum*, but all specimens examined are consistent in the characters noted by Copeland. No typical *A. falcatum* has been recorded from Rarotonga.

*Asplenium tenerum* Forst.

Rarotonga—Cheeseman (AK 113518-21), Hynes (AK 107166), Philipson 10443, 10460 (CHR)

*Asplenium unilaterale* Lam.; *Asplenium resectum* Sm. in Cheesem. 308, 1903

Rarotonga—Cheeseman (AK 113492-3)

*Loxoscaphe gibberosum* (Forst.) Moore; *Davallia gibberosa* Sw. in Cheesem. 307, 1903; *Asplenium gibberosum* (Forst.) Mett. in Wilder 9, 1931

Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 113480-3, 114297-300), Given (CHR 205418, 205427), Hynes (AK 107167-8, 117480, CHR 177890), Philipson 10385, 10452, 10453 (CHR), Wilder 1078 (BISH)

#### ATHYRIACEAE

*Diplazium barpeodes* Moore; *Asplenium arborescens* auct. Cheesem. 309, 1903 (non Mett.); *Athyrium enorme* Copel. 379, 1931, syn. nov.

Mangaia—Graham s.n. (BISH)

Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 113023-5), Given (CHR 193199, 205411), Hynes (AK 116191, 116193, 117445-6, CHR 176367 A, B), Parks 22495 (type of *A. enorme*) (UC), Philipson 10444 (CHR)

*Diplazium petersenii* C. Chr.; *Asplenium japonicum* auct. Cheesem. 309, 1903 (non Thunb.)

Rarotonga—Cheeseman (AK 113109-11)

## THELYPTERIDACEAE

*Macrothelypteris polypodioides* (Hk.) Holtum; *Dryopteris leucolepis* (Pr.) Maxon in Wilder 11, 1931

Rarotonga—Parks 22498 (BISH), Wilder 1110 (BISH)

*Macrothelypteris torresiana* (Gaud.) Ching; *Nephrodium setigerum* Baker in Cheesem. 309, 1903; *Dryopteris setigera* (Bl.) O. Ktze. in Wilder 11, 1931

Mangaia—Graham 1, 23 s.n. (BISH)

Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 127089-94), Given (CHR 205448), Hynes (AK 116197-9), Parks 22547 (BISH), Wilder 1091 (BISH)

*Cyclosorus dentatus* (Forst.) Ching; *Nephrodium molle* Desv. in Cheesem. 310, 1903; *Nephrodium cucullatum* p.p. in Cheesem. 310, 1903; *Dryopteris nymphalis* (Forst.) Copel. in Wilder 11, 1931

Atiu—Ramsay (CHR 170691-3)

Mangaia—Graham 22 (BISH)

Mitiaro—Ramsay (CHR 170686-7)

Rarotonga — Cheeseman (AK 112596-8, 113051-3), Hynes (AK 116202), Park 22306 (BISH), Wilder 1112 (BISH)

"*Cyclosorus extensus*"; *Nephrodium haenkeanum* auct. Cheesem. 310, 1903 (non Pr.)

Rarotonga—Cheeseman (AK 112932-5)

The identification of this species must be left in doubt, but it appears to belong to the Malaysian-Pacific complex related to *C. extensus*. Cheeseman's collections consist of four sheets each of two pinnae only. It is surprising that such a large species has not been collected since Cheeseman records it as being not uncommon in the lower parts of the island and in the valleys.

*Cyclosorus invisus* (Forst.) Copel.; *Nephro-*

*dium invisum* Carr. in Cheesem. 309, 1903; *Dryopteris invisus* (Forst.) O. Ktze. in Wilder 10, 1931

Aitutaki—Ramsay (CHR 170632, 170634-6), Stoddart 2265, 2333 (CHR)

Atiu—Katu 0091 (CHR), Ramsay (CHR 170638)

Mitiaro—Ramsay (CHR 170631, 170633, 170637, 170639)

Rarotonga — Cheeseman (AK 112904-5, 112907, 112909), Given (CHR 205446-7), Hynes (AK 116203-4), Philipson 10100, 10406 (CHR), Wilder 1113 (BISH)

*Cyclosorus obstructus* (Copel.) Copel.; *Dryopteris obstructa* Copel. 378, 1931; in Wilder 11, 1931

Rarotonga—Parks 22536 (BISH, UC), Wilder 1120 (BISH)

*Cyclosorus parasiticus* (L.) Farwell; *Nephrodium cucullatum* Baker p.p. in Cheesem. 310, 1903

Rarotonga—Cheeseman (AK 113048-9)

*Thelypteris harveyi* (Mett.) Brownlie

Mangaia—Ramsay (CHR 170688-90)

## ASPIDIACEAE

*Acrophorus leucorbachis* (Cheesem.) Brownlie comb. nov.; *Nephrodium leucorbachis* Cheesem. 309, 1903

Rarotonga — Cheeseman (AK 112192, 114317)

This remains the only collection of this species, which is distinct from the widespread *A. blumei*. From description, only a very closely related, if not identical, species is *A. raiaateensis* J. W. Moore from the Society Islands (J. W. Moore 1933).

*Arachniodes aristata* (Forst.) Tindale; *Aspidium aristatum* Sw. in Cheesem. 309, 1903; *Polystichum aristatum* (Forst.) Pr. in Wilder 13, 1931

Mangaia—Graham 5 (BISH)

Rarotonga — Armstrong s.n. (BISH),

Cheeseman (AK 112465-8), Given (CHR 205402, 205428, 205445), Hynes (AK 116210, CHR 177894), Philipson 10117, 10425, 10456 (CHR)

"*Ctenitis dissecta*"; *Dryopteris dissecta* (Forst.) O. Ktze. in Wilder 10, 1931; in Copel. 378, 1931; *Nephrodium leuzeanum* auct. Cheesem. 310, 1903 (non Hk.)

Atiu — Katu 0099 (CHR), Ramsay (CHR 170736-8).

Mangaia—Graham 19 (BISH)

Rarotonga—Cheeseman (AK 112741-3), Given (CHR 193198, 205433-5), Hynes (AK 116194-6, CHR 176365), Parks 22196 (BISH), Philipson 10241 (CHR), Wilder 1085 (BISH)

Copeland (1931) pointed out that Cheeseman may have misinterpreted *Nephrodium leuzeanum* when he used this name for the Rarotongan specimens, and this premise is borne out by examination of his collections. However, this Eastern Polynesian species, which may, in fact, be identical with Forster's *Polypodium dissectum*, belongs correctly to the genus *Tectaria* and not to *Ctenitis*. It is one of the group of free-veined species to which Ching applied the generic name *Ctenitopsis*. Young fronds are in fact not completely free-veined, although adult fertile fronds invariably lack any anastomosing.

*Ctenitis tenuifrons* (C. Chr.) Ching; *Dryopteris tenuifrons* C. Chr. in Copel. 378, 1931; *Polypodium unidentatum* auct. Cheesem. 310, 1903 (non Hk. and Arn.)

Rarotonga—Armstrong s.n. (BISH), Cheeseman (AK 113059-63), Parks 22147 (BISH)

*Lastreopsis pacifica* Tindale; *Nephrodium decompositum* auct. Cheesem. 309, 1903 (non R. Br.); *Dryopteris decomposita* auct. Wilder 10, 1931 (non [R. Br.] O. Ktze.)

Rarotonga—Cheeseman (AK 127086-8), Wilder 1092 (BISH)

*Tectaria decurrens* (Pr.) Copel.; *Nephrodium decurrens* Baker in Cheesem. 310, 1903

Rarotonga—Cheeseman (AK 112690-8), Philipson 10427 (CHR)

#### BLECHNACEAE

*Blechnum orientale* L.; *Blechnum orientale* L. in Wilder 9, 1931 (in error)

Rarotonga — Cheeseman (AK 113218, 113224), Hynes (AK 107135, CHR 177609, A, B), Parks 22193 (BISH), Wilder 1083 (BISH)

"*Blechnum procerum*"; *Lomaria procerata* Spr. in Cheesem. 308, 1903

Rarotonga — Cheeseman (AK 113245), Given (CHR 205413), Tilden (AK 113246), Wilder 1084 (BISH)

"*Blechnum vulcanicum*"; *Lomaria vulcanica* Bl. in Cheesem. 308, 1903

Rarotonga—Cheeseman (AK 113792-7), Philipson 10294, 10435 (CHR)

The complex of forms appearing under these two names in the South Pacific is in need of monographic revision, but the nearest relative of the Rarotongan and Society Islands *B. vulcanicum* appears to be *Lomaria pilosa* Brack. of Fiji.

*Doodia media* R. Br.

Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 113776-9), Given (CHR 205409, 205421), Philipson 10463, 10468 (CHR), Wilder 1119 (BISH)

#### LOMARIOPSIDACEAE

*Bolbitis lonchophora* (Ktze.) C. Chr.; *Acrostichum repandum* Bl. in Cheesem. 311, 1903; *Campium palustre* (Brack.) Copel. in Wilder 9, 1931

Atiu—Ramsay (CHR 170663-7)

Rarotonga — Cheeseman (AK 114149, 114151-4), Given (CHR 205429), Hynes (AK 16136-7, CHR 177889), Parks 22508 (BISH), Philipson 10130 (CHR)

*Elaphoglossum samoense* Brack.; *Acrostichum samoense* Baker in Cheesem. 311, 1903

Rarotonga—Cheeseman (AK 114310-6), Philipson 10380 (CHR)

*Elaphoglossum savaiense* (Baker) Diels;

*Acrostichum gorgoneum* auct. Cheesem. 311, 1903 (non Kaulf.); *Ephoglossum* sp. in Wilder 11, 1931

Rarotonga—Cheeseman (AK 112441-4), Philipson 10373 (CHR), Wilder 1106 (BISH)

Although all collections are sterile they show the characters distinguishing *E. savaiense* from *E. gorgoneum* as indicated by Christensen (1943).

*Teratophyllum wilkesianum* (Brack.) Holtt.; *Acrostichum wilkesianum* Hk. in Cheesem. 311, 1903; *Lomagramma wilkesiana* (Brack.) Copel. in Wilder 12, 1931

Rarotonga—Given (CHR 205436), Philipson 10293, 10454, 10470 (CHR), Tilden (AK 112452-4), Wilder 1125, s.n. (BISH)

#### GRAMMITIDACEAE

*Grammitis hookeri* (Brack.) Copel.; *Polypodium hookeri* Brack. in Cheesem. 310, 1903

Rarotonga—Cheeseman (AK 114059-60), Philipson 10376 (CHR)

The specimens are consistently much smaller than the typical form from Hawaii, Fiji, and Samoa but characters of hairs, sori, and sporangia are in agreement.

#### POLYPODIACEAE

*Belvisia mucronata* (Fée) Copel.; *Acrostichum spicatum* auct. Cheesem. 311, 1903 (non L.); *Hymenolepis mucronata* Fée in Wilder 12, 1931

Rarotonga—Cheeseman (AK 113716-8), Given (CHR 205404), Hynes (AK 107137-8, CHR 177612), Philipson 10126, 10289, 10429 (CHR)

*Microsorium sylvaticum* (Brack.) Copel.; *Polypodium expansum* Baker in Cheesem. 311, 1903; *Polypodium vitiense* auct. Copel. 381, 1931 (non Baker)

Rarotonga—Cheeseman (AK 114070-4), Hynes (AK 116138-9), Parks 22041 (BISH), Philipson 10472 (CHR)

*Pyrrosia angustata* (Sw.) Ching; *Polypodium angustatum* Sw. in Cheesem. 310, 1903; *Cyclophorus angustatus* (Sw.) Desv. in Wilder 10, 1931; *Cyclophorus macrocarpus* (Hk. and Arn.) Copel. 381, 1931

Atiu—Ramsay (CHR 170696)

Mangaia—Ramsay (CHR 170695)

Rarotonga — Armstrong s.n. (BISH), Cheeseman (AK 114133, 114181), Given (CHR 205424, 205430), Hynes (AK 116211), Parks 22346 (BISH), Philipson 10183 (CHR), Wilder 1114 (BISH)

*Phymatodes scolopendria* (Burm.) Ching; *Polypodium phymatodes* L. in Cheesem. 310, 1903; *Polypodium scolopendria* Burm. in Wilder 13, 1931

Aitutaki—Ramsay (CHR 170711, 170714-5), Stoddart 2223 (CHR)

Atiu—Katu 0096 (CHR) Philipson 10526 (CHR), Ramsay (CHR 170671, 170675-6)

Mangaia—Graham 9 (BISH), Ramsay (CHR 170710, 170712 A, B, 170723) Manuae — Ramsay (CHR 170681-5, 170717, 170719, 170722, 170729)

Mauke—Katu 0014-6, 0044 (CHR)

Mitiaro—Ramsay (CHR 170672, 170716, 170718)

Palmerston—Ramsay (CHR 170677-80)

Rarotonga—Cheeseman (AK 114163-7), Given (CHR 205417), Hynes (AK 116138-9, CHR 176368 A, B, 177616 A, B), Philipson 10161, 10401 (CHR), Tilden (AK 114294), Wilder 1105 (BISH)

This list includes forms differing in size, texture, and numbers of segments, and it possibly represents a highly complex situation which can only be resolved by a long-term collecting and experimental project.

*Phymatodes katuii* Brownlie sp. nov.

*Diagnosis Holotypi*

Rhizoma repens. Stipes laevis, ad 35 cm longus, paleis brunneis basi praeditus. Frons ad 60 cm longa, 20 cm lata, basi pinnata usque



tribus paribus pinnarum liberarum. Pinnae infima lanceolatae, 10 cm longae, 2 cm latae, inter se 3–5 cm distantes, infima petiolo 15 mm longo. Pinnae mediae c. 7-jugae, inferiorae sessiles ceterae adnatae. Frons apice pinnatifida segmentis 3–4 lateralibus anguste alatis segmentoque terminali. Lamina papyracea. Costa utrinque prominens, venae obscurae. Sori impressi, uniseriati, in pagina superiore pustulis prominentibus similes.

#### *Diagnosis of Holotype*

Rhizome creeping. Stipes smooth, about 35 cm long, with dark-brown scales at the base. Fronds up to 60 cm long, 20 cm wide, pinnate at the base with up to three pairs of free pinnae, the lowest of which has a petiole 15 mm long. Free pinnae lanceolate, 10 cm by 2 cm, widest just below the middle, 3–5 cm apart. Midportion of the frond consisting of up to seven pairs of pinnae, the lower sessile, the remainder adnate. Apical portion pinnatifid with three or four narrowly winged lateral segments and a terminal segment. Midrib prominent on both surfaces, other veins obscure. Sori in a single row on each side of the midrib, immersed, appearing as prominent pustules on the upper surfaces.

#### *Holotype*

Katu 0017, Mauke Island, south side (CHR).

#### *Other Specimens Noted*

Manuae—Ramsay (CHR 170729, 170733A, B)

Mitiaro—Ramsay (CHR 170730-1, 170734-5)

These specimens differ from all the Cook Islands' forms of *P. scolopendria* in the frond being largely pinnate instead of pinnatifid, in the deeply sunken sori, and obscure veins. The latter characters suggest a possible relationship to *P. nigrescens* Bl. but that species has not been recorded from the group. It seems more likely that it is a locally evolved derivative of the *P. scolopendria* complex confined to the smaller islands of the Southern Cooks. It is apparently unknown on the main island of Rarotonga.

Two species listed by Cheeseman remain in

doubt. The specimen listed by him as *Asplenium lunulatum* Sw. could not be located, and we are in agreement with him that the one ascribed by him to *Polypodium (Phymatodes)* sp. is too imperfect for proper determination. The specimens (AK 114092-3) are sterile, deeply pinnatifid with nine pairs of segments each narrowed toward the base and with the wing between almost obsolescent toward the base of the frond. In this latter character it is almost intermediate between *Phymatodes scolopendria* and the new species described above. However, the locality quoted by Cheeseman is not typical of that in which *Phymatodes scolopendria* has been collected in the Cook Islands. Further collecting may show this to be another endemic species of this complex.

#### *Affinities of the Flora*

With a total of 80 species listed, none can be described as typical of the Cook Islands only. Where endemic species have been recognized, these are in all cases closely related to other species occurring in the Cooks themselves or in other South Pacific island groups. The closest immediate relationship is with the Society Islands where almost all the species noted occur. With the smaller area and lower altitude of the Cooks many genera (such as *Dicksonia*, *Calymmodon*, *Ctenopteris*, and *Oleandra*) typical of forested mountain tops in the larger Pacific Islands are absent. This is also reflected in the rather small representation of the family Hymenophyllaceae. While the immediate relationship of the flora is with the Society Islands it can be broadly interpreted as an extension of the Malaysian fern flora characteristic of the South Pacific island region as a whole. This concept is dealt with in greater detail in Copeland (1932), Christensen (1943), and Brownlie (1965).

#### ACKNOWLEDGMENTS

We wish to thank Professor R. E. Holttum for assistance in identifications of some of the species in the family Thelypteridaceae. We also acknowledge the help of the directors of the institutions mentioned for loan of material or for permission to study collections held by them.

## LITERATURE CITED

- BROWNLIE, G. 1965. The geographical affinities of the South Pacific island fern floras. *Pacific Science*, vol. 19, pp. 219-223.
- CHEESEMAN, T. F. 1903. The flora of Rarotonga, the chief island of the Cook Group. *Transactions of the Linnaean Society of London II (Botany)*, vol. 6, pp. 261-313.
- CHRISTENSEN, C. 1943. A revision of the Pteridophyta of Samoa. *Bulletin of the Bernice P. Bishop Museum*, no. 177. Honolulu.
- COPELAND, E. B. 1931. Rarotonga ferns collected by Harold E. and Susan Thew Parks. *University of California Publications in Botany*, vol. 12, pp. 375-381.
- 1932. Pteridophytes of the Society Islands. *Bulletin of the Bernice P. Bishop Museum*, no. 93. Honolulu.
- 1933. Trichomanes. *Philippine Journal of Science*, vol. 51, pp. 119-279.
- MOORE, J. W. 1933. New and critical plants from Raiatea. *Bulletin of the Bernice P. Bishop Museum*, no. 102. Honolulu.
- WILDER, G. P. 1931. Flora of Rarotonga. *Bulletin of the Bernice P. Bishop Museum*, no. 86. Honolulu.