APOCYNACEAE.

Tabernaemontana stapfiana, Britten. (1) Mlanje, Whyte.

T. ventricosa, Hochst. (1) Mlanje, Whyte.

T. elegans. (1) River Ruo, Johnston.

Voacanga africana, Stapf. (1) Shire Valley, Kirk; Shire Highlands, Scott-Elliot; Buchanan.

Strophanthus Kombe, Oliv. (1) Mañanja hills, Meller; Buchanan; (4) Victoria Falls, Kirk.

S. ecaudatus, Rolfe. (1) Buchanan; (4) Batoka country, Kirk.

Strophanthus sp. (2) Carson; Nyasa-Tanganyika plateau, Scott-Elliot.

Mascarenhasia variegata, Britten et Rendle. (1) Mlanje, Whyte.

Adenium multiflorum, Klotzsch. (1) Near Metope, L. Scott.

ASCLEPIADACEAE.

Cryptolepis obtusa, N. E. Br. (1) Lower Shire Valley, Meller; (4) Menyharth.

C. Welwitschii, Schlechter. (1) Buchanan; Mlanje, Whyte; (2) Nyasa-Tanganyika plateau, Scott-Elliot.

Cryptolepis sp. (1) Mañanja hills and west shore of Lake Nyasa, Kirk; Shire Highlands, Scott-Elliot.

Raphionacme grandiflora, N. E. Br. (1) Blantyre, Last.

R. longifolia, N. E. Br. (1) Mañanja hills, Kirk.

Secamone zambesiaca, Schlechter. (1) Shire River, Kirk; Chiromo, Scott-Elliot.

Taccazia Kirkii, N. E. Br. (4) Menyharth.

Chlorocodon Whytei, Hook. fil. (1) Buchanan.

Daemia extensa, R. Br. (1) Shire Valley, Meller; Buchanan.

D. barbata, Klotzsch. (4) Menyharth.

Xysmalobium spurium, N. E. Br. (1) Buchanan.

X. Carsoni, N. E. Br. (2) Carson.

X. bellum, N. E. Br. (1) Buchanan; Mañanja hills, Kirk; Shire Highlands, K. C. Cameron; (2) Carson.

X. reticulatum, N. E. Br. (1) Buchanan.

X. fraternum, N. E. Br. (1) Blantyre, Last.

Xysmalobium sp. (2) Carson.

Schizoglossum connatum, N. E. Br. (2) Carson.

S. elatum, K. Schum. (1) Buchanan.

S. shirense, N. E. Br. (1) Shire Valley, Kirk and Waller.

S. Nyasae, Britten et Rendle. (1) Mlanje, Whyte; Buchanan.

S. barbatum, Britten et Rendle. (1) Mlanje, Whyte and McClounie.

S. erubescens, Schlechter. (1) Mlanje, Scott-Elliot.

Schizoglossum sp. (1) Mlanje, Scott-Elliot; (4) Menyharth.

Asclepias spectabilis, N. E. Br. (1) Buchanan; Blantyre, Last; Magomera, Waller.

A. conspicua, N. E. Br. (2) Carson.

A. fruticosa, L. (1) Lower Shire Valley, Meller.

A. amabilis, N. E. Br. (2) Carson.

A. pygmaea, N. E. Br. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

A. reflexa, Britten et Rendle. (1) Mañanja hills, Meller and Waller; Zomba, Meller; Mlanje, Whyte; Shire Highlands, Scott-Elliot; Buchanan; (2) North Nyasa, L. Scott.

A. lineolata, Schlechter. (1) Mlanje, Scott-Elliot; Shire Valley, Kirk and Waller; (2) Carson.

A. palustris, Schlechter. (1) Zomba, Whyte; Mlanje, Scott-Elliot and McClounie.

Asclepias sp. (2) Nutt.

ASCLEPIADACEAE.

Gomphocarpus foliosus, K. Schum. (1) Mañanja hills, Waller; Blantyre, Last; (2) Higher plateau, north of Lake Nyasa, J. Thomson.
Brachystelma Buchanani, N. E. Br. (1) Sochi, Chiromo and Mañanja, Scott-Elliot; Buchanan.
Cynanchum mossambicense, K. Schum. (1) Shire Rapids, Kirk.
Margaretta distincta, N. E. Br. (2) Lower plateau, north of Lake Nyasa, J. Thomson.
M. orbicularis, N. E. Br. (1) Maravi country, Kirk; (2) North Nyasa, L. Scott.
M. Whytei, K. Schum. (1) Chiradzulu, Meller; Zomba and east end of Lake Chilwa, Meller; Blantyre, L. Scott; Buchanan; Mlanje, Whyte; near Metope, Scott-Elliot.
Dregea macrantha, Kl. (1) Chiromo, Scott-Elliot; (4) Menyharth.
Gymnema sylvestre, R. Br. (1) Buchanan.
Pergularia africana, N. E. Br. (1) Zomba, Whyte.
Sphaerocodon obtusifolium, Benth. (1) Buchanan.
Ceropegia constricta, N. E. Br. (2) Carson.
C. debilis, N. E. Br. (1) Zomba, Buchanan.
Riocreuxia profusa, N. E. Br. (1) Buchanan.

LOGANIACEAE.

Mostuaea Brunonis, F. Didrichs. (1) Mlanje, Whyte.
Buddleia salviaefolia, Lam. (1) Zomba, Kirk and Whyte; Buchanan.
Buddleia sp. (1) Mlanje, Whyte.
Nuxia congesta, R. Br. (1) Buchanan; Zomba, Whyte; var. *N. tomentosa*, Sond. (1) Buchanan; var. *N. dentata*, R. Br. (1) Mañanja hills, Meller.
N. sambesina, Gilg. (1) Zomba, Kirk.
Strychnos dysophylla, Benth. (1) Buchanan.
S. spinosa, Lam. (1) Mañanja hills, Kirk; Buchanan.
Strychnos sp. (1) Buchanan; (4) Menyharth.
Anthocleista zambesiaca, Baker. (1) Buchanan; Shire Highlands, Scott-Elliot.
A. nobilis, Don. (1) Zomba, Whyte.
Anthocleista sp. (1) Buchanan.

GENTIANACEAE.

Exacum sp. (1) Buchanan.
Sebaea brachyphylla, Griseb. (1) Buchanan; Blantyre, Last.
S. crassulaefolia, Cham. et Schlecht. (1) Mlanje and Zomba, Whyte; Buchanan.
Sebaea sp. (4) Victoria Falls, Kirk.
Tachiadenus continentalis, Baker. (2) Carson.
Chironia purpurascens, Benth. (1) Buchanan; (2) Nutt.
C. laxiflora, Baker. (1) Mañanja hills, Meller and Kirk.
C. densiflora, Scott-Elliot. (1) Shire Highlands, Scott-Elliot.
Chironia sp. (2) Nutt.
Faroa salutaris, Welw. (1) West shore of Lake Nyasa, Kirk.
F. Buchanani, Baker. (1) Buchanan.
Swertia Mannii, Hook. fil. (1) Buchanan; (2) Carson; Nutt.
Swertia spp. (1) Buchanan.

BORAGINEAE.

Cordia abyssinica, R. Br. (1) Buchanan.
C. Myxa, L. (1) Buchanan.
C. Kirkii, Baker. (4) Menyharth.
C. Rothii, Roem. et Schult. (4) Menyharth.

BORAGINEAE.

Ehretia divaricata, Baker. (1) Chiradzulu, Kirk.

Ehretia sp. (4) Menyharth.

Trichodesma zeylanicum, R. Br. (1) Blantyre, Descamps.

T. physaloides, A. DC. (1) Zomba and east end of Lake Chilwa, Meller; Mañanja hills, Meller; Zomba, Whyte; Buchanan; Shire Highlands, Scott-Elliot; (2) Carson; Nyasa-Tanganyika plateau, J. Thomson.

Heliotropium ovalifolium, Forsk. (1) Shire Valley, L. Scott; Fort Johnston, Scott-Elliot.

H. strigosum, Willd. (1) Buchanan.

H. bracteatum, R. Br. (2) North Nyasa, L. Scott.

H. zeylanicum, Lam. (1) Buchanan; North Nyasa, L. Scott and J. Thomson.

H. indicum, L. (1) Shire River, L. Scott; Buchanan; Shire Highlands, Scott-Elliot.

Cynoglossum lanceolatum, Forsk. (1) Mlanje, McClounie; Chiradzulu, Whyte; Buchanan; (2) Nyasa-Tanganyika plateau, Scott-Elliot.

Lithospermum erythrocephalum, Baker. (2) Carson.

Lobostemon cryptocephalum, Baker. (2) Carson.

CONVOLVULACEAE.

Argyreia laxiflora, Baker. (1) Buchanan.

Lepistemon africanum, Oliv. (1) Shire Highlands, Kirk; Lake Nyasa, Simons.

Hewittia bicolor, Wight. (1) Chiradzulu, Whyte; Mañanja hills, Meller; Shire Valley, L. Scott; Mlanje, Whyte; Buchanan.

Jacquemontia capitata, Don. (1) Shire Valley, L. Scott.

Convolvulus hyoscyamoides, Vatke. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

C. malvaceus, Oliv. (1) Shire Highlands, Scott-Elliot; Mlanje, Whyte; Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson.

C. sagittatus, Thunb. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

C. Thomsoni, Baker. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Evolvulus alsinoides, L. (1) Buchanan; (3) Serpa Pinto.

Ipomoea simplex, Thunb. (1) Shire Highlands, Scott-Elliot; Buchanan.

I. Pes-tigridis, L. (4) Menyharth.

I. tanganyikensis, Baker. (2) Carson.

I. discolor, Baker. (2) Carson.

I. operosa, Wright. (1) Shire Highlands, Whyte.

I. involucrata, P. Beauv. (1) Lower plateau, north of Lake Nyasa, J. Thomson.

I. pileata, Roxb. (2) Carson; Nutt.

I. crassipes, Hook. (1) Shire Highlands, Scott-Elliot; Buchanan.

I. chryseides, Ker. (4) Menyharth.

I. Hanningtoni, Baker. (2) Carson.

I. Welwitschii, Vatke. (1) Buchanan.

I. angustifolia, Jacq. (1) Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson; (3) Serpa Pinto; (4) Menyharth.

I. vagans, Baker. (1) Buchanan.

I. Carsoni, Baker. (2) Carson.

I. inconspicua, Baker. (1) Buchanan.

I. eriocarpa, R. Br. (1) Shire Highlands, V. Scott; Buchanan; (2) Nyasa-Tanganyika plateau, J. Thomson; (4) Menyharth.

I. mweroensis, Baker. (2) Mweru, Carson.

I. pharbitiformis, Baker. (2) Mweru, Carson.

I. simonsiana, Rendle. (1) Nyasa, Simons.

I. shirensis, Oliv. (1) Shire Highlands, Kirk; Buchanan.

I. halleriana, Britten. (1) Buchanan; Chiradzulu, Whyte; near Katunga, Kirk.

CONVOLVULACEAE.

Ipomoea tambelensis, Baker. (1) Upper Shire Valley, Kirk.
I. obscura, Koen. (1) Zomba, Whyte; Buchanan; (2) Nyasa-Tanganyika plateau, J. Thomson.
I. Buchanani, Baker. (1) Buchanan.
I. Lindleyi, Choisy. (1) Shire Valley, Kirk; Buchanan; (4) ? Menyharth.
I. aquatica, Forsk. (1) Lake Nyasa, Kirk.
I. pilosa, Sweet. (1) Buchanan; (4) Menyharth.
I. Wightii, Choisy. (4) Menyharth.
I. afra, Choisy. (1) Buchanan.
I. pterygocaulis, Choisy. (1) Shire Valley, Kirk; Buchanan; (4) Menyharth.
I. pinnata, Hochst. (1) Buchanan; (4) Menyharth.
I. palmata, Forsk. (1) Shire Valley, Kirk; Buchanan; (4) Menyharth.
I. dissecta, Willd. (1) Buchanan; (4) Menyharth.
I. kirkiana, Britten. (1) Shire Highlands, Kirk; Buchanan.
I. fulvicaulis, Boiss. (1) Mlanje, Whyte.

SOLANACEAE.

Solanum nodiflorum, Jacq. (1) Shire Valley, Kirk.
S. nigrum, L. (1) Blantyre, Descamps.
S. schimperianum, Hochst. (1) Chiradzulu, Whyte.
S. Naumannii, Engl. (1) Buchanan.
S. anomalum, Thonn. (1) Chiradzulu, Whyte.
S. aculeastrum, Dun. (1) Blantyre, L. Scott; Buchanan; Mañanja hills, Meller.
S. Rohrii, Wright. (1) Mpatamanga, Kirk.
S. chrysotrichum, Wright. (1) Buchanan.
S. acanthocalyx, Klotzsch. (1) Buchanan; Mlanje, Whyte.
S. trepidans, Wright. (1) Shire Valley, L. Scott.
Physalis pubescens, L. (1) Blantyre, Descamps.
P. peruviana, L. (1) Blantyre, L. Scott.
Capsicum conoides, Mill. (4) Sesheke, Kirk.
Datura alba, Nees. (1) Shire Highlands, Kirk; Buchanan; Mañanja hills, Meller.

SCROPHULARIACEAE.

Diclis ovata, Benth. (1) Mandala, Scott-Elliot.
D. tenella, Hemsl. (1) Chiradzulu, Whyte.
Halleria lucida, L. (1) Zomba, Whyte.
H. elliptica, Thunb. (1) Mlanje, Whyte.
Chaenostoma sp. (2) Nyasa-Tanganyika plateau, Scott-Elliot.
Mimulus gracilis, R. Br. (1) Zomba and east end of Lake Chilwa, Meller; Buchanan.
Craterostigma plantagineum, Hochst. (1) Buchanan.
Torenia parviflora, Hamilt. (2) North of Lake Nyasa, L. Scott.
Vandellia lobelioides, Oliv. (2) Nyasa-Tanganyika plateau, J. Thomson.
Ilysanthes sp. (1) Buchanan; Shire Valley, L. Scott; (2) Nutt.
Alectra melampyroides, Benth. (1) Mbami, near Blantyre and Mañanja hills, Kirk; Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson.
Alectra, sp. (1) Buchanan.
Aulaya obtusifolia, Benth. (1) Shire Highlands, K. C. Cameron.
Buchnera quadrifaria, Baker. (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson; Nutt.
B. Lastii, Engl. (1) Blantyre, Last.

SCROPHULARIACEAE.

Buchnera spp. (1) Mañanja hills, Meller; Buchanan; Mlanje and Chiradzulu, Whyte; (2) Upper plateau, north of Lake Nyasa, J. Thomson.

Striga elegans, Benth. (1) Blantyre, Last.

S. coccinea, Benth. (1) Shire Highlands, Kirk; Buchanan.

S. Forbesii, Benth. (1) Shire Highlands, Meller.

S. orobanchoides, Benth. (2) North of Lake Nyasa, L. Scott; Carson.

Striga spp. (1) Buchanan; (2) North of Lake Nyasa, L. Scott; Carson.

Rhamphicarpa fistulosa, Benth. (2) North of Lake Nyasa, L. Scott.

R. serrata, Klotzsch. (1) Zomba and east end of Lake Chilwa, Meller; Buchanan.

R. tubulosa, Benth. (1) Mandala, Scott-Elliot.

Rhamphicarpa spp. (1) Mañanja hills, Kirk; Buchanan; (2) Carson.

Cycnium adonense, E. Mey. (1) Mlanje and Zomba, Whyte; Buchanan; (2) Carson; Nyasa-Tanganyika plateau, Scott-Elliot.

C. longiflorum, Eck. et Zeyh. (1) Shire Valley, Kirk; Buchanan; (2) North of Lake Nyasa, J. Thomson and L. Scott.

Cycnium spp. (1) Buchanan; (2) Carson.

Sopubia lanata, Engl. (2) Carson; Nutt.

S. ramosa, Hochst. (1) Mañanja hills, Meller and Kirk; Blantyre, Last; Buchanan; (2) Carson; Nutt.

S. dregeana, Benth. (1) Zomba, Whyte; Shire Highlands, Scott-Elliot.

S. Hildebrandtii, Vatke. (1) Chiradzulu, Whyte.

Sopubia spp. (1) Mañanja hills, Meller; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson.

OROBANCHACEAE.

Orobanche cernua, Loefl. (1) Shire Highlands, L. Scott.

LENTIBULARIACEAE.

Utricularia capensis, Spreng. (1) Buchanan; Blantyre, Last.

Utricularia spp. (1) Buchanan; Lake Nyasa, Laws; (2) Nutt; Carson; Lower plateau, north of Lake Nyasa, J. Thomson; (4) Victoria Falls and Batoka country, Kirk.

GESNERACEAE.

Streptocarpus caulescens, Vatke. (1) Buchanan.

S. Cooperi, C. B. Clarke. (1) Buchanan.

BIGNONIACEAE.

Tecoma shirensis, Baker. (1) Buchanan.

T. nyassae, Oliv. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Dolichandrone obtusifolia, Baker. (1) Shire Highlands, Buchanan and Scott-Elliot.

D. tomentosa, Benth. (2) Carson.

Stereospermum kunthianum, Cham. (1) Shire Highlands, Waller; Buchanan; Chiradzulu, Meller; West shore of Lake Nyasa, Kirk; (2) Mweru, Carson; (4) Batoka country, Kirk.

Kigelia pinnata, DC. (1) Buchanan.

PEDALINEAE.

Sesamum angolense, Welw. (1) Buchanan; West shore of Lake Nyasa, Kirk; Blantyre; Last; (2) Carson; Nutt.

S. indicum, L. (2) Karonga, L. Scott.

S. calycinum, Welw. (4) Holub.

Ceratotheca sesamoides, Endl. Buchanan; (1) Shire Valley, L. Scott; West shore of Lake Nyasa, Kirk and Simons; (2) Carson; Karonga, L. Scott; (4) Holub.

Ceratotheca sp. (2) Karonga, L. Scott.

Pretrea zanquebarica, J. Gay. (1) Zomba and east end of Lake Chilwa, Meller; (4) Holub.

SELAGINEAE.

Hebenstreitia sp. (4) Holub.

Selago milanjiensis, Rolfe. (1) Mlanje, Whyte.

S. whyteana, Rolfe. (1) Mlanje, Whyte and McClounie.

Selago spp. (1) Chiradzulu, Meller and Whyte; Mlanje, McClounie; Buchanan; (2) Lower and Upper plateaux, north of Lake Nyasa, J. Thomson; (4) Menyharth.

ACANTHACEAE.

Thunbergia kirkiana, T. Anders. (1) Buchanan; Mlanje, Whyte; Buchanan.

T. alata, Bojer. (1) Buchanan; Mlanje, Whyte; Mañanja hills, Kirk and Meller; (2) Carson.

T. lancifolia, T. Anders. (1) Blantyre, L. Scott; Mañanja hills and Chiradzulu, Meller; Buchanan; Zomba, Whyte; (2) Carson; Nyasa-Tanganyika plateau, J. Thomson.

T. obtusifolia, Oliv. (2) Upper plateau, north of Lake Nyasa, J. Thomson.

T. erecta, Benth. (1) Buchanan; Blantyre, Last; Mañanja hills, Waller.

T. oblongifolia, Oliv. (1) Mañanja hills, Waller; Buchanan; (2) Nyasa-Tanganyika plateau, Scott-Elliot.

T. subulata, Lindau. (1) Buchanan.

T. mollis, Lindau. (1) Buchanan.

T. manganjensis, Lindau. (1) Mañanja hills, Kirk.

Thunbergia spp. (1) Buchanan; Zomba, Whyte; Shire Highlands, Scott-Elliot; (2) Nutt; Carson; Nyasa-Tanganyika plateau, Scott-Elliot.

Nelsonia campestris, R. Br. (1) Mañanja hills, Meller; Buchanan.

Hygrophila spinosa, T. Anders. (1) Buchanan; Shire River, Kirk.

H. parviflora, Lindau. (1) Buchanan.

Mellera lobulata, S. Moore. (1) Buchanan; Mañanja hills, Meller.

Calophanes spp. (1) Buchanan; Chiradzulu, Whyte.

Ruellia prostrata, T. Anders. (1) Buchanan; Shire Highlands, Scott-Elliot; Lower Shire Valley, Kirk; (2) Carson.

Paulo-wilhelmia sp. (1) Buchanan; Chiradzulu, Whyte; Mañanja hills, Meller.

Mimulopsis sesamoides, S. Moore. (1) Mlanje, Whyte.

Mimulopsis sp. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Eranthemum senense, Klotzsch. (1) Buchanan; Mlanje, McClounie; Mañanja hills, Kirk.

Acanthopale sp. (*Dischistocalyx confertiflora*, Lindau). (1) Buchanan.

Whitfieldia sp. (2) Carson.

Dyschoriste, sp. (*Calophanes verticillaris*, Oliv.) (1) Mañanja hills, Meller; Buchanan; Chiradzulu, Whyte; (2) Higher plateau, north of Lake Nyasa, J. Thomson.

Dyschoriste spp. (2) Carson; (4) Batoka country, Kirk.

Strobilanthes sp. (1) Buchanan.

Phaylopsis parviflora, Willd. (1) Buchanan; Chiradzulu, Whyte.

Phaylopsis sp. (*Micranthus Poggei*, Lindau). (1) Chiradzulu, Whyte.

Blepharis serrulata, Ficalho et Hiern. (3) Serpa Pinto.

B. longifolia, Lindau. (1) Buchanan.

Blepharis spp. (1) Buchanan; (2) Nutt.

Crossandra Greenstockii, S. Moore. (1) Mañanja hills, Meller; Mlanje, Whyte and McClounie; Shire Highlands, Scott-Elliot; Buchanan.

C. nilotica, Oliv. (2) Tanganyika and Mweru, Carson.

C. puberula, Klotzsch. (1) Lower Shire Valley, Meller and Kirk; Mañanja hills, Meller; Buchanan.

Crossandra sp. (1) Buchanan.

Barleria Kirkii, T. Anders. (1) Buchanan.

B. calophylloides, Lindau. (1) Nutt.

B. Prionitis, L. (1) Shire Highlands, Meller.

ACANTHACEAE.

Barleria spinulosa, Klotzsch. (1) River Shire, Meller and Kirk; Buchanan.
B. eranthemoides, R. Br. (1) Buchanan.
Barleria sp. (2) Carson; Nutt.
Crabbeanana, Nees (*C. aovalifolia*, Ficalho et Hiern.) (3) Serpa Pinto.
Crabbea sp. (1) Buchanan.
Lepidagathis spp. (1) Buchanan; (2) Nutt.
Asystasia coromandeliana, Nees. (1) Zomba, Whyte; Buchanan; (2) Carson.
Asystasia sp. (2) Carson.
Brachystephanus africanus, S. Moore. (1) Mlanje, Whyte.
Justicia Whytei, S. Moore. (1) Mlanje, Whyte.
J. heterocarpa, T. Anders. (2) Nutt.
J. anselliana, T. Anders. (1) Mlanje, Whyte.
J. melampyrum, S. Moore. (1) Mlanje, Whyte.
Justicia spp. (1) Buchanan; Chiradzulu, Whyte; Blantyre, Last; Shire Highlands and Lake Nyasa, Scott-Elliot; (2) Nutt; Carson; Nyasa-Tanganyika plateau, Scott-Elliot.
Isoglossa milanjiensis, S. Moore. (1) Mlanje, Whyte.
Isoglossa sp. (1) Buchanan.
Rhinacanthus communis, Nees. (1) Shire Highlands, Scott-Elliot.
Rhinacanthus sp. (1) Buchanan; Blantyre, Last; Chiradzulu, Whyte.
Himantochilus marginatus, Lindau. (1) Chiradzulu, Whyte.
Dicliptera sp. (1) Buchanan.
Peristrophe bicalyculata, Nees. (2) Nyasa-Tanganyika plateau, Scott-Elliot.
Hypoestes verticillaris, R. Br. (1) Mlanje, Whyte; (2) Carson; Nutt.
H. phaylopsoides, S. Moore. (1) Mlanje, Whyte.
H. Rothii, T. Anders. (1) Chiradzulu, Whyte.
H. latifolia, H. (1) Buchanan.
Hypoestes spp. (1) Buchanan; (2) Carson.

VERBENACEAE.

Lantana salviaefolia, Jacq. (1) Buchanan; Mlanje and Chiradzulu, Whyte; Shire Highlands, Scott-Elliot; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson; Nutt; (3) Serpa Pinto.
Lippia nodiflora, A. Rich. (1) Buchanan.
L. asperifolia, Rich. (1) Lower Shire Valley, Meller; Chiradzulu, Whyte; (2) Plateau, north of Lake Nyasa, J. Thomson.
Lippia sp. (2) Carson.
Priva leptostachya, Juss. (1) Buchanan.
Premna senensis, Klotzsch. (1) Buchanan.
Premna sp. (1) Buchanan.
Holmskioldia tettensis, Vatke. (1) Banks of Shire River, Kirk.
Vitex milanjiensis, Britten. (1) Shire Highlands, Scott-Elliot; Mlanje and Zomba, Whyte; (2) Nyasa-Tanganyika plateau, Scott-Elliot.
V. Mombassae, Vatke. (1) Buchanan.
V. paludosa, Vatke. (1) River Shire, Kirk; Buchanan; Mañanja hills, Meller; (2) Karonga, L. Scott.
V. Buchananii, Baker. (1) Buchanan.
Vitex spp. (1) Buchanan; Lake Chilwa, Kirk; (4) Menyharth.
Clerodendron tanganyikense, Baker. (2) Carson.
C. capitatum, Schum. (1) Buchanan; (2) Upper plateau, north of Lake Nyasa, J. Thomson; Carson.
C. discolor, Vatke. (1) Mlanje and Zomba, Whyte.

VERBENACEAE.

Clerodendron lanceolatum, Gürke. (4) Menyharth.

C. myricoides, R. Br. (1) Buchanan; Mlanje and Zomba, Whyte; Shire Highlands, Scott-Elliot; Mañanja hills, Meller.

C. spinescens, Gürke. (1) Maravi country, Kirk; (2) Carson; Nutt.

Clerodendron spp. (1) Mañanja hills, Meller; Lower Shire Valley, Waller; Buchanan.

LABIATAE.

Ocimum suave, Willd. (1) Shire Highlands, Last; Chiradzulu, Whyte; (2) Nutt.

O. affine, Hochst. (1) Blantyre, L. Scott; Mlanje, McClounie; (2) Carson.

O. filamentosum, Forsk. (1) Mlanje, Whyte.

O. cornigerum, Hochst. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

O. hians, Benth. (1) Mlanje, Whyte.

O. bracteosum, Benth. (1) Buchanan.

Ocimum spp. (1) Buchanan; Shire Highlands, Scott-Elliot, L. Scott and K. C. Cameron; (2) Upper and Lower plateaux, north of Lake Nyasa.

Acrocephalus callianthus, Briquet. (1) Buchanan; Chiradzulu, Whyte; Blantyre, Last; Mañanja hills, Meller.

A. zambesiacus, Baker. (1) Buchanan.

A. caeruleus, Oliv. (2) Nutt.

Acrocephalus spp. (1) Buchanan; Mañanja hills, Kirk; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson; Nutt.

Orthosiphon coloratus, Vatke. (1) Zomba, Whyte.

O. trichodon, Baker. (1) Buchanan.

O. Kirkii, Baker, ined. ex. Britten, in Trans. Linn. Soc. 2nd Ser. iv., p. 37. (1) Mlanje, Whyte.

O. Cameroni, Baker. (2) Carson.

Orthosiphon spp. (1) Shire Highlands, Scott-Elliot; (2) Carson; Nutt.

Geniosporum affine, Gürke. (1) Buchanan.

Moschosma polystachyum, Benth. (1) Chiradzulu, Whyte.

M. riparium, Hochst. (1) Murchison Falls, Meller; Chiradzulu, Whyte; Last; Buchanan; Shire Highlands, L. Scott; (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Moschosma sp. (1) Buchanan; Blantyre, Last.

Coleus umbrosus, Vatke. (1) Blantyre, Descamps.

C. leucophyllus, Baker. (2) Mweru, Carson.

C. punctatus, Baker. (2) Mweru, Carson.

C. shirensis, Gürke (*Plectranthus glandulosus*, Britten, non Hook. fil.). (1) Buchanan; Zomba, Whyte.

Coleus spp. (1) Buchanan; Chiradzulu, Whyte; (2) Carson.

Solenostemon sp. (1) Blantyre, Last; Chiradzulu, Whyte.

Aeolanthus Nyassae, Gürke. (1) Buchanan.

A. ukambensis, Gürke. (1) Buchanan.

Aeolanthus spp. (1) Buchanan.

Pycnostachys parvifolia, Baker. (2) Carson.

P. verticillata, Baker. (2) Carson.

P. cyanea, Gürke. (1) Buchanan.

P. pubescens, Gürke. (1) Buchanan.

P. reticulata, Benth. (2) Carson.

P. urticifolia, Hook. (1) Mañanja hills, Meller; Buchanan; Chiradzulu, Whyte.

Pycnostachys spp. (2) Nutt; Carson.

Plectranthus subacaulis, Baker. (2) Mweru, Carson.

LABIATAE.

Plectranthus modestus, Baker. (2) Carson.

Pl. floribundus, N. E. Br.; var. *longipes*, N. E. Br. (1) Mañanja hills, Meller; Maravi country, Kirk; Buchanan; Shire Highlands, L. Scott; (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Pl. elegans, Britten. (1) Mlanje, Whyte.

Pl. primulinus, Baker. (2) Mweru, Carson.

Pl. sanguineus, Britten. (1) Mlanje, Whyte.

Pl. betonicaefolius, Baker. (2) Carson; Nutt.

Pl. densus, N. E. Br. (2) Higher plateau, north of Lake Nyasa, J. Thomson.

Pl. manganjensis, Baker, ined. ex. Britten, in Trans. Linn. Soc. 2nd Ser. iv., p. 37. (1) Zomba, Whyte.

Plectranthus sp. (*Pl. Melleri*, Britten, non Baker). (1) Mlanje, Whyte; Chiradzulu, Meller.

Plectranthus spp. (1) Shire Valley and Mañanja hills, Kirk; Buchanan; Last; Shire Highlands, Scott-Elliot; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson.

Hoslundia opposita, Vahl. (1) Mlanje and Zomba, Whyte; Mañanja hills, Zomba and east end of Lake Chilwa, Meller.

Hyptis pectinata, Poit. (1) Zomba and Chiradzulu, Whyte; Blantyre, Descamps.

Calamintha simensis, Benth. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Micromeria biflora, Benth. (1) Mlanje, Whyte; (2) Lower plateau, north of Lake Nyasa, J. Thomson.

Micromeria sp. (1) Zomba, Whyte.

Elsholtzia sp. (2) Carson.

Achyrospermum sp. (1) Ndirande Mountain, Buchanan.

Lasiocorys sp. (2) Carson.

Leonitis pallida, R. Br. (1) Blantyre, Descamps.

L. nepetaefolia, R. Br. (2) Carson.

L. Leonurus, R. Br. (2) Carson.

L. velutina, Fenzl. (1) Buchanan; Descamps; Mañanja hills, Meller.

Leonitis spp. (1) Mañanja hills, Meller; Chiradzulu, Whyte.

Tinnea sp. (1) Mañanja hills, Kirk; Buchanan; (4) Batoka country, Kirk.

Scutellaria paucifolia, Baker. (2) Carson; Lower plateau, north of Lake Nyasa, J. Thomson; Mweru, Carson.

S. Livingstonei, Baker, ined. ex. Britten, in Trans. Linn. Soc. 2nd ser. iv. p. 37. (1) Mañanja hills, Kirk; Buchanan; Blantyre, L. Scott; Zomba, Whyte; Livingstone; (2) Mweru, Carson.

Scutellaria sp. (2) Carson.

Stachys aethiopica, L. (1) Mlanje, Whyte.

Stachys sp. (1) Buchanan.

Leucas martinicensis, R. Br. (1) Buchanan; (4) Menyharth.

L. Nyassae, Gürke. (1) Buchanan.

L. milanjiana, Gürke (*L. glabrata*, Britten, non R. Br.) (1) Mlanje, Whyte; Buchanan.

L. decadonta, Gürke. (1) Buchanan.

Leucas spp. (1) Mañanja hills, Meller; Buchanan; (2) Nutt; Carson; Lower plateau, north of Lake Nyasa, J. Thomson; (4) Batoka country, Kirk.

NYCTAGINEAE.

Mirabilis Jalapa, L. (1) Shire Valley, Meller; Mañanja hills, Kirk.

Boerhaavia repens, L., var. *ascendens*, Willd. (1) Buchanan.

B. plumbaginea, Cav. (1) Shire Highlands, Scott-Elliot.

B. Burchellii, Choisy. (1) Shire Valley, Waller.

ILLECEBRACEAE.

1 sp. (3) Serpa Pinto.

AMARANTACEAE.

Celosia argentea, L. (2) Carson.

C. Schweinfurthii, Schinz. (1) Shire Valley, L. Scott.

C. trigyna, L. (1) Buchanan; Mañanja hills, Meller; Mlanje and Chiradzulu, Whyte; Blantyre, Last.

Celosia spp. (1) Shire Valley, Kirk; Buchanan.

Amarantus Blitum, L. (1) Shire Highlands, Scott-Elliot; Buchanan.

A. Thunbergii, Moq. (1) Shire Valley, L. Scott.

A. caudatus, L. (1) Mañanja hills, Meller; Mpatamanga, Shire River, Kirk; (2) North Nyasaland, L. Scott.

Centema Kirkii, Hook. fil. (1) Lake Nyasa, Kirk; Elephant Marsh, Shire River, L. Scott; Buchanan.

Cyathula cylindrica, Moq. (1) Chiradzulu, Whyte; Buchanan.

C. globulifera, Moq. (1) Mañanja hills, Meller; Buchanan; Chiradzulu, Whyte; Mpatamanga, on Shire River, Kirk.

Pupalia lappacea, Moq. (1) Buchanan.

Aerua lanata, Juss. (1) Buchanan.

A. javanica, Juss. (1) Shire Highlands, and throughout the Mañanja and Shire hills, Buchanan, Meller and L. Scott.

Psilotrichum spp. (1) Blantyre, Buchanan and Last; Chiradzulu, Whyte.

Achyranthes aspera, L. (1) Blantyre, Descamps; Chiradzulu, Whyte; (2) Carson; var. *argentea*, Lam. (2) Chiradzulu, Whyte.

Achyranthes sp. (2) Carson.

Alternanthera sessilis, R. Br. (1) Shire Highlands, Scott-Elliot; (2) North Nyasa, L. Scott.

A. nodiflora, R. Br. (1) Buchanan.

CHENOPODIACEAE.

Chenopodium Botrys, L. (1) Buchanan; var. *C. procerum*, Hochst. (1) Buchanan.

PHYTOLACCACEAE.

Phytolacca abyssinica, Hoffm. (1) Chiradzulu, Whyte; Buchanan.

POLYGONACEAE.

Oxygonum atriplicifolium, Baker (*Centogonum atriplicifolium*, Meisn.), var. *O. sinuatum*, Engl. (1) Lake Chilwa, Kirk.

Polygonum Poiretii, Meisn. (1) Chiradzulu, Whyte.

P. plebeium, R. Br. (1) Buchanan.

P. senegalense, Meisn. (1) Banks of Shire River, Kirk; (2) North Nyasa, L. Scott.

P. tomentosum, Willd. (1) Buchanan.

P. serrulatum, Lag. (1) Zomba, Whyte; (2) Lake Nyasa, L. Scott.

P. barbatum, L. (1) Buchanan; Lake Nyasa, Scott-Elliot.

P. tristachyum, Baker. (1) Buchanan.

P. glabrum, Willd. (1) Upper Shire, Scott-Elliot.

P. lanigerum, R. Br. (1) Upper Shire, Scott-Elliot; Lower Shire Valley, Meller; Lake Chilwa, Buchanan; Shire Highlands, K. C. Cameron.

P. lapathifolium, L. (1) Lower Shire Valley, Meller.

P. alatum, Hamilt. (1) Buchanan.

P. strigosum, R. Br. (1) Buchanan.

Rumex nepalensis, Spreng. (1) Buchanan.

R. abyssinicus, Jacq. (1) Shire Highlands, K. C. Cameron; Buchanan.

R. maderensis, Lowe. (2) Carson; Higher plateau, north of Lake Nyasa, J. Thomson.

PODOSTEMACEAE.

Hydrostachys polymorpha, Klotzsch. (1) Tributary of Shire to north-east of Katunga, Kirk; Blantyre, Last; Buchanan.

Sphaerothylax sp. (1) Blantyre, Last.

PIPERACEAE.

Piper capense, L. fil. (1) Chiradzulu and Zomba, Whyte; Buchanan.

Peperomia reflexa, Dietr. (1) Mlanje, McClounie and Whyte; Zomba, Whyte; Buchanan.

LAURACEAE.

Cassytha guineensis, S. et T. (1) Buchanan.

PROTEACEAE.

Protea Nyasae, Rendle. (1) Mlanje, Whyte.

P. abyssinica, Willd. (1) Blantyre, L. Scott; Buchanan; (2) Nutt; (4) Batoka country, Kirk.

Protea spp. (1) Mañanja hills, Meller; Buchanan; Katunga, Kirk; (2) Higher plateau, north of Lake Nyasa, J. Thomson.

Faurea speciosa, Welw. (1) Buchanan; Zomba, Whyte.

Faurea sp. (1) Chiradzulu, Meller; near Chiradzulu, Kirk; Buchanan; (4) Batoka country, Kirk.

THYMELAEACEAE.

Arthrosolen flavus, Rendle. (1) Mlanje, Whyte; Blantyre, L. Scott; (2) Nutt.

A. glaucescens, Oliv. (2) Carson.

Arthrosolen spp. (1) Mañanja hills, Kirk and Meller; Last; Buchanan; (2) Nutt.

Gnidia Buchananii, Gilg. (1) Buchanan; Chiradzulu and Mañanja hills, Meller.

G. microcephala, Meisn. (1) Mlanje and Zomba, Whyte; Zomba and east end of Lake Chilwa, Meller.

G. apiculata, Gilg. (1) Buchanan.

G. fastigiata, Rendle. (1) Mlanje, Whyte.

Gnidia spp. (1) Foot of Chiradzulu, Kirk; Blantyre, L. Scott; Sochi, Kirk; Buchanan; (2) Carson; Upper and Lower plateaux, north of Lake Nyasa, J. Thomson; Nutt.

Lasiosiphon spp. (1) Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson; (4) Batoka country, Kirk.

Peddiea longipedicellata, Gilg. (1) Buchanan.

LORANTHACEAE.

Loranthus mweruensis, Baker. (2) Mweru, Carson.

Loranthus spp. (1) Lower Shire, Meller; Zomba, Kirk; Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Carson.

SANTALACEAE.

Thesium nigricans, Rendle. (1) Mlanje and Zomba, Whyte.

T. whyteanum, Rendle. (1) Mlanje, Whyte.

Thesium spp. (1) Foot of Chiradzulu, Kirk; Blantyre and Matope, L. Scott; Buchanan; Mlanje, McClounie; (4) Batoka country, Kirk.

Colpoon sp. (1) Buchanan.

Osyridacarpus scandens, Engl. (1) Katunga, Kirk.

EUPHORBIACEAE.

Euphorbia scordifolia, Jacq. (1) Buchanan.

E. zambesiaca, Benth. (1) Mlanje, McClounie; Buchanan; Zomba and east end of Lake Chilwa, Meller; (2) Mweru, Carson.

E. Grantii, Oliv. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

EUPHORBIACEAE.

Euphorbia whyteana, Baker fil. (1) Mlanje, Whyte.
E. shirensis, Baker fil. (1) Mlanje, Whyte.
E. indica, Lam. (4) Menyharth.
Euphorbia spp. (1) Above Elephant Marsh and Murchison Falls, Shire River, and Mañanja hills, Meller; Katunga, Kirk; west shore of Lake Nyasa, Kirk; Buchanan; (2) Karonga, L. Scott; Carson.
Synadenium Grantii, Hook. fil. (4) Menyharth.
Synadenium sp. (2) Carson.
Bridelia micrantha, Baill. (1) Buchanan.
Bridelia sp. (1) Zomba, Kirk; Buchanan; (4) Menyharth.
Phyllanthus nummulariaefolius, Poir. (1) Blantyre, Last.
P. leucanthus, Pax. (1) Buchanan.
P. maderaspatensis, L. (1) Above Elephant Marsh, on River Shire, L. Scott.
P. hysteracanthus, Muell.-Arg. (1) West shore of Lake Nyasa, Kirk.
P. rotundifolius, Willd. (1) Mlanje, Whyte; var. *leucocalyx*, Muell.-Arg. (1) Mlanje, Whyte.
Phyllanthus spp. (1) Buchanan; Blantyre, L. Scott; Mlanje, Whyte; (2) Karonga, L. Scott; Carson; Nutt; (4) Menyharth.
Securinega obovata, Muell.-Arg. (4) Menyharth.
Uapaca nitida, Muell.-Arg. (4) Batoka country, Kirk.
U. kirkiana, Muell.-Arg. (1) Mañanja hills, Kirk; Buchanan.
Uapaca spp. (1) Buchanan.
Antidesma spp. (1) Shire River, Kirk; Mlanje, Whyte; Buchanan.
Jatropha Curcas, L. (1) Buchanan; Mlanje, McClounie; (4) Menyharth.
Jatropha sp. (2) Carson.
Croton macrostachyus, Hochst. (1) Buchanan.
Croton spp. (1) Buchanan; (4) Menyharth.
Cluytia richardiana, Muell.-Arg. (1) Buchanan; Chiradzulu, Whyte.
Cluytia sp. (2) Lower plateau, north of Lake Nyasa, J. Thomson.
Caperonia spp. (1) Blantyre, Last; Buchanan.
Cephalocroton sp. (1) Buchanan.
Micrococca Mercurialis, Benth. (1) Elephant Marsh, on Shire River, L. Scott.
Acalypha benguelensis, Muell.-Arg. (1) Mlanje and Zomba, Whyte.
A. villicaulis, A. Rich. (1) Mañanja hills, Meller; Mlanje and Zomba, Whyte; Buchanan; (2) Carson.
A. pilostachya, Hochst. (1) Mpatamanga, on Shire River, Kirk; Buchanan; Chiradzulu, Whyte; (2) Lower plateau, north of Lake Nyasa, J. Thomson.
Acalypha spp. (1) Buchanan.
Alchornea sp. (1) Buchanan.
Neoboutinia africana, Muell.-Arg. (1) Zomba, Whyte.
Mallotus Melleri, Muell.-Arg. (1) Mañanja hills, Meller; Buchanan.
Macaranga spp. (1) Buchanan.
Ricinus communis, L. (1) Lower Valley of Shire, Meller.
Tragia mitis, Hochst. (4) Menyharth.
Tragia sp. (1) Shire River above Elephant Marsh, L. Scott.
Dalechampia sp. (1) Lower Shire River, Kirk; (4) Menyharth.
Maprounea sp. (4) Batoka country, Kirk.
Excoecaria sp. (1) Buchanan.

URTICACEAE.

Trema spp. (1) Buchanan; Mañanja hills, Meller and Kirk.
Dorstenia Buchananii, Engler. (1) Buchanan.

URTICACEAE.

Dorstenia Walleri, Hemsl. (1) Mañanja hills, Meller; Buchanan.
Dorstenia spp. (1) Buchanan.
Ficus capreaefolia, Del. (1) Island in River Shire, near Mbenje, L. Scott.
Ficus spp. (1) Katunga, Shire Valley, L. Scott; Buchanan; Kankanje, Kirk; (2) Karonga, L. Scott.
Treculia sp. (1) West shore of Lake Nyasa, Kirk.
Myrianthus sp. (1) Buchanan.
Urtica sp. (1) Chiradzulu, Whyte.
Fleurya aestuans, Gaudich. (1) Buchanan.
Fleurya sp. (1) Shire Valley, L. Scott; (4) Menyharth.
Urera sp. (1) Buchanan.
Girardinia heterophylla, Dcne. (1) Buchanan; Mañanja hills, Waller; Chiradzulu, Kirk.
Girardinia sp. (1) Buchanan.
Pilea sp. (1) Buchanan.
Boehmeria platyphylla, Don. (1) Chiradzulu, Whyte; Buchanan.
Boehmeria sp. (1) Buchanan.
Pouzolzia sp. (1) Buchanan.
Pipturus sp. (1) Buchanan.

MYRICACEAE.

Myrica pilulifera, Rendle. (1) Mlanje, Whyte.
Myrica spp. (1) Buchanan.

CERATOPHYLLEAE.

Ceratophyllum sp. (1) Blantyre, Last; Lake Nyasa, Laws.

HYDROCHARIDACEAE.

Lagarosiphon Nyassae, Ridley. (1) Lake Nyasa, Laws.
Vallisneria spiralis, L. (1) Lake Nyasa, Laws.
Ottelia spp. (1) Luangwa, west shore of Lake Nyasa, Kirk; Blantyre, Last.

BURMANNIACEAE.

Burmannia bicolor, Mast., var. *africana*, Ridley. (2) Lower plateau, north of Lake Nyasa, J. Thomson.

ORCHIDACEAE.

Liparis Bowkeri, Harv. (1) Buchanan.
Megaclinium Melleri, Hook. fil. (1) Chiradzulu, Meller; Mlanje, McClounie.
Eulophia callichroma, Rchb. fil. (1) Mañanja hills, Meller and Kirk; Zomba, Meller.
E. Nyasae, Rendle. (1) Mlanje, Whyte.
E. cristata, Rendle. (1) Shire Highlands, Scott-Elliot.
E. praestans, Rendle. (1) Shire Highlands, Scott-Elliot.
E. milanjiana, Rendle. (1) Mlanje, Whyte; Mañanja hills, Meller; Buchanan.
E. missionis, Rendle. (1) Mlanje, Scott-Elliot.
E. Shupangae, Kränz. (1) Mañanja hills, Kirk and Waller; Blantyre, L. Scott; Zomba, Buchanan.
E. longesepala, Rendle. (1) Mlanje, Whyte.
E. venulosa, Rchb. fil. (*E. humilis*, Rendle). (1) Mañanja hills, Meller; Shire Highlands, Scott-Elliot.
Eulophia spp. (1) Mañanja hills, Kirk, Meller and Waller; Mlanje, McClounie; Buchanan; (2) Nyasa-Tanganyika plateau, J. Thomson and H. H. Johnston; Carson; Nutt; (4) Sesheke, Holub.
Cyrtopera Walleri, Rchb. fil. (1) Mañanja hills, Waller; Buchanan.

ORCHIDACEAE.

Lissochilus microceras, Rchb. fil. (1) Sochi, Kirk; Mañanja hills, Meller.
L. heteroglossus, Rchb. fil. (1) Upper Shire Valley, Kirk.
L. gracilior, Rendle. (1) Shire Highlands, Scott-Elliot.
L. livingstonianus, Rchb. fil. (1) Mañanja hills, Waller and Meller; Mlanje, Whyte and McClounie; between Matope and Blantyre, L. Scott.
L. arenarius, Lindl. (1) Mañanja hills, Kirk and Meller; Shire Highlands, Scott-Elliot; Mlanje, Whyte; Buchanan; (2) North of Lake Nyasa, L. Scott; Carson.
L. Sandersoni, Rchb. fil. (1) Buchanan.
L. papilionaceus, Rendle. (2) Nyasa-Tanganyika plateau, Scott-Elliot.
L. Krebsii, Rchb. fil. (1) Mlanje, McClounie.
L. shirensis, Rendle. (1) Sochi, Shire Highlands, Scott-Elliot.
L. calopterus, Rchb. fil. (1) Lower Shire Valley, L. Scott.
L. Wakefieldii, Rchb. fil. (1) Mlanje, Whyte.
L. dispersus, Rolfe. (1) Livingstonia (Collector not known).
L. brevisepalus, Rendle. (1) Sochi and Ndirande, Scott-Elliot.
L. milanjianus, Rendle. (1) Mlanje, Whyte; Mañanja hills, Meller; Buchanan.
Lissochilus spp. (1) Buchanan; Mañanja hills, Waller; (2) Nyasa-Tanganyika plateau, Carson and J. Thomson; Mweru, Carson.
Polystachya imbricata, Rolfe. (1) Buchanan.
P. Buchanani, Rolfe. (1) Buchanan.
P. shirensis, Rchb. fil. (1) Shire River, Meller.
P. zambesiaca, Rolfe. (1) Buchanan.
P. lawrenceana, Kränz. (1) Buchanan.
P. villosa, Rolfe. (1) Buchanan.
P. minima, Rendle. (1) Sochi, Shire Highlands, Scott-Elliot.
Polystachya spp. (1) Mlanje, Whyte and McClounie, Zomba, Kirk.
Angraecum alcicorne, Rchb. fil. (1) Mlanje; McClounie; Shire River, Kirk.
A. chiloschistae, Rchb. fil. (1) Shire Valley, Kirk; Blantyre, Last.
A. megalorrhizum, Rchb. fil. (1) Shire Valley, Kirk and Waller; Buchanan.
A. verrucosum, Rendle. (1) Mlanje, Whyte.
Angraecum sp. (1) Buchanan.
Pogonia spp. (1) Buchanan.
Stenoglottis sp. (1) Buchanan.
Holothrix Johnstonii, Rolfe. (1) Mlanje, McClounie; Zomba, Whyte.
Holothrix sp. (1) Blantyre, Last; (2) Upper plateau, north of Lake Nyasa, J. Thomson.
Peristylis hispidula, Rendle. (1) Buchanan.
Habenaria zambesina, Rchb. fil. (1) Buchanan.
H. subarmata, Rchb. fil. (1) Katunga, Kirk.
H. sochensis, Rchb. fil. (1) Sochi hill, Kirk.
H. Welleri, Rchb. fil. (1) Mañanja hills and foot of Mlanje, Kirk; Blantyre, Last.
H. praestans, Rendle. (1) Buchanan; Blantyre, Last.
H. buchananiana, Kränz. (1) Buchanan; Mañanja hills, Waller; Mlanje, Scott-Elliot; (2) Nutt.
Habenaria spp. (1) Carson.
Brachycorythis pleistophylla, Rchb. fil. (1) Buchanan; Mlanje, McClounie and Whyte; Sochi, Shire Highlands, Scott-Elliot; Blantyre, Last.
B. pubescens, Harv. (1) Mlanje, Scott-Elliot; Blantyre, Last; Buchanan.
Brachycorythis tenuior, Rchb. fil. (1) Blantyre, Last; (2) Nutt; Carson.
Satyrium cheirophorum, Rchb. fil. (1) Blantyre, Last.
S. minax, Rchb. fil. (1) Blantyre, Last.
S. Buchanani, Rchb. fil. (1) Blantyre, Last.

ORCHIDACEAE.

Satyrium spp. (1) Mpatamanga and Mañanja hills, Kirk; Buchanan; (2) Carson; Nutt.

Disa hircicornis, Rchb. fil. (1) Mañanja hills, Kirk.

D. Walleri, Rchb. fil. (1) Mañanja hills, Waller.

D. zombaensis, Rendle. (1) Zomba, Whyte.

D. hamatopetala, Rendle. (1) Mlanje, McClounie and Whyte.

Disa spp. (1) Buchanan; Zomba, Kirk; Blantyre, Last; (2) Higher plateau, north of Lake Nyasa, J. Thomson; Carson; Nutt; Nyasa-Tanganyika plateau, Johnston.

SCITAMINEAE.

Kaempferia aethiopica, Benth. (1) Buchanan; Mandala, Scott-Elliot; Mañanja hills, Meller; near Blantyre, L. Scott; (2) Karonga, Carson; Nyasa-Tanganyika plateau, H. H. Johnston.

K. rosea, Schweinf. (1) Shire Highlands, Scott-Elliot; Lake Nyasa, L. Scott; Buchanan; Lower Shire Valley, Kirk; Shire Valley, Meller.

Kaempferia sp. (2) Karonga, Carson.

Cadalvenia spectabilis, Fenzl. (1) Shire Highlands, Scott-Elliot; Buchanan; Blantyre, Last; (2) Nyasa-Tanganyika plateau, H. H. Johnston.

Amomum sp. (1) Zomba, Kirk.

Canna indica, L., subsp. *C. orientalis*, Roscoe. (1) Lower valley of Shire River, Meller.

Musa Buchanani, Baker. (1) Shire Highlands, Kirk; Buchanan.

M. sapientum, L., var. *M. paradisiaca*, L. (1, 2, and 4) abundant.

M. livingstoniana, Kirk. (1) Lake Nyasa, Kirk.

HAEMODORACEAE.

Sansevieria Kirkii, Baker. (1) Buchanan.

Cyanastrum sp. (2) Nyasa-Tanganyika plateau, H. H. Johnston; Nutt.

IRIDACEAE.

Morasa zambesiaca, Baker. (1) Mañanja hills, Meller; Sochi and Katunga, Kirk; Zomba, Buchanan; Mlanje, McClounie; (2) Higher plateau, north of Lake Nyasa, and between Nyasa and Tanganyika, J. Thomson.

M. angusta, Ker. (2) Carson; Nutt.

M. ventricosa, Baker. (2) Carson.

M. Thomsoni, Baker. (2) Higher plateau, north of Lake Nyasa, J. Thomson.

M. Carsoni, Baker. (2) Carson.

M. iridoides, L. (1) Mpatamanga, Kirk.

Aristea johnstoniana, Rendle. (1) Mlanje, Whyte and McClounie.

Dierama pendula, Baker. (1) Mlanje, Whyte and McClounie; (2) Nyasa-Tanganyika plateau, J. Thomson.

Lapeyrousia erythrantha, Baker. Mañanja hills, Waller.

L. Sandersoni, Baker. (1) Buchanan; (4) Menyharth.

L. grandiflora, Baker. (1) Mañanja hills, Meller; Buchanan.

L. holostachya, Baker. (2) Carson.

Crocosma aurea, Planch. (1) Buchanan; Shire Highlands, Scott-Elliot.

Acidanthera bicolor, Hochst. (1) Buchanan.

Gladiolus unguiculatus, Baker. (2) Nyasa-Tanganyika plateau, J. Thomson; Carson.

G. Oatesii, Rolfe. (1) Mlanje, Whyte; Buchanan.

G. Thomsoni, Baker. (2) Higher plateau, north of Lake Nyasa, J. Thomson.

G. flexuosus, Baker. (2) Carson.

G. atropurpureus, Baker. (1) Mañanja hills, Waller; Shire Highlands, Scott-Elliot.

G. Melleri, Baker. (1) Mañanja hills, Meller and Waller; Katunga and Mpimbi, Kirk; Buchanan; Mlanje, Whyte.

IRIDACEAE.

Gladiolus Buchanani, Baker. (1) Ndirande, Buchanan.
G. gracillimus, Baker. (2) Carson.
G. tritonioides, Baker. (2) Carson.
G. Hanningtoni, Baker. (2) Carson; Nutt.
G. zambesiacus, Baker. (1) Blantyre, Last.
G. oligophlebius, Baker. (2) Carson; Nutt.
G. erectiflorus, Baker. (2) Carson.
G. caudatus, Baker. (2) Carson.
G. brachyandrus, Baker. (2) Buchanan.
G. quartinianus, A. Rich. (1) Buchanan; (2) Carson; Nutt.
Gladiolus spp. (1) Shire Highlands, Scott-Elliot; (2) Carson.

AMARYLLIDACEAE.

Hypoxis villosa, L. (1) Buchanan; Shire Highlands, L. Scott and Scott-Elliot; Mañanja hills, Meller; (2) Lower plateau, north of Lake Nyasa, J. Thomson.
H. obtusa, Burch. (1) Shire Highlands, Scott-Elliot; (2) Lower plateau, north of Lake Nyasa, J. Thomson.
H. angustifolia, Lam. (1) Mlanje, Whyte.
Curculigo gallabatensis, Schweinf. (2) R. Nsessi, L. Scott.
Curculigo sp. (1) Buchanan.
Crinum subcernuum, Baker. (1) Shire River, Kirk.
Crinum sp. (4) Menyharth.
Buphane disticha, Herb. (1) Mañanja hills, Meller; Shire Highlands, Buchanan and Scott-Elliot; (2) between Nyasa and Tanganyika, and upper plateau, north of Lake Nyasa, J. Thomson.
Brunsvigia Kirkii, Baker. (2) Nyasa-Tanganyika plateau, Scott-Elliot.
Cyrtanthus Welwitschii, Hiern. (1) Mlanje, Whyte and McClounie; Buchanan.
Haemanthus multiflorus, Martyn. (1) Mañanja hills, Meller; Buchanan.
Haemanthus sp. (4) Menyharth.
Pancratium trianthum, Herb. (1) Shire cataracts, Kirk.
Vellozia splendens, Rendle. (1) Mlanje, Whyte and McClounie.
Vellozia sp. (1) Mañanja hills, Meller; Zomba and east end of Lake Chilwa, Kirk; Shire Highlands, Scott-Elliot and Buchanan.

TACCACEAE.

Tacca pinnatifida, L. (1) Shire Highlands, Buchanan and Scott-Elliot.

DIOSCOREACEAE.

Dioscorea Buchanani, Benth. (1) Buchanan.
D. prehensilis, Benth. (1) Buchanan.
D. schimperiana, Hochst. (1) Mpatamanga, Kirk; Buchanan.
D. dumetorum, Pax. (1) Mañanja hills, Meller; Buchanan.
D. beccariana, Martelli, var. *vestita*, Pax. (1) Shire Highlands, Buchanan and Scott-Elliot.

LILIACEAE.

Dracaena fragrans, Ker.-Gawl. (1) Chiradzulu, Meller; Buchanan; Zomba, Whyte.
D. elliptica, Thunb. et Dallm. (1) Buchanan.
Smilax kraussiana, Meisn. (1) Mañanja hills, Kirk; Mlanje, Whyte; Buchanan; Shire Highlands, Scott-Elliot.
Asparagus virgatus, Baker. (1) Buchanan; Mlanje, Whyte.
A. plumosus, Baker. (1) Buchanan; Mlanje, Whyte.

LILIACEAE.

Asparagus Paulo-gulielmi, Solms. (1) Shire Highlands, L. Scott.
A. puberulus, Baker. (1) Mañanja hills, Meller.
A. irregularis, Baker. (1) Foot of Chiradzulu, Kirk.
A. africanus, Lam. (2) Carson; Nutt; (4) Menyharth.
A. asiaticus, L. (4) Menyharth.
A. racemosus, Willd. (1) Chiradzulu, Whyte; Buchanan; (2) Carson.
A. Buchanani, Baker. (1) Buchanan.
Asparagus sp. (1) Buchanan; Blantyre, Last.
Hylonome reticulata, Webb. (1) Mlanje, Whyte.
Kniphofia longistyla, Baker. (1) Zomba, Kirk; Buchanan.
K. zombensis, Baker. (1) Zomba, Buchanan.
Aloe Buchanani, Baker. (1) Buchanan.
A. Nuttii, Baker. (2) Nutt; Carson.
A. cryptopoda, Baker. (4) Menyharth.
Eriospermum abyssinicum, Baker. (1) Buchanan; Shire Highlands, Scott-Elliot.
E. Kirkii, Baker. (1) Shire Highlands, Buchanan and L. Scott.
Eriospermum sp. (2) Carson.
Bulbine alooides, Willd. (1) Chiradzulu, Kirk and Meller.
B. asphodeloides, Schult. fil. (1) Shire Highlands, K. C. Cameron, Scott-Elliot and Buchanan; Mlanje, McClounie.
Anthericum subpetiolatum, Baker. (1) Buchanan; Shire Highlands, Scott-Elliot.
A. Nyasae, Rendle. (1) Mlanje, Whyte.
A. milanjianum, Rendle. (1) Mlanje, Whyte.
A. Cameroni, Baker. (2) Carson.
A. nidulans, Baker. (1) Chiradzulu, Meller.
A. jacquinianum, Schult. fil. (2) Carson.
Anthericum sp. (1) Buchanan; Mlanje, Whyte; (2) Nutt; Carson.
Chlorophytum blepharophyllum, Schweinf. (1) Zomba, Whyte; Fort Johnston, Scott-Elliot; Buchanan.
C. stenopetalum, Baker. (1) Buchanan.
C. brachystachyum, Baker. (1) Buchanan.
C. gallabatense, Schweinf. (1) Buchanan.
C. andongense, Baker. (1) Buchanan.
C. pubiflorum, Baker. (1) Buchanan.
Chlorophytum spp. (2) Carson; (4) Menyharth.
Dasystachys drimiopsis, Baker. (1) Buchanan; (4) Menyharth.
Dasystachys spp. (2) Carson; Nutt.
Tulbaghia alliacea, Thunb. (1) Shire Highlands, Buchanan and Scott-Elliot.
Drimia robusta, Baker. (1) Mlanje, Whyte and McClounie.
Drimia sp. (1) Zomba, Kirk.
Dipcadi longifolium, Baker. (1) Lower Shire River, Meller.
Hyacinthus ledebourioides, Baker. (1) Zomba and east end of Lake Chilwa, Meller; Shire Highlands, L. Scott.
Eucomis zambesiaca, Baker. (1) Mbami, Kirk; Buchanan.
Albuca caudata, Jacq. (1) Mlanje, McClounie; Shire Highlands, Buchanan, L. Scott and Scott-Elliot.
A. Buchanani, Baker. (1) Buchanan.
A. Wakefieldii, Baker. (? 1) Lake Nyasa.
Albuca sp. (1) Mañanja hills, Meller; (4) Menyharth.
Urginea altissima, Baker (*U. maritima*, Rendle, non Baker). (1) Mañanja hills, Meller; Mlanje, Whyte; Shire Highlands, L. Scott and Buchanan; Mpimbi, Kirk; Zomba, Whyte; (2) Carson.

LILIACEAE.

Urginea Nyasae, Rendle. (1) Mlanje, Whyte and McClounie; Buchanan.
Urginea spp. (1) Mandala, Scott-Elliot; (2) Nutt.
Scilla rigidifolia, Kunth. (2) Upper plateau, north of Lake Nyasa, and between Nyasa and Tanganyika, J. Thomson.
S. indica, Baker. (1) Shire Highlands, L. Scott.
S. maesta, Baker. (4) Menyharth.
S. Buchanani, Baker. (1) Buchanan.
S. zambesiaca, Baker. (1) Buchanan; (4) Menyharth.
Scilla sp. (1) Buchanan; Zomba, Whyte; Mlanje, McClounie.
Ornithogalum Eckloni, Schlecht. (1) Shire Highlands, Buchanan and Scott-Elliot; Mlanje, Whyte.
Ornithogalum sp. (1) Buchanan.
Androcymbium melanthioides, Willd. (1) Shire Highlands, Buchanan and Scott-Elliot.
Ornithoglossum glaucum, Salisb. (1) Blantyre, Last.
Gloriosa superba, L. (1) Mañanja hills, Waller.
G. virescens, Lindl. (1) Shire Highlands, Scott-Elliot; (4) Menyharth.
G. Carsoni, Baker. (2) Carson.
Walleria Mackenzii, Kirk. (1) Mañanja hills, Waller; Buchanan.
W. nutans, Kirk. (1) Mañanja hills, Waller.

XYRIDACEAE.

Xyris pauciflora, Willd. (1) Mlanje, McClounie.
Xyris spp. (1) Buchanan; (2) Carson; Nutt.

COMMELYNACEAE.

Commelyna benghalensis, L. (1) Buchanan; (4) Holub.
C. zambesiaca, C. B. Clarke. (2) Carson.
C. latifolia, Hochst. (1) Buchanan; (2) Carson.
C. africana, L. (1) Shire Highlands, Scott-Elliot; Zomba and east end of Lake Chilwa, Meller; Zomba, Whyte; Buchanan; (2) Carson; Nutt.
C. involucrata, A. Rich. (1) Blantyre, L. Scott; Buchanan.
C. Kirkii, C. B. Clarke. (1) Shire Highlands, Scott-Elliot; (2) Nyasa-Tanganyika plateau, J. Thomson.
C. Forskalaei, Vahl. (4) Holub.
C. Bainesii, C. B. Clarke, var. *glabrata*, Rendle. (1) Zomba, Whyte.
C. Vogelii, C. B. Clarke. (1) Buchanan.
C. Welwitschii, C. B. Clarke. (1) Shire Highlands, Scott-Elliot.
C. nudiflora, L. (1) Shire Highlands, Scott-Elliot.
C. subulata, Roth. (1) Buchanan.
C. albescens, Hassk. (1) Mlanje, Whyte.
Commelyna sp. (2) Carson; Nutt.
Aneilema sinicum, Lindl. (1) Buchanan; Mlanje, Whyte; (2) Nutt; Carson.
A. aequinoctiale, Kunth. (1) Buchanan; Chiradzulu, Meller; Shire Highlands, Scott-Elliot; Mlanje and Zomba, Whyte; var. *Kirkii*, C. B. Clarke. (1) Buchanan; var. *adhaerens*, C. B. Clarke. (1) Mañanja hills, H. Waller.
A. pedunculosum, C. B. Clarke. (4) Menyharth.
A. lanceolatum, Benth. (1) Buchanan.
A. dregeanum, Kunth. (1) Buchanan.
Cyanotis lanata, Benth. (2) Carson; var. *Schweinfurthii*, C. B. Clarke. (1) Buchanan.
Cyanotis sp. (2) Nutt.
Floscopa rivularis, C. B. Clarke. (2) Nutt.
F. glomerata, Hassk. (1) Buchanan; Zomba, Whyte; (2) Carson; (4) Victoria Falls, Kirk.

PALMAE.

Elaeis guineensis, L. (1) West shore of Lake Nyasa, Kirk.

Borassus flabellifer, L., var. *Aethiopum*, Mart. (1) Lower Shire and Lake Nyasa, Kirk.

Raphia vinifera, P. de Beauv. (1) Shire Highlands, Kirk.

Hyphaene crinita, Gaertn. (1) Along the Shire River and at south end of Lake Nyasa, Kirk.

H. ventricosa, Kirk. (4) Victoria Falls, Kirk.

Phœnix sp. (1) Matope, Scott-Elliot; (4) Central regions, Kirk.

TYPHACEAE.

Typha angustifolia, L. (1) Shire River, below Katunga, L. Scott.

Typha sp. (1) Mañanja hills, Meller.

AROIDEAE.

Stylochiton spp. (4) Menyharth.

Amorphophallus spp. (2) Nsese River, North Nyasa, L. Scott; (4) Menyharth.

Gonatopus Boivinii, Hook. fil. (1) Lower Shire Valley, Kirk; Mlanje, McClounie; Buchanan.

Gonatopus sp. (4) Menyharth.

ALISMACEAE.

Limnophyton obtusifolium, Miq. (2) Mweru, Carson.

NAIADACEAE.

Potamogeton pectinatus, L. (1) South-western bay of Lake Nyasa, Kirk; Livingstonia, Laws.

P. obtusifolius, Mert. et Koch. (1) Zomba, Whyte.

P. longifolius, Gay. (1) South-western bay of Lake Nyasa, Kirk.

P. crispus, L. (1) Ruangwa, Lake Nyasa, Kirk.

ERIOCAULACEAE.

Eriocaulon sonderianum, Körn. (1) Mlanje, Whyte.

Eriocaulon spp. (1) Mañanja country and Katunga, Kirk; Buchanan; (2) Lower plateau, north of Lake Nyasa, J. Thomson; Nutt.

RESTIACEAE.

sp. (1) Mlanje, McClounie.

CYPERACEAE.

Pycreus flavescens, Nees. (2) Nsese River, North Nyasa, L. Scott.

P. nigricans, C. B. Clarke. (1) Mlanje, Whyte; Buchanan.

P. macranthus, C. B. Clarke. (1) Buchanan; (2) Nutt.

P. Mundtii, C. B. Clarke. (1) Buchanan.

P. sulcinux, C. B. Clarke. (2) Umbaka River, North Nyasa, L. Scott.

P. capillaris, Nees. (1) Buchanan.

P. umbrosus, Nees. (2) Carson.

P. spissiflorus, C. B. Clarke. (2) Mlanje, Whyte.

P. albomarginatus, Nees. (1) Buchanan.

Juncellus alopecuroides, C. B. Clarke. (1) Buchanan.

J. laevigatus, C. B. Clarke. (1) Mañanja hills, Meller.

Cyperus nudicaulis, Poir. (1) Lower Shire River, Kirk.

C. compactus, Lam. (1) Buchanan; (2) Nutt.

C. angolensis, Boeck. (*Rhynchospora ochrocephala*, Boeck.) (1) Mlanje, Whyte; Zomba, Kirk; (2) Nutt.

C. margaritaceus, Vahl. (1) Buchanan; (2) Carson; (3) Serpa Pinto.

CYPERACEAE.

Cyperus amabilis, Vahl. (1) Buchanan; (3) Serpa Pinto.
C. tenax, Boeck. (1) Buchanan.
C. Haspan, L. (2) Karonga, L. Scott.
C. sphaerospermus, Schrad. (4) Victoria Falls, Kirk.
C. flabelliformis, Rottb. (1) Mañanja hills, Meller; Great Elephant Marsh, Shire River, L. Scott; Buchanan.
C. sexangularis, Nees. (4) Menyharth.
C. Deckenii, Boeck. (1) Shire Highlands, Scott-Elliot.
C. fischerianus, Hochst. (1) Chiradzulu, Meller; Buchanan.
C. glaucophyllus, Boeck. (1) Buchanan.
C. longifolius, Poir. (1) Buchanan.
C. aristatus, Rottb. (1) Buchanan; (3) Serpa Pinto; (4) Menyharth.
C. distans, L. fil. (1) Shire Highlands, Scott-Elliot; (2) Carson.
C. articulatus, L. (1) Elephant Marsh, Shire River, L. Scott.
C. schweinfurthianus, Boeck. (2) Carson.
C. maculatus, Boeck. (1) Buchanan; (2) Umbaka and Nsese Rivers, North Nyasa, L. Scott.
C. rotundus, L. (1) Lower Shire Valley, Kirk; (3) Serpa Pinto.
C. esculentus, L. (1) Buchanan.
C. radiatus, Vahl. (1) Great Elephant Marsh, Shire River, L. Scott; (2) Umbaka River, North Nyasa, L. Scott.
C. zambesiensis, C. B. Clarke, ined. in Trans. Linn. Soc. 2nd Ser. iv., p. 53. (1) Mlanje, Whyte; Buchanan.
C. exaltatus, Retz, var. *C. dives*, Del. (1) Buchanan; Lower Shire Valley, Meller; Elephant Marsh, Shire River, Kirk and L. Scott.
Cyperus spp. (1) Mañanja hills, Meller; Shire Highlands, Scott-Elliot; (2) Umbaka River, North Nyasa, L. Scott; (3) Serpa Pinto.
Mariscus coloratus, Nees. (1) Buchanan.
M. vestitus, C. B. Clarke. (1) Shire Highlands, Scott-Elliot.
M. sieberianus, Nees. (1) Buchanan; Blantyre, Last; Mlanje, Whyte.
M. hemisphaericus, C. B. Clarke. (1) Buchanan; Mandala, Scott-Elliot; Blantyre, Scott; Mlanje, Whyte; Lower Shire Valley, Meller.
M. squarrosus, C. B. Clarke. (1) Buchanan.
Mariscus sp. (1) Mlanje, Whyte.
Kyllinga pungens, Link. (2) Karonga, L. Scott.
K. elatior, Kunth. (1) Buchanan.
K. alba, Nees. (3) Serpa Pinto.
K. aurata, Nees. (2) Nsese River, North Nyasa, L. Scott.
Kyllinga sp. (*Cyperus albiceps*, Ridley). (2) Nsese River, North Nyasa, L. Scott.
Kyllinga sp. (1) Buchanan.
Eleocharis sp. (4) Victoria Falls, Kirk.
Fimbristylis dichotoma, Vahl. (2) Karonga and River Nsese, North Nyasa, L. Scott.
F. diphylla, Vahl. (1) Buchanan.
F. exilis, Roem. et Sch. (1) Buchanan.
F. africana, C. B. Clarke. (1) Mañanja hills, Meller; Buchanan; Shire Highlands, Scott-Elliot.
F. zambesiaca, Dur. et Schinz. (1) Sochi, Kirk; Blantyre, L. Scott; Kampala, Shire Highlands, Scott-Elliot.
Bulbostylis schoenoides, C. B. Clarke. (1) Mlanje, Whyte.
B. cinnamomea, Dur. et Schinz. (1) Buchanan.
B. sphaerocarpus, C. B. Clarke. (3) Serpa Pinto.
B. capillaris, Kunth. (1) Blantyre, Last.

CYPERACEAE.

Bulbostylis pusilla, Dur. et Schinz. (2) Nutt.
B. Burchellii, Dur. et Schinz. (1) Blantyre, Last; (3) Serpa Pinto.
B. abortiva, Dur. et Schinz. (1) Buchanan.
B. oritrephes, C. B. Clarke. (1) Mlanje, Whyte.
Bulbostylis spp. (1) Buchanan.
Scirpus articulatus, L. (1) Buchanan.
S. littoralis, Schrad. (1) West shore of Lake Nyasa, Kirk; Zomba and east end of Lake Chilwa, Meller.
S. maritimus, L. (1) Lower Shire River, Kirk and Meller.
S. costatus, Boeck. (1) Mlanje, Whyte.
Fuirena pubescens, Kunth, var. *Buchanani*, C. B. Clarke. (1) Buchanan; (3) Serpa Pinto.
F. Welwitschii, Ridley. (1) Mlanje, Whyte; (2) Nutt.
F. umbellata, Rottb. (1) Buchanan; Mbami, near Blantyre, Kirk.
Fuirena sp. (3) Serpa Pinto.
Lipocarpha argentea, R. Br. (2) Nkonde country, North Nyasa, L. Scott.
L. albiceps, Ridley. (1) Mandala, Scott-Elliot; Buchanan.
L. pulcherrima, Ridley. (1) Buchanan.
Ascolepis protea, Welw., var. *bellidiflora*, Welw. (1) Mandala, Scott-Elliot; Buchanan; (2) Nutt.
A. anthemiflora, Welw. (2) Carson; Nutt.
A. speciosa, Welw. (2) Carson.
A. elata, Welw. (2) Carson; Nutt.
A. capensis, Benth. (1) Buchanan; Mlanje, Whyte; (2) Lower plateau, north of Lake Nyasa, J. Thomson.
A. brasiliensis, Benth. (1) Buchanan; (2) Nutt; Carson.
Rynchospora candida, Boeck. (*R. adscendens*, C. B. Clarke). (1) Buchanan; (2) Nutt.
Eriospora Oliveri, C. B. Clarke. (1) Buchanan.
E. villosula, C. B. Clarke. (1) Mlanje, Whyte; Ndirande, near Blantyre, Scott-Elliot.
Scleria pulchella, Ridley. (1) Buchanan.
S. remota, Ridley. (1) Buchanan.
S. glabra, Boeck. (1) Buchanan; Mandala, Scott-Elliot.
S. hirtella, Swartz. (2) Nkonde country, North Nyasa, L. Scott.
S. catophylla Dur. et Schinz. (1) Buchanan.
S. Buchanani, Boeck. (1) Buchanan; Shire Valley, Waller.
S. dregeana, Kunth. (1) Mañanja hills, Kirk; Buchanan.
S. bulbifera, A. Rich. (1) Ndirande, near Blantyre, Scott-Elliot.
S. multispiculata, Boeck. (1) Buchanan.
S. melanomphala, Kunth. (1) Buchanan.
Scleria spp. (1) Mañanja hills, Kirk; Buchanan.
Carex boryana, Schk. (1) Mlanje, Whyte.
Carex spp. (1) Mlanje, Whyte; Buchanan.

GRAMINEAE.

Paspalum scrobiculatum, L. (3) Serpa Pinto.
Panicum sanguinale, L. (1) Buchanan; (2) Karonga and Umbaka River, North Nyasa, L. Scott; (3) Serpa Pinto.
P. brizanthum, Hochst. (1) Buchanan.
P. Crus-galli, L. (1) Shire Valley, Meller; Buchanan; (2) Umbaka River, North Nyasa, L. Scott; Carson.
P. colonum, L. (1) Lower Shire Valley, L. Scott; (2) Karonga, L. Scott.
P. indicum, L. (1) Mañanja hills, Kirk.

GRAMINEAE.

Panicum nudiglume, Hochst. (1) Lower Shire, L. Scott.
P. paludosum, Roxb. (1) Shire River, Kirk.
P. pectinatum, Rendle. (1) Mlanje, Whyte; (2) Buchanan.
P. unguiculatum, Trin. (1) Buchanan.
P. insigne, Steud. (1) Mañanja hills, Meller; Buchanan; Mlanje, Whyte; (2) Nutt; Carson; (3) Serpa Pinto.
P. plicatum, Lam. (2) Carson.
P. milanjianum, Rendle. (1) Mlanje, Whyte.
P. serratum, R. Br. (3) Serpa Pinto.
P. maximum, Jacq. (3) Serpa Pinto.
P. nigropedatum, Munro. (3) Serpa Pinto.
Panicum spp. (1) Shire River and Mañanja hills, Kirk; Shire River, Meiler; Mandala and Shire River, L. Scott; Buchanan; (2) Carson; (4) Batoka country, Kirk.
Setaria spp. (1) Mañanja hills, Waller; Elephant Marsh, Shire River, Kirk and L. Scott; Buchanan; Blantyre, L. Scott; (2) Umbaka and Nsese Rivers, North Nyasa, L. Scott.
Pennisetum Benthamii, Steud. (1) Lower Shire Valley, Meller.
P. unisetum, Benth. (1) Buchanan.
Pennisetum sp. (1) Mañanja hills, Kirk.
Cleistachne sp. (1) Buchanan.
Perotis latifolia, Ait. (1) Buchanan.
Imperata arundinacea, Cyr. (1) Buchanan; (3) Serpa Pinto.
Saccharum purpuratum, Rendle. (1) Buchanan; Mlanje, Whyte.
Saccharum sp. (1) West shore of Lake Nyasa, Kirk.
Hemarthria compressa, R. Br. (1) Lower Shire, L. Scott.
Hemarthria sp. (1) Elephant Marsh, Shire River, Kirk; Buchanan; (2) Nsese River, North Nyasa, L. Scott.
Elionurus argenteus, Nees. (3) Serpa Pinto.
Rottboellia exaltata, L. (1) Lower Shire Valley, L. Scott.
Manisuris granularis, Sm. (1) Mañanja hills, Waller; near Sochi, Kirk; Buchanan.
Vossia procera, Griff. (1) Elephant Marsh, on Shire River, Kirk.
Ischaemum sp. (4) Victoria Falls, Kirk.
Andropogon ceresiaeformis, Nees. (1) Buchanan.
A. squamulatus, Hochst. (1) Buchanan.
A. schirensis, Hochst. (1) Buchanan.
A. Sorghum, Brot. (1) Mañanja hills, Meller; (2) Nutt.
A. annularis, Forsk. (1) Lower Shire Valley, Kirk.
A. hirtus, L. (1) Mlanje, Whyte; (3) Serpa Pinto.
A. anthistirioides, Hochst. (3) Serpa Pinto.
A. pertusus, Willd., var. *insculptus*, Hackel. (3) Serpa Pinto.
A. Schoenanthus, L. (3) Serpa Pinto.
A. eucomus, Nees. (3) Serpa Pinto.
A. intermedius, R. Br., var. *punctatus*, Hackel. (3) Serpa Pinto.
A. Nyasae, Rendle. (1) Buchanan.
A. cymbarius, L. (1) Buchanan; (2) Nutt.
Andropogon spp. (1) Buchanan; Mbami, near Blantyre, Kirk.
Anthistiria ciliata, Retz. (1) Buchanan.
Anthistiria sp. (1) Mañanja hills, Kirk.
Aristida barbicollis, Trin. et Rupr. (3) Serpa Pinto.
A. vestita, Thunb. (3) Serpa Pinto.
Aristida spp. (1) Upper Shire Valley, Kirk; Buchanan; (4) Batoka country, Kirk.

GRAMINEAE.

Sporobolus minutiflorus, Link. (1) Buchanan ; (4) Holub.
S. leptostachys, Ficalho et Hiern. (3) Serpa Pinto.
S. indicus, R. Br. (1) Mañanja hills, Meller.
Sporobolus spp. (1) Upper and Lower Valley of the Shire River, Kirk ; Buchanan ; (2) Umbaka River, North Nyasa, L. Scott.
Agrostis sp. (1) Buchanan.
Tristachya decora, Stapf. (2) Carson.
T. inamoena, K. Schum. (1) Buchanan.
Tristachya spp. (1) Blantyre, L. Scott ; (2) Carson.
Trichopteryx leucothrix, Trin. (2) Carson.
Trichopteryx sp. (1) Buchanan.
Microchloa abyssinica, Hochst. (1) Buchanan.
Triraphis sp. (3) Serpa Pinto.
Chloris gayana, Kunth. (1) Chiromo, L. Scott.
C. radiata, Sw. (1) Buchanan.
C. petraea, Thunb. (3) Serpa Pinto.
C. breviseta, Benth. (2) Umbaka River, North Nyasa, L. Scott.
Chloris spp. (1) Lower Shire Valley, Kirk and Meller.
Harpechloa altera, Rendle. (1) Buchanan ; Mlanje, Whyte and McClounie.
Eleusine indica, L. (1) Elephant Marsh, on Shire River, Kirk ; Buchanan ; Katunga, L. Scott ; (2) Umbaka River, North Nyasa, L. Scott.
Leptochloa uniflora, Hochst. (1) Buchanan.
L. chinensis, Nees. (1) Elephant Marsh, on Shire River, Kirk.
Leptochloa sp. (1) Lower Shire Valley, L. Scott.
Schmidtia quinqueseta, Benth. (3) Serpa Pinto.
Triodia sp. (1) Buchanan.
Phragmites communis, Trin. (1) Lower Shire Valley, Meller ; near Blantyre, L. Scott.
Phragmites sp. (1) Buchanan.
Koeleria cristata, Pers. (1) Mlanje, Whyte and McClounie ; Buchanan.
Eragrostis namaquensis, Nees. (2) Umbaka River, North Nyasa, L. Scott.
E. nindensis, Ficalho et Hiern. (3) Serpa Pinto.
E. major, Host. (1) Buchanan.
E. elata, Munro. (3) Serpa Pinto.
E. aspera, Nees. (1) Buchanan.
E. gummiflua, Nees. (3) Serpa Pinto.
E. Lappula, Nees. (3) Serpa Pinto.
E. obtusa, Munro. (3) Serpa Pinto.
Eragrostis spp. (1) Mañanja hills, Meller ; Buchanan ; Mlanje, Whyte ; (2) Umbaka and Quaqua Rivers, North Nyasa, L. Scott.
Festuca milanjiana, Rendle. (1) Mlanje, Whyte ; Buchanan.
F. costata, Nees. (1) Mlanje, Whyte.
Bromus milanjianus, Rendle. (1) Mlanje, Whyte.
Oxytenanthera sp. (1) Mbami and Blantyre, Lake Chilwa, and Katunga, Kirk.

CONIFERAE.

Podocarpus milanjiana, Rendle. (1) Mlanje, Whyte.
Widdringtonia Whytei, Rendle. (1) Mlanje, Whyte and McClounie ; Zomba, Whyte.

GNETACEAE.

Gnetum africanum, Welw. (1) Buchanan.

CRYPTOGAMS.

LYGOPODIACEAE.

Lycopodium dacrydioides, Baker. (1) Buchanan.
L. cernuum, L. (1) Buchanan.

SELAGINELLACEAE.

Selaginella versicolor, Spring. (1) Buchanan ; (2) Carson.
S. molliceps, Spring. (1) Shire Highlands, Buchanan.
S. Vogelii, Spring. (2) Carson.

EQUISETACEAE.

Equisetum elongatum, Willd. (1) Shire Highlands, Buchanan.

SALVINIACEAE.

Azolla pinnata, R. Br. (1) Lake Nyasa, Laws.

FILICES.

Gleichenia polypodioides, Sm. (1) Mlanje, McClounie.
G. dichotoma, Hook. (2) Nutt.
Cyathea Dregei, Kze. (1) Buchanan ; (2) Nutt.
C. Thomsoni, Baker. (2) Lower plateau, north of Lake Nyasa, J. Thomson.
C. zambesiaca, Baker. (1) Buchanan.
Hymenophyllum australe, Willd. (1) Buchanan.
Davallia thecifera, H. B. K. (1) Buchanan.
D. Speluncae, Baker. (2) Carson.
Cheilanthes Schimperi, Kze. (1) Buchanan.
C. multifida, Sw. (1) Mlanje, McClounie.
Pellaea hastata, Link. (1) Buchanan.
P. dura, Willd. (1) Shire Highlands, Scott-Elliot.
P. Calomelanos, Link. (3) Serpa Pinto.
P. doniana, Hook. (1) Buchanan ; (2) Carson.
P. pectiniformis, Baker ; (2) Nutt.
Pteris quadriaurita, Retz. (1) Shire Highlands, Scott-Elliot and Buchanan ; (2) Carson.
Pt. biaurita, L. (2) Carson.
Pt. flabellata, Thunb. (2) Carson.
Pt. cretica, L. (1) Buchanan.
Pt. atrovirens, Willd. (2) Carson.
Adiantum aethiopicum, L. (1) Buchanan.
A. Capillus-Veneris, L. (1) Buchanan.
A. caudatum, L. (1) Buchanan.
A. hispidulum, Sw. (1) Buchanan.
A. lunulatum, Burm. (1) Buchanan ; (2) Carson.
Lonchitis pubescens, Willd. (2) Nutt.
Lomaria boryana, Willd. (1) Buchanan.
Actiniopteris radiata, Link. (1) Buchanan.
Asplenium Sandersoni, Hook. (1) Shire Highlands, Buchanan and Scott-Elliot.
A. Mannii, Hook. (1) Shire Highlands, Scott-Elliot.
A. anisophyllum, Kze. (1) Chiradzulu, Whyte ; Shire Highlands, Scott-Elliot.
A. lunulatum, Sw. (1) Buchanan ; Chiradzulu, Whyte ; Shire Highlands, Scott-Elliot.
A. formosum, Willd. (1) Buchanan ; Mlanje, McClounie.
A. brachypteron, Kze. (1) Shire Highlands, Scott-Elliot.
A. protensum, Schrad. (1) Buchanan.

FILICES.

Asplenium furcatum, Thunb. (1) Shire Highlands, Buchanan and Scott-Elliot; (2) Carson.
A. rutaefolium, Kze. (1) Chiradzulu, Whyte.
A. cicutarium, Sw. (1) Buchanan; Shire Highlands, Scott-Elliot.
A. Thunbergii, Kze. (1) Buchanan.
A. nigripes, Blume. (1) Buchanan.
A. patens, Desv. (1) Shire Highlands, Scott-Elliot.
A. cordatum, Forst. (1) Mlanje, McClounie.
Nephrodium Filix-mas, Rich., var. *elongatum*, H. et A. (1) Shire Highlands, Scott-Elliot and Buchanan.
N. patens, Desv. (1) Buchanan.
N. unitum, R. Br. (1) Buchanan.
N. molle, Desv. (1) Buchanan; (2) Carson.
N. pennigerum, Hook. (1) Buchanan.
N. cicutarium, Baker. (1) Shire Highlands, Buchanan and Scott-Elliot; Chiradzulu, Whyte.
N. albo-punctatum, Desv. (1) Buchanan; (2) Nutt; Carson.
N. athamanticum, Hook. (2) Nutt.
N. Thelypteris, Desv. (2) Carson.
Nephrolepis cordifolia, Presl. (1) Buchanan; (2) Carson.
Polypodium fissum, Baker. (1) Shire Highlands, Scott-Elliot.
P. lanceolatum, L. (1) Shire Highlands, Scott-Elliot.
Acrostichum conforme, Sw. (1) Buchanan.
A. hybridum, Bory. (1) Buchanan.
A. virens, Wall. (2) Carson.
Osmunda regalis, L. (2) Nutt.
Anemia tomentosa, Sw. (1) Buchanan.
Mohria vestita, Baker. (1) Buchanan.
Marattia fraxinea, Sm. (1) Buchanan; Mlanje, McClounie.
Ophioglossum reticulatum, L. (1) Buchanan.

MUSCI.

Polytrichum commune, L. (1) Mlanje, Whyte.
Bryum sp. (1) Mlanje, Whyte.
Holomitrium acutum, Wright. (1) Zomba, Kirk.
Dicranum sp. (1) Mlanje, Whyte.
Leucoloma sp. (1) Mlanje, Whyte.
Leptodontium radicosum, Mitt. (1) Buchanan.
Erpodium grossirete, K. Muell. (4) Menyharth.
E. Menyharthii, K. Muell. (4) Menyharth.
Pterogonium abruptum, Wright. (1) Shire Highlands, Buchanan; Chiradzulu, Whyte.
P. decipiens, Wright. (1) Shire Highlands, Buchanan.
Pilotrichella imbricata, Jaeg. (1) Mlanje, Whyte.
Acrobryum capense, K. Muell. (1) Mlanje, Whyte.
Porotrichum dentatum, Gepp. (1) Mlanje, Whyte.
Thuidium sp. (1) Mlanje, Whyte.

HEPATICAE.

Marchantia polymorpha, L. (1) Shire Highlands, Buchanan.
Metzgeria furcata, Dum. (1) Mlanje, Whyte.
M. myriapoda, Lindb. (1) Mlanje, Whyte.
Frullania brunnea, Gottsche, Lindb. et Nees. (1) Mlanje, Whyte.

HEPATICAE.

Lejeunea gracillima, Mitt. (1) Mlanje, Whyte.
L. decursiva, v. d. Sande-Lacoste. (1) Mlanje, Whyte.
L. flava, Gottsche. (1) Mlanje, Whyte.
Phragmicoma pappeana, Nees. (1) Mlanje, Whyte.
Radula sp. (1) Mlanje, Whyte.
Lophocolea sp. (1) Mlanje, Whyte.
Plagiochila Rutenbergii, Gottsche. (1) Mlanje, Whyte.
P. dichotoma, Dum. (1) Chiradzulu, Meller.

FUNGI.

Flammula penetrans, Fr. (1) Lower Shire, Scott-Elliot.
Schizophyllum commune, Fr. (1) Shire Highlands, K. C. Cameron; Chiromo, Lower Shire, Scott-Elliot.
Crepidotus mollis, Schaeff. (1) Shire Highlands, Scott-Elliot.
Hexagonia polygramma, Mont. (1) Buchanan
Favolus Rhipidium, Berk. (1) Shire Highlands, Scott-Elliot.
Trametes fibrosus, Nees. (1) Shire Highlands, Last.
T. rigidus, Fr. (1) Buchanan.
T. pictus, Berk. (1) Chiromo, Scott-Elliot.
Lenzites applanata, Fr. (1) Buchanan.
L. aspera, Klotzsch. (1) Buchanan.
Polyporus scruposus, Fr. (1) Buchanan.
P. sanguineus, Fr. (1) Buchanan.
P. rudis, Berk.? (1) Buchanan.
Polystictus occidentalis, Klotzsch. (1) Chiromo, Scott-Elliot.
Parodiella Pentanisiae, Sacc. (2) Lake Nyasa, J. Thomson.
Physalospora Bambusae, Sacc. (1) Chiradzulu, Whyte.
Phyllachora Hieronymi, P. Henn. (1) Buchanan.

LICHENS. [All from (4) Boroma (Menyharth), except the last two.]

Leptogiopsis Brebissonii, Muell.-Arg.
Collema furvum, Ach.
Pyrenopsis robustula, Muell.-Arg.
Ramalina complanata, Ach.
Parmelia Hildenbrandtii, Keplh., forma *nuda*, Muell.-Arg., forma *sorediosa*, Muell.-Arg.
P. praetervisa, Muell.-Arg.
P. zambesica, Muell.-Arg.
P. Zollingeri, Hepp.
P. tiliacea, Ach., var. *scortea*, Nyl., var. *rimulosa*, Muell.-Arg.
Candelaria stellata, Muell.-Arg.
Physcia adglutinata, Nyl., var. *pyrethrocardia*, Muell.-Arg.
P. stellaris, Fr., var. *acrita*, Nyl.
P. ochroleuca, Muell.-Arg.
P. picta, Nyl., var. *sorediata*, Muell.-Arg.
P. aegialita, Nyl.
Endocarpiscum Guepini, Nyl.
Pyxine Meissneri, Tuck., var. *endoleuca*, Muell.-Arg., var. *sorediosa*, Muell.-Arg.
Placodium perexiguum, Muell. Arg.
Lecanora subfusca, Ach., var. *allophana*, Ach., var. *glabrata*, Ach., var. *cinereo-carnea*, Tuck.

LICHENS.

Lecanora hypocrocina, Nyl.
L. caesio-rubella, Ach.
L. pallescens, Fr.
Lecania punicea, Muell.-Arg.
Callopisma cinnabarinum, Muell.-Arg., var. *opacum*, Muell.-Arg.
C. zambesicum, Muell.-Arg.
C. flavum, Muell.-Arg.
Rinodina conspersa, Muell.-Arg.
Pertusaria velata, Nyl.
P. xanthothelia, Muell.-Arg.
P. mamillana, Muell.-Arg.
Lecidea russula, Ach.
L. mutabilis, Fée.
L. impressa, Keplh.
Patellaria leptolytra, Muell.-Arg.
Blastenia poliotera, Muell.-Arg.
Buellia parasema, Körb., var. *disciformis*, Th. M. Fries, var. *vulgata*, Th. M. Fries.
B. africana, Muell.-Arg.
B. olivacea, Muell.-Arg.
B. inquilina, Tuck.
Opegrapha Menyharthii, Muell.-Arg.
Arthonia dispersa, Nyl.
Mycoporum pycnocarpum, Nyl.
Placothelium staurothelioides, Muell.-Arg.
Trypethelium Eluteriae, Sprgl.
Lepra citrina, Schaer.
Usnea barbata, Ach., var. *ceratina*, Schaer. (2) Carson.
Physcia speciosa, Ach., var. *hypoleuca*, Nyl. (2) Carson.

ALGAE. [All from (1?) Lake Nyasa (Laws), except the first.]

Chara sp. (2) Carson.
Conferva sp.?
Bulbochaete parvula, Ktz.
Spirogyra pallida, Dickie.
Cosmarium margaritiferum, Turp.
Cylindrospermum Nyassae, Dickie.
Lyngbya martensiana, Menegh.?
Oscillaria sp.?
Cyclotella rotula, Ktz.
C. operculata, Ktz.
Epithemia ventricosa, Ktz.
E. Zebra, Ehb.
E. alpestris, Sm.
E. Sorex, Ktz.
E. turgida, Ktz.
E. clavata, Dickie.
Eunotia tridentula, Ehb.
Himantidium pectinale, Ktz.
Cocconema cymbiforme, Ehb.
C. Cistula, Hemp.

ALGAE.

Amphora ovalis, Ktz.
Eucyonema prostratum, Berk.
Cocconeis placentula, Ehb.
Fragilaria undata, Sm.
Synedra Ulnæ, Ehb.
S. Acus, Ktz.
S. biceps, Ktz.
Navicula acrosphaeria, Rabh., var. *sandvicensis*, Schmidt.
N. gibberula, Sm.
N. Gastrum, Ehb.
N. elliptica, Ktz.
N. rhomboides, Ehb.
N. gracillima, Pritch.
Stauroneis Phoenicenteron, Ehb.
Diadesmis confervacea, Ktz.
Gomphonema dichotomum, Ktz.
G. intricatum, Ktz.
G. naviculoides, Sm.
G. Turris, Ehb.

CHAPTER IX.

ZOOLOGY

ALTHOUGH British Central Africa would appear to be a purely political and artificial division of the continent it is, as a matter of fact, coincident with a clearly marked zoological sub-region as far as its mammalian fauna is concerned, though these special peculiarities in the distribution of species are not quite so marked in the birds and reptiles, and still less so in fishes and invertebrates.[1] These distinctive zoographical features of British Central Africa, however, are rather negative than positive, and relate more to what the country does not possess than to its monopoly of peculiar forms. As a matter of fact all British Central Africa as far west as the Upper Zambezi, together with the province of Moçambique, the southern part of German East Africa, and the southernmost districts of the Congo Free State, forms a remarkable break between South and East Africa in the range of well-known types of mammals and birds. The British Central Africa sub-region differs from that of West Africa in not possessing any form of anthropoid ape, and in the absence of a good many monkeys, of several small antelopes, and of the interesting *Dorcatherium*. On the other hand it agrees with West Africa in possessing a peculiar Civet (*Nandinia*), one or more genera of bats, and a Colobus monkey closely allied to or identical with the common West African form. Amongst the birds which it shares alone with West Africa is the remarkable black and white vulturine fishing eagle, *Gypohierax*.[2]

Although this sub-region possesses much closer relationships (as might be supposed owing to its geographical position) with the South African sub-region south of the Zambezi, and the East African sub-region (north of the Rufiji river and to the east of Tanganyika), still it differs from these two sub-regions (which are more closely allied the one to the other than each is to British Central Africa) in not possessing the following forms, in whose distribution the interposition of this sub-region under review causes a complete break: the Caracal lynx, the Aard-wolf (*Proteles*), found in South and South West Africa and in Somaliland; the long-eared foxes, the mountain zebras, the wild asses, (to which group I consider the South African quagga to belong); the *Oryx* antelopes, the gazelles, the true jerboas, the *Orycteropus* or antbear, the secretary vulture, the typical vultures of the genera *Gyps* and *Pseudogyps*, and the ostrich.

[1] Though, if a portion of Tanganyika be included—as it is intended to be—within the term "British Central Africa" this lake still more markedly than Nyasa differs in its marine fauna from the other great lakes of Africa farther to the north.

[2] I have seen it asserted by some naturalists that *Gypohierax* reappears on Pemba Island near Zanzibar but this statement is unsupported by conclusive evidence.

To this list might almost be added the giraffe, and the *Damaliscus* genus of antelopes, were it not that according to native report the giraffe is found in the southern part of the Senga country along the Lower Luangwa river above its confluence with the Zambezi, and that Mr. Sharpe believes he has seen tsessébe (*Damaliscus*) antelopes a little to the north of the same region. Still here, again, the zoological boundaries of this sub-region rather coincide with the political because it is well known that certain South African forms do cross the Central Zambezi and extend a little distance to the north of its banks, and this may, therefore, account for the existence of the giraffe and the tsessébe in the Luangwa valley. It is quite certain, however, that the giraffe is found nowhere in East Africa south of the Rufiji river and between the Moçambique coast on the east and the Angola coast on the west.[1] Neither are the ostrich nor the other antelopes and carnivora mentioned above. Yet all these forms, either the same or other species closely allied thereto, reappear north of the Rufiji river, or at any rate in Somaliland and the Egyptian Sudan; some of them even in the Western Sudan and in Senegambia. It is very curious that this break should occur right across the continent as it cannot be sufficiently explained by any reasons of climate or soil. The country is not one dense impenetrable forest like parts of the Congo Basin, nor is it a waterless desert. It is dry enough for ostriches and yet not too dry for water-loving antelopes. It must be admitted, however, that it is probably too moist for the absent animals which are rather desert-loving types.

Taken by itself the British Central Africa sub-region may be divided into two districts, at any rate as regards its mammalian fauna—Nyasaland and the adjoining countries to the east; and all which lies between the watershed of Nyasa and the northern, western, and southern frontiers of the sphere of British influence. There is not much difference between the two, but Nyasaland probably lacks a few mammalian types such as the Situtunga (*Tragelaphus spekei*); the Puku and Lechwe antelopes (*Cobus vardoni* and *Cobus lechwe*), and the Cheetah; on the other hand the western division does not possess the grey baboon (*Papio pruinosus*); the long-nosed Shrew (*Rhynchocyon*); a number of rodents; the sable antelope, and several birds which are peculiar to the mountains of the Shire districts.[2]

[1] It reaches to the Ubena country, N.E. of Lake Nyasa.

[2] I should be disposed to divide the African region into two sub-regions and these again into certain provinces. They would stand thus:

(1) The West African sub-region (the forest country of West Africa from the Gambia on the north to the Kwanza river on the south, including the coast belt of West Africa and the whole Congo basin as far as the west coast of Tanganyika);

(1 *a*) The Guinea province (Gambia to the Volta river);
(1 *b*) The Lower Niger Province (Volta river to the Cameroons and the Upper Benue);
(1 *c*) The Gaboon province (Cameroons to the Congo mouth and inland to the Congo watershed);
(1 *d*) The Congo province (all the Congo basin except in the extreme south);
(1 *e*) The Angola province (on the coast, the river Loge to Benguela and inland to the Congo watershed, but including the extreme Upper Zambezi).

(2) The Ethiopian sub-region (Tropical Arabia, and all Tropical Africa not included in the West African sub-region):

(2 *a*) The Sudan province (from the Senegambian coast on the west to the frontiers of Abyssinia on the east, with the Sahara on the north and the Congo Basin and West African Coast belt on the south);
(2 *b*) The Abyssinian province;
(2 *c*) The Arabian province;
(2 *d*) The Somaliland province (bounded by Abyssinia, the Egyptian Sudan, the east coast of Tanganyika, and the Rufiji river);
(2 *e*) The British Central African province; and
(2 *f*) The South African province (bounded more or less on the north by the Zambezi, and up the south-west coast of Africa to the Angola province).

Monkeys are not abundant in British Central Africa, nor are they numerous in species. The most remarkable among them is the grey baboon (*Papio pruinosus*) recently discovered on the south coast of Lake Nyasa. The first specimen of this animal was shot by Dr. Percy Rendall, a medical officer in the service of the Administration. He was not at first much struck with the novelty of the creature's appearance, however, and had I not been passing at the time and observed the body of the beast as it lay dead on his verandah, it might have been thrown away, but it struck me as being very remarkable in the colouring of its fur, and I induced him to let me forward it to the British Museum, where it turned out to belong to a new species. Its fur is a pale bluish-grey above and a dirty white below and is well illustrated by the plate which appears in the Proceedings for April 1st, 1897, of the Zoological Society. The common yellow baboon is the other cynocephaline species which is found in the Protectorate. It is extremely common everywhere,[1] very bold and very cunning. It is constantly robbing the natives' plantations, and the women profess to go in terror of the large male baboons (which grow to the size of a big mastiff dog) as they say that these latter will attempt to outrage them if they see no man accompanying the party. I do not myself believe there is any truth in this idea; I think all the baboons want to ravish are the contents of the baskets of food the women are carrying; it is quite certain that they will come down and endeavour to rob women and children if they see them unaccompanied by persons armed with weapons.

When the baboons descend to raid the plantations one or more of their number (a half-grown baboon generally) invariably stands sentry to warn the rest of the troop when danger is approaching. The baboons are not very shy of approach unless one is armed with a gun. Not infrequently when I have been riding alone between Blantyre and Katunga a number of baboons have come down to the road to look at me as I went by and have even trotted along on the road in front of my horse. On one occasion their demeanour was distinctly threatening. Several of them were waiting for me on either side of the road making hideous grimaces and grunts. They dispersed, however, when I rode straight at them and showed that I had a switch. The young baboons become quite tame after a few days' captivity and are most amusing though very impudent pets.

The two commonest Cercopithecus monkeys are the white-throated and the red-rumped (*C. albigularis* and *C. pygerythrus*). The Colobus monkey (*Colobus palliatus*) is the white-thighed species. This animal is rare in British Central Africa, and is so far as I know only found in the high mountains west and north of Lake Nyasa. Its skins are much valued by the natives who use the long black and white hair to make capes and mantles and anklets for their war dresses.

The Lemuroids are represented by the great Galago[2] and the small Moholi Galago. The big species is a beautiful animal about the size of a cat. The colour of the fur (at any rate in the Nyasa variety) is quite a light whitish-grey and the tail is exceedingly bushy. This creature when captured full grown is rather intractable and difficult to tame. It can and will bite savagely. When brought to bay it stands up on its hind legs and boxes with the fore paws, partly to repel an assault and partly to seize and bite the assaulter.

[1] The yellow baboon (*Papio babuin*) is found nearly all over tropical Africa south of the Equator. It is in some respects the most generalised of the baboons.

[2] *Otogale Kirkii*.

The young of the great Galago are exquisite little creatures like Chinchillas. It would appear to be an animal of rather slow growth, and the young are therefore taken by Europeans to be a different species to the full grown animal.[1]

There is not much remarkable about the bats of British Central Africa so far as I am aware. They have been chiefly collected by Dr. Percy Rendall who was for a time our medical officer on Lake Nyasa. Prior to this Dr. Rendall was Colonial Surgeon at the Gambia. Whilst in that West African Colony he shot one day a curious white-winged bat which was named "*Vesperugo rendalli*." The specimen he sent home from the Gambia was the only one known. Years afterwards, however, Dr. Rendall caught a bat on the Upper Shire, and to his surprise found it was identical with the white-winged bat of the Gambia. As Mr. Oldfield Thomas observes in his paper on the mammals of Nyasaland, "It is a curious coincidence that the second known capture of this bat should take place in a country so far distant from the Gambia as Nyasa, and that it should be due to the very same naturalist who originally discovered it and after whom it was named. There appear to be no differences of the least importance between the Gambian and Nyasan examples."

Two species of fruit-eating bats are found in Nyasaland.[2]

Among the insectivores which are few in Central Africa, are the long-nosed, jumping shrews. One genus (*Petrodromus*) (about the size of a large rat) has the nose merely prolonged into a long snout; but the more specialised genus (*Rhynchocyon*) has a positive proboscis. In spite of the development of the snout these are pretty little animals. They soon die when captured, which is the more to be regretted as with their large eyes and soft fur they would make admirable pets.

The carnivora are well represented in this country. Firstly, we have the lion —almost too abundant—and the leopard, still more common. The handsome serval-cat is also found everywhere throughout the whole of British Central Africa. Their kittens are easily reared and stand confinement well; one which I kept for three years in captivity is now in the Zoological Gardens. These serval-cats become tame to a certain extent, but never as absolutely friendly as a pet leopard. The serval resents caresses and is ready to strike out with its sharp claws. Still upon such occasions as when those that I kept escaped they submitted in a somewhat docile manner to be laid hold of and hauled about, and their cage could always be entered by the negro attendant without any aggressive action on their part.

The serval appears to me to be an interesting form for the reason that I think it represents a more generalised type of true cat, something akin to the primal feline stock from which the cheetah branched off a little lower down. The serval suggests the cheetah in many ways while it also has a marked

[1] The leaping powers of all the Galagos are remarkable, but reach their highest development perhaps, in the great Galago. In West Africa I used to be much struck with the bat-like movements of the smaller Galagos. A tame one would suddenly leap from my hand—I had almost said "fly"—two yards away to the window-pane and there kill a moth or fly that was buzzing against the glass. The swift movements of the great Galago still more resemble flight, and it has a habit of slightly spreading out the limbs, especially the arms, as it noiselessly jumps through the air. It can jump horizontally or upwardly: its leaps are not necessarily downwards. The large pads on the under surface of almost all the fingers except one (for a faithful feature throughout all the Lemuroids is that one finger remains thin and provided with a sharp claw, whereas the other fingers and toes are padded and provided with square nails) seem to assist this lemur in breaking the shock of its jumps, and enabling it to cling to almost any surface.

I cannot help thinking that the flight of the bats began in some such way as this, especially if the bats arose rather through a Lemuroid type than as a section of the Insectivora.

[2] *Xantharpyia* and *Epomophorus*.

relationship to the lynxes. The spots are simple like those in the cheetah and the lynxes, and although he is a true cat (in that the claws are fully retractile), still the paw is much smaller in relative size than it is with other members of the genus *Felis*, and much more like the paw of the cheetah. Also the claws are not proportionally so large. The ears have a slight approach to a tuft at the apex suggesting the lynx; the tail though much longer than that of an average lynx is still rather short but very thick; and in this particular the animal has diverged from the ancestral cat rather in the direction of the lynxes. The legs are very long which is also a characteristic of the cheetah and the lynx but may have been acquired by the serval from its hunting habits; for from all accounts it often pursues its prey instead of lying in wait and securing it by sudden leaps. Nevertheless, it is a good climber and owing to the small size of its feet and thin body can find a foothold on a ledge not more than two inches broad.

The serval is most destructive to the smaller game, but it is a beautiful animal and often attains a length of nearly four feet and a height at the shoulder of three feet. The other wild cat of British Central Africa is the *Felis caffra*, very like the form which gave rise to the Egyptian domestic cat, and which, mingled with the true wild cat of Europe and Asia, was the joint parent of the European domestic cat.

The cats kept by the natives are scarcely distinguishable sometimes from the wild *Felis caffra*, though undoubtedly the main origin of their domesticated animal (remotely derived from the cat of Egypt and Syria—*Felis maniculata*) is from a foreign source—from Europe and India, *via* the East Coast of Africa. But unquestionably the wild cat of British Central Africa mingles freely with the domestic and semi-domestic animal, and the natives often bring in its kittens from the woods and rear them as domestic cats. These animals are charming when in the kitten stage, but when they grow up they become lanky, with small heads and thin tails. The domestic cats which are too directly derived from the wild species are not very tame or tractable.

The cheetah is very rare but is found on the Nyasa-Tanganyika plateau, near Lake Mweru, probably in the Luangwa Valley, and possibly in the countries to the north-east of Lake Nyasa. I have no positive record of this hunting cat having been actually killed in the Nyasaland province. The animal has been shot by Mr. J. B. Yule (who showed me the skins, one of which I sent home) on the Nyasa-Tanganyika plateau. The cheetah in question was the common variety with black spots. I have never heard of the red spotted cheetah of South Africa having been found north of the Zambezi.

The hyena of British Central Africa is the ordinary spotted species whose range extends from South Africa to the Egyptian Sudan up the eastern side of the continent; the spotted hyena is probably found in the Central Sudan and may enter the Niger territories outside the forest region.[1]

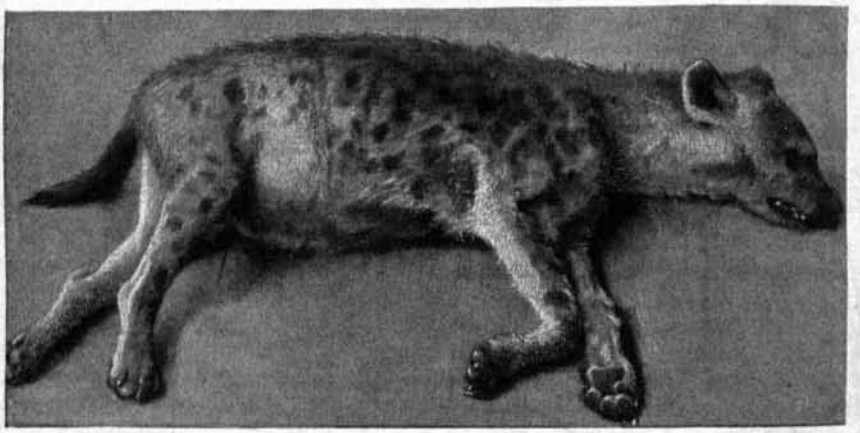
The civet cat is extremely common. Strange to say the natives seem to make no use of its remarkable scent gland. A lovely little genet cat, whose large spots are a rich umber brown instead of black is very common, and makes a charming house pet.

[1] The remarkable brown hyena has a somewhat similar range but less continuous. I believe I met with it on Kilimanjaro; it is commonest in south-east Africa and is said to extend along the south-west coast as far as the district of Mossamedes. Up to the present it has not been recorded from British Central Africa. The range of the striped hyena is altogether far to the north. It probably nearly meets the range of the spotted hyena in the Sudan and elsewhere extends over the Mediterranean basin, Persia, and Western India.

A remarkable animal from the point of view of distribution is the palm civet (*Nandinia*) which as far as is yet known extends right across from West Africa into Nyasaland, but is not found in East or South Africa. Ichneumons of three genera are found in this country.

The only species of Jackal which is recorded from our collection is the side-striped jackal (*Canis lateralis* or *C. adustus*). It is entirely unlike the handsome black-backed jackal of South Africa, which has a black back and a silvery band of fur below the black; the centre of the back of the Nyasaland jackal is a rich chestnut brown and the silvery streak below is only faintly marked.

The Cape hunting-dog[1] has been killed on Mount Zomba and is reported from West Nyasaland. Other specimens were obtained by Mr. Crawshay in the Lake Mweru district and sent home by me. From all accounts it is not a common animal in British Central Africa unless it be in the Luangwa valley.



A SPOTTED HYENA

M. Foa, a French sportsman, reports these animals as frequently met with in the Makanga country to the south-west of Nyasaland.

A pretty little white-necked weasel[2] has been obtained in the Shire Highlands. I have also met with the ratel or honey badger in the same district, but we have not yet found the small black and white "Cape polecat" (*Ictonyx*), which inhabits South and East Africa, and whose range may—like that of so many other species—be interrupted by British Central Africa.

An otter is very common on the Shire, in Lake Chilwa, Lake Nyasa, and in other large waters of British Central Africa. The only species recorded by complete specimens is *Lutra maculicollis*, or the "spotted-necked otter"; but I am inclined to think that *Lutra capensis* is also found in parts of British Central Africa. I can only base my impression on dressed skins seen in the possession of natives, which I believe to have been of this animal.

Except to naturalists there is nothing very interesting in the rodents of British Central Africa. A hare is present in Nyasaland of the big species, *Lepus whytei*. One or other types of hare are also found in the western part of British Central Africa but may possibly belong to species common to South

[1] *Lycaon.* [2] *Poecilogale.*

or East Africa. I should like to make a special mention of the large Octodont —one of the few Octodont rodents found outside America—the "ground-pig," *Aulacodus swinderenianus*. This creature which is especially fond of sugar-cane plantations is such a delicious article of diet that it ought to be domesticated for the table. Its flesh tastes something like that of a rabbit but has a savour quite its own.

As regards rats, I should mention that they are numerous and a great pest. The natives eat them with gusto. The common rat of the native villages and European settlements is a brown variety of the Black rat (*Mus rattus*). There is one rat which is an appalling creature to look at. It is apparently allied to the Bandicoot-rat of India—about the size of a rabbit, with pale grey fur, a long tail and hideously long snout. In captivity it is ferocious to the last degree and looks a thoroughly evil animal.

A porcupine has been found in British Central Africa but I have not been able to obtain specimens for identification and only know it from native report and from having seen its quills in use for native ornaments. The natives state that there are two species, one large and one small, for which they have slightly different names, *Nungu* and *Kanungu*.

The Hyraxes are represented by at least two species—*Procavia johnstoni* and *P. brucei*. They are chiefly confined in their distribution to the high mountains and plateaux.

The Ungulates, as elsewhere in Tropical Africa, are well represented.

There is the African elephant of course, and among the *Perissodactyla* we have the ordinary two-horned rhinoceros and the zebra. The *Artiodactyla* are represented by the hippopotamus, two genera of swine, and numerous examples of the *Bovidæ* or hollow-horned ruminants.

The elephant was formerly most abundant throughout the whole of British Central Africa, and in the years following on Livingstone's first expedition many sportsmen from England made large sums of money by the ivory which they obtained in the Shire district and at the north end of Lake Nyasa. Subsequently this great beast has become very scarce within the limits of the Protectorate though he is still found in large numbers in the rest of British Central Africa, especially in the Mweru districts, the Luangwa Valley and the country between the Luangwa and the Luapula. They are also occasionally met with in the Ruo, Zomba, West Shire, South Nyasa, Central Angoniland, Marimba, and West Nyasa districts of the Protectorate, being most abundant in Central Angoniland and in Marimba. They feed chiefly on leaves and such fruits as are in season. They also eat the top shoots of the *Phragmites* reeds and the roots of certain trees, which they are fond of chewing. These trees they uproot with their trunks and also by butting. Mr. Sharpe, who has studied elephants closely, denies that they use their tusks for prizing-up the trees or for exhuming roots. Although I respect him as a great authority on the subject I cannot agree with him in this particular. I have seen something of elephants on the Congo and at the back of the Cameroons, and there the natives have told me spontaneously that the elephant used one of his tusks for digging in the ground and for uprooting the small trees. Moreover, it often happens that one of the elephant's tusks—the "ground tusk"—is more worn and blunted than the other, probably from being put to this use.[1] At the same time

[1] The term "ground tusk" may bear two interpretations. According to old custom, when a native in Central Africa kills an elephant he gives the "ground tusk" to the Chief of the Country. This may either mean the inferior tusk worn with digging, but more probably the undermost of the two tusks—that which is touching the ground, in reference to the proprietary rights of the "Lord of the Manor."

although I have seen elephants at work in Hyphæne palm forests on the Congo actually being able to watch them from a boat working their will on these trees for the sake of the "ginger-bread" covering of the nuts, I cannot say I have seen them kneel down and uproot a tree with the tusk. One is a little puzzled sometimes to account for the enormous development of the two remaining upper incisor teeth, unless they were used for some such purpose as digging up roots. They are not so useful as defensive or offensive weapons that they should be worth development for this purpose alone. In killing animals much less in size than himself the elephant generally uses his trunk and feet, though I admit many cases occur—including one which took place a few months ago in England—where an elephant does deliberately slay his victim with his tusk. On the whole I am inclined to believe that where the elephant retains these huge teeth he uses them occasionally for digging in the ground. This belief is supported by the very distinct statements of such authorities as (the late) Sir Samuel Baker and Mr. F. C. Selous. The former writes "They (the acacia trees) are easily overturned by the tusks of the elephants which are driven like crowbars beneath the roots and used as levers, in which rough labour they are frequently broken . . . . It is nearly always the right tusk which is selected for this duty." Mr. Selous states that he has seen large areas of sandy soil ploughed up by the tusks of these animals in their search for roots.

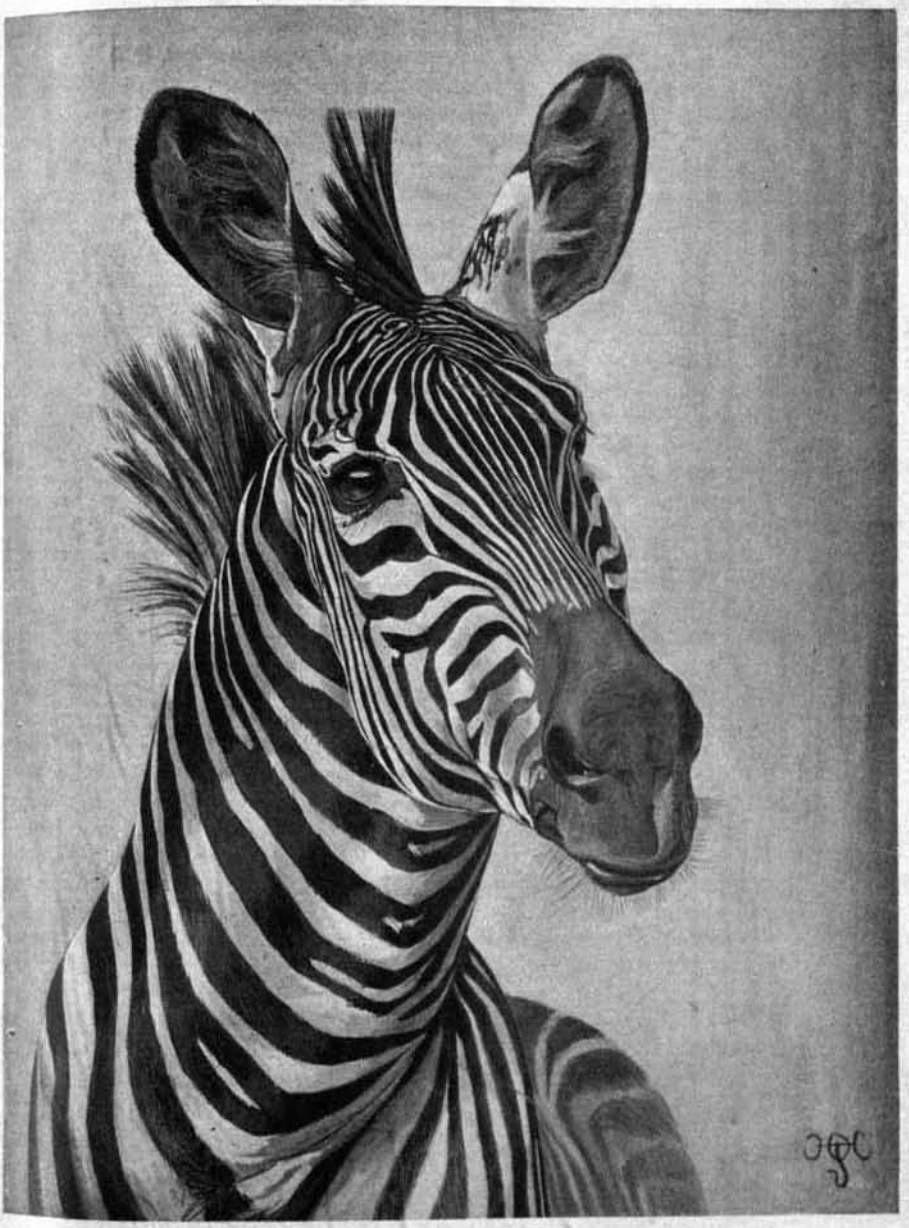
Although nowhere very abundant, the ordinary two-horned rhinoceros is probably found pretty generally over all British Central Africa except on the high plateaux. But from all accounts it is absent from the south shore of Tanganyika and from the Nyasa-Tanganyika plateau. Unless, therefore, it can be proved to exist in the interior of the Moçambique district the rhinoceros will be another of those animals whose range is completely broken by the interposition of British Central Africa.[1] Is the so-called "white rhinoceros" (*Rhinoceros simus*) found north of the Zambezi? This is a question rather hard to answer in the negative or affirmative. I should not be surprised to hear that it was, though not within British territory but in the adjoining districts of Portuguese Zambezia. In 1892 an English trader, Mr. Harry Pettitt, gave me an extraordinary pair of horns which he had obtained in Portuguese territory to the south of the river Ruo. These horns were very similar in appearance to those of the "white rhinoceros," that is to say, both horns were of good length but the front one was extremely long, slender and directed forwards. There are specimens extant of the white rhinoceros in which the front horn is not directed forwards but is exactly vertical, or turned slightly backwards. Still I never remember to have seen a specimen of the ordinary two-horned rhinoceros which has the front horn directed forwards. The pair of horns to which I allude I sent to Mr. Sclater and I believe they are now in the British Museum.[2]

The zebra of British Central Africa is a singularly beautiful beast and should, if right were done, be made a type species under the name of *Equus tigrinus*[3] with three sub-species or varieties—*E. tigrinus burchelli*, *E. tigrinus chapmani*, and *E. tigrinus granti*, to indicate in addition to the clear and perfectly striped Central African form the three other varieties which are marred in their beauty by intermediate faint stripes, and one of which

[1] Abundant evidence, however, of the existence of the Rhinoceros in the vicinity of Lake Rukwa was obtained by the Rev. Harwood Nutt of the London Missionary Society.

[2] Mr. Sclater suggests they may belong to a sub-species of Rhinoceros proposed by Dr. Gray, "Gray's Rhinoceros."

[3] Namely *the* striped horse, *par excellence*.



THE CENTRAL AFRICAN ZEBRA

(Burchell's zebra) has the legs below the "knee" and hock almost without stripes.

The question with regard to the striped horses stands thus:—There is the true or mountain zebra (*Equus zebra*), a smaller animal than the zebra of the plains and with the pattern and breadth of the stripes differing from the three types of (so-called) Burchell's zebra. The true zebra is perhaps the most perfectly striped of all the Tigrine horses. This creature is nearly extinct but has always been for the last hundred years or so confined to the mountains of South Africa.

Then there is the closely allied *Equus grevyi* which inhabits the mountains of southern Abyssinia and Somaliland. From the resemblance between these two types of mountain zebra one might imagine that there had been a regular race of mountain zebras inhabiting all the highlands from the north-east to the south-west of Africa, but that all the links between Shoa and Cape Colony had died out in the course of time. It is curious that the natives of Mlanje assert that there is a small mountain zebra dwelling on Michesi Mountain which is an outlying spur of the Mlanje range. Up to the present, however, we have been unable to secure a specimen.

Then comes the race of big zebras of the plains. These are characterised by much broader stripes, by the ground colour of the skin being darker and yellower in tint than that of the mountain zebra and, in one variety, by the imperfect striping of the legs. What I object to is that this imperfect type should be taken as the type of the species merely because it was the first one to be discovered (it was named after the South African traveller Burchell).[1] Subsequently as explorers and sportsmen penetrated more and more into South Central Africa they found that the zebra of the plains was striped right down to the hoof. A specimen was sent home by a Mr. Chapman and naturalists then called it *Equus burchelli*, variety *chapmani*. But both Burchell's and Chapman's zebras have this point in common, that in between the broad black stripes there are thin hazy dun-coloured streaks, much as though one took a photograph of a striped zebra, he moved, and so the stripes were faintly duplicated. This intervening brown zigzag marking has, in my opinion, a very ugly effect. Now the zebra of Nyasaland and, as far as I know, of all British Central Africa, is without this duplication of the stripe, and is one of the most beautiful animals in existence. Its ground colour is very pale fawn, melting into white, and the stripes are broad and jet black. It is striped down to its very hoofs. But on the other hand, the common zebra of East Africa and Uganda also has these duplications of the stripes, though not in such a marked degree as the South African zebra of the plains. It would seem, therefore, that the zebra found in South Central Africa is a distinct variety, if not species. I consider it should be the type of the large zebras and that the others should be classified as inferior varieties, tending more towards the Quagga. This point, however, was first raised by Mr. Richard Crawshay, and up to the present zoologists are not agreed as to the validity it possesses.[2]

Last in the list of zebras is the Quagga which is dun coloured, with stripes only on the neck, shoulders, and forelegs. The Quagga is nearly if not quite

[1] The story goes that Dr. Gray, of the British Museum, and the explorer Burchell—both peppery men—had quarrelled. Dr. Gray having a new zebra to name, called it, half in fun, half in malice, "Asinus burchelli." Burchell, so far from appreciating the honour, challenged Dr. Gray to fight a duel!

[2] Since writing the above I have read the article on the subject by Mr. W. E. de Winton in the *Magazine of Natural History*, but I think it best to let my views stand as they are.

extinct and, so far as we know, is confined in its range to Africa south of the Zambezi. It is very asinine in its affinities.[1]

The zebra is still extremely common almost all over the Protectorate, and measures have now been taken to preserve it from undue diminution at the hands of sportsmen and natives. I have several times tried to tame the young but have had great difficulty in rearing them away from their mothers, and all experimented on have died within a few days of their capture.

When our system of Game Reserves is perfected we shall be able from time to time to make drives and possibly catch some of the young zebras sufficiently old to be independent of a milk diet and yet not so old as to be quite intractable. They might then be broken in and tamed as is now being done increasingly in South Africa.

The zebra of British Central Africa is slightly larger than his South African congener and is, perhaps, the largest representative of the zebra group.

When I first came to this country I found the hippopotamus so numerous on the Shire as to be a serious danger to navigation in vessels smaller than a steamer. They were very vicious and fond of pursuing and upsetting canoes. Mr. Sharpe in travelling down the Shire in 1892 was, as I have already related, upset by a hippopotamus and nearly drowned. I have been in a boat myself on the Upper Shire which was so far tilted over by a hippopotamus that most of the men fell into the water and I only saved myself by clinging to the doorway of the house. This being the case, we have never attempted to check the slaughter of these animals and they are now so far reduced in numbers on the Shire as no longer to be a source of danger. They are still abundant on parts of the coasts of Lakes Nyasa, Tanganyika, and all the other big lakes, and are found in every river with a sufficient amount of water to immerse their bodies.[2] They are said to visit Lake Chilwa at certain times of the year, travelling overland from the Shire. When we have reduced the numbers of the hippopotamus to something more compatible with the safety of canoe travelling we shall probably add him to the list of protected animals, as we have no desire to bring about the absolute extinction of one of the few great survivors of the Tertiary Epoch.

Pigs are represented in British Central Africa by the bush pigs (*Potamochærus Africanus* and *P. johnstoni*) and the wart hog (*Phacochærus æthiopicus*).

The bush pigs chiefly frequent the hills and mountains, though they are also found in the plains near rivers. They are weird looking creatures with long wiry hair which is yellow and grey with a few white marks. Along the back

[1] Summarized the revised classification of the horses might stand thus:

A. True horses—	*Equus caballus.*
	Equus prjevalski.
B. Asses—	*Equus kiang.*
	Equus hemionus.
	Equus asinus.
	Equus somalicus.
C. Striped horses—	*Equus quagga.*
	Equus tigrinus.
	E.t., burchelli.
	E.t., chapmani.
	E.t., granti.
	Equus grevyi.
	Equus zebra.

[2] Though the hippopotamus will go into the Indian Ocean off the mouths of big rivers and though it can if need be swim across any African lake, still one never meets with them as a rule much out of their depth. They do not care for swimming but prefer walking along the bed of rivers or shallow lakes below the surface or resting thereon, rising every now and then to the surface to breathe and float.

HEAD OF A HIPPOPOTAMUS

there is a considerable whitish mane. The bush pigs are closely allied to the Red river hog of West Africa.[1]

The young of the bush pig are spotted and striped with white as are the young of almost all members of the genus *Sus*. This is not the case with the

[1] When this chapter had been written I learnt through Mr. W. E. de Winton that Dr. Forsyth Major, after examining the pigs' skulls in the British Museum sent home by me in 1889, had determined a new species which he had named *Potamochœrus johnstoni*, and which is remarkable as being an intermediate form between the Bush pigs and the True pigs.

young wart hogs, which are born without these white markings. The wart hog is chiefly distinguished from the true pigs by the reduction in number of its upper incisor teeth. In young animals one pair of perfectly useless incisor teeth —the outermost pair—is retained, but these fall out in the old males. In old animals it sometimes happens that there are few teeth left in the head except the molars and the canine tusks. There are also peculiarities in the number and shape of the molar teeth which separate these animals from the typical pigs. In the male there is very little hair on the body except along the line of the back where a thin mane of very long coarse bristles extends from the top of the head to the tail. This mane is not erect but falls over on either side. Around the chest there is also a frill of whitish bristles. The rest of the body is nearly bare but is sprinkled with a bristly growth. My illustration, which was drawn from life, will give some idea of this extraordinary creature. I kept a wart hog for over a year at Zomba as a pet. He was brought down from the Lake Mweru district by Mr. Crawshay and is now in the Zoological Gardens. The animal derives its name from the huge excrescences or warts on the face, four in number—the large ones seemingly serving as defences to the eyes and two small ones on either side of the nasal bones not sufficiently developed as yet to be of any particular use.

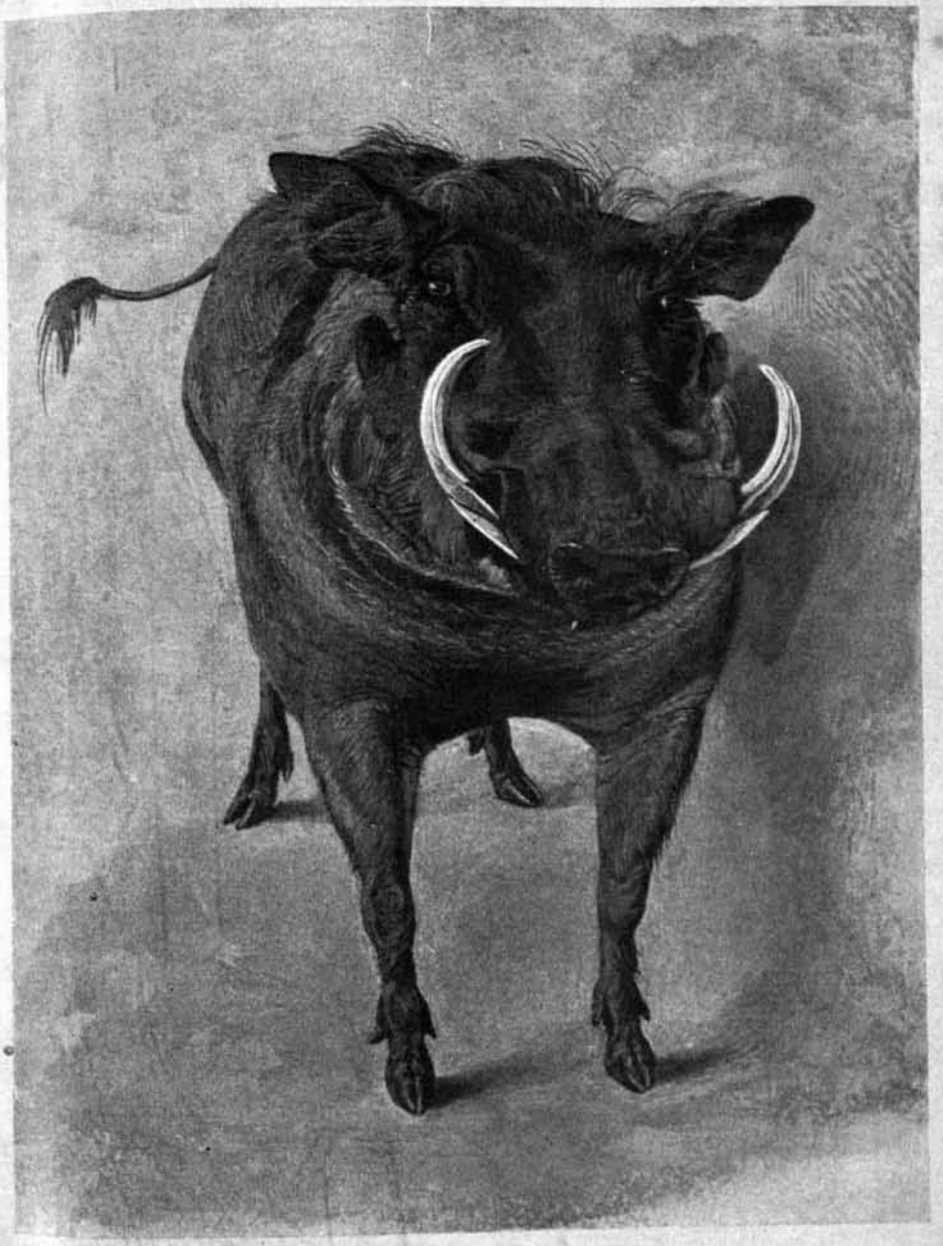
The wart hog prefers a dry country and likes a loose sandy soil in which it burrows, or at least is thought to burrow. In the opinion of some observers it does not make these holes itself but occupies the lair of some other animal, or a natural crevice in any mound. The natives state that the female wart hog seldom has more than two young ones at a time. Certainly the number of teats is much reduced, being only four, which are inguinal in position. The female is a good deal smaller than the male and has not quite such a preposterous development of head, nor are her tusks nearly as large.

As it exists, the mature male wart hog looks like a beast of another epoch. I doubt if there is any other mammal whose head is so disproportionately large.

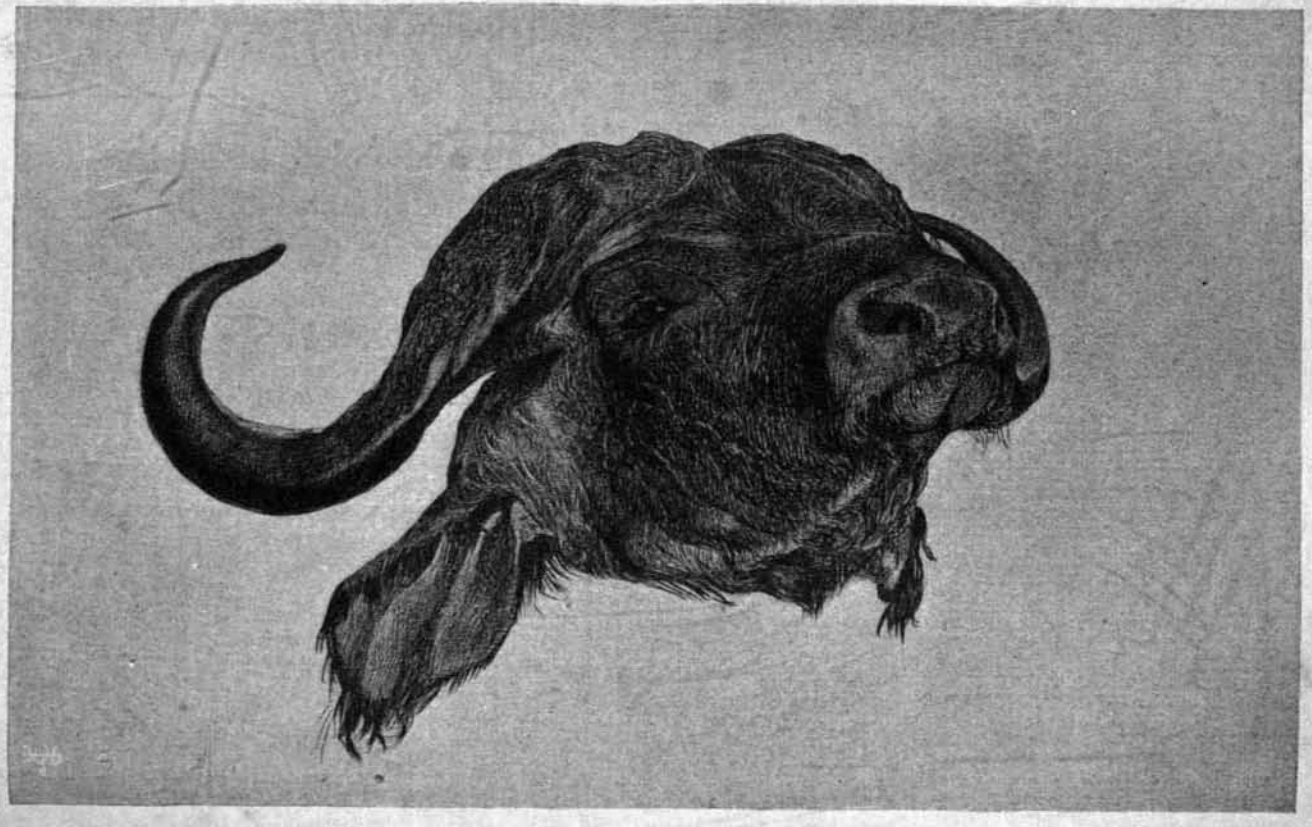
The existence of the giraffe in British Central Africa is still a moot question. The natives report its presence in the Luangwa Valley with very circumstantial details and they are probably telling the truth; but up to the present time no European has sighted the animal in that country, nor have any tangible proofs, such as skulls, or tails, or skins, been sent back as evidence of its existence.[1]

We have seen so few specimens of the giraffe living or dead in England, and those specimens commonly exhibited have not been very good ones that perhaps we do not realise the remarkable fact that one species or sub-species of the giraffe is really a three-horned animal. I saw recently at the British Museum a head from Somaliland in which the central horn between the eyes was nearly six inches in length. As a matter of fact the giraffe is an animal which has lost its horns and retained little more than the basal portion, the bony cores from which the horns (probably in the form of antlers) once grew. An analogy may be found in the prong buck of North America, an animal which appears to be very distantly related to the stock from which the giraffe sprang. Imagine the horn cores of the prong buck increased in growth till they resemble those of the muntjac deer and you have something answering the present condition of the giraffe's so-called "horns."

[1] It is a point so interesting as to be worth a special expedition on the part of some enterprising sportsman-naturalist, as it would be desirable to know whether it differed in any way from the giraffe of South Africa and is more akin to the giraffe of East Africa and the Northern Sudan. This subject has lately been discussed by Mr. W. E. de Winton.



A WART-HOG



HEAD OF A BUFFALO (*Bos Caffer*)

The buffalo of British Central Africa is the type known as the Cape Buffalo (*Bos caffer*). The range of this species probably extends from South Africa up the eastern half of the continent to the Victoria Nyanza, the White Nile, and Somaliland. Its place in Abyssinia and the Egyptian and Central Sudan is taken by another variety or species known as the Central African Buffalo.[1] It extends into West Africa as far as the southern boundaries of the district of Angola proper and thence over the whole Zambezi region into the south and east of the Congo Free State, reaching more than half-way up the coast of Tanganyika and being found on the upper waters of the Lualaba and Kasai. Thenceforward to the north and west its place is taken by the curious short-horned red buffalo of West Africa, which is the only species found in the forest part of the Congo Basin and along the west coast and in Nigeria

It may be interesting to give here a drawing of the horns of this forest buffalo of the Congo, which I did at Bolobo on the Upper Congo some years ago. On the whole I am disposed to regard the forest buffalo of West Africa as rather a degenerate than a primitive type of buffalo. It is evidently a deteriorated race of the *Bos caffer*.[2]

HORNS OF CONGO BUFFALO

Buffaloes are very abundant all over British Central Africa, but of course are retiring from the vicinity of European settlements. They are also frequenters of the plain rather than the mountains, though they will ascend high plateaux in the dry season for the sake of the green herbage. The favourite places of their resort are wide marshy districts like the Elephant Marsh near Chiromo, where even after the most wanton and indiscriminate slaughter at the hands of Europeans[3] they exist in large numbers—thousands, it is said. Like the Indian buffalo they are fond of wallowing in mud and water, though perhaps not as aquatic in their habits as the last-named animal. They are dangerous beasts to tackle under certain conditions though less dangerous than the elephant and lion. It is seldom that they will take aggressive action against the sportsman when not wounded.[4]

[1] *Bos æquinoctialis*. This variety of buffalo is much more interesting than appears from the meagre accounts given of it by all naturalists. It is to some degree a connecting link between the African and Indian buffaloes. The horns are much longer, and are directed farther backwards than in the Cape buffalo. There is not such an exaggerated boss on the forehead.

[2] The most primitive known buffalo or ox is the Anoa of the island of Celebes. This creature shows signs of affinities with the *Tragelaphs* (a group of [so called] bovine antelopes, to which the Nilgai, the Kudu, Eland, and Bushbuck belong). Even at the present day with the aid of the Philippine Islands buffalo, there are existing a series of gradations leading up to the long-horned buffalo of India, and thence through the Central African buffalo to the Cape species which may be regarded as the culmination of Bubaline development at the present day. But fossil remains from both North and South Africa show us that there existed buffalo in this continent in past ages the development of whose horns was gigantic though perhaps not as extravagant even as some extinct Indian species. Mr. Lydekker states that a fossil buffalo skull from South Africa showed horn cores which were 14 feet long, and to this length must, of course, be added that of the horn covering—a foot or so longer. One weeps to think of the degenerate days in which we live. The big game we pursue are but small deer compared with the glorious beasts which surrounded our pithecoid ancestors.

[3] Now checked by this stretch of country having been declared a Government Game Reserve.

[4] Occasionally out of stupid curiosity or because the traveller is standing in the way of a newly born buffalo calf, buffaloes will advance unprovoked to the attack. I remember visiting the Songwe plains at the north end of Lake Nyasa in 1889 for the purpose of sport, accompanied by the late Mr. Kydd.

"LIVINGSTONE'S ELAND"

Even when wounded it is doubtful whether they charge in the open. The danger in connection with shooting buffaloes is this, that the wounded beast retires into long grass or thickets. If the sportsman follows him up then the buffalo puts no bounds to his rage and is also very cunning. He will charge from out of his hiding place and pursue his enemy with a great deal of intelligence, that is to say not altogether in blind rage, and if he succeeds

Soon after we had landed at the mouth of the Songwe we found ourselves in the midst of an enormous herd of buffalo. So far from their retreating before us these animals began to toss their heads and paw up the ground. It seemed as though an imprudent shot would provoke a charge of buffaloes which would drive us into the crocodile-haunted reeds of the marshy lake margin, so that at first we refrained from firing until one bull buffalo advanced in front of the herd and came so near that we had no option but to shoot. The beast fell, then rose to his feet, but instead of charging made for the river, and was dropped by two more shots from our rifles. The rest of the buffaloes turned and fled.

in catching him up will gore him and kneel on him. But I can obtain no authentic record of a buffalo when wounded in open country immediately charging his assailant.

Buffalo calves are born about the end of the rainy season (March, April). Although quickly tamed they are very difficult to rear. They easily catch cold and do not much appreciate cows' milk. I have been so anxious to start the domestication of these fine animals that I brought a number of tame Indian buffaloes from Bombay in 1895, and induced one of them to suckle a young African buffalo. The little beast throve until he was almost ready for weaning, but suddenly caught a chill and died of pneumonia. The Indian buffaloes I introduced are still in the country, not one of them having died, and I am still hoping that they may be used as foster mothers to rear up the newly caught young of the African buffalo until we have established a tame breed of this animal, which should be as useful in a domesticated state as is the long-horned buffalo of India.

The Tragelaphs are well represented in this part of Africa by Livingstone's Eland, the Kudu, the beautiful *Tragelaphus angasi*, or Inyala,[1] by the remarkable Situtunga (*Tragelaphus spekei*) and the South African variety of the bushbuck (*Tragelaphus scriptus roualeyni*).

The Eland of Central Africa differs from the variety found in South and East Africa by its yellower colour, and by its retention of the Tragelaphine white stripes. Also I have never seen a specimen shot in British Central Africa which possessed that great development of "brush" on the nose so characteristic of the South African Eland. The Derbian Eland of West Africa is however quite a separate species from the Eland of Central Africa (Livingstone's Eland), which latter is after all little but a sub-species of the common form. The Central African Eland has in the male larger and longer horns than the South African species. I give an illustration here of what I believe is an exceptionally fine male eland head. It was shot not far from my house at Zomba by one of my native hunters and was presented by me to the Zoological Society. The length of these horns is 29½ inches, and they are 16½ inches apart from tip to tip.

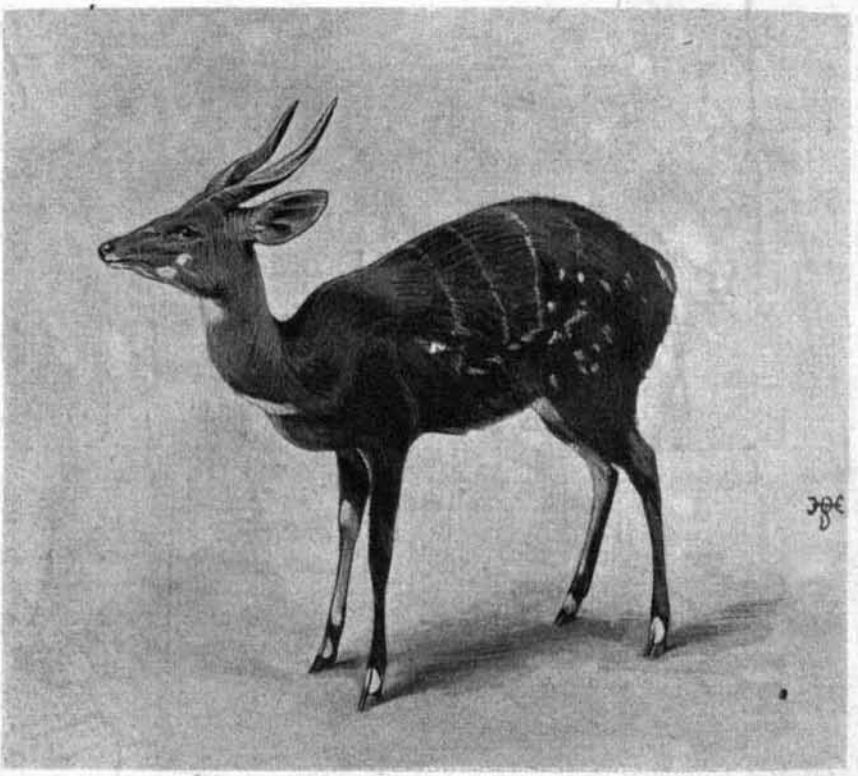
HORNS OF LIVINGSTONE'S ELAND

The eland is seldom met with in the low-lying plains, frequenting mostly wooded hills and high-lying open grass-covered districts on the plateaux. This also is the favourite habitat of the kudu, the glory of the Tragelaphs, an animal to which shrines should be erected and worship tendered on account of its beauty. The Central African kudu is almost the finest development of the genus. Mr. Sharpe measured one pair of horns shot in Nyasaland which gave 62 inches as the length of the horn following the curve. I have myself a pair of horns which measure 48 inches along the curve.

I am inclined to think that the Inyala antelope of British Central Africa is limited in its range as far as we yet know to the Western and Upper Shire

[1] Locally called *Bōō*.

districts and the Lake Mweru district and may be a different variety to the Inyala of South East Africa, inasmuch as the males retain white spots and stripes on the skin to a greater extent, and do not assume such a grey fur at maturity. The Inyala, locally called Bōō, is a very rare animal frequenting dense thickets. Its horns somewhat resemble those of the bushbuck, but are much larger proportionately, much wider apart and slenderer. They may measure as much as 22½ inches in length along the curve. (I have a pair of horns giving this measurement.) I have only twice seen skins of the adult



A MALE BUSHBUCK (*Tragelaphus scriptus*)

animal. They were extraordinarily beautiful in colour—the females a deep chestnut with narrow stripes and spots in pure white and a black line along the middle of the back from the neck to the base of the tail; the male purplish-grey with white markings. The Situtunga (*Tragelaphus spekei*) is not found in Nyasaland but is met with abundantly in the swamps of Lakes Mweru and Bangweolo, in the Luangwa Valley and in other parts of British Central Africa. This Tragelaph has taken to an entirely aquatic residence and the hoofs are enormously developed.[1] The horns of the Situtunga, unlike those of the rest of the animals of the genus *Tragelaphus*, have two turns instead of a turn and

[1] Another instance of great development of the hoof for the purpose of traversing marshy ground exists in *Tragelaphus gratus* of West Africa.

HEAD OF A MALE KUDU

a half.[1] This aquatic Tragelaph further differs from the other members of the genus in having long, coarse, uniformly grey-coloured hair without white spots or stripes in the adult. The young are said to be faintly striped and spotted with white.

There remains to be considered the Bushbuck of Central Africa. I am inclined to think that the naturalists are wrong in the classification of the Bushbucks. They should restore to them that designation *Tragelaphus silvaticus* which was formerly applied to the Bushbuck of South-Central and East Africa, making it a separate species from *Tragelaphus scriptus*, the "Harnessed Antelope" of West Africa. The coloration of the Bushbuck is usually uniform between South and East Africa and so different to that of the Harnessed Antelope that it is scarcely logical to class it as merely a variety of the latter. Besides which the horns of the Bushbuck are usually long[2] and more slender than those of the Harnessed antelope and offer a more distinct beginning of a second curve. The Bushbuck is extremely common throughout British Central Africa and is without exception the most delicious eating of any mammal in the world. In tenderness and flavour its flesh surpasses the best Welsh mutton, or any venison. Here, emphatically, is an animal which should be domesticated and saved from extinction. The young and the females of the Bushbuck are a bright yellow chestnut in colour, with well marked white spots and stripes, but the adult males become bluish grey, sepia and black, with the inner side of the legs white, a few white spots and one or two white stripes on the hind quarters, two white bars on the front of the throat and neck, and the usual tragelaphine white spots and stripe on the face. There is also a scattered white stripe down the line of the back.

There now remains to be considered the great group of true antelopes, or ring-horned *Bovidæ*, found in British Central Africa.[3] These are represented by the following antelopes:—One or more species of Duyker (*Cephalophus*), the Oribi, Steinbok (*Raphicerus*), Klipspringer, Reedbuck, five species of *Cobus*, the Roan antelope, Sable antelope, Pallah, Lichtenstein's Hartebeest, possibly the Tsessébe (*Damaliscus*), and the Blue Gnu. There should be one or more representatives of the little Livingstone's Antelopes (*Nesotragus*), but no specimens have yet been obtained.

The Duyker antelopes are neither so numerous in species nor in actual numbers as they are in South and West Africa. They frequent chiefly the low-lying plains in the vicinity of water courses. The Cephalophines are an interesting antelopine group to which is related the four-horned antelope of India. Although in regard to the modification of their toes by which all

[1] The kudu and the lesser kudu have three turns, the eland two turns and a half, the situtunga two turns, and the remainder of the African Tragelaphs one turn and a half, and the Nilgai of India only the beginning of a turn.

[2] A pair in my possession measures 17¾ inches along the curve.

[3] There are certain families of mammals and of birds in the classification of which most naturalists, with the exception of the late Professor Garrod, seem to miss the meaning of a conjunction of characteristics and to fail to grasp true relationships, mistaking parallel developments for evidence of direct inter-connection. In no mammalian group has this persistence in error been more remarkable than in the arrangement of the *Bovidæ*. That vague and facile term "antelope" has been made to include at least two groups of hollow-horned ruminants which are only akin one to the other in that they can prove descent from a common ancestral type of hollow-horned ruminant. The term "antelope" should be reserved to the ring-horned ruminants and should include gazelles and all the African and Indian antelopes which have annulated horns. The goats and sheep and capricorns are nearly-allied sub-families. Another group of equal value is the Oxen, or *Bovinæ*, and a third similarly distinct, is the *Tragelaphinæ*, or Tragelaphs. The diagram on next page will show my idea of the right classification, arrangement and development of the *Bovidæ*. It is based on ideas expressed many years ago by the late Professor Alfred Garrod.

vestiges of the second and fifth metacarpal and metatarsal bones are lost, and even the false hoofs representing these missing toes are often flattened and reduced in size (so that some Duykers are almost completely two-toed), yet in other respects they may be regarded as a low type of antelope not far removed from the central stem from which the ring-horned ruminants branched out. The nose is quite naked and irresistibly suggests a resemblance to that feature in the pig-like *Dorcatherium* of West Africa, which is the nearest living representative of the type from which all existing ruminating Artiodactyles sprang. I believe some anatomists have discovered minute traces of an upper canine which does not pierce the gum in the young of *Cephalophus*. The species of

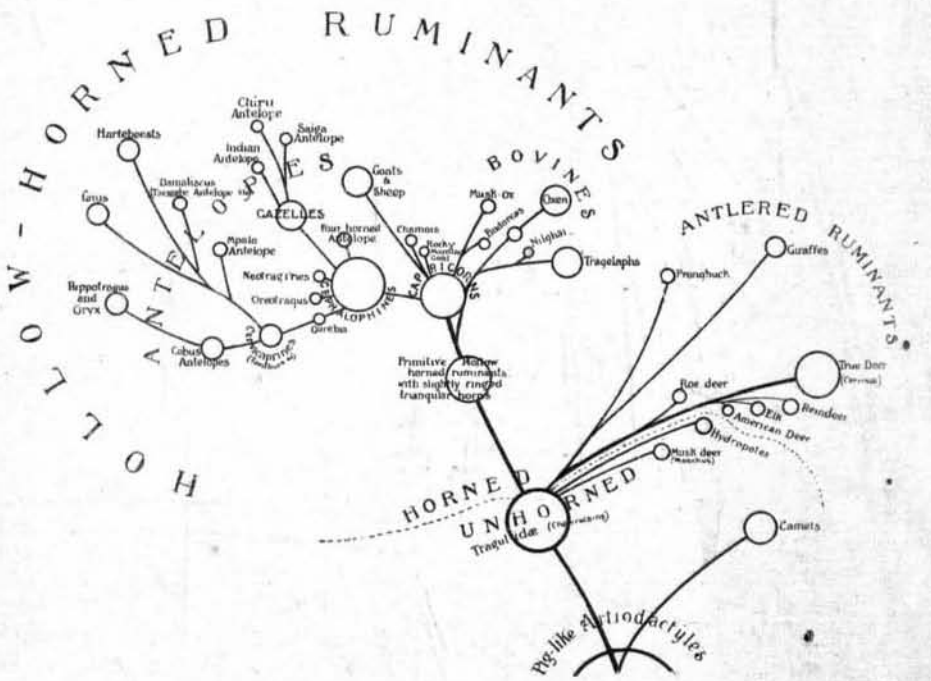


DIAGRAM SHOWING ORIGIN AND RELATIONSHIPS OF MODERN GROUPS OF HORNED RUMINANTS

this genus which is found in Nyasaland is the common Duyker, *Cephalophus grimmi*.

A remarkable little antelope of the genus *Raphicerus* was recently discovered by Mr. Sharpe at the south end of Lake Nyasa and sent home. It proved to be a new species of Steinbok and was named *R. sharpei* after its discoverer. It is illustrated in the Zoological Society's Proceedings of April 1st, 1897, and is closely allied to the Steinboks of South Africa.

The little Klipspringer is found in all rocky places and upon high mountains like Mlanje. The stories told of its jumps are almost as marvellous as those of the Ibex and Chamois. I have not myself witnessed any of these wonderful leaps but it is quite conceivable that they occur. Exaggerated stories are told of its being able to place all four feet together on a space not larger than a crown piece. Of course this is impossible, but it can stand with all of its four

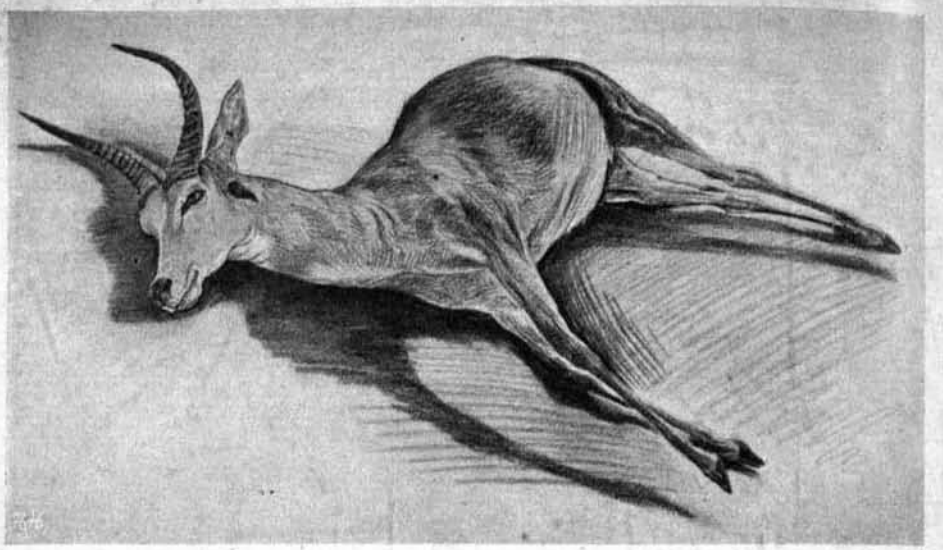
feet together on an area which might be covered by a very small saucer. The fur has a curious brittle, shiny appearance, as though the hairs were thickening into spines. The Oribi of British Central Africa is *Ourebia hastata* and also comes from the Portuguese province of Moçambique.

The Reedbuck of British Central Africa is a large animal of the genus *Cervicapra*. The variety found in the Mweru district has a well marked black

A KLIPSPRINGER

patch on the crown between the horns.[1] I have sometimes thought that the Reedbucks (which I illustrate on next page) found at the north end of Nyasa were exceptionally large. The drawings made are from specimens shot by myself in 1889. At the time the beasts were killed I almost thought that they were a small species of *Cobus* antelope, a genus into which *Cervicapra* insensibly melts. The Reedbuck is good eating and ranks next to the Bushbuck as

[1] So states Mr. Oldfield Thomas in his paper on the mammals of British Central Africa; he further says that similar patches have been noticed in South African specimens.



A MALE REEDBUCK

palatable meat. I do not think the Reedbuck is met with on high mountains or that it even cares much for hilly country, but it is very abundant on elevated plateaux of gentle undulating surface. Ordinarily it frequents the grassy plains and answers to its name by affecting beds of high reeds. On the Nyasa-Tanganyika plateau one used to see it with its head just appearing out of the high grass and tall yellow ground orchids of the genus *Lissochilus*.[1]

A MALE REEDBUCK'S HEAD

There are, as I have said, five species of *Cobus*, or waterbuck, to wit:—(1) the well-known South African waterbuck (*Cobus ellipsiprymnus*); (2) the nearly allied *Cobus crawshayi*; (3) the Lechwe (*Cobus lechwe*); (4) the Puku (*Cobus vardoni*); and (5) the Senga Cobus (*Cobus senganus*) also discovered by Mr. Crawshay. The common waterbuck is almost the largest member of the genus. The female, as is the case throughout all the Cervicaprines, is without horns. Crawshay's waterbuck, which is found in the Mweru district and probably thence

[1] See illustration, page 208 in Chapter VIII.

westward to the vicinity of Angola (where a closely allied form, *Cobus penricei* has been found), is slightly smaller than the common waterbuck. The waterbucks of Crawshay and Penrice differ from the common species in the following points:—The horns are smaller and less incurved, the rump is yellow white instead of being a mere white streak sandwiched between two patches of dun colour. Penrice's waterbuck differs from Crawshay's very slightly if at all. The known specimens, however, are slightly larger and rather blacker in colour and the horns are proportionately shorter. The common waterbuck is extremely hairy especially about the neck, the female being in my opinion even hairier than the male. She bears an extraordinarily superficial resemblance to the hind of a large species of deer. These animals have such a

MALE WATERBUCK (*Cobus ellipsiprymnus*)

strong coarse smell (something like that of a goat) that the natives say they can often smell them before they see them. In going through the Elephant Marsh with natives they have suddenly commenced sniffing the air and declared that waterbuck were near, and they have been usually right. From this cause and also because it is coarse and tough in grain, the meat of the waterbuck is not at all liked by Europeans, though I have found the flesh of the female and of the young ones just tolerable when well cooked. The Puku is not found in Nyasaland proper, but it is fairly abundant in the country west of the Nyasa watershed from Lake Mweru southwards, and at the south end of Lake Tanganyika. This animal is considerably smaller than the common waterbuck. It is a bright chestnut yellow in colour and does not assume the grey tint so characteristic of the larger waterbucks. Mr. Sharpe states that it is still found in enormous herds about the river Luapula and in the vicinity of Lake Mweru. As regards its habits, it is fond of entering the water, but not so much as the

closely related *Cobus lechwe*. A smaller Cobus closely allied to the Puku has recently been discovered in the Senga country (Luangwa Valley) by Mr. Crawshay and has been described by Mr. Oldfield Thomas under the designation of *Cobus senganus*. In colour it is said to be rather darker than the Puku. The Lechwe waterbuck is one of the most water-loving antelopes known, though it must be admitted that it is some degrees less aquatic than Speke's Tragelaph which has been longer at this mode of life and has therefore developed very remarkably extended hoofs. The Lechwe though having slightly longer hoofs than in the other forms of *Cobus*, does not present any very striking development of the foot for life in the water, except that at the

FEMALE WATERBUCK

back of the toes, between the false and the big hoofs, there is a naked place not covered with hair. Mr. Sharpe and other observers relate that the Puku and Lechwe constantly associate together in large herds. Up to the present time the range of the Lechwe does not seem to extend farther north than Lake Mweru, nor farther east than the watershed of Lake Nyasa

Amongst other heterodox opinions I hold that the Hippotragine section of antelopes, including the Oryxes, was developed from a form of waterbuck. This would appear to be absurd to anyone who merely looked at the commoner forms of Cobus; but that remarkable and most beautiful antelope, Mrs. Gray's Waterbuck (*Cobus maria*) of the White Nile irresistibly suggests in the shape of its horns and the coloration of the face an approach to the Equine antelopes which again have given rise to the Addax and to the four species of Oryx.

The *Hippotragine* or Equine antelopes are represented in British Central

THE SABLE ANTELOPE

Africa by the Sable and the Roan. Curiously enough there is no representative of the Oryx genus throughout all British Central Africa. This type at the present day is confined in its distribution to South Africa, East, North-East and North Africa, and Southern Arabia. As in the case of the zebra, of the giraffe, and of other animals quoted there is a complete break in the distribution of this genus between Moçambique and the West Coast of Africa. The Sable antelope is extremely common. Next to the Kudu, perhaps, or Mrs. Gray's Waterbuck, it is the most beautiful antelope that exists. As large as a small ox with the graceful shape of a beautiful stag, the colours of the male being jet black and snow-white (and of the female bright chestnut-brown and white), the head surmounted by a magnificent pair of horns symmetrically ringed and describing almost the curve of a half circle, the long neck clothed abundantly with a black mane, the large, long-lashed eye, and the tufted tail, make up a beast of grand proportions, striking coloration and beautiful detail, whose extermination would be one of the worst crimes that humanity has ever perpetrated.

Fortunately the Sable antelope is still extremely common in Nyasaland though it is not certain that its range extends east over the Moçambique province, or westward over British Central Africa. It is found, I believe, on the Saïsi river (on the eastern portion of the Nyasa-Tanganyika plateau). I think it is met with in parts of East Africa, and I believe that I saw one specimen of it near Taveita and another near the river Ruvu, as far north as the Kilimanjaro district. [It is sometimes difficult to tell at a distance the young male or female Sable from a Roan antelope, therefore as I did not secure the beast I cannot speak positively on this latter point though in my diary I wrote most positively on this occasion that I had seen a sable and was struck by the vivid contrast between its black and white coloration.] In any case it is not confined to South Africa, a legend still appearing in circles which should be well informed. At the present time it is one of the commonest antelopes in the Shire Highlands and throughout Nyasaland, where it frequents the wooded hills rather than the low-lying plains. I have myself only seen it in what might be called scrub country—rough land of red clay and rocks on which grow trees of sparse foliage and of no great height. In spite of their very marked colours both the male and female sable become singularly invisible in this low forest, their bodies getting mixed up with the glooms of tree trunks in black shadow or brown light. There would appear to be these differences between the sable of Nyasaland and that of South Africa. The Nyasaland variety is rather larger, the neck is somewhat thicker but the mane a little shorter and the ears are slightly longer and have a black tip at the end which I believe is missing in the South African sable.

It would seem to be a general rule that where the sable is found there the roan antelope, its near congener, is not to be met with. This animal is coloured somewhat like the immature male and female of the sable—chestnut with a tendency to black, and with bold white markings. Its horns are not so handsome as those of the sable. The ears are even longer than in the sable and the tips more recurved and ending in a tuft of black hair.[1] In all the Hippotragine antelopes (including the Oryxes) the female is horned as well as the male, a sign, of course, of great specialisation. The range of the roan antelope apparently lies mainly outside British Nyasaland though both Mr. Sharpe and myself have sometimes thought that it existed in the Ruo district and across that river in Portuguese territory, and it has been shot

[1] The culmination of this development of the ear is seen in the fringe-eared Oryx (*Oryx callotis*).

in the North Nyasa district by Mr. G. A. Taylor. It undoubtedly occurs on the east coast of Lake Nyasa for it has been shot there by Major Frank Trollope. To the west of Nyasaland it is the common Hippotragine species and its range probably extends north and east to the Egyptian Sudan and thence westward across Nigeria to Senegambia. A third species of Hippotragus —the Blaubok—was a bluish-grey in colour and more uniform in tint with longer hair and in some respects more suggestive of the *Cobus* antelopes. Like many other remarkable creatures in South Africa it was promptly exterminated by the European settlers.

Probably evolving from some *Cervicaprine* form we have the beautiful pallah, or mpala antelope (*Æpyceros melampus*), the shape of whose horns will be shown in the accompanying drawing which however illustrates the small Nyasaland variety.[1] The coloration of the pallah is a rich dark chestnut with a white stomach and a black longitudinal mark in the front of the feet. It also is

A ROAN ANTELOPE (*Hippotragus equinus*)

marked by a black tuft of hair on the inner side of the hind legs below the tarsus. The lesser pallah, a variety named after myself because I happened to send home the first specimens, is the one usually met with in Nyasaland, the larger pallah being found in the regions to the west and east. The accompanying illustration is the head of Johnston's pallah which differs from the more typical animal in the smaller size of the horns and body. Mr. Sharpe states that in his opinion the pallah all over Central Africa affects a special kind of country —forested plains with open glades of short grass not far removed from water.

The Nyasaland Gnu or Wildebeest would appear to be a new species. Hitherto it has been treated as a new variety of the Blue Wildebeest (*Connochætes taurinus*). The first specimen sent home was killed by Mr. H. C. McDonald of the British Central Africa Administration in the vicinity of Lake Chilwa. This example was figured in the Zoological Society's Proceedings for 1896.[2] Subsequently a fine specimen of this gnu was killed by Mr. James Harrison, an English sportsman, who was travelling in the Portuguese territories between Quelimane and the Protectorate. Mr. Harrison also saw a small herd of this gnu about sixty miles to the south of Lake Chilwa. The one

[1] A good drawing of the head of the larger pallah will be seen in my book on the Kilimanjaro Expedition, page 219.

[2] p. 616.

JOHNSTON'S PALLAH

which he shot he obtained about thirty miles to the south-east of Mount Chiperone.[1] I should say that the Nyasa gnu (the range of which in Nyasaland

[1] A small photograph was taken of the head, and this was subsequently sent to Mr. W. E. de Winton, an English naturalist, who is making a special study of African mammals. To the courtesy of Mr. de Winton I owe the loan of Mr. Harrison's photograph from which together with other data I possessed I have made the accompanying drawing of the head of the Nyasa gnu. Mr. Harrison's photograph is particularly valuable for this reason. It confirms the presence on the head of this gnu of a white chevron

THE NYASALAND GNU (*Connochætes taurinus johnstoni*)

appears to be confined to the vicinity of Lake Chilwa and to the Elephant Marsh [1]) is the least differentiated of all the gnus and bears more signs of relationship to certain forms of hartebeest.

The position and origin of the gnu in the classification of the antelopes has always been a difficult one for naturalists to settle. It is obviously a very specialised animal and yet in some respects it retains more primitive characteristics than the hartebeest. For instance, the female has four *mammæ*, whereas in the hartebeests there are only two. Also the length of the head is not so disproportionately great as in the hartebeest though it possesses a peculiar

across the ridge of the nose just below the line of the eyes. This white mark had become somewhat effaced in the dry skin which we sent home, and its extent and direction were not sufficiently realised by the artist who drew the picture for the Zoological Society's Proceedings. Mr. Harrison's photograph is important, therefore, as showing the proper direction taken by the white marking of the face and the clearness of this marking which has a definite outline, and is not hazy as represented in the Zoological Society's plate. The presence of this white mark across the face, together with other peculiarities, almost constitutes the gnu of Nyasaland a different species to the Blue Wildebeests of South and East Africa. If this is the case it will be another curious instance of the closer relationship in mammalian types which subsists between North-East and South Africa as compared to South-Central Africa. It will be a parallel to the eland and the zebra.

[1] Though the existence of a gnu is reported from the Luangwa Valley, west of the Protectorate.

development of its own in the great breadth across the nose. On the whole, I should think it likely that the gnu developed from an early type of hartebeest somewhat similar to *Bubalis swaynei.*

One point about the gnu used to puzzle naturalists like Dr. Gray, who founded their classification too much on external characters, and that was that the gnu had no rings on its horns. They were apt therefore to dissociate it from its nearest congeners among the antelopes and to class it with an extraordinarily far-removed animal—the *Budorcas* of Tibet. Yet the gnu really belongs to the group of antelopes and is derived from a form which once had rings on its horns. Traces of these rings may not only be seen on the horns of the most northern species of gnu, the white bearded gnu of East Africa (*Connochætes albojubatus*) but are present on the under side and in the inner bend of the horns in female gnus when they have not had time to wear the marks away by rubbing the horns on the ground or against trees. The male gnu, however, has completely lost any trace of annulation, and in this resembles (as a parallel case) the *Budorcas* of Tibet, and the musk-sheep (*Ovibos*) of North America, both of which animals are aberrant types of Capricorns, a central group having annulated horns (though the annulation on the horns of the Capricorns is less marked than in the antelopes, goats and sheep). On the whole I think the Nyasaland gnu from the shape of the horns and the fact that the face is almost entirely without the great black brush which grows on it in the other gnus, is the least differentiated of all the species of this remarkable genus and comes nearest to a generalised type of hartebeest.

We are now left with no order to discuss amongst the mammals but the Edentates, the River Shire and the great lakes being without any cetaceous animals such as the peculiar river dolphins which are found in the Amazon and the Ganges. The Edentates, as far as I know, are only represented by one type —the Manis or scaly Ant-eater. The Manis of British Central Africa is the short-tailed species[1] which extends in its range right across Africa from the west coast to Natal and to Somaliland. It is very common in Nyasaland, but only in the well-wooded country. Its food consists of white ants and other insects. This animal has an extraordinary power of escaping from almost any prison. Its powerful claws and the extraordinary leverage which it can exert by means of its limbs and the tripod they form with the tail, the smallness of its head and its remarkable "squeezability" and power of burrowing enable the Manis to obtain egress from almost any place of confinement. It can on occasions dig up cement with its claws by scratching it away from the edge of the wall. When shy and annoyed the Scaly Ant-eater rolls itself up into a ball. It is then an awkward animal to lift and carry away as the fingers may get between the interstices of the sharp-edged scales and be severely pinched. The animal seems to know this and promptly contracts so as to catch the fingers between the sharp edges.

The *Orycteropus*, or Aard Vark, of South and East Africa is so far as I know entirely absent from British Central Africa—another animal whose range is interrupted by this section of the continent. It may yet be found (and if so it will probably be met with in the Luangwa Valley or about Lake Mweru) but no report of its existence has as yet come to hand.[2]

[1] *Manis temmincki.*

[2] It is a curious point that such southern or eastern forms as are absent from Nyasaland but are still found in British Central Africa are usually met with in the Mweru district. The country between Mweru and Tanganyika would appear to be rather dry and desert-like, and more resembling the harsh steppes of Equatorial East Africa and of South Africa.

APPENDIX I.

LIST OF MAMMALS RECORDED IN BRITISH CENTRAL AFRICA

NOTE.—This list is principally based on the work of Mr. Oldfield Thomas, of the Mammalian Department at the British Museum of Natural History. This work is summed up in Mr. Thomas's paper in the Zoological Society's Proceedings for April, 1897. The arrangement of the species, however, is my own. In order to make the list complete I have also inserted between brackets species known to be present in British Central Africa, though not represented by specimens sent to the British Museum or Zoological Gardens. Where the species was new to science and made known through our collections, *sp. nov.* is placed after the name.

Order, PRIMATES.

[*Homo sapiens*, sub-species *æthiops*; Bantu negroes.]

Papio babuin; the Yellow Baboon.
Represented by live animal in Zoological Gardens.

Papio pruinosus (*sp. nov.*); the Grey Baboon.
Discovered by Dr. Percy Rendall at the south end of Lake Nyasa. A remarkable new species with fur of a hoary grey and dirty white colour, nearly allied to *Papio thoth* of North-East Africa.

Cercocebus aterrimus; the Black Mangabey.
Living specimen obtained by me from Lake Tanganyika and presented to Zoological Gardens. Its actual habitat on the shores of Lake Tanganyika was uncertain. It was given to me by an Arab of Ujiji—said to come from N. Tanganyika; scarcely to be included in a list of British Central African mammals except that natives state the animal is also found in South Tanganyika and on the Luapula River: a regular West African type.

Cercopithecus opisthostictus (*sp. nov*).
Discovered by Mr. Richard Crawshay in the Lake Mweru district: allied to *C. samango* of South Africa (*vide* P.Z.S. of November 21, 1893).

Cercopithecus albigularis; the white-throated grivet Monkey from the Shire province, but probably spread throughout British Central Africa.

Cercopithecus moloneyi; Moloney's monkey.

[*Cercopithecus pygerythrus*]; the russet-rumped grivet Monkey.
Probably this is the common species of grivet so often seen as pets in European settlements.

Cercopithecus stairsi; Stairs's monkey (P.Z.S. 1892, p. 580).

Colobus palliatus; the white-thighed Colobus Monkey.
Found abundantly in the forested mountain regions to the west and north-west of Lake Nyasa and thence westward to the Congo Free State. This species is also, I believe, found on high mountains in East Africa; otherwise its affinities are mainly West African.

Otogale kirki; the Great Galago.
This lemuroid has hitherto only been met with in the Shire province.

Galago moholi.

Order, CHIROPTERA.

Epomophorus crypturus; the Hidden-tailed Fruit Bat.

Xantharpyia straminea; the Yellow Fox-Bat.

Rhinolophus hildebranti
Rhinolophus landeri } Horseshoe-nosed Bats.
Rhinolophus capensis

Hipposiderus caffer.

Nycteris hispida.

Vesperugo megalurus.

Vesperugo rendalli (*sp. nov.*); Rendall's Bat.

Discovered by Dr. Rendall; a remarkable white-winged Bat.

Vesperugo nanus.

Scotophilus nigrita.

Order, INSECTIVORA.

Rhynchocyon cirnei; long-nosed jumping Shrew.

Petrodromus tetradactylus; rock-jumping Shrew.

Crocidura (species undetermined); small musk Shrew.

Order, CARNIVORA.

Felis leo; the Lion.

Felis pardus; the Leopard,

Felis serval; the Serval.

Felis caffra; the Kaffir Cat.

[*Cynælurus jubatus*]; the Cheetah, found on Nyasa-Tanganyika Plateau.

Hyæna crocuta; the spotted Hyæna.

Viverra civetta; the Civet.

[*Genetta tigrina*]; the blotched Genet.

Nandinia gerrardi; Gerrard's Paradoxure; the "Palm Civet," found in N. Nyasaland.

Related to West African forms.

Herpestes galera
Herpestes gracilis } Ichneumons or "Mongooses."

Rhyncogale melleri; the fruit-eating Mongoose.

Crossarchus fasciatus; the banded Mongoose.

Allied to a West African form, and also found in South Africa.

Canis lateralis or *Canis adustus*; the side-striped Jackal.

Lycaon pictus; the Hunting Dog.

Shot by Mr. Crawshay in the Lake Mweru district, and by Mr. Sharpe at Zomba, and reported from the Luangwa Valley and North Zambezia (M. Edouard Foa).

Poecilogale albinucha; a white-necked weasel.

[*Mellivora ratel*]; the Honey-Badger.

I have had the young of this animal in my possession.

Lutra maculicollis; spotted-necked Otter.

[*Lutra capensis* (?)]; the Cape Otter.

It is thought that dried skins of this animal have been seen in the natives' possession.

Order, RODENTIA.

Sciurus mutabilis; the changeable Squirrel.

Sciurus palliatus; the pale Squirrel.

Anomalurus cinereus; the grey flying Squirrel.

Mr. Oldfield Thomas adds this flying Squirrel to his list of Nyasaland mammals as it was procured by another collection, not of our sending, from "Upper Ruvuma River, towards Lake Nyasa." It would therefore come within the British Central African province as defined by me. No specimen of a Flying Squirrel has yet been sent home from within the actual limits of the British Central Africa Protectorate.

Otomys irroratus.

Gerbillus afer; the Jerboa Rat.

Cricetomys gambianus; the Gambian Bush Rat.

Golunda fallax.

Arvicanthis dorsalis.

Arvicanthis pumilio.

Mus rattus; the common Black Rat.

Mus dolichurus; the long-tailed Tree Rat.

Mus natalensis.

Mus modestus.

Mus minutoides.

Mus incomtus.

Saccostomus campestris.

Acomys spinosissimus; the Spiny Mouse.

Obtained by Dr. Percy Rendall in the South Nyasa district.

Dendromys mesomelas.

Steatomys protensis.

Lophuromys aquilus.

Myoscalops argento-cinereus.

Aulacodus swinderenianus; the Ground Rat.

"Excellent eating."—H. H. J.

[*Hystrix, sp. inc.*]; Porcupine.

From the quills in the natives' possession there must be a porcupine in the country, but the species is not yet determined. Native name: *nungu.* A smaller species called "kanungu" is stated to exist also.

Lepus whytei (*sp. nov.*); Whyte's Hare.

Order, UNGULATA.

Sub-order, *Hyracoidea.*

Procavia johnstoni (*sp. nov.*); Johnston's Hyrax.

Procavia brucei; Bruce's Hyrax.

Sub-order, *Proboscidea.*

Elephas africanus; the African Elephant.

Sub-order, *Perissodactyla*.

Rhinoceros bicornis; the common African Rhinoceros.

[*Rhinoceros simus ?*]; the square-lipped (white) Rhinoceros.

A pair of horns from the River Ruo was sent home in 1893 which strongly resembled those of the "white" rhinoceros.

Equus tigrinus; the Central African Zebra.

This I take as the type of the species of large Zebra of the plains, of which *Equus tigrinus burchelli*, *E. t. chapmani*, and *E. t. granti* are sub-species.

Sub-order, *Artiodactyla*.

Potamochœrus johnstoni; Johnston's Bush pig.

A connecting link between the True pigs (*Sus*) and the Bush pigs (*Potamochœrus*).

Potamochœrus africanus; the Bush Pig.

Allied to the Red River hog of West Africa.

Phacochœrus æthiopicus; the Wart Hog.

[*Giraffa camelopardalis*]; the Giraffe.

Reported to exist in the Luangwa Valley and in Ubena, N.E. of Lake Nyasa.

Tragelaphus scriptus, var. roualeyni; Gordon Cumming's Bushbuck.

The common bushbuck of South and East Africa.

Tragelaphus angasi; the Inyala. (P.Z.S. 1892, p. 98; 1893, p. 507 and p. 729.)

Occurs along the west side of the River Shire and also in the Lake Mweru district. This handsome Tragelaph is probably found in other parts of British Central Africa as well as in Natal and South-East Africa.

Tragelaphus spekei; Speke's Tragelaph.

Lives almost entirely in the water. Frequents the swamps of Bangweolo, Mweru and the River Luapula.

Strepsiceros kudu; the Kudu.

Oreas canna livingstonii; Livingstone's Eland. The white-striped Eland.

Bos caffer; the Cape Buffalo.

Cephalophus grimmi; the common Duyker Antelope.

Oreotragus saltator; the Klipspringer.

Ourebia hastata; Peters' Oribi.

[*Ourebia scoparia ?*]; the Cape Oribi.

This animal is briefly recorded in our collections from Lake Chilwa by Mr. Oldfield Thomas under the name of *Nanotragus scoparius* (P.Z.S. 1894, p. 146). As he has not repeated the name in his recent list of British Central Africa mammals it may be that the specimens have since been referred to Peters' Oribi.

Raphicerus sharpei (*sp. nov.*); Sharpe's Steinbok.

Cervicapra arundinum; the Reedbuck.

Cobus vardoni; the Puku.

This waterbuck, of which I have horns in my collection, has been killed by Mr. Sharpe in the Luangwa Valley and in the Mweru district.

Cobus senganus; the Senga Puku.

A smaller species of Puku discovered by Mr. R. Crawshay in Northern Senga.

Cobus lechwe; the Lechwe Waterbuck.

Found by Mr. Sharpe in the Mweru district, its farthest (known) northward range.

Cobus crawshayi (*sp. nov.*); Crawshay's Waterbuck.

Discovered by Mr. R. Crawshay in the Lake Mweru district; remarkably similar to Penrice's waterbuck in South-West Africa.

Cobus ellipsiprymnus; the common Waterbuck.

Æpyceros melampus; the Pallah or Impala Antelope.

The larger pallah—the common type—is apparently found all over British Central Africa to the west of the Nyasaland province (*vide* P.Z.S. 1893, p. 728): but in Nyasaland and the adjoining territory of Portuguese East Africa the small Johnston's Pallah (*Æ. melampus johnstoni, sub-species nov.*) is the prevailing or exclusively represented type (*vide* P.Z.S.).

[*Damaliscus sp. inc.*]; the Tsessébe?

Mr. Sharpe believes he has seen in the Luangwa Valley an antelope allied to or identical with the Tsessébe—or "Sassaby"—of South Africa. Mr. Poulett Weatherley reports the same animal to exist in the Lake Bangweolo district.

Bubalis lichtensteini; Lichtenstein's Hartebeest.

Connochætes taurinus johnstoni (*sub-species nov.*); the Nyasaland Gnu.

Found in south-east Nyasaland. A gnu is reported by the natives to exist in south-west Nyasaland and in the Luangwa Valley and on parts of the Tanganyika plateau. This may be the ordinary *C. taurinus* (Blue Wildebeest) or the *johnstoni* variety. The sub-species is determined by specimens shot by Mr. H. C. McDonald of the B.C.A.A., and by Messrs. James Harrison and Kirby.

Hippotragus equinus; the Roan Antelope. (P.Z.S. 1893, p. 728.)

This animal is not usually found concurrently with its near ally, the sable antelope. It is consequently rare in or absent from Nyasaland proper (except in the N. Nyasa and the Ruo districts), but is common to the west in the Luangwa Valley, Mweru, and Tanganyika districts.

Hippotragus niger; the Sable Antelope.

Common in Nyasaland, and said to be present in German and Portuguese East Africa.

Order, EDENTATA.

Sub-order, *Manes.*

Manis temminckii; the Scaly Ant-eater.

APPENDIX II.

GAME REGULATIONS OF BRITISH CENTRAL AFRICA

1. THESE Regulations shall apply to the killing, hunting, and capturing of all wild beasts within the Protectorate.

2. For the purposes of these Regulations—

"Game reserve" means all the territories within the boundaries of the Elephant Marsh Reserve and the Lake Chilwa Reserve respectively, as the same are described in the first schedule; and

"Kill, hunt, or capture" includes killing, hunting, or capturing by any methods, also all attempts to kill, hunt, or capture, and "hunt" includes molesting in any manner.

3. The Commissioner may from time to time, with the approval of the Secretary of State, proclaim any other territory as a game reserve, or may, by Proclamation, extend or restrict the limits of any game reserve; and thereupon these Regulations shall apply to the territories affected by any such Proclamation as if they had been constituted game reserves by these Regulations.

4. The Commissioner may in his discretion grant licences in such form as he thinks fit in accordance with the following scale as regards the animals authorized to be killed, hunted, or captured, the local limits to which the licence extends, and the payments to be made for the respective licences, that is to say:—

Licence.	Wild Beast.	Local Limits.	Payment.
			£
Licence (A) . . .	Any wild beast mentioned in Schedule II. . . .	Any part of the Protectorate .	25
Licence (B) . . .	Any wild beast mentioned in Schedule II., Part II. .	Ditto	3
Licence (C) . . .	Ditto	Except within a game reserve.	1

Licence (A) includes the right to kill, hunt, or capture any wild beast whether mentioned in Schedule II. or not.

Licences (B) and (C) include the right to kill, hunt, or capture any wild beast except those mentioned in Schedule II., Part I.

None of these licences entitles the holder to kill, hunt, or capture any wild beast upon, or to trespass upon, private property without the consent of the owner or occupier.

5. A person may without any licence kill, hunt, or capture any wild beast not mentioned in Schedule II. in any part of the Protectorate, except within a game reserve or on private property.

6. The Commissioner may in his discretion grant any licence for which a higher rate is payable in substitution for a licence for which a lower rate is payable, on payment of the difference, or he may on such payment make the existing licence available, by indorsement, as if it had been originally granted at the higher rate.

7. Every licence shall be in force for one year from its date, and shall then expire, and every substituted or indorsed licence shall be in force for the residue of the year for which the original licence was granted.

8. Any person who kills, hunts, or captures any wild beast in contravention of these Regulations shall, on conviction, be liable to the following penalties, that is to say:—

(*a.*) If without the proper licence he kills, hunts, or captures any wild beast mentioned in Schedule II., Part I., he shall be liable to a fine not exceeding 50*l.*, and, in default, to imprisonment for three months.

(*b.*) If without the proper licence he kills, hunts, or captures any wild beast mentioned in Schedule II., Part II., he shall be liable to a fine not exceeding 20*l.*, or, in default, to imprisonment for two months.

(*c.*) If without holding any licence under these Regulations he kills, hunts, or captures any animal whatever within a game reserve, or is found within a game reserve under such circumstances as to show that he was in pursuit of animals, and was not lawfully employed there, he shall be liable to a fine not exceeding 5*l.*, or, in default, to imprisonment for one month, without prejudice to his liability to any other penalty under this Regulation.

9. Nothing in these Regulations shall be deemed to relieve any person from the obligation of taking out any licence which for the time being is required to be taken out for possessing or using a gun.

10. The Regulations of the 9th September, 1896, for the preservation of wild game in certain parts of the Protectorate are hereby repealed.

11. These Regulations may be cited as "The Game Regulations, 1897."

SCHEDULE I.

Game Reserves.

1. *The Elephant Marsh Reserve.*

Commencing at the junction of the Ruo and Shire Rivers, the boundary of the Elephant Marsh Reserve shall follow the right bank of the River Ruo as far as the Zoa Falls, and shall thence be carried along in a straight line in a north-westerly direction until it strikes the left bank of the River Shire opposite the junction of the Mwanza with the Shire; the boundary shall then cross the River Shire and follow the right bank of the Mwanza River up stream to a point distant from the Shire 12 miles in a straight line; thence the boundary shall run in a southerly direction, keeping always at a distance of 12 miles from the right bank of the Shire River until it reaches the boundary-line dividing the Lower Shire district from the Ruo. It shall then follow that boundary-line in an easterly direction until it strikes the right bank of the Shire River; the boundary shall then follow the right bank of the Shire River up stream to a point opposite the point of commencement, namely, the junction of the Shire and the Ruo Rivers.

2. *The Lake Chilwa Reserve.*

Commencing at the source of the River Palombe in the Mlanje district, the boundary of the Lake Chilwa Reserve shall be carried in an easterly direction to the source of the most southern affluent of the River Sombani, and from this point shall be carried along a straight line in an easterly direction to the Anglo-Portuguese frontier, which it shall follow to the shores of Lake Chilwa. The boundary shall continue along the shore of the lake southward, westward, and northward, as far as the confluence of the Likangala River. It shall then follow the course of the Likangala River up stream as far as the eastern boundary of Messrs. Buchanan Brothers' Mlungusi estate, thence along the said eastern boundary of the said estate southwards to a point on the left bank of the Ntondwe River. It shall then follow the northern boundary of Mr. Bruce's Namasi estate eastwards until the said boundary reaches the Palombe River, thence along the right bank of the Palombe River up stream to its source.

SCHEDULE II.

Part I.

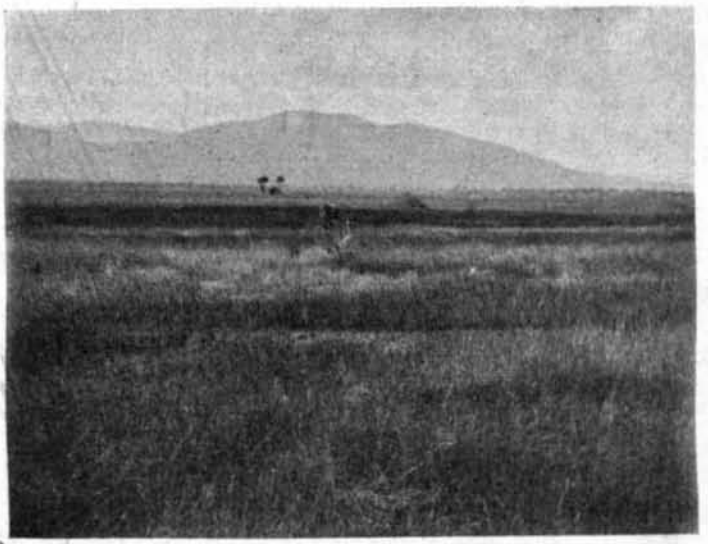
Wild beasts in respect of which licence (A) is required:—

Elephant.	Giraffe.
Rhinoceros.	Gnu (Wildebeest).

PART II.

Wild beasts in respect of which licence (B) or licence (C) is required :—

Zebra.
Wart hog (*Phacochœrus*).
Bush pig (*Potamochœrus*).
Buffalo.
Eland.
Kudu.
Situtunga (*Tragelaphus spekei*).
Inyala (*T. angasii*).
Bushbuck (*T. scriptus.*)
Duyker (*Cephalophus*).
Oribi (*Ourebia*).
Sharpe's antelope (*Raphicerus sharpei*).
Klipspringer.
Reedbuck.
Puku (*Cobus vardoni*).
Senga Puku (*C. senganus*).
Lechwe (*C. lechwe*).
Crawshay's Cobus (*C. crawshayi*).
Waterbuck (*C. ellipsiprymnus*).
Impala (*Æpyceros melampus*).
Hartebeest (*Bubalis*).
Tsessébe (*Damaliscus*).
Sable antelope.
Roan antelope.



THE ELEPHANT MARSH

As to the Avi-fauna: it is a country singularly rich in bird life. Amongst the birds, however, occur the same curious gaps in the distribution of species and genera which are found to the south of the Zambezi and in East Africa but are wanting in this south-central part of the continent. The ostrich, and the secretary-vulture, three genera of true vultures, nearly all the genera and species of African larks and of bustards are represented in Africa south of the Zambezi, skip British Central Africa, and reappear again north of the Rufiji River extending thence northwards and westwards through East Africa, across the Sudan to Senegambia. There is a great paucity of species or genera amongst the guinea fowl; practically the only guinea fowl ordinarily found in British Central Africa is the common species, the origin of the domestic bird, though *Guttera edouardi*, the crested guinea fowl is met with near the Zambezi and on the Moçambique Coast. The sand grouse is only

found in one part of British Central Africa, in the Mweru district.[1] There may be other examples to be quoted; but no doubt the break in distribution is less marked amongst the birds (which have easier means of distribution and are less subject to the attacks of man) than among the mammals. It will also be found that this breach in continuous distribution is less and less apparent amongst reptiles and Batrachians, fishes and invertebrates. It is practically confined to birds and mammals.

And now to notice some of the more remarkable birds which meet the traveller's eye or deserve his attention in British Central Africa. Amongst the Passerines there are two crows—possibly three—the great white-necked raven (*Corvultur albicollis*) the common black and white crow (*Corvus scapulatus*) and, I think, the black rook or crow, of South Africa (*Corvus capensis*). Of this last named no specimen has been sent home, but I have seen it—or a bird singularly like it, entirely black in plumage—on the upper part of Mount Mlanje and on the higher plateaux of Zomba mountain. Of the two first named crows the white-necked raven is extremely common in all the hill country, while the black and white crow (though also visiting the hills) replaces the larger bird in the plains. The white-necked raven has an enormous beak from which feature the bird is named *Corvultur*. It is even larger than the common raven and very handsome, its body being shiny, almost bluish black and deep dull sepia black, with a large white patch on the back of the neck, extending downwards till it nearly forms a white collar.[2] The common black and white crow is found throughout Africa from the verge of the Sahara to Natal; but I have sometimes thought that it was less prevalent in the interior, especially in the forest regions than on or near the sea coast, where it is always the bird most commonly met with. It is very useful as a scavenger and is not such a robber as the white-necked raven, which, in spite of its beauty, one is obliged to destroy, as it carries off all small ducks and chickens within its reach. There is no form of magpie or jay ever met with in Tropical Africa. Amongst the starlings we have the red-billed oxpecker.[3] It is the mission of the red-billed oxpecker to cling by its sharp claws to the bodies of buffaloes and other large herbivora and remove from their skins the blood-sucking ticks. The beautiful glossy starlings are represented by the genera *Lamprotornis* and *Lamprocolius*. One stammers in admiration before these lovely birds whose plumage is iridescent purple, emerald-green, bronze-red, and vivid ultramarine-blue. Their eyes are golden-yellow. Their plumage is literally *glossy*, and although they seldom live long in captivity, they become delightfully tame. It is only the mature birds that assume these gorgeous colours; the young begin by being brown with dull mottlings—they look very like the young of the common starling—but by degrees the gem-like feathers appear amongst the brown and gradually the whole plumage is covered with this iridescent gloss. Another very beautiful member of the starling group is the *Amydrus morio*.

Amongst the Orioles we have three, two of which are widespread species and yellow, grey, and black in colour, but one has proved to be entirely new to science and was discovered by Mr. Whyte on Mount Chiradzulu in the Shire Highlands and sent home by me in 1895 (*Oriolus chlorocephalus*). It has

[1] Represented by one species only.

[2] This bird is illustrated in my Kilimanjaro book.

[3] Another curious instance of interrupted distribution is that of the common African oxpecker (*Buphaga Africana*), which is found in north-east and north-west Africa, and in the Transvaal, but not in the intervening districts of South-Central Africa.

a grass-green head and throat, a golden yellow collar round the neck and the same bright tint over the breast, stomach, and edges of the tail feathers; it is olive green on the back and middle of the tail; the wings are blue-grey and the same tint is on the outer tail feathers mixed with the yellow; the eye is crimson and the beak reddish-brown.

Weaver birds are well represented. There is an elegant Widow bird (*Vidua paradisea*) the male of which in the breeding season develops enormous black plumes as an addition to his tail feathers—plumes more than three times as long as his body. The rest of the plumage is black, cream-yellow and chestnut red. It is charming to see this bird flying with an undulatory motion through the air. So far from being impeded by its tail feathers in a high wind it is as it were buoyed up by the widespread plumes to which so disproportionately small a body is attached. The Widow bird with its long black feathers may bear some resemblance (especially the upper plumes which are crimped like crape) to a widow's weeds, but is far from widow-like in disposition. The male is one of the most uxorious of birds, each cock having a harem of ten to fifteen hens devoted to him and on whom he lavishes great attention. He has an innate conviction of his own beauty and is perpetually strutting about to show off his plumes. Then there is the exquisite Bishop bird—flame-coloured and black, the flame-coloured portion of the body being like plush in appearance. This lovely creature is present in enormous numbers in the grasslands, and to see these little soft balls of flame-coloured plush hanging to the grass stems and fluttering about almost within reach of one's hands is one of the few alleviations of the unspeakable misery of travelling through long grass in Africa, the barbed seeds of which work their way through one's clothing until they penetrate the skin.

Closely allied to the Weavers are the tiny Waxbills or Weaverfinches, some of which for their minute size are only surpassed by humming birds. One of these which is spread almost all over Tropical Africa is especially noticeable. It is called by the French "Cordon bleu" and is an exquisite mixture of smalt-blue and grey. Others of these little Waxbills are rosy red, and when they come with confident tameness to a clear patch of ground to feed on the grass seeds they are so small and so exquisitely coloured that they seem like the pets of a Lilliputian race. Of course there is a sparrow in Africa (*Passer diffusus*) —common also to South Africa. The African buntings (*Emberiza* and *Fringillaria*) are pretty little birds of black, grey and yellow which have a pleasing song. The Makua are very fond of catching and taming this bird and keeping it in neatly made cages round their houses. When these men were stationed at Zomba as soldiers they would speedily catch the buntings in small traps, put them in tiny cages made of reeds, hang them up outside the hut or barrack and in a week the bird would be perfectly tame and singing away shrilly. Another favourite singing bird of the Makua, and one commonly met with, is a close ally of the wild canary, the "Serin finch" (*Serinus*, the same genus as the canary). These birds very much resemble the wild canary in appearance. There are no less than three species in Nyasaland. Wagtails of two or more species visit British Central Africa during the dry season, presumably migrating thither from the winter of South Africa. They are liked and protected by everyone—white and black—and flit about the native villages, European settlements and Arab towns with charming familiarity and freedom from fear. Their song is very pleasant.

There are two Pipits of the genus *Anthus*, three species of Thrush (which