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REPORTS UPON TWO COLLECTIONS OF MOSSES
FROM BRITISH EAST AFRICA

(WITH TWO PLATES)

BY

H. N. DIXON, M. A., F. L. S.



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REPORTS UPON TWO COLLECTIONS OF MOSSES FROM
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(WITH TWO PLATES)

I. THE MOSSES OF THE DÜMMER-MACLENNAN EXPEDITION
TO MOUNT ELGON, 1918

Several sets of the mosses collected on this recent expedition to Mount Elgon have been issued. I have received part of one through Mr. T. R. Sim, of Maritzburg; and I have also had through my hands the sets belonging to the U. S. National Museum and to the Kew Herbarium. The material in many cases is poor, but in others it is good; and though the whole collection is not large, consisting of about 50 numbers (many of which, however, contained several species), it contains some interesting novelties, notably a species of *Holomitrium* quite distinct from any of the African species, a fine new *Bryum* of the Rosulata group, and an interesting new *Braunia*. The types of these and of the other novelties are in the U. S. National Museum; duplicate types are in my own herbarium.

An unusual feature of this collection is the number of species generally rupestral, which were here epiphytic. This is notably the case with *Grimmia ovata* Web. & Mohr, *Amphidium cyathicarpum* (Mont.), *Anomobryum robustum* (the species of this genus are normally rupestral or terrestrial), *Bryum alpinum* Huds., *Hedwigia albicans* (Web.), and *Ectropothecium lateriticolum* Broth. The suggestion may be hazarded that these mosses formed the ancient flora of the crater, at the time when it was mostly unclothed with vegetation, and that as the phanerogamic vegetation increased and covered the rock surface the mosses were driven to the only substratum left for them, viz, the stems of the tree heaths, and other wood, living or dead.

In the following list the abbreviation c. fr.=fruiting, and st.=sterile.

DICRANACEAE

CERATODON PURPUREUS (L.) Brid.

Nos. 2391f, 3393b, 3414c. Mostly fruiting. The capsules are frequently subsymmetrical, very little strumose, and only lightly plicate, as I have found also in specimens collected by Scott-Elliot in Central Africa; but these characters are far from constant and may indeed be pathological.

HOLOMITRIUM MACLENNANI Dixon, sp. nov.

(Pl. I, fig. 2.)

Sat robustum; habitu *H. crispuli* Mart. brasiliensis; laxiuscule caespitosum, pallide olivaceo-viride. Caulis rigidiusculus, *densifolius*, circa 3 cm. altus, parce divisus; folia e basi erecta ovata subvaginante *squarrosa*, siccitate crispula, undulata, suberecta, superne in acumen *latiusculum actum* sensim angustata, marginibus inferne revolutis, supra dense *arguteque et grosse inaequaliterque dentata*; costa sat valida, infra apicem desinens; cellulae superiores ovaes, dorso *papillis numerosis dense scaberulae*; basin versus sensim elongatae, infimae aurantiacae, laeves, juxtacostales lineares, marginem versus latiores, breviter rectangulares, pellucidae, ad alas decurrentes *perpaucae paullo dilatatae indistinctae*.

Seta 1-1.5 cm. alta, foliis perichaetialibus peraltis, circa tertiam partem setae saepe attingentibus, convolutis. Theca subcylindrica, circa 3.5 mm. longa. Peristomium e dentibus *irregularibus inaequalibus, in crura plura inaequalia, longa, pallida, brevissime interne nodosa fissis* instructum. Annulus multiplex.

Hab.: Heath Zone. 12,000 ft., epiphytic, rare; No. 3445.

A fine species, differing in the coarsely toothed, broadly pointed, squarrose leaves from all the African species except *H. acutum* Wright, to which it is allied; that species, however, has the leaves more narrowly pointed, less sharply serrate, and with the base less widely vaginant, and the perichaetia are much shorter. The peristome teeth here are more or less equidistant, but very variable, sometimes showing a tendency to approximation in pairs; they are very irregular, but the capsules are overripe and it is difficult to know how much of the irregularity is due to wear. Each tooth is made up of two, three, or more vertical, filiform, red laminae, more or less coherent, without transverse bars below, and without striolations; above they are pale, and closely articulate with shortly protuberant internal nodules.

DICRANOWEISIA AFRICANA Dixon, sp. nov.

(Pl. I, fig. 1.)

Corticola; densissime caespitulosa, circa 1 cm. alta, flavo-viridis. Folia conferta, madida erecta, sicca crispata, e basi *anguste oblonga* sensim acuminata, carinata, acuta; marginibus *inferne vel medio leniter revolutis*, supra planis, integris; costa latiuscula, variabilis, *tenuis, indistincte definita*. Cellulae superiores majusculae, 6-8 μ latae, breviter rectangulares vel isodiametricae, angulis rotundatis, laeves; basilares omnes laxiores, lineares vel rectangulares, angulos versus saepius dilatatae, numerosae, *partem basilarem maximam occupantes*.

Autoica. Bractee masculae internae perconcaevae convolutae, obtusae. Perichaetium parvum, e foliis externis paullo brevioribus, latius acuminatis, minus acutis, internis *brevibus, late vaginantibus, obtusis* instructum. Seta *brevis*, 5-6 mm. longa, theca (vetusta) *parva, anguste elliptica, microstoma*. Operculum et peristomium non visa.

Hab.: On tree heaths, in crater, 13,000 ft.; No. 3396.

The only two species of the genus hitherto found in Africa are the widely distributed *D. cirrata* and *D. crispula*. The latter differs in the plane margins of the leaves. The present species is very near *D. cirrata*, but appears to be distinct in the denser tufts, smaller size of all its parts, shorter capsule, and distinctly weaker nerve.

CAMPYLOPUS ACROCAULON (C. M.) Par.

Heath Zone and moorland, 12,000-14,000 ft.; Nos. 3412d, 2391e, 3398b, 3407d, 3762. I determine these from the description alone, having seen no specimens of the original plant from Kilimanjaro. Sterile only. The color of the plant, length of stem, and evolution of auricles vary considerably.

CAMPYLOPUS CAGNII Negri

Moorland in crater, 13,500 ft.; No. 3425, c. fr. I determine this with some hesitation from Negri's description of the sterile plant from Ruwenzori. It appears to agree with that in every respect but one: the leaves are given as 7.2 mm. in length, while here they are only 4 to 5 mm. long. The crowded, rigid, almost entire leaves, only the comal (fructiferous) ones finely setaceous, are rather characteristic; the nerve is smooth at back. Capsules aggregate; calyptra smooth at base.

POTTIACEAE

? *TRICHOSTOMUM* sp.

No. 3444c. A rather distinct, sterile plant, with somewhat sheathing, flexuose, suberect, fragile leaves, and trichostomoid areolation, may belong here, but its generic position is somewhat doubtful. The description of *T. usambaricum* (Broth.) Broth. reads much like it, but I have not seen specimens.

LEPTODONTIOPSIS FRAGILIFOLIA Broth.

Heath Zone, epiphytic, 12,000 ft.; Nos. 3447g, 3772c; also No. 3756 in the Kew set. St. A very distinct plant.

TORTULA CAVALLII Negri

Nos. 3406, 3410, 3424, 3430b; mostly c. fr.

TORTULA EU-BRYUM (C. M.) Dixon

Tree heaths in crater, 13,500 ft.; No. 3426. With numerous setae and a few old capsules, apparently small for the size of the plant. It has not been found before in fruit. (Some of Dümmer's specimens issued under this number do not belong here but to *T. Cavallii*.)

GRIMMIACEAE

GRIMMIA OVATA Web. & Mohr.

Nos. 3403, 3403b, 3409d, 3412c, 3418; mostly c. fr. Most or all of these gatherings were epiphytic, on bark of trees, a very curious condition.

ORTHOTRICHACEAE

ANOECTANGIUM sp.

Heath Zone, epiphytic, 12,000 ft.; No. 3759d. A small, delicate species, with numerous setae and a few capsules in very old, poor condition. It has the appearance of *A. Wilmsianum* (C. M.), but shows larger, more pellucid cells, more tapering, short-acuminate leaves, etc.

AMPHIDIUM CYATHICARPUM (Mont.) Broth.

On tree heaths; No. 3422b, c. fr.; No. 3444c (p. p.). st.

ZYGODON EROSUS Mitt.

No. 3412b, st. I have seen no specimens of Mitten's plant, but from the description there can be hardly a doubt that this belongs there.

ORTHOTRICHUM UNDULATIFOLIUM C. M.

Tree heaths, western crater lip, 13,000 ft.; No. 3407c, c. fr. jun. From the description there can be no doubt, I think, that this is C. Müller's plant.

ORTHOTRICHUM LEIKIPIAE C. M.

Tree heaths in crater, 13,000 ft.; No. 3417b (p. p.), c. fr. A fertile stem mixed with *Braunia*. The endostome segments are as described by C. Müller, unusually broad, almost, in fact, connivent at base. The plant is no doubt nearly allied to *O. speciosum*.

MACROMITRIUM HYALINUM Broth.

No. 3766, c. fr.

MACROMITRIUM ABYSSINICUM C. M.

Tree heaths, 12,000-13,000 ft.; No. 3413, c. fr.; No. 3756b, forma *laxiramea*, c. fr.

After careful comparison of *M. hyalinum* Broth. with *M. abyssinicum* I feel very doubtful whether the two can be kept separate. Brotherus rests his species on the smaller size and the very acute leaves, often with hyaline tip. Comparison of Holst's Usambara plant, however, with *M. abyssinicum* (No. 431, Schimp. Iter Abyssin., in Schimper's herbarium) shows no difference, or at any rate no constant difference, in leaf. The Central African plant appears as a rule to run rather smaller than the Abyssinian specimens, but this is by no means constantly the case and Dümmer's No. 3413 is as robust as any of these. No. 3766 is smaller and agrees in dimensions with Holst's plant, and I have retained it provisionally under *M. hyalinum*.

No. 3756b is a very peculiar plant. The stems are elongate, robust, distantly and fairly regularly pinnate, apparently pendulous, with none of the habit of a *Macromitrium*, but closely resembling some forms of *Papillaria*. The leaves are very acutely long-acuminate, often with the apex half-twisted, and when dry somewhat recurved. I do not think, however, that the leaf form must be considered as of any importance in comparing it with *M. abyssinicum* (type), as the leaves with which one is familiar there are the branch leaves, while owing to the peculiar growth of this plant the bulk of the leaves probably, and of course those of the primary stem, are of the nature of stem leaves. A seta and capsule in my specimen are identical with those of *M. abyssinicum*, while the specimen of No. 3413 in the Wash-

ington set indicates a distinct transition between this form and ordinary *M. abyssinicum*. It is, therefore, probably only a remarkable form of that.

FUNARIACEAE

FUNARIA VOLKENSII Broth.

Moorland, 13,500-14,000 ft.; Nos. 2391b, 3414b, both c. fr.

BRYACEAE

BRACHYMENIUM FLEXIFOLIUM B. & S.

Tree trunks in crater, 13,000 ft.; No. 3423, c. fr. This agrees with the Abyssinian specimens of Schimper's at Kew, especially with No. 452. No. 29 has the outer teeth more strongly bordered, the endostomial membrane paler and more pellucid, and the leaves with rather smaller cells, and wider border. No. 452, however, agrees quite well with Dümmer's plant in the peristome and cells, though the border is somewhat wider, showing that these characters are variable and not correlated, while here and there a leaf on Dümmer's No. 3423 has the border exactly as in the Abyssinian plant. Moreover, another specimen of Schimper's (No. 552) has the leaves exactly as here.

The outer teeth are densely barred, trabeculate within; the inner membrane is rather low, the processes linear, distant.

BRACHYMENIUM STENOTHECUM Dixon, sp. nov.

(Pl. I, fig. 3.)

§ ORTHOCARPUS. Robustum, infra densissime tomentosum. Folia confertissime interrupteque comosa, sicca erecta, haud torquescentia, paullo flexuosa, inferne rubella, anguste oblonga, infra haud angustata, supra parum dilatata non spathulata, breviter et acute acuminata, marginibus inferioribus anguste recurvatis, superne dentibus argutis tenuibus sat distincte dentatis, limbo lato flavido c cellulis 6-8-seriatis angustissimis incrassatis circumdata: cellulae superiores breviter hexagonae, 40-50 μ longae; circa 3-4 \times 1. Costa infra valida, supra sensim angustata, in cuspidem perangustam flexuosam breviusculam integram excurrans.

Synoicum. Seta 3-4 cm. alta, flexuosa; theca elongata, sat angusta, cum collo ad 6-7 mm. longa, inclinans vel subpendula, e collo praelongo in setam sensim attenuato anguste elliptica vel fusiformis, microstoma, castanea, operculo brevi, conico, obtuso; exothecium e cellulis

parvis, valde irregularibus, inaequalibus, parietibus flexuosis instructum. Peristomii dentes fusco-aurantiaci, apicibus peracutis pallidis; opaci, plus minusve pallide marginati, dense lamellati, intus alte trabeculati; endostomii membrana sat alta, aurantiaca, processibus *brevibus, imperfectis, irregularibus*. Spori 25-30 μ .

Hab.: Moorland in crater, 13,000 ft.; Nos. 3399, 3421, 3768.

The densely imbricate leaves, erect and little altered when dry, little broader above and not narrowed to base, with broad border and the long, narrow, subpendulous capsule, with very distinct collum, distinguish this from the allied synoicous species, most of which have the leaves twisted, or at least highly flexuose, when dry. *B. abyssinicum* C. M. has the leaves much narrowed to base and entire above, the capsule smaller, etc.

I have figured the peristome, showing a process in the most perfect condition, but they are mostly fragmentary and more or less adherent to the outer teeth.

ANOMOBRYUM ROBUSTUM Dixon, sp. nov.

(Pl. I, fig. 4.)

E robustioribus generis. Stirps circa 2-2.5 cm. alta, pallide viridis, subnitida. Caules julacei, foliis *dense confertis ad 1.25 mm. longis, suborbicularibus, cochleariformibus, obtusis vel obtusissime apiculatis, marginibus superioribus indistincte sinuolatis*; costa apud basin 60-70 μ lata, rubella, medium folium versus multo tenuior, sed parum angustata, *circa tertiam quartam folii* attingens. Areolatio superior e cellulis *angustissimis, vermicularibus*, parietibus firmis nec incrassatis instructa, inferior per tertiam partem folii laxissima.

Seta circa 1.5 cm. alta; theca e collo longo, infra in setam sensim angustato atque illic curvato, oblongo-elliptica, leniter curvata, infra orificium paullo contracta, badia, operculo *purpureo, obtuso, nitido*. Peristomium externum e dentibus aurantiacis, dense trabeculatis, externe striolatis instructum, internum membrana praealta, hyalina, laevi, circa $\frac{2}{3}$ - $\frac{3}{4}$ dentium altitudinem aequante; processibus *brevibus, inferne latis, superne raptim angustatis, filiformibus, subintegris, vel angustissime rimatis*; ciliis plerumque binis, *subaequilongis, articulatis nec nodosis, superne tenerrime papillosis*. Spori parvi.

Hab.: Bamboo Zone, 9,000 ft., epiphytic; No. 3764.

The comparatively large densely crowded leaves give the stems a robust appearance, and in this as well as in structural details it is a markedly distinct species. *A. promontorii* (C. M.) Dixon has much narrower, smaller leaves, a longer nerve, acute lid, etc.

BRYUM ARGENTEUM L.

Nos. 3752, 3752b, c. fr. These plants afford rather more interest than it usually falls to the lot of this ubiquitous species to present. They show in the same gathering a form with the leaves widely rounded at summit and obtuse, without any trace of apiculus or hair-point, and others with long hyaline hair-points, practically identical with var. *lanatum* B. & S.; and all transitions between these extreme forms occur, even (with the exception of the form with the longest hair-points) within the limits of a single tuft.

It was gathered at an elevation of 12,000 ft., on the roofs of the mud huts of the Ratmen. The Ratmen or Molemen—as their name “Mese” signifies—are a small tribe of very primitive savages inhabiting the extinct crater of this mountain.

BRYUM ALPINUM Huds.

Nos. 2391d, 3422, 3444b; No. 3422b (sparingly fruiting). These plants were—a very unusual thing for this species—epiphytic, on tree heaths. They differ somewhat from our northern *B. alpinum* in being robust, with the nerve very stout, excurrent in a short, acute or obtuse point, the leaves usually acute, subdenticulate at apex; these characters however are not constant and are not correlated, while some of the tufts are quite ordinary *B. alpinum*. The fruit also agrees exactly. I have no hesitation, therefore, in placing them under *B. alpinum*, which occurs also in South Africa, where, as in the Northern Hemisphere, it shows considerable variation.

BRYUM BREVINERVE Dixon, sp. nov.

(Pl. 2, fig. 8.)

§ ROSULATA. *E. robustioribus generis*, habitu *B. spinidentis* Ren. & Card., vel *B. perspinidentis* Broth. Caulis validus, usque ad 10-12 cm altus, inferne tomentosus, sat dense *regulariter foliosus*, vix, nisi *sub floribus*, *comosus*; flexuosus vel hic illic geniculatus; folia *erectopatentia*, sicca flexuosa, contracta; 6-7 mm. longa, e basi angusta *decurrente*, late obovata, obtusa, apiculo *perbrevis plerumque reflexo*; marginibus inferne anguste reflexis, superne sat conferte interrupteque et breviter acuteque dentata; costa ad basin valida, rubra, raptim angustata, *supra perangusta*, *infra apicem sat longe desinens*, rarissime percurrens. Areolatio densa, e cellulis superioribus anguste hexagonis circa 60 μ longis instructa, infimis elongatis, angustis. hexagono-rectangularibus, nec valde laxis; marginalibus supra serie-

bus 3-4 perangustis, incrassatis, *limbum bene notatum, aliquando rufescentem*, inferne evanescentem, instruentibus. Fructus ignotus.

No. 3408b. Cliff base in thicket, western side of crater, alt. 13,500 ft.

A very fine species, quite distinct in leaf form and structure, and especially in the short nerve, from any of its allies.

BARTRAMIACEAE

BARTRAMIA RUVENZORENSIS Broth.

Tree heaths in crater, 13,000 ft.; No. 3422c. Bamboo heath zone, 10,000 ft., No. 3444, c. fr.

BARTRAMIA STRICTULA C. M.

Moorland, 14,000 ft.; No. 2391c, st. This seems to agree with C. Müller's description of the above species. It is probably not distinct from the South African *B. substricta* Schimp.

BREUTELIA STRICTICAULIS Dixon, Smiths. Misc. Coll. 69²: 21. 1918

Cliff base in thicket, 13,500 ft.; No. 3408, st.

BREUTELIA SUBGNAPHALEA (C. M.) Par.

Cliff base in thicket, 13,500 ft.; No. 3415, c. fr. This agrees perfectly in the vegetative characters; the seta is about 1 cm. long. C. Müller says only, "seta perbrevis," which would seem to apply; the seta in the Kew specimen of the original plant is perhaps slightly shorter.

The peristome, not described by C. Müller, is double, the outer teeth well developed, red-brown, the inner fragmentary, pale orange-brown.

POLYTRICHACEAE

POLYTRICHUM PILIFERUM Schreb.

Polytrichum nano-globulus C. M., Flora, 71: 408. 1888.

Nos. 2391, 3407e, 3414; all c. fr.

POLYTRICHUM HOEHNELII C. M.

Nos. 3409, 3776 (Kew set); both c. fr. This species, while closely allied to *P. commune*, seems really distinct in the marginal toothing of the leaves and in their position when dry, more or less spirally contorted with the points rigidly spreading—"horrida patentia."

POLYTRICHUM KENIAE Dixon, *Smiths. Misc. Coll.* 69²: 21. 1918

Moorland, 13,000 ft.; No. 3411, st. The present specimen agrees well with the plant from Mt. Kenia, except that the sheathing leaf base is not so elongated as in that; I have perhaps overrated the importance of that character in the description.

HEDWIGIACEAE

HEDWIGIA ALBICANS (Web.) Lindb.

Nos. 3407, 3409b, 3419; all c. fr. These were growing on tree heaths, an unusual station for what is commonly so rupestral a species.

BRAUNIA BRACHYTHECA Dixon, *subsp. nov.*

(Pl. I, fig. 5.)

Habitus, folia etc., omnino *B. diaphanae*, *capensis*, et *B. secundae*, *americanae*. Differt solum thecae forma, *latissime elliptica* vel *subglobosa*, submicrostoma, *omnino fere sine collo*, sicca vetusta *subplicata*, ore latiore, suburceolata.

Hab.: On tree trunks in crater, 13,000-13,500 ft.; Nos. 3398, 3413b, 3413c; all c. fr. Nos. 3407, 3407b, 3417b (p. p.), st.

The vegetative characters, perichaetial leaves, and seta are so exactly similar to *B. diaphana*, that I thought at first, in view of the paucity of the capsules on my specimens, that it was possibly a case of malformation of fruit. However, further material from the U. S. National Museum and from Kew entirely confirmed the normality of the structure, and Mr. Sim writes to me that the capsules on his three specimens—eight in all—are identical in the subglobose form, scarcely tapering at neck, all except one being more or less striate when old. In *B. diaphana* the capsule is narrowly elliptic, or fusiform, being narrowed to the mouth, and with a well-defined very gradually tapering neck (cf. pl. I, fig. 5b). Though often somewhat wrinkled when old, moreover, it has no sign of regular striae.

Mitten,¹ in describing the mosses collected in Central Africa by Bishop Hannington, refers a Kilimanjaro plant "perfectly fruited" to Hedwigia (§Braunia) *secunda* Hook., and raises the question, "Are the *B. sciuroides* of Europe, the *B. indica* so luxuriant in the Nilgiri Mts., and the Abyssinian *B. Schimperii*, really different, or are they not most probably slight variations of one wide-spread

¹ Journ. Linn. Soc. Bot. 22: 310. 1886.

species?" So far as my observation goes, *B. sciuroides* and *B. Schimperii* stand on a somewhat different footing from the others; but the Indian plant is most certainly identical with that which occurs in several parts of Africa, and which has generally been known as *B. diaphana*. It is especially frequent in South Africa, where it fruits commonly. The fruit is described by Thériot;¹ and Brotherus² says of it, "Kapsel unbekannt." I have several fruiting specimens from South Africa, however, and the fruit occurs on several specimens in the British Museum and Kew collections. Both vegetatively and in the fruit the Indian plant is exactly identical with the African, and as Mitten finds the Kilimanjaro plant identical with the Mexican there can be no doubt that they must all fall under the name *B. secunda*. As regards the Indian and African plants at least, I do not find even the "slight variations" which Mitten allows them. The leaves vary in the degree of plication. They may be quite without a hyaline point, or they may have a short hyaline tip, even occasionally a quite long, flexuose hair-point, and the perichaetial leaves vary much in length; but none of these characters shows any constancy, nor are they correlated in any way with geographical distribution.

In the course of studying the Indian plant, however, I stumbled upon a very unexpected thing: In the British Museum collection, in Herb. Wilson, there are two specimens of an undetermined moss, labelled "Indies, *Winterbotham*," which are identical with my *B. brachytheca*. I find no reference to it in any bryological works, and it appears to have remained, otherwise than in Wilson's herbarium, quite undetected. It can scarcely be supposed that two independent species, *B. secunda* and *B. brachytheca*, would exist side by side both in Africa and in India, especially with the very restricted range that appears to appertain to *B. brachytheca*; and I have therefore thought it best to consider the latter as a subspecies of *B. secunda*.³

¹ Bull. Soc. Bot. Genève II. 9: 135. 1917.

² Engl. & Prantl, Pflanzenfam. 1³: 718. 1905.

³ It may be as well to give here the more important part of the synonymy of *B. secunda*, so far as it bears on our African plant:

BRAUNIA SECUNDA (Hook.) B. S. G. Bryol. Eur. (29-30:) Braunia 3. 1846.

Hedwigia secunda Hook. Musc. Fxot. pl. 46. 1818-1820.

Neckera macropelma C. M. Syn. 2: 104. 1851.

Braunia macropelma Jaeg. Adumbr. 2: 87. 1869-1870.

Hedwigia indica Mitt. Journ. inn. Soc., Bot. 3: Suppl. 123. 1859.

Braunia indica Par. Ind. 149. 1894.

Neckera diaphana C. M. Syn. 2: 105. 1851.

Braunia diaphana Jaeg. Adumbr. 2: 87. 1874-1875.

LEUCODONTACEAE

ANTITRICHIA KILIMANDSCHARICA Broth.

Heath Zone; Nos. 3413d, 3756, 3758b, 3772. No. 3756 is in good fruit, which has not been described, but I do not find any difference from that of *A. curtipendula*. The others are sterile.

NECKERACEAE

NECKERA PLATYANTHA (C. M.) Par.

Heath Zone, principally; Nos. 3443, 3449, 3754, 3756f, 3759; mostly c. fr. The perichaetial bracts may be three times as long as the capsule, which, however, is not always concealed, as it may protrude laterally from the perichaetium (Cf. pl. I, fig. 6).

NECKERA SUBMACROCARPA Dixon, sp. nov.

(Pl. I, fig. 7.)

Habitu foliisque *N. platyanthae* (C. M.) et *N. macrocarpae* Broth.¹ simillima, huic quoque speciei cauli *paraphylliis numerosis* praedito similis et affinis, fructu tamen longe aliena. Perichaetium 8-10 mm. longum, bracteis externis thecam longe superantibus. Theca immersa, vel saepe e perichaetio lateraliter emergens, e seta pro more *praelonga*, 2-2.5 mm.; theca 2-3 mm., aurantiaca; operculum conicum breviter curvirostratum. Peristomii dentes longi, angusti, supra dense tenereque infra grossius papilloso, *non striolati*, intus trabeculati; endostomii membrana perbrevis, pallida, laevis; processus anguste lineares, *circa dimidiam partem dentium longitudinis aequantes*, pallidi laeves, carinati, haud rimosi, plus minusve nodosi. Spori 25-30 μ .

Hab.: Heath Zone, 12,000 ft., epiphytic; No. 3443b.

Dümmer writes on the label "Frequent"; but this is by confusion with *N. platyantha*, which in habit is identical or nearly so; the two were growing intermixed, and the Washington specimen under this number was entirely *N. platyantha*, which is evidently a frequent moss on Mount Elgon, in the Heath Zone.

At first sight the fruit of the two species does not show any great difference, but on examination it will be seen that in *N. platyantha* the capsule is almost sessile and is hidden at the base of the perichaetium, with the bracts two or three times its length; in *N. submacrocarpa* the capsule itself is about the same length, but both

¹Wissensch. Ergebn. Deutsch. Zentral Afrika Exped., 1907-1908, 2: 162. 1914.

vaginula and seta being extremely long, together about equalling the capsule length, it is much less immersed, often not even hidden.

The differences from *N. macrocarpa* Broth. may be tabulated thus:

	Seta	Theca	Teeth	Processes
<i>N. macrocarpa</i>	1 mm.	3-5 mm.	striolate at base	equalling teeth
<i>N. submacrocarpa</i>	2-2.5 mm.	2-3 mm.	papillose to base	half length of teeth

Brotherus gives for his species certain characters derived from form of leaf, and branching, which do not quite agree with the present plant. I am not inclined, however, to lay much stress on these differences, as the branching and form of leaf apex appear to vary considerably within the limits of the same species in this group; they certainly do in *N. platyantha*. In fact the whole group of African species, *N. Hoehnliana*, *N. Valentiniana*, and the above mentioned plants, are in my opinion quite inseparable from one another by vegetative characters alone. For this reason I feel some doubt as to the validity of *N. subplatyantha* Broth.,¹ which appears to be separated from *N. platyantha* on vegetative characters alone. I have not, however, seen the plant itself.

ENTODONTACEAE

LEVIERELLA FABRONIACEA ABYSSINICA (Broth.) Dixon

Heath Zone, epiphytic, 12,000 ft.; No. 3765, c. fr.

FABRONIACEAE

FABRONIA sp.

Tree heaths in crater, 13,000 ft.; No. 3420. The quantity is too small for determination; it appears near *F. Leikipiae* C. M., but has a very unusual range of denticulation, as among the leaves even of a single plant.

HOOKERIACEAE

DALTONIA MILDREADII Broth. in *Wissensch. Ergebn. Deutsch. Zentral Afrika Exped.*, 1907-1908, 2: 164. 1914

No. 3423b; c. fr.

HOOKERIOPSIS VERSICOLOR (Mitt.) Broth.

Without number. In quantity, and fruiting well.

¹Op. cit. 161.

THUIDIACEAE

THUIDIUM PALLIDISETUM Dixon, *Smiths. Misc. Coll.* 69^s: 8. 1918

Without number. The material agrees perfectly with Dümmer's original plant from Kipayo. The leaf cells are perhaps a little more distinct and pellucid.

HYPNACEAE

STEREODON CUPRESSIFORMIS (L.) Brid.

Nearly a dozen numbers contained this cosmopolitan species, in very varying forms. Three of them (Nos. 3445b, 3756g, 3756h) represent a slender form, with narrow leaves and slender tapering branches, which I have no doubt is the *Hypnum Hoehnelii* of C. Müller; but they cannot be separated from the species, though perhaps quite deserving of varietal rank, and I should call it *Stereodon cupressiformis* (L.) var. **Hoehnelii** (C. M.) Dixon, comb. nov.

ECTROPOTHECIUM LATERITICOLUM Broth.

Without number. In good though somewhat old fruit. I have not seen a specimen of the original plant, but the present specimen agrees perfectly with the description. The only point of doubt would be in the habitat, since the specific name of Brotherus implies a station on stonework or brickwork; but this is not of great importance, and it becomes still less so in view of the prevailing tendency towards an arboreal habitat shown by the mosses of this locality.

RHAPHIDOSTEGIUM ELGONENSE Dixon, sp. nov.

(Pl. 2, fig. 9.)

§ **APTUCHUS**. Stirps, quoad species africanæ spectantur, *R. brachytheciiformi* (C. M.) et *R. rivuletorum* (C. M.) proxima. Sat robustum, *flavo-aureum*, ramis *turgidis*, brevissime cuspidatis; folia dense imbricata, saepius vix secunda, rarius paullo assurgentia, apicibus falcatis, 1.25-1.5 mm. longa, ovato-oblonga, supra cito angustata, *breviter acute acuminata*, saepe semitorta, concava, marginibus *anguste explanatis, planis, vel angustissime recurvis*, integerrimis; areolatio perangusta, *pellucida, cellulis basilaribus aurantiacis*, alaribus trinis *magnis inflatis*, supra-alaribus nonnullis majusculis pellucidis.

Autoicum. Folia perichaetialia *foliis caulibus subsimilia*, paullo latiora, magis sensim acuminata, acumine latiore, *subintegro*, interna

erecta. Seta 1.25-1.5 cm. longa, laevis. Theca *suberecta*, *cylindrica*, *vir curvata*, operculo curvirostro, subaequilongo.

Hab.: Heath Zone, 12,000 ft., epiphytic; Nos. 3447, 3770.

It is rather difficult to diagnose the somewhat numerous species of this section; but if habit, length of seta, form of capsule, and leaf outline are taken into account, it will be found that there are no African species very near this plant. *R. brachytheciiforme* (C. M.) is more robust, with a foliation strikingly like that of *Brachythecium albicans*, and a different coloring. *R. rivuletorum* is smaller, of different habit, greener, with less crowded leaves, and horizontal or subpendulous capsule.

BRACHYTHECIACEAE

PLEUROPUS SERICEUS (Hornsch.) Broth.

Heath Zone, 12,000 ft., epiphytic; Nos. 3759b, 3759c; st.

BRACHYTHECIUM VELLEREUM (Mitt.) Par.

Heath Zone, 12,000 ft.: No. 3756c. On tree heaths in crater, 13,000 ft.; No. 3441. Both fruiting. I have compared this with Mitten's plant, and there is no doubt of its identity. It is a very striking species, but it is certainly autoicous. Mitten describes his plant as dioicous, and I have found fruiting stems on which I have been unable to detect male flowers, but there is no question that it is normally autoicous.

I suspect *B. gloriosum* (C. M.) Par., of which the sterile plant only was described, to be the same thing.

BRACHYTHECIUM UGANDAE Dixon, sp. nov.

Subgen. *SALEBROSIUM*. Robustum; *luteo-aureum*, *nitidum*, habitu *B. salebrosi*. Caules suberecti, irregulariter distanter ramosi, flexuosi, *subteretes*, acutiusculi. Folia e basi subcordata late ovato-lanceolata, in acumen anguste nec longe tenuiter acuminatum sat cito attenuata, integerrima, profunde plicata, marginibus planis vel *superne* anguste recurvis; costa basin versus sat valida, cito multo attenuata, circa dimidian partem folii attingens. Cellulae angustissimae, pellucidae, alares *multae*, *majusculae*, subquadratae, inanes vel obscuriusculae, *bene notatae*. Flores masculi majusculi, turgidi.

Autoicum. Perichaetia magna, foliis erectis, in acumen filiforme flexuoso-recurvum integrum attenuata. Seta 1.5-1.75 cm. longa, laevis; theca badia, *suberecta*, *leniter curvata*, *oblonga*, operculo brevi, obtuso.

Hab.: Tree heaths, 13,500 ft.; No. 3430. Bamboo Zone, 7,000 ft.; No. 3763. Heath Zone, 12,000 ft.; Nos. 3768b, 3775. All c. fr.

Very near to *B. salebrosum* (Hoffm.) and perhaps not specifically distinct; but as that species has not been recorded from tropical Africa, and as the present plant exhibits certain characters of distinction, notably the golden, glossy coloring, the terete branches, and a suberect, only slightly curved, narrower capsule, I have provisionally treated it as distinct.

BRACHYTHECIUM DÜMMERI Dixon, sp. nov.

(Pl. 2, fig. 10.)

Subgen. CIRRIPHYLLOPSIS. Habitu *B. stricto-patentis* C. M. capensis vel formarum gracillimarum *B. implicati* (Hornsch.). Gracile, laete viride, vix nitidum, dense pinnatum, ramis circa 1 cm. longis. Folia madida rigidiuscule erecto-patentia, e basi cordato vel hastato triangularia, sensim longe acuminata, ubique denticulata; ramea brevius latiusque acuminata, dense et argute denticulata, concaviuscula, vix striata, nec plicata; marginibus planis vel basin versus angustissime recurvis; costa basi sat valida, superne foliis caulinis multo, rameis paullo attenuata, circa secundam tertiam partem folii attingens. Cellulae superiores perangustae, inferne seriebus pluribus multo breviores, laxiores, pellucidae, alares sat numerosae, parvae, subquadratae.

Autoicum. Perichaetia majuscula, archegoniis numerosis, foliis erectis, latis, in acumen subfiliforme reflexum, denticulatum raptim angustatis. Seta 1-1.5 cm. longa papillosa. Theca horizontalis, fusca, brevis, vetustate sub ore contracta, operculo conico, obtuso.

Hab.: Heath Forest Zone, 12,000 ft.; epiphytic; Nos. 3, 3425b, 3447e, 3760, 3761; all c. fr.

Brachythecium stricto-patens C. M., which this resembles in having the leaves rigidly subpatent when dry, differs in its smooth seta and dioicous inflorescence; *B. implicatum* in its larger size and strongly striate-plicate leaves. *B. atrotheca* Duby is more robust, with wider, less rigid leaves and wider cells.

RHYNCHOSTEGIELLA ALGIRIANA (Brid.) Broth.

Epiphytic, on wood, Heath Zone, 12,000 ft.; No. 3447b; c. fr. Also No. 3773 in the Kew set. This plant is exactly our European and Northern African form, golden green. The epiphytic habit is unusual, but is not unknown with us (the var. *scabrellum*, indeed, is usually so). *R. Holstii* Broth., from Usambara, etc., is a green plant

of a slightly different habit; but I can find no structural differences, and I am strongly disposed to consider it only a slight form of the same thing.

II. A SMALL COLLECTION OF MOSSES FROM THE ABERDARE MOUNTAINS

The mosses in the following list were collected near Mount Kenia by Mr. A. Y. Allan in 1910, and were sent me for determination by Rev. D. Lillie. Although the collection is small it is of unusual interest, containing as it does the type of a new genus.

CAMPYLOPODIUM EUPHOROCLADUM (C. M.) Besch.

Nos. 395b, 398. This species has not previously been found in Africa. It is known otherwise from Java, Tahiti, New Caledonia, New Zealand. The second specimen above cited has very young fruit and old setae.

[*Campylopodium khasianum* (Mitt.), a very closely allied species, indeed doubtfully distinct, differs in its fruit only, so far as I have been able to observe; the vegetative characters described by Mitten do not appear to hold good. There is the possibility, therefore, that the African plant may belong there; but *C. euphorocladum* being a plant of much wider distribution (and not improbably including *C. khasianum*) I have thought it best to refer this plant to the former.]

DICRANUM JOHNSTONI Mitt.

Dicranum Stuhlmannii Broth. Bot. Jahrb. Engler 20: 177. 1894.

No. 400, c. fr. I have compared this with the original of *D. Johnstoni* (Kilimanjaro, *H. H. Johnston* 52), and it agrees perfectly. It is also identical with *D. Stuhlmannii* (*Stuhlmann* 3290b, and *Volken* 1166, det. *Brotherus*). Mitten's description of the leaves of his species as "linearia, sensim loriformi-angustata," and "unlike any form of *D. scoparium* from the narrower lower portions of the leaf," is very misleading, and is no doubt the cause of *Brotherus* having redescribed the plant. As a matter of fact, in *Johnston's* specimen the leaves, though occasionally (abnormally) narrow at the base, are usually dilated there quite as in *D. Stuhlmannii* and other species.

The fruit has not hitherto been described. Perichaetium about 6 mm. long, tubular, the bracts convolute with spreading points; seta about 2 cm. long; capsule erect, symmetrical, cylindrical, with very

gradually tapering neck and no struma, dark chestnut-brown, lightly plicate when dry and old; lid finely subulate, erect or suberect; deoperculate capsule about 4 mm. long.

CAMPYLOPUS JOANNIS-MEYERI (C. M.) Par.

No. 397; c. fr.

FISSIDENS LINEARI-LIMBATUS C. M.

No. 403; st. From the description this would seem to agree exactly with the original plant, collected in the same district.

KLEIOWEISIOPSIS Dixon, gen. nov.

Stirps habitu *Astomi* Hampe, sed cellulac superiores majusculae, et folia superne distincte denticulata. Paroica; antheridia 3-4, infra fructum, in folii perichaetialis axilla. Theca fere sessilis, in seta brevissime sita, immersa, minima, globosa, microstoma, operculo rostellato, annulo male evoluto persistente, calyptra parva, cucullata; peristomium nullum. Spori majusculi.

KLEIOWEISIOPSIS DENTICULATA Dixon, sp. nov.

(Pl. 2, fig. II.)

Caespitosa seu dense gregaria; minuta. Stirps (vetusta) sordide pallideque luteo-viridis; circa 5 mm. alta, plerumque ad caulis basin divisa. Folia erecto-patentia, sicca subcrispata, inferiora brevissima, supra sensim longiora, superiora (fructifera) 3-4 mm. longa, *e basi concava latiore linearia, latiuscule breviterque acuminata*, obtuse acutata, carinata, marginibus planis, superne *plus minusve grosse et sat distanter denticulata*. Costa infra circa 60 μ lata tenuis, superne angustata, sat pellucida, percurrens. Cellulae superiores 9-13 μ , isodiametricae et subquadratae vel breviter rectangulares, seriebus longitudinalibus regularibus dispositae, *pellucidae, perdistinctae, laeves*, basilares omnes *perlaxae, rectangulares, hyalinae*.

Theca *profunde immersa*; vaginula circa 200 μ , seta 60-100 μ , theca 400 μ longa. Operculum *subaequilongum, conico-rostellatum, curvatum, acutum*. Calyptra *parva, late cucullata*. Spori 18-22 μ , fusci, conferte non alte papilloso. Exothecium e cellulis tenerrimis instructum; infra orificium series 1-2 cellularum pellucidarum persistentium quasi annulum imperfectum sistentes.

No. 395. With *Campylopodium euphorocladum*.

A remarkable little plant, the position of which is somewhat doubtful. In areolation and denticulation the leaves are very similar

to those of some species of *Rhabdoweisia*, and on this account it might be placed in the Dicranaceae. On the whole, however, it seems to be best placed in the Pottiaceae, near *Astomum* and the subgenus *Kleioweisia* of *Hymenostomum*.

The plant is paroicous; but I suspect it may be heteroicous, as I have seen what seems to be a male flower below the fertile flower.

The capsule is, accurately speaking, neither cleistocarpous nor stegocarpous. The lid is perfectly differentiated, and there is a distinct row of subannular cells at the orifice; these may be in more than one series. On the other hand, the lid is probably not normally functional; the capsule wall is of extremely delicate texture and under pressure breaks up without the lid being detached, and this appears to be the case also under normal conditions.

It is unfortunate that the altitude is not recorded. The association of the plant with *Campylopodium* would seem to indicate a comparatively low level.

TORTULA ERUBESCENS (C. M.) Broth.

No. 399; st.

POLYTRICHUM COMMUNE L.

No. 394; st.

BRAUNIA SECUNDA (Hook.) B. S. G.

Nos. 401, 404; st. Presumably this species.

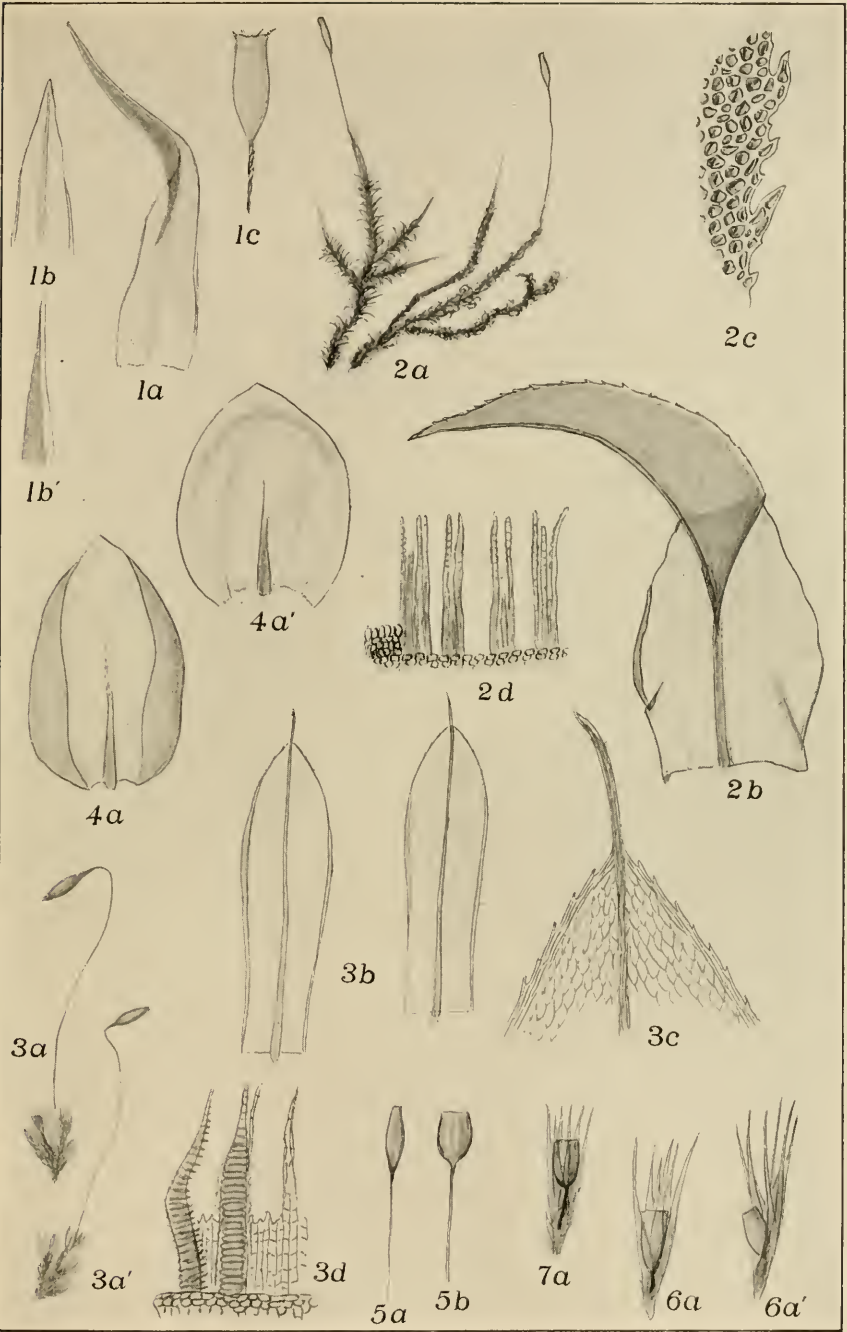
EXPLANATION OF PLATES

PLATE I

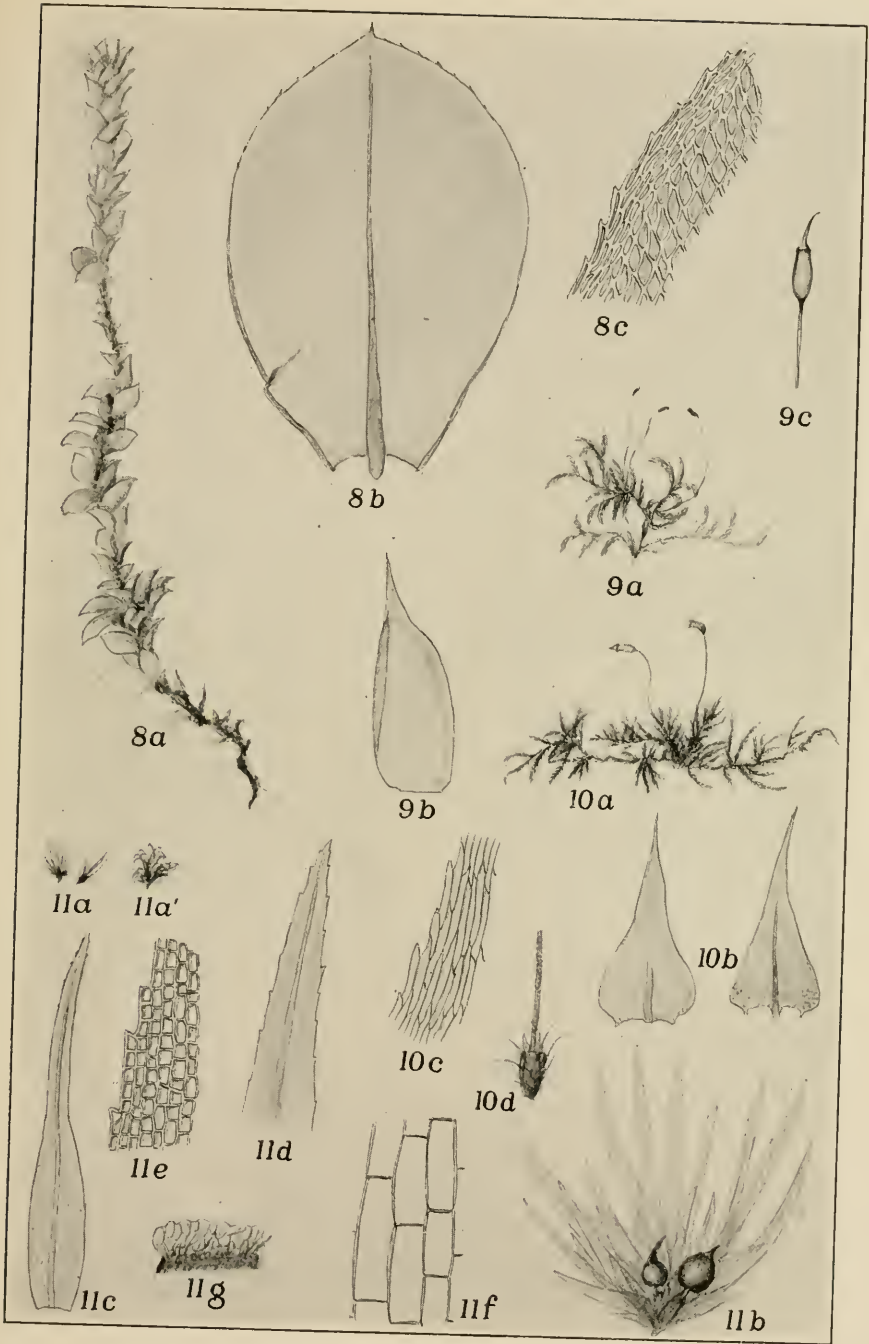
- FIG. 1. *Dicranoweisia africana*. *a*, Leaf, $\times 20$; *bb'*, apex, $\times 50$; *c*, capsule, $\times 6$.
- FIG. 2. *Holomitrium Maclennani*. *a*, Plant, $\times 1$, (left moist, right dry); *b*, leaf, $\times 20$; *c*, cells, $\times 200$; *d*, peristome teeth, $\times 50$.
- FIG. 3. *Brachymnium stenothecum*. *a*, Stem, dry, $\times 1$; *a'*, do., moist, $\times 1$; *b*, leaves, $\times 10$; *c*, apex, $\times 40$; *d*, part of peristome, $\times 50$.
- FIG. 4. *Anomobryum robustum*. *a*, *a'*, leaves, $\times 20$.
- FIG. 5. *Braunia*. *a*, *B. secunda*, *b*, *B. brachythea*; capsules, $\times 3$.
- FIG. 6. *Neckera platyantha*. *a*, *a'*, Capsule with perichaetium, $\times 2$.
- FIG. 7. *Neckera submacrocarpa*. *a*, Capsule with perichaetium, $\times 2$.

PLATE II

- FIG. 8. *Bryum brevincrve*. *a*, Stem, $\times 1$; *b*, leaf, $\times 10$; *c*, cells in upper part, $\times 50$.
- FIG. 9. *Rhaphidostegium elgonense*. *a*, Stem, $\times 1$; *b*, leaf, $\times 20$; *c*, capsule, $\times 5$.
- FIG. 10. *Brachythecium Dümmeri*. *a*, Stem, $\times 1$; *b*, stem leaves, $\times 20$; *c*, cells, $\times 200$; *d*, perichaetium, $\times 5$.
- FIG. 11. *Kleioveisiopsis denticulata*. *a*, Plant (moist), $\times 1$; *a'*, do. dry, $\times 1$; *b*, plant, $\times 8$; *c*, leaf, $\times 20$; *d*, leaf apex, $\times 40$; *e*, upper cells, $\times 200$; *f*, basal cells, $\times 200$; *g*, cells at orifice of capsule, $\times 200$.



BRITISH EAST AFRICAN MOSSES



BRITISH EAST AFRICAN MOSSES