

New Orchids from Yunnan and Northern Burma

BY

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THE orchids described in the following pages were collected chiefly in the temperate and sub-alpine areas of S.W. Yunnan and the Burmo-Chinese frontier. The greater part of the material was obtained by Mr George Forrest and the remainder by Captain Kingdon Ward and the late Mr Reginald Farrer. I have omitted reference to species previously recorded from Yunnan and Burma respectively, but in addition to the new species I have made note of orchids not previously found in these areas. The number of species added to the flora of the area—whether new species or new records—is considerable. This may be accounted for in the first place by the close affinity of the flora of that portion of Yunnan centring round Tengyueh with the flora of Upper Burma. Many well-known Burmese orchids are represented in this corner of China and are not found further north or east. A huge lava-bed near Tengyueh at an elevation of some 5,000 feet—overgrown by a dense matted jungle of shrubs and climbers—was found by Forrest to be rich in Orchideae of pronounced Burmese affinity. Further the sub-alpine flora of the Burmese frontier is little known and ground orchids appear to form a considerable element thereof. The specimens obtained from the frontier by Kingdon Ward and Farrer indicate that genera such as *Habenaria* have a development there akin to what obtains in the Eastern Himalaya. What has been found already on the Burmese side of the frontier can represent only a tithe of the alpine orchid flora of the area. As may be expected there are species common to the area and to Yunnan, as well as species common to the area and the East Himalaya. Interesting extensions eastwards are *Risleya atropurpurea*, King et Pantling, from the East Himalaya, *Eriodes barbata*, Rolfe, from the Khasias, *Habenaria urceolata*, Clarke, from the East Himalaya and the Khasias.

The paper may be looked upon as supplementary to previous papers on the Orchideae collected by Forrest. The orchids obtained by Forrest during his expeditions in the years 1904-05 were dealt with by Mr Rolfe in the Notes R.B.G. Edin., viii. (1913), pp. 19-29. Those resulting from the explorations of the year 1906 were identified and described by Dr. Schlechter in the

same publication Vol. v. (1912) pp. 93-113. The present paper deals with the collections of the years 1912-1914 and 1917-1919.

The writer had the pleasurable anticipation of the co-operation of Mr R. A. Rolfe in the elucidation of the present series but to the great regret of all who knew him Mr Rolfe died on 13th April 1921. All that was accomplished together, was two days' survey of the series, employed in comparison of the specimens with the types at Kew. This served to eliminate the majority of the known species which was all that could be done at the time. Consequently for any errors in identification or description in what follows the present writer is responsible.

***Bulbophyllum hyacinthiodorum*, W. W. Sm. Sp. nov.**

Species affinis *B. odoratissimo*, Lindl. a quo inflorescentiis oblongis haud globosis, floribus majoribus, sepalis 5-nerviis divergit; in *B. congesto*, Rolfe flores multo minores sunt.

Planta repens rhizomate 60-90 cm. longo. Pseudobulbi 8-10 cm. inter se distantes, circ. 4 cm. longi, circ. 6 mm. lati, anguste oblongi, monophylli. Folia vulgo 6-7 cm. longa, 1.2-1.6 cm. lata, oblonga, apice subrotundata et breviter retusiuscula, basi breviter petiolatim angustata, in sicco coriacea. Scapus ad 10 cm. altus, folia plerumque paulo superans, vaginis circ. 4 ovato-lanceolatis circ. 1 cm. longis subappressis acutis munitus; racemus 2-3 cm. longus multi- et densiflorus, bracteis 1 cm. longis lanceolatis acutis acuminatisve subpatentibus albidis bene ornatus. Pedicelli 5-6 mm. longi. Flores albi, nonnunquam viridi-tincti, fragrantissimi. Sepala lateralia patentia circ. 1 cm. longa, basi 2.5 mm. lata ibique 5-nervia, mox angustata et baculiformia, marginibus cujusque sepali involutis et cohaerentibus, obtusa glabra, textura tenuiter membranacea; sepalum dorsale subsimile circ. 7 mm. longum minus obtusum. Petala vix 2 mm. longa, tenuissima, ovata, obtusa, integra, glabra. Labelum parvum, tantum 1.5 mm. longum, ad pedem columnae adnatum, mobile, linguiforme, recurvatum, glabrum. Columna brevis fere 1.5 mm. alta, late alata, apice biapiculata. Anthera bilocularis polliniis 4 quorum duo majora.

"West China :—Lava bed west of Tengyueh, Yunnan. Epiphytic on trees and rocks. Lat. 25° N. Alt. 5,000 ft. Trailing plant of 2-3 ft. Flowers pure white or slightly tinged green; strongly fragrant. Fragrance identical with that of Roman hyacinths. May 1912." G. Forrest. No. 7987.

***Bulbophyllum reptans*, Lindl.**

"West China :—Shweli-Salween divide, Yunnan. Epiphytic on trees and rocks in shady side valleys. Lat. 25° N. Alt.

8-9,000 ft. Plant of 3-5 inches. Flowers pale yellow, brownish at base. April 1919." G. Forrest. No. 17,822.
New to China.

Bulbophyllum shweliense, W. W. Sm. Sp. nov.

Species affinis *B. radiato*, Lindl. a quo floribus fere sessilibus inter alia differt; a *B. caulifloro*, Hook. f. rhizomate gracili, petalorum forma praeter alia signa removitur; a *B. protracto*, Hook. f. valde affini pedicellis subnullis, bracteis ovaria longe superantibus, petalis trinerviis distinguitur; in *B. odoratissimo*, Lindl. petala minima uninervia; *B. leptanthum*, Hook. f. et *B. Gamblei*, Hook. f. autem affines, petalis viridulis uninerviis separantur.

Planta pusilla rhizomate repente gracillimo. Pseudobulbi 10-15 mm. longi, 4-5 mm. lati, 3-5 cm. inter se distantes, oblongi, monophylli. Folia plerumque 3 cm. longa, 1 cm. lata, oblonga, apice rotundata et breviter retusa, basi brevissime petiolatim angustata, in sicco firme papyracea. Scapus ad 4-5 cm. altus flexuosus gracillimus bracteis 2-3 remotis vaginiformibus praeditus; racemus in capitulum 5-10-florum circ. 1 cm. diametro compactus; bractee florales 10-12, albae, 3-4 mm. longae, lanceolatae, acutae, concavae, tenuissime membranaceae. Flores aurantiaco-flavi subsessiles. Sepala circ. 7 mm. longa lanceolata longe acuminata trinervia. Petala circ. 3.5 mm. longa, subelliptica, brevissime acutata, trinervia, glabra. Labellum petala subaequans, linguiforme, curvatum, marginibus erectis, pedi circ. 1.5 mm. longo affixum, glabrum. Columna brevis alis parvis acutis. Anthera bilocularis pollinibus 4 quorum duo minima.

"West China:—Shweli Valley, Yunnan, on trees and rocks. Lat. 24° 40' N. Alt. 5-6,000 ft. Epiphytic plant of 1½-2½ inches. Flowers golden-yellow. August 1919." G. Forrest. No. 18,398.

Calanthe amoena, W. W. Sm. Sp. nov.

Species affinis *C. puberulae*, Lindl. a qua habitu multo robustiore, floribus flavidis, petalis linearibus uninerviis differt.

Planta terrestris erecta 40-50 cm. alta rhizomate brevi radicibus elongatis pilosis bene praedito. Folia basalia circ. 6, basi fibris solutis circumdata, sub anthesin satis bene evoluta, plus minusve elliptica, ad 25 cm. longa, ad 8.5 cm. lata, apice acuta vel acuminata, basi petiolatim angustata, plicata, in sicco membranacea, utrinque glabra. Scapus erectus, folia longe superans, foliis reductis bracteiformibus lanceolatis 2-3 ornatus, flores circ. 15 gerens, minute pubescens; inflorescentia infra laxa

supra sat densa; bracteae persistentes ad 2.5 cm. longae, erecto-patentes, lineares vel sublineares acutissimae membranaceae in sicco brunneae; flores mediocres; pedicelli longiusculi inferiores 1.5–2 cm. longi minute pubescentes. Sepala lateralalia circ. 1.8 cm. longa; 6 mm. lata, patentia, falcato-ovata, longiuscule acuminata, glabra, flava; intermedium paululo brevius ovatum longe acuminatum. Petala circ. 1.4 cm. longa, 1 mm. lata, linearia, uninervia, acutissima, flava. Labellum columnae adnatum, circ. 1.4 cm. longum, trilobum, lobis lateralibus quadrato-oblongis 5 mm. longis apice 4 mm. latis integris, lobo intermedio breviter stipitato late obovato apice 7 mm. lato, breviter emarginato et distincte mucronato ad latera eroso, parte inter lobos laterales lineis tribus in isthmum productis indistinctis pererrata; calcar nullum. Columna carnea 5 mm. alta; pollinia 8. Ovarium sublineare pedicello brevius 12–13 mm. longum minute puberulum.

"West China :—In the Minkwong Valley, Yunnan, in open, stony situations. Lat. $25^{\circ} 20'$ N. Alt. 6,500 ft. Plant of 16–20 inches. Ovary pale, dull rose-purple. Sepals dull maize-yellow, flushed pale, dull purple on exterior. Petals dull maize-yellow, labellum same, deepest towards base where slightly touched crimson on exterior. Aug. 1912." G. Forrest. No. 8867.

Calanthe arcuata, Rolfe.

A form of this species extends into Yunnan :—

"On the Tong-Shan, Yunnan, in open situations on the margins of thickets. Lat. $27^{\circ} 20'$ N. Alt. 8–9,000 ft. Plant of 9–14 inches. Flowers pale rose. August 1919." G. Forrest. No. 13107.

Closely allied and probably also a form of the same species are :—

"Upper Burma :—Naung-Chaung Valley, at 8,000 ft. in shade of forest, in leafy soil. Terrestrial orchid with brownish-yellow flowers. July 1914." F. K. Ward. Nos. 1654, 1696, 1721.

Calanthe lepida, W. W. Sm. Sp. nov.

Species valde affinis *C. puberulae*, Lindl. et *C. amoenae*, W. W. Sm. supra descriptae; ab hac floribus roseis labello diverso recedit; ab illa habitu robustiore; scapo pedicellisque floribusque glaberrimis, labello fere ecalloso divergit. Pro varietate *C. puberulae* fortasse rectius aestimanda.

"S.E. Tibet :—Salween-Kiuchiang divide, province of Tsarong, in shady situations amongst grass on the margins of thickets. Lat. $28^{\circ} 40'$ N. Long. $98^{\circ} 15'$ E. Plant of 14–15

inches. Flowers rose, labellum darkest. August 1919." G. Forrest. No. 19,063.

Calanthe plantaginea, Lindl.

"West China :—Hills to the south of Tengyueh, Yunnan, in shady openings in thickets. Lat. 25° N. Alt. 6-7,000 ft. Plant of 1-1½ ft. Flowers rose and dull yellow. March 1913." G. Forrest. No. 9738. Also No. 12,294.

"Upper Burma :—Langyang Pass at 7,500 ft., on woodland banks coming down from the pass. April 1919." R. Farrer. No. 827.

Not previously recorded, I believe, from China or Burma.

Calanthe shweliensis, W. W. Sm. Sp. nov.

Species affinis *C. angustae*, Lindl. et *C. Davidi*, Franch. et *C. ensifoliae*, Rolfe; inflorescentia pro numero florum breviuscula, lobo labelli alte bifido inter socios illos bene notata.

Planta terrestris erecta 30-60 cm. alta rhizomate brevi radicibus elongatis pilosis bene praedito. Folia basalia vulgo 3-4, basi fibris solutis circumdata, sub anthesi satis bene evoluta, anguste lanceolata, ad 20 cm. longa, 1.5-2.5 cm. lata, apice acuta vel acuminata, basi petiolatim angustata, plicata, in sicco membranacea, utrinque glabra. Scapus folia longe superans, flores 12-20 subcongestos gerens, ubique minute pubescens, foliis reductis bracteiformibus 4-6 remotis ornatus; inflorescentia 7-8 cm. longa, 4-6 cm. lata; bractae persistentes ad 1 cm. longae, ad 5 mm. latae, subpatentes, ovato-lanceolatae, obtusiusculae, textura subfoliaceae; flores mediocres; pedicelli circ. 5 mm. longi. Sepala lateralia circ. 1.2 cm. longa, fere 5 mm. lata, patentia, oblique ovata, obtusa, glabra, flava; intermedium ovatum paulo brevius. Petala paulo minora sepalis subsimilia. Labellum columnae adnatum, circ. 1.2 cm. longum, trilobum, lobis lateralibus oblongis 5 mm. longis 2 mm. latis integris, lobo intermedio late obovato ad medium in lobulos obovatos 6 mm. longos 5 mm. latos integros apice rotundatos diviso; calcar 9 mm. longum sublineare fere rectum subacutum. Columna carinosa 5 mm. alta; pollinia 8. Ovarium subclavatum 1.3 cm. longum minute puberulum.

"West China :—Valley of the Shweli (Lungchiang), Yunnan, on margins of thickets. Lat. 25° N. Alt. 5,000 ft. Plant of 1-2 ft. Flowers biscuit-yellow with a tinge of pink or lavender on exterior; fragrant. May 1912." G. Forrest. No. 7824.

A very distinct member of the group which contains *C. Davidi*, Franch. and *C. ensifolia*, Rolfe.

Calanthe Wardii, W. W. Sm. Sp. nov.

Species ex affinitate *C. angustae*, Lindl. a qua labello latiore quam longiore inter alia facile recognoscitur.

Planta terrestris erecta, in specimenibus nostris circ. 70 cm. alta sed ex collectore ad 120 cm., rhizomate crasso radicibus elongatis pilosis praedito. Folia basalia circ. 4, basi fibris solutis circumdata, sub anthesi satis bene evoluta, anguste lanceolata, 40-45 cm. longa, plus minusve 3 cm. lata, apice longe acuminata, basi longe petiolatim angustata, plicata, in sicco firme membranacea, utrinque glabra. Scapus folia longe superans, valde robustus flores 10-20 laxe dispositos gerens, ubique minute pubescens, foliis reductis bracteiformibus paucis basi amplexicaulibus ornatus; pars florifera circ. 15 cm. longa; bractee persistentes ad 2.5 cm. longae, lineares vel sublineares, acutae, sub anthesi deflexae; flores mediocres; pedicelli 3-4 mm. longi. Sepala lateralalia 10-11 mm. longa, 3.5 mm. lata, patentia, oblique ovata, obtusa, breviter apiculata, glabra; intermedium subsimile ovatum. Petala anguste lanceolata, 9 mm. longa, 2 mm. lata, acuta. Labellum (ut sepala petalaeque) valde carnosa, columnae adnatum, circ. 7 mm. longum, circ. 11 mm. latum, lobis lateralibus fere obsoletis, lobo intermedio in formam securis bipennis constructo, margine integro, apice late exciso, lamellis elevatis tribus pererrato; calcar 9-11 mm. longum lineari-oblongum obtusiusculum. Columna carnosa brevis; pollinia 8. Ovarium subclavatum circ. 8 mm. longum minute pubescens.

"Upper Burma:—Hpimaw in shady forest, damp humus soil, at 7,000 ft. Flowers greenish-yellow; height of plant about 4 ft. June 1914." F. K. Ward. No. 1661.

"In the Naung-Chaung Valley in open places, at 10,000 ft. Flowers bright sulphur-yellow, fragrant. July 1914." F. K. Ward. No. 1734.

"Hpimaw; Alt. 7,000 ft. June 1919." Farrer. No. 1040.

The species has the habit of *C. Davidi*, Franch. It is well distinguished from its allies by the twin-axe-headed shape of the labellum.

Calanthe yunnanensis, Rolfe.

"Upper Burma:—Htwagaw, valley of Naung-Chang, Lashi country. Terrestrial orchid growing in leaf mould etc. in damp deep shade of rain forest at 8,000 ft. Petals green, labellum purplish-red. Flowers pointing down completely as protection against rain. Masses in the forests of Teng-shui-ling, grown in big colonies on dead tree trunks, on humus, etc. in deep shade, not in very wet places. May 1914." F. K. Ward. No. 1606.

"Ngaw Chang Woods. Alt. 5,000 ft. Flowers greenish. May 1919." E. H. M. Cox. No. 1010.

Cirrhopetalum aemulum, W. W. Sm. Sp. nov.

Species valde affinis *C. cornuto*, Lindl. a quo sepalo dorsali integro eciliolato, petalis minute erosulis vix ciliolatis, floribus flavidis divergit.

Rhizoma validum repens squamis membranaceis indutum. Pseudobulbi numerosi 3-4 cm. longi, ovoidei, monophylli. Folia 7-17 cm. longa, 1.5-2.8 cm. lata, oblonga, apice brevissime retusa, coriacea, petiolo ad 3 cm. longo munita. Scapus folia semiaequans vel nunc ad 20 cm. attingens, gracilis, bracteis 2-3 vaginiformibus remotis praeditus, vulgo 6-15-florus, bracteis floralibus ad 8 mm. longis lanceolatis tenuiter membranaceis, pedicellis cum ovario ad 1.5 cm. longis glabris. Flores saturate aurantiaco-flavi. Sepalum dorsale circ. 8 mm. longum, basi fere 4 mm. latum, ovatum, obtusiusculum, 5-nervium, eciliolatum, glabrum; sepala lateralia circ. 2.2 cm. longa, basi 4 mm. lata, anguste lanceolata, acuminata, cohaerentia, marginibus involutis haud planis. Petala circ. 3 mm. longa, ovata, sub-obtusa, margine minute erosula (vel si vis minute ciliolata). Labellum circ. 4 mm. longum linguiforme glabrum. Columna brevis alis acutis.

"West China :—Shweli Valley, Yunnan, on trees and rocks. Lat. 24° 50' N. Alt. 5-6,000 ft. Epiphytic plant of 6-9 inches. Flowers in heads of 6-15, dull orange, non-fragrant. June 1912." G. Forrest. No. 8130.

"Shweli Valley. Lat. 25° 30' N. Flowers deep orange-yellow, veined a deeper shade. August 1913." G. Forrest. Nos. 11,901, 17,970.

"Upper Burma :—Hpimaw; 5-7,000 ft. Epiphytic on alder and oak trees in open park land. Flowers orange. June 1914." F. Kingdon Ward. No. 1554.

The species is a very close ally of *C. cornutum*, Lindl.

Cirrhopetalum aurantiacum, W. W. Sm. Sp. nov.

Species ex affinitate *B. gamosepali*, Griff. et *C. Roxburghii*, Lindl. a quibus pseudobulbis minimis, foliis parvis, sepalis petalisque glandulosis facile distinguitur; *C. sikkimense*, King et Pantling valde affine scapis brevibus multifloris inter alia differt.

Planta pusilla rhizomate repente gracili. Pseudobulbi 4-7 mm. longi, 3-4 mm. lati, ovoidei vel subcylindrici, inter se circ. 3-4 mm. distantes monophylli. Folia 1-2 cm. longa, 5-10 mm. lata, plus minusve elliptica, utrinque rotundata, petiolo 1 mm. longo suffulta, in sicco coriacea. Scapus 4-7 cm. altus, nunc fructifer

ad 13 cm. attingens, flexuosus gracillimus, bracteis vaginiformibus 1-2 munitus; umbella 3-4-flora, pedicellis circ. 5 mm. longis gracilimis, bracteis circ. 4 lanceolatis 2 mm. longis acutis membranaceis. Flores aurantiaci. Sepalum dorsale cymbiforme circ. 3 mm. longum trinervium, apice in cilium (ipsum 3 mm. longum productum, glandulis sessilibus pellucidis bene conspersum, marginibus cilioque longiuscule ciliolatis; sepala lateralia linearia ad 3 cm. longa, 2 mm. lata. Petala sepalo dorsali subaequilonga atque similiter ciliolata et glandulosa, trinervia. Labellum circ. 2 mm. longum linguiforme curvatum pedi brevi affixum glabrum. Columna 1 mm. alta alis acuminatis. Anthera bilocularis; pollinia non visa. Fructus fere 1 cm. longus.

"West China:—Szemao, Yunnan, on the west mountains at 6,000 ft. Epiphytic on tree. Flowers orange." A. Henry. No. 13,087.

The very small bulbs and leaves, the fringed petals and dorsal sepal, and the pellucid glands on the sepals and petals well distinguish this species.

Cirrhopetalum Farreri, W. W. Sm. Sp. nov.

Species ex affinitate *C. Wallichii*, Lindl. atque ejus sociorum; sepalis lateralibus (atque sepalo dorsali basi tantum) capillis longe papilliformibus dense indutis bene notata.

Pseudobulbi 1-2 cm. inter se distantes, anguste ovoidei, ad 2.5 cm. longi, unifoliati. Folia circ. ad 5 mm. petiolatim angustata, in spec. nostris vivis ad 7.5 cm. longa, ad 2 cm. lata, oblonga, apice rotundata et bifidula, coriacea. Scapus e basi pseudobulbi ortus, ascendens circ. 9 cm. altus, gracilis, flexuosus, bracteis inanibus tribus circ. 1 cm. longis lanceolatis aequidistantibus subappressis praeditus. Inflorescentia umbelliformis circ. 6-flora bracteis ovaria pedicellata paulo superantibus. Sepala lateralia circ. 3.5 cm. longa, ad basim circ. 3 mm. lata, lineari-lanceolata, longe acuminata, 5-nervia, nervis erga basin purpureis valde distinctis, integra, sordide brunnea, basi purpurascens, cohaerentia, capillis longe papilliformibus a basi supra medium dense obsita; sepalum dorsale 6 mm. longum, basi 3 mm. latum, anguste ovatum, obtusum, in parte inferiore papillis induta, nervis tribus purpureis pererrata, marginibus purpurascens. Petala 4 mm. longa, 3 mm. lata, ovata, obtusa, ut sepala nervata atque colorata. Labellum sepalo dorsali brevius, ad pedem columnae circ. 2 mm. longum affixum; pars mobilis circ. 3.5 mm. longa, linguiformis, in modum leonis unguis curvata, carnosula, marginibus erectis, copiose purpureo-maculata. Columna crassa 1 mm. paulo superans purpurea, dentibus apicalibus erectis. Ovarium cum pedicello 6-7 mm. longum viride obscure purpureo-maculatum.

Upper Burma. Cultivated in Royal Botanic Garden, Edinburgh, from plants collected by the late Mr Reginald Farrer. The stout papilliform hairs on the lateral sepals are very characteristic. It flowered Oct. 1920.

The following is conspecific but has much smaller pseudobulbs and leaves and rather smaller flowers than the cultivated specimen:—

"Upper Burma:—Htawgaw, valley of Naung-Chaung, Lashi country. Epiphytic orchid, in open park land, in shady places, at 5,000 ft. Flowers brick-red. May 1914." F. Kingdon Ward. No. 1560.

Cirrhopetalum oreogenes, W. W. Sm. Sp. nov.

Species ex affinitate *C. Wallichii*, Lindl. a quo scapo foliis multo longiore, floribus flavis inter alia divergit; ex descriptione cum *C. retusiusculo*, Hemsl. specie ex Yunnan et Burma collecta non quadrat, (sepalo dorsali haud retuso sepalis lateralibus longioribus).

Pseudobulbi 1.5–2.5 cm. inter se distantes, 1.5–2.5 cm. longi, ovoidei, monophylli. Folia petiolo circ. 5 mm. longo suffulta, 5–8 cm. longa, circ. 1.5 cm. lata, apice rotundata nunc obscure retusa, coriacea. Scapus gracillimus circ. 12 cm. longus, vulgo folia duplo superans bracteis vaginiformibus 2–3 remotis munitus; bractee florales lineari-lanceolatae acuminatae 5–7 mm. longae tenuiter membranaceae; pedicelli cum ovario bracteas paulo superantes. Flores plerumque circ. 5 saturate aurantiaco-flavi inter majusculos. Sepala lateralalia circ. 4 cm. longa, medio circ. 6 mm. lata, lineari-lanceolata, acuta, trinervia, integra, flava, primum cohaerentia, basi apiceque exceptis; sepalum dorsale 6 mm. longum, 3 mm. latum, oblongum, apice rotundatum, trinerve. Petala 5 mm. longa, 2.5 mm. lata, subobovata, apice obtusa. Labellum sepalo dorsali multo brevius, ad pedem columnae processu incurvo 1 mm. longo affixum; pars mobilis 3 mm. longa, linguiformis, curvata, integra, carnosula, obtusa, jugis duobus lateralibus percursa, supra paulo furfuracea. Columna crassa 1 mm. paulo superans alis angustissimis, dentibus apicalibus duobus erectis. Anthera bilocularis pollinibus ovalibus (majoribus duobus visis). Ovarium cum pedicello 8–9 mm. longum.

"Western China:—On the Tong Shan in the Yangtze bend, Yunnan, on trees in forests. Lat. 27° 20' N. Alt. 7–8,000 ft. Epiphytic plant of 6–9 inches. Flowers deep orange-yellow. Sept. 1913." G. Forrest. No. 11,468.

"Hills to the north-east of Tengyueh, Yunnan, on trees and rocks. Lat. 25° 15' N. Alt. 7,000 ft. Epiphytic plant of 6–9 inches. Oct. 1912." G. Forrest. No. 9285.

"Shweli-Salween divide, Yunnan. Epiphytic on trees and rocks. Lat. $25^{\circ} 40'$ N. Alt. 6-7,000 ft. Plant of 4-6 inches. Flowers orange-yellow. Aug. 1919." G. Forrest. No. 18,449.

Coelogyne flaccida, Lindl.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 6-12 inches. Sepals dull greenish-yellow, flushed on exterior pale rose. Petals same only lighter. Labellum yellowish, veined crimson-lake, margined same at apex. Faintly fragrant. May 1912." G. Forrest. No. 7801. Also sepals and petals ivory white. March 1913. G. Forrest. No. 9784.

New to China.

Coelogyne graminifolia, Reichb. f.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 6-15 inches. Sepals and petals waxy-white, labellum and rostellum brown, tinged crimson; fragrant. Jan. 1913." G. Forrest. No. 9510.

"Shweli Valley, Yunnan, on rocks and cliffs. Lat. 25° N. Alt. 6,000 ft. Epiphytic plant of 12-18 inches. In fruit. July 1912." G. Forrest. No. 8649.

New to China.

Coelogyne leucantha, W. W. Sm. Sp. nov.

Species gregis *Imbricatarum*; ob flores omnes, ut videtur, eodem anno apertos ad sectionem *Elatas* spectat; in sectione illa *C. pulchellae*, Rolfe proxima sed pseudobulbis parvis approximatis, foliis longiuscule petiolatis, labello haud obcordato recedit; si forte apud *Proliferas* ponenda, affinis *C. proliferae*, Lindl. et *C. flavidae*, Lindl. a quibus pseudobulbis parvis, petiolis pseudobulbum longe superantibus, racemo densifloro, floribus albis, carinis tribus distinguitur.

Pseudobulbi 1.5-2 cm. longi, ad 1 cm. lati, ovato-oblongi, in rhizomate sat crasso arcte approximati diphylli. Folia ad 4 cm. petiolata, circ. 12 cm. longa, 2 cm. lata, anguste oblongo-lanceolata, acuta atque apiculata, tenuiter coriacea. Scapus 10-20 cm. altus, gracilis multiflorus, infra flores glumis imbricatis dense indutus; bractae cito deciduae non visae. Flores eodem anno omnes evoluti, ut ex spec. nostris videtur, albi, magnitudine eos *C. pulchellae* aequantes. Sepala 13-14 mm. longa, suboblonga, acuta. Petala aequilonga acuta. Labellum aequilongum trilobum; lobi laterales dimidium labelli aequantes antice rotundati; lobus intermedius fere orbicularis nec obcordatus

nec bilobus, margine undulato-crenulatus; carinae tres a basi labelli ad duas partes lobi intermediarii pertinentes. Gynostemium 1.1 cm. longum.

"Upper Burma :—Hpimaw village, growing on rocks on grassy hillsides on granite substratum. Alt. 8,000 ft. Flowers white. June 1914." F. Kingdon Ward. No. 1669.

A near ally of *C. pulchella*, Rolfe of which the native country is unknown.

Coelogyne longipes, Lindl.

"West China :—Shweli Valley, Yunnan. Epiphytic on rocks. Lat. 25° N. Alt. 6,000 ft. Plant of 20 inches. Flowers dull yellow, striped and marked brown. May 1912." G. Forrest. No. 7986.

"Flank of volcanic mountain north-west of Tengyueh, Yunnan, on rocks. Lat. $25^{\circ} 10'$ N. Alt. 7,000 ft. Epiphytic plant of 12–18 inches. Sepals and petals dull white, flushed rose on exterior. Labellum yellowish-brown with a white margin. June 1912." G. Forrest. No. 8109.

"Upper Burma :—Valley of the Nanaung-hka. Alt. 4–5,000 ft. Epiphytic orchid, growing on big trees in patches of jungle. Flowers dense brownish-yellow, racemes more or less pendant. June 1919." F. Kingdon Ward. No. 3209.

Not recorded from China and apparently not from Burma.

Coelogyne ovalis, Lindl.

"West China :—Hills to the north-east of Tengyueh, Yunnan, on trees in open situations. Lat. 25° N. Alt. 6–7,000 ft. Epiphytic plant of 6–8 inches. Sepals and petals dull yellow. Rostellum dull yellow, faintly marked lake. Labellum fringed, ground colour dull yellow, heavily veined lake crimson merging towards centre into a double blotch; non-fragrant. July 1912." G. Forrest. No. 8668. July 1917. G. Forrest. No. 16,035.

"S.E. Tibet :—Salween Valley, province of Tsarong; Salween-Kiuchiang divide, in shady situations on trees and humus-covered rocks. Lat. $28^{\circ} 40'$ N. Long. $98^{\circ} 20'$ E. Creeping epiphytic plant of 5–7 inches. Flowers creamy-yellow, labellum heavily lined and marked deep blood crimson. July 1919." G. Forrest. No. 19,030.

Apparently unrecorded for China and Tibet.

Coelogyne prolifera, Lindl.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 12–18 inches. Sepals and petals dull yellow, flushed rose. Labellum

white at base, yellowish towards apex with brownish-yellow markings; fragrant. June 1912." G. Forrest. No. 8613.

New to China.

Coelogyne Sanderae, Kränzl.

"West China :—Lava bed west of Tengyueh, Yunnan, epiphytic on rocks. Lat. 25° N. Alt. 5,000 ft. Plant of 12–18 inches. Flowers fleshy, sweetly fragrant. Sepals dull ivory-white; petals same. Labellum dull white exterior, interior having two parallel lines of golden-brown hair on lower surface with base flushed golden brown; apex bright yellow. Rostellum white. May 1912." G. Forrest. No. 7935.

New to China. The species has typically three fimbriate carinae, not two as in the Yunnan specimen of Forrest.

Cremastra Wallichiana, Lindl.

Kweichow :—At Pai Tchen. Very rare. May 1908. J. Cavalerie. No. 3361 in Herb. Lév.

Occurs in the East Himalaya and in Japan; apparently unrecorded previously from China.

Dendrobium candidum, Wall.

"West China :—N.W. Yunnan. 4,000 ft. On dry rocks. April 1913." F. Kingdon Ward. No. 214.

"N'Maikha-Salween divide, Yunnan, on trees in mixed forest. Lat. $26^{\circ} 10'$ N. Alt. 7,000 ft. Epiphytic plant of 9–14 inches. Flowers white, flushed pale purplish-rose exterior; labellum yellow. May 1919." G. Forrest. No. 17,960.

"Upper Burma :—Hpimaw; 6,000 ft. Flowers white, scarcely scented. On granite rocks at foot of Hpimaw Hill. April 1919." R. Farrer. No. 853.

An extension eastwards into China and Upper Burma.

Dendrobium Hookerianum, Lindl.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 18–30 inches. Sepals and petals bright orange. Labellum orange at base, yellow towards apex, margins heavily fringed, heavily marked crimson-lake from centre down sides to base. Rostellum light yellow with two blotches on inner base of crimson-lake; non-fragrant. June 1912." G. Forrest. No. 8542.

New to China.

Dendrobium porphyrochilum, Lindl. var.

"West China :—N'Maikha-Salween divide, Yunnan, on trees

and rocks in side valleys. Lat. $26^{\circ} 25'$ N. Alt. 7,000 ft. Epiphytic plant of 2-4 inches. Flowers yellow. August 1919." G. Forrest. No 18,374.

Possibly a variety of this Himalayan and Khasian species, agreeing very closely in structure but differing somewhat in the yellow colour of the flowers. In the dried state the labellum has a faint purplish tinge.

Dendrobium scoriarum, W. W. Sm. Sp. nov.

Species ex affinitate *D. yunnanensis*, Finet a quo foliis oblongis, floribus longius pedicellatis, sepalis petalisque acutiusculis, labello ad medium calloso, antherae apice longe producto divergit.

Planta epiphytica ad 60 cm. alta. Caules caespitosi, plus minusve erecti, sinuosi, gracillimi, 2-3 mm. crassi, foliosi, sub anthesi defoliati. Folia disticha, plerumque 4-4.5 cm. longa, 1-1.5 cm. lata, oblonga, apice obtusa paulo asymmetrica, coriacea, vaginis persistentibus caulem tegentibus. Flores cito in sicco decidui, ut videtur 1-2-nati, basi vaginulis paucis praediti, pedicellis cum ovario circ. 2.5 cm. longis. Sepala lateralialia falcato-ovata, circ. 1.6 cm. longa, basi fere 1.3 cm. lata, acutiuscula, 5-nervia; dorsale ovato-lanceolatum, circ. 1.5 mm. longum acutatum 5-nervium. Petala circ. 1.4 cm. longa, medio 6 mm. lata, lanceolata, acutiuscula textura tenuissima glabra. Labellum columnae pedi adnatum trilobum, circ. 1.2 cm. longum, medio ad 9 mm. latum; lobi laterales rotundati circ. 4 mm. diametro sub lente minute serratuli et intus minute pubescentes; intermedius paulo longior circ. 6 mm. latus ovatus apice acutus intus puberulus, margine minute serratulus; discus circ. 4 mm. longus, antice ad basin lobi intermedii callositate sphaerica praeditus; pes circ. 1.2 cm. longus ad insertionem labelli jugis carnosus munitus, ad columnam supra papilloso-scabridulus. Columna brevis dentibus anticis obsoletis. Anthera bicellularis processu bifido 3 mm. longo roseo coronata. Quoad floris colorem confer infra.

"West China :—West of Tengyueh, Yunnan, on rocks and trees on the outskirts of lava bed. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 2 ft. Sepals yellowish with a flush of red; petals pale yellowish-white. Labellum, base crimson-lake, centre pale-yellow, apex crimson-lake. Rostellum, base yellowish, tip brilliant rose-magenta; odourless. June 1912." G. Forrest. No. 8517.

Dendrobium stuposum, Lindl.

"West China :—Flank of volcanic mountain north-west of Tengyueh, Yunnan, on rocks. Lat. $25^{\circ} 10'$ N. Alt. 7,000 ft.

Epiphytic plant of 12-20 inches. Flowers pale yellow, base of spur tinged dull rose. June 1912." G. Forrest. No. 8414.
New to China.

Dendrobium tapingense, W. W. Sm. Sp. nov.

Species ex affinitate *D. hymenopteri*, Hook. f. a quo labello oblongo-cuneato inter alia recedit.

Caules fasciculati 20-45 cm. alti, pauciramosi, graciles, pluri-articulati internodiis sulcatis 2-3 cm. longis, primo vaginis membranaceis albidis obsiti tandem nudi nitidi. Folia sub anthesin decidua. Flores solitarii ad apicem ramulorum pauciarticulatum orientes, inter minores, flavi, roseo-tincti, fragrant. Sepalum dorsale oblongum 4 mm. longum apice rotundatum; sepala lateralibus ovata obtusa latere posteriore 4 mm. longa, antice in mentum saccatum 5 mm. longum cum pede gynostemii ejusque lateribus omnino conjuncta. Petala fere 4 mm. longa, oblanceolata, apice subtruncata. Labellum circ. 1 cm. longum, ad pedem gynostemii affixum, oblongo-cuneatum vel subspathulatum, incurvum, basi angustius et bicallosum, apice 3 mm. latum subtruncatum, medio marginibus paulo crenulatis. Columna brevissima; filamentum subulatum longiusculum; pollinia 4. Ovarium cum pedicello 1.6-1.7 cm. longum gracile. Capsula anguste obovoidea ad 4.5 cm. longa.

"Upper Burma :—Bank of the Taping. Lat. 24° 25' N. Alt. 2,000 ft. Epiphytic plant of 9-18 inches. Flowers dull creamy-yellow, flushed rose, fragrant. On trees in shady jungle. March 1914." G. Forrest. No. 12,608.

Dendrobium thyrsoflorum, Reichb. f.

Forma parviflora ex R. A. Rolfe in scheda.

"West China :—Shweli Valley, Yunnan, on trees. Lat. 25° 30' N. Alt. 5,000 ft. Epiphytic plant of 9-12 inches. Petals and sepals white, labellum bright orange. May 1919." G. Forrest. No. 18,051.

Not previously recorded from China.

Dendrobium Wardianum, Warner.

"West China :—Hills to the east of Tengyueh, Yunnan, epiphytic on rocks and cliffs. Lat. 25° N. Alt. 6,000 ft. Plant of 1-2½ ft. Flowers fleshy, fragrant. Sepals pure white flushed magenta-rose towards apex. Petals white with a blotch of bright magenta-rose towards apex. Rostellum yellowish, rose towards base. Labellum deep orange, veined purplish-lake and with two blotches of the same colour, one on each side

towards base. Apex broadly margined, light lemon-yellow. May 1912." G. Forrest. No. 7771.

New to China.

Eria bambusifolia, Lindl.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks in open situations. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of $2\frac{1}{2}$ –4 ft. Flowers dull yellowish-white, striped purple-maroon. December 1912." G. Forrest. No. 9349.

New to China.

Eria obvia, W. W. Sm. in Notes Roy. Bot. Gard. viii (1915), 335.

This plant was described from a plant in cultivation. Since the publication dried specimens have come to hand. These agree with the cultivated plant. The localities in Yunnan for this species can now be given more accurately.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,600 ft. Epiphytic tufted plant of 12–18 inches. Sepals and petals ivory white. Rostellum, base white, apex pale orange, side margins pale rose; faintly fragrant. July 1912." G. Forrest. Nos. 8753, 9089.

"Shweli-Salween divide, Yunnan, on rocks in open situations. Lat. $25^{\circ} 30'$ N. Alt. 9,000 ft. Matted plant of 10–16 inches. Flowers maroon and white, fragrant. July 1913." G. Forrest. No. 11,762. Also August 1919. G. Forrest. No. 18,441.

Eriodes barbata, Rolfe.

Tainia barbata, Lindl.; *Eria barbata*, Reichb. f.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Plant of 2– $2\frac{1}{2}$ ft. Flowers yellow, netted and marked crimson-maroon, fragrant. November 1912." G. Forrest. No. 9303. September 1917. G. Forrest. No. 15,989.

An extension into China of the Khasian species.

Eulophia monantha, W. W. Sm. Sp. nov.

Species ex affinitate *E. bracteosae*, Lindl. et *E. herbaceae*, Lindl. a quibus foliis linearibus, inflorescentiis subunifloris, sepalis angustis longe distat.

Planta ex collectore 15–22 cm. alta. Tuber crassum oblongum. Folia in speciminibus nostris ad 18 cm. longa, 4–5 mm. lata, linearia, acuminata, plicata, textura firma, glabra; ad basin caulis folia 2–3 reducta squamiformia. Scapus folia subaequans gracilis rigidus glaber bracteis 2–3 remotis lanceolatis

acutis membranaceis praeditus. Flos in spec. nostris solitarius bracteis inferioribus sterilibus majusculus viridis fragrans. Sepala circ. 3 cm. longa, 5 mm. lata, anguste oblanceolata, obtusa. Petala 2 cm. longa, 6 mm. lata, oblonga, obtusa. Labellum 2.3 cm. longum, fere 1 cm. latum, lobis lateralibus angustissimis, intermedio obscure undulato-trilobulato lineis furfuraceis circ. 7 pererrato; calcar 5 mm. longum. Columna 9 mm. alta pollinibus typicis duobus; pes nulla.

"West China :—Tali Range, Yunnan, in open dry situations amongst rocks in pine forests. Lat. $25^{\circ} 40'$ N. Alt. 9,000 ft. Plant of 6-9 inches. Flowers olive-green with brown markings, fragrant. August 1913." G. Forrest. No. 11,725.

A very distinct species in its narrow leaves and solitary flowers.

Galeola shweliensis, W. W. Sm. Sp. nov.

.Species affinis *G. Lindleyanae*, Reichb. f. a qua inflorescentiis valde ramosis, sepalis petalisque angustis oblongis haud ovatis praeter alia signa removitur.

Rhizoma circ. 2 cm. crassum squamis triangulari-ovatis carnis praeditum. Caules 1 m. alti vel paulo altiores, simplex nisi in regione florali, vaginis triangularibus 2-3 cm. longis muniti, fulvido-furfuracei, glabrescentes. Paniculae amplae ramis elongatis ascendentibus multifloris; bractae 5-10 mm. longae ovato-lanceolatae acutae. Sepala subaequalia 2.5 cm. longa, 5 mm. lata, lineari-oblonga, obtusa. Petala sepalis sub-similia. Labellum cymbiforme circ. 2 cm. longum, 8 mm. altum, marginibus erosulis, lamellis numerosis crenulatis percursum. Columna 1 cm. longa. Capsula vix matura 16 cm. longa, 2 cm. lata, oblonga, paululo falcato-curvata, obtuse apiculata.

"West China :—Shweli-Salween divide, Yunnan, amongst heavy grass on the margins of thickets and among rocks. Lat. $25^{\circ} 45'$ N. Alt. 7-8,000 ft. Plant of 3-4 ft. Flowers fleshy; outer segments of perianth dull creamy-yellow, flushed crimson, interior segment dull crimson. July 1919." G. Forrest. No. 18,166.

"Duplicate of No. 18,166 in fruit. Fruits crimson, fleshy. September 1919." G. Forrest. No. 18,596.

Habenaria chrysea, W. W. Sm. Sp. nov.

Species inter *Habenarias* cum *H. camptocerate*, Rolfe, comparanda a qua signis multis longe recedit.

Planta ad 10 cm. alta tubere parvo subgloboso praedita. Caulis basi squamis 1-2 longiusculis circumdatus. Folia sub-

basalia duo fere opposita in partem brevem vaginantem angustata; lamina 3.5-4 cm. longa, 8-10 mm. lata, oblonga vel oblongo-lanceolata apice angustata breviter apiculata. Bractea maxima circ. 4.5 cm. longa oblanceolata apiculata involuta; in axilla bractee oritur flos solitarius caulem terminans. Flos laete flavus longe stipitatus, ovario circ. 1 cm. longo, stipite erecto valido ad 2.5 cm. longo, calcare circ. 2.5 cm. longo cylindrico fere recto stipiti subparallelo atque approximato; sub anthesi floris stipes atque calcar in bractea involuta fere omnino abscondita. Sepala dissimilia; dorsale oblongum circ. 1 cm. longum 4 mm. latum supra angustatum apice ipso apiculata; lateralia falcata, 1.4 cm. longa, basi ovata ibique 3 mm. lata, supra sensim in apicem acuminatum angustata, erecta post dorsale retro projecta. Petala late ovata circ. 1.2 cm. longa, 7 mm. lata, apice obtusa, basi obliqua, uno latere ascendente, altero latere auriculatim extenso. Labellum deltoideum, 1.2 cm. longum, basi 1.2 cm. latum, subintegrum marginibus paulo undulatis, per costulam mediam incrassatum, basi ad os calcaris sulco parvo mediano praeditum. Gynostemium circ. 4 mm. altum, antherae locellis magnis parallelis approximatis infelicit in spec. nostro vacuis, canalibus brevibus, pollinibus non visis, staminodiis parvis ovatis, processibus stigmaticis ut videtur nullis, stigmate sub rostello et supra os calcaris posito.

"S.E. Tibet:—On Doker-la, Mekong-Salween divide, Tsarong province, in open alpine pasture. Lat. $28^{\circ} 20'$ N. Alt. 12-13,000 ft. Plant of 3-5 inches. Flowers bright yellow, spur a shade darker. August 1917." G. Forrest. No. 14,738.

The material of this very interesting plant is unfortunately very scanty and I have not succeeded in making a satisfactory analysis of the structure of the gynostemium. The pollinia were absent from the flower examined. The whole structure and appearance of the flower recalls *H. camptoceras*, Rolfe in a general way but it is not closely akin to that species. Mr Forrest on this present expedition may be able to supplement the material.

Habenaria constricta, Hook. f.

Peristylus constrictus, Lindl.

"West China:—Szemao, N.W. grass mountains at 5,000 ft.; white flowers." A. Henry. No. 13,126.

"Divide between the Shweli and Tengvuch valleys, Yunnan, in open situations on the margins of scrub. Lat. $25^{\circ} 10'$ N. Alt. 6-7,000 ft. Plant of 20-28 inches. Flowers white non-fragrant. July 1912." G. Forrest. No. 8625.

Not previously recorded from China.

Habenaria corticicola, W. W. Sm. Sp. nov.

Species valde affinis *H. furciferæ*, Lindl. a qua floribus plus duplo majoribus, calcare ad 3 cm. longo, labelli lobis lateralibus recto angulo abeuntibus inter alia divergit.

Planta ad 20 cm. alta. Caulis basi squamis paucis indutus, infra foliis approximatis bene munitus supra bracteatus. Folia ad basim vaginantem breviter angustata, plerumque 7-11 cm. longa, ad 2.5 cm. lata, plus minusve oblonga vel nunc anguste oblanceolata, apice acuta vel breviter acutata; bracteae 2-3, ad 2.5 cm. longae, supra decrescentes, lanceolatae, acuminatae. Racemus 6-8 cm. longus, laxe 4-8-florus; bracteae florales ad 1.5 cm. longae, lanceolatae, ovario stipitato multo breviores. Sepala lateralia ovato-lanceolata, circ. 6 mm. longa, paulo falcata, deflexa, obtusa, trinervia; dorsale 6 mm. longum, ovatum, cucullatum, obtusum, trinervium. Petala sepalis aequilonga lineari-oblonga, basi latiuscula, obtusa uninervia. Labellum sepalis multo longius tripartitum; lobi laterales 1.5-2 cm. longi recto angulo abeuntes filiformes intermedio simillimo haud latiore paulo longiores; calcar ad 3 cm. longum ovario stipitato duplo longius gracillimum paululo curvatum. Anthera canalibus divergentibus 1 mm. longis, pollinibus 1 mm. paulo superantibus ovoideis, caudiculis gracillimis 2 mm. longis, glandulis parvis, rostello triangulari infra utrinque producto, staminodiis parvis subovatis. Processus stigmatici circ. 2 mm. longi anguste cylindrici.

"Upper Burma:—Mang-kyi. Alt. 4,000 ft. Flowers pale greenish-yellow. Epiphytic on alder trees, rooted in the crevices of the bark. September 1919." F. Kingdon Ward. No. 3538.

Habenaria diceras, Schltr.

"Upper Burma:—Hpimaw hill; 8,200 ft. In coppice on the northward slope of the limestone col. September 1919." F. Kingdon Ward. No. 1307.

New to Burma.

Habenaria (Platanthera) glossophora, W. W. Sm. Sp. nov.

Species affinis *P. Henryi*, Rolfe atque *P. interruptae*, Maxim.; foliis lineari-lanceolatis acuminatis, petalis ita late ovatis ut orbicularia videantur, labello basi angustata spatulato-dilatato inter alia notata.

Planta gracilis ad 60 cm. alta tuberidiis anguste cylindricis. Caulis basi squamis paucis brevibus munitus. Folia circ. 5 aequaliter distributa deinde sensim in bracteas abeuntia, infra in partem tubulosam vaginantem ad 4.5 cm. longam angustata: lamina ad 16 cm. longa, vulgo 1-1.5 cm. lata, lineari-lanceolata,

longe acuminata; bracteae 4-5, ad 4 cm. longae lineares valde acuminatae. Spica ad 19 cm. longa, 2 cm. lata, multiflora, subdensiflora, floribus regulariter dispositis viridibus fragrantibus, bracteis floralibus ad 1.8 cm. longis linearibus acuminatis supra sensim decrescentibus. Sepala inaequalia; dorsale 4 mm. longum, ovatum obtusum, cucullatum; lateralia 6 mm. longa, deflexa, ovato-oblonga, subfalcata, obtusa. Petala sepalo dorsali aequilonga late ovata, fere suborbicularia apice obtusissima. Labellum sepalis lateralibus aequilongum linguiforme a basi angustata paululo spathulato-dilatatum integerrimum; calcar ovario dimidium longius gracile bene curvatum. Pollinia ovoidea caudiculo aequilongo atque glandula lineari-oblonga munita; staminodia ovata parva; stigma in fovea processubus nullis.

"West China :—Hills to the north-west of Tengyueh, Yunnan, amongst grass on the margins of thickets. Lat. 25° 10' N. Alt. 6-7,000 ft. Plant of 1½-2 ft. Flowers white and green, fragrant. June 1912." G. Forrest. No. 8148.

Habenaria (*Platanthera*) *multibracteata*, W. W. Sm. Sp. nov.

Species ex affinitate *Platantherae Henryi*, Rolfe a qua habitu foliosiore, bracteis inanibus numerosis nunc ad 14, spica densiflora, bracteis floralibus flores vulgo semi-aequantibus, sepalo dorsali obtusissimo, petalis haud acutis recedit.

Planta ad 60 cm. alta habitu *P. Henryi*, tuberidiis anguste cylindricis. Caulis basi squamis paucis brevibus circumdatus. Folia vulgo 3-4, fere sessilia, parte vaginante brevissima, in spec. nostris 5-6 cm. longa, 2-3 cm. lata, late vel nunc anguste elliptica, apice obtusissima vel breviter obtuse angustata; bracteae numerosae nunc ad 14, anguste oblongo-lanceolatae, ad 4 cm. longae, supra gradatim decrescentes. Spica 15-20 cm. longa multiflora subdensiflora, bracteis floralibus 7-15 mm. longis flores plerumque semi-aequantibus lanceolatis vel ovato-lanceolatis subacuminatis. Sepala paulo inaequalia; dorsale late ovatum vel subellipticum, 5 mm. longum, 3-5 mm. latum, obtusissimum; lateralia deflexa circ. 6 mm. longa, oblique oblonga obtusa. Petala 5 mm. longa, oblique ovata obtusa. Labellum 7 mm. longum ligulatum integrum, calcar gracili curvato quam ovarium parte tertia longiore. Pollinia ovoidea caudiculo aequilongo atque glandula suborbiculari praedita; staminodia parva; anthera medium petalorum superans latiuscula loculis sejunctis; fovea stigmatica supra os calcaris posita.

"West China :—Hills to the north-east of Tengyueh, Yunnan, in rocky pasture. Lat. 25° N. Alt. 6-7,000 ft. Plant of 18-24 inches. Flowers green. June 1912." G. Forrest. No. 8402.

Habenaria ophiocephala, W. W. Sm. Sp. nov.

Species quoad habitum ex affinitate *H. pectinatae*, Don sociisque ejus sed floribus 1-2, labello integro lineari-lanceolato praelongo, calcare ad 7 cm. longo praeter alia signa bene notata; a speciebus cognitis sectionis *Hologlossae*, Hook. f. longe recedit.

Planta 25-30 cm. alta tuberidiis magnis cylindricis crassissimis. Caulis basi squamis longis 2-3 circumdatus. Folia vulgo tria basi breviter vaginatim angustata; lamina 10-15 cm. longa, 2-4 cm. lata, oblonga vel oblongo-lanceolata, apice plus minusve acuta. Inflorescentiae vulgo biflorae, bracteis ad 4.5 cm. longis ovato-lanceolatis acutis, floribus magnis albis, calcare sepalisque lateralibus pallide viridibus exceptis. Sepala inaequalia; dorsale late ovatum, 2 cm. longum, 1.6 cm. latum, apice obtusa acutatum; lateralia deflexa ovato-lanceolata valde falcata, 2.7 cm. longa, ad basim 8 mm. lata, acuminata. Petala sepalis lateralibus subsimilia sed 2 cm. vix superantia. Labellum fere 4 cm. longum, integrum, anguste lineari-lanceolatum, basi circ. 6 mm. latum; calcar ad 7 cm. longum cylindricum vix curvatum apice paulo dilatatum. Gynostemium magnum circ. 1.2 cm. altum, vix expansum fere 2 cm. latum, subquadratum; pollinia ovoidea circ. 4 mm. longa, caudiculo circ. 8 mm. longo, glandula magna orbiculari; antherae locelli distantes; rostellum late triangulare; structuram stigmati e materie haud bene siccata non intellego. Ovarium ad 3.5 cm. longum.

"Upper Burma:—Laktang, at 7,000 ft. Epiphyte (?) growing low down and therefore well shaded in the temperate rain-forest. Flowers white, except spur and lower petals (sepals?) which are pale green. A remarkable plant. The two stamens are widely separated by the large stigmatic area at the base of which is the entrance to the long sack-like spur. Honey is secreted at the base of the spur in large quantities. The spur is so long that no insects save butterflies and moths could get at the honey unless they went into the tube. One tube was bitten through at the base, another had a quarter of an inch of honey in it. Not common. Plants always solitary. July 1919." F. Kingdon Ward. No. 3336.

The species recalls *H. pectinata*, D. Don and *H. Susannae*, R. Br. but it has a long simple labellum. It is very different from anything in section *Hologlossae* of Hooker. Its affinities in spite of the form of the lip seem to be with the species mentioned above. In the dried state the outline of the flower resembles the bluntly triangular flattened head of a viper.

Habenaria (Platanthera) oreophila, W. W. Sm. Sp. nov.

Species ex affinitate *P. interruptae*, Maxim. et *P. japonicae*,

Lindl. a quibus inflorescentiis densis, floribus minoribus, petalis diversis inter alia recedit.

Planta ad 35 cm. alta robusta tuberidiis cylindricis crassissimis. Caulis basi squamis 1-2 longiusculis circumdatus. Folia circ. 4 distributa in partem tubulosam vaginantem longam angustata; lamina 8-9 cm. longa, ad 3 cm. lata, elliptica vel lanceolata, breviter acutata; bracteae 3-5 anguste lanceolatae, ad 4.5 cm. longae, acutae. Spica circ. 7.5 cm. longa multiflora densiflora, bracteis floralibus 1-2 cm. longis inferioribus flores superantibus lanceolatis acutiusculis, floribus viridibus. Sepala carnosula paulo inaequalia, dorsale 6 mm. longum late ovatum cucullatum obtusum, lateralia deflexa ovata fere 7 mm. longa, paulo acutata. Petala sepalo dorsali aequilonga triangulari-ovata paulo acutata margine minutissime puberula. Labellum circ. 7 mm. longum integrum lineare carnosum apice acutatum, calcare ad 1.3 cm. longo cylindrico latiusculo apice dilatato paululo curvato quam ovarium fere duplo longiore. Pollinia ovoidea caudiculo aequilongo atque glandula suborbiculari praedita; staminodia auriculaeformia parva; anthera ipsa latiuscula ad medium petalorum attingentia loculis parallelis sejunctis; processus stigmatici nulli; stigma sub rostello triangulari positum.

"West China :—Mountains in the N.E. of the Yangtze bend, Yunnan, in open stony pasture. Lat. 27° 45' N. Alt. 10,000 ft. Plant of 14 inches. Flowers green. July 1913." G. Forrest. No. 10,631.

Habenaria (*Platanthera*) *pugionifera*, W. W. Sm. Sp. nov.

Species affinis *Habenariae Biermannianae*, King et Pantling labello simillimo praedita sed foliis ellipticis obtusis, calcare longo ovarium plus minusve aequante distinguitur.

Planta 40-50 cm. alta tuberidiis anguste cylindricis. Caulis basi squamis 2-3 longiusculis circumdatus. Folia 2-3, in partem vaginantem longam angustata; lamina 8-12 cm. longa, 2.5-4 cm. lata, elliptica, apicē rotundata vel obtusa; bracteae 2-3 lineari-lanceolatae ad 4.5 cm. longae acutatae. Spica ad 11 cm. longa multiflora subdensiflora, bracteis floralibus circ. 1 cm. longis flores subaequantibus lineari-lanceolatis acutis. Sepala paulo inaequalia obtusa, dorsale ovatum 3 mm. longum, lateralia patentia oblonga circ. 4 mm. longa. Petala sepalo dorsali aequilonga anguste oblonga basi latiuscula obtusa. Labellum forma ei *H. Biermannianae* simillimum circ. 4 mm. longum lineari-oblongum basi utrinque denticulis triangularibus patentibus instructum, calcari 7-8 mm. longo ovarium aequante gracili paulo curvato. Pollinia ovoidea caudiculo subaequilongo atque glandula suborbiculari (nuda sed inter valvulas carnosulas posita) praedita; staminodia minima; anthera latiuscula loculis

parallelis sejunctis; fovea stigmatica sub rostello triangulari.

"West China :—At Atuntzu, N.W. Yunnan in forest sub-belt in damp shade. 12-13,000 ft. July 1913." F. Kingdon Ward. Nos. 920, 921.

Habenaria roseotincta, W. W. Sm. Sp. nov.

Species ex affinitate *H. oliganthae*, Hook. f. a qua floribus secundis albis, calcare brevi, inter alia differt; etiam *H. urceolatam*, Clarke (*Diphylacem urceolatam*, Hook. f.) in memoriam revocat sed staminodia singularia ejus speciei omnino desunt.

Planta 7-20 cm. alta gracilis tuberidiis anguste cylindricis. Caulis flexilis basi squamis 1-2 longiusculis praeditus. Folia nunc solitaria multo sub medio cauli orientia, nunc alterum multo minus supra medium additum lanceolatum acutum sub-bracteiforme; folium inferius in partem vaginantem longiusculam angustatum; lamina ad 6 cm. longa, ad 2.5 cm. lata, elliptica apice obtusa apiculata vel nunc acuta; bractae inanes nullae nisi folium superius ita definitum. Spica circ. 5 cm. longa 5-12-flora, floribus approximatis albis roseo-tinctis, bracteis floralibus 6-12 mm. longis lanceolatis acutis inferioribus flores aequantibus vel nunc superantibus. Sepala subaequalia circ. 6 mm. longa, textura tenuia, dorsale lanceolatum acutum, lateralia deflexa lanceolata paululo falcata acuta. Petala 4 mm. paulo superantia, ovato-lanceolata, acuta. Labellum circ. 4.5 mm. longum, lanceolato-linguiforme integrum, sepalis textura firmitus sed vix carnosum acutatum, calcare 3 mm. longo elongato-scratifolmi, ovario circ. 7 mm. longo. Anthera ad medium sepali dorsalis attingens loculis approximatis parallelis, polliniis anguste cylindricis, caudiculis brevibus, glandula minima, canalibus subnullis; staminodia parva ad latera antherae sub-ovata; processus stigmatici breviter oblongi.

"S.E. Tibet :—On Doker-la, Mekong-Salween divide. Tsarong province, in open stony pasture by streams. Lat. 28° 20' N. Alt. 12,000 ft. Plant of 3-9 inches. Flowers white, faintly flushed rose. August 1917." G. Forrest. No. 14,743.

"Upper Burma :—Chimili Ridge, at 12,500 ft. In the fine grass on the actual arête. Flowers white, fragrant. August 1919." R. Farrer. No. 1150.

Habenaria (Platanthera) subulifera, W. W. Sm. Sp. nov.

Species affinis *P. Henryi*, Rolfe et *P. interruptae*, Maxim. a quibus petalis quam sepalis multo angustioribus subuliformibus anthera latissima fere celatis inter alia recognoscitur.

Planta ad 40 cm. alta, habitu *P. Henryi*, tuberidiis anguste cylindricis. Caulis basi squamis 1-2 elongatis circumdatus. Folia plerumque duo subbasalia in partem tubulosam vaginan-

tem angustata; lamina 12-14 cm. longa, 3-3.5 cm. lata, anguste elliptica, apice rotundata vel obtusa; bracteae circ. 3 lineari-lanceolatae vel lineares acutae 2-4.5 cm. longae. Spica ad 10 cm. longa multiflora subluxiflora bracteis floralibus ad 1.5 cm. longis lineari-lanceolatis acutis. Sepala inaequalia; dorsale 6-7 mm. longum, fere 6-7 mm. latum, perlate ovatum, obtusiusculum; lateralia circ. 9 mm. longa, ovata, apice breviter acutata, deflexa. Petala circ. 5.5 mm. longa subuliformia circ. 0.5 mm. lata, basi paulo latiora, inter sepalum dorsale atque antheram fere celata. Labellum ligulatum simplex circ. 1 cm. longum; calcar ovario circ. 1.3 cm. longo dimidium longius valde curvatum. Pollinia ovoidea caudiculo aequilongo atque glandula orbiculari munita; staminodia ovata parva; anthera latissima circ. 4 mm. lata subquadrata loculis bene sejunctis; rostellum triangulare obtusissimum; fovea stigmatica latiuscula.

"West China:—N.W. Yunnan, Mekong-Salween divide. In pine forests. Alt. 10,000 ft. July 1913." F. Kingdon Ward. No. 784.

Habenaria urceolata, Clarke.

Diphylax urceolata, Hook. f.

"S.E. Tibet:—N.W. Yunnan, Doker-la. Alt. 14,000 ft. Under Abies at tree limit. October 1913." F. Kingdon Ward. No. 1136.

"Upper Burma:—Hpimaw pass; 11,000 ft. In the highest alpine woodland in particularly damp cold Rhododendron glades, occasional among the deep moist mosses and Hymenophyllums that clothe their perpetually dripping trunks. Flowers pure white. September 1919." R. Farrer. No. 1314.

Not recorded from Tibet or Burma previously.

Herminium calceoliforme, W. W. Sm. Sp. nov.

Species ex affinitate *H. Duthiei*, Hook. f. et *H. orbicularis*, Hook. f. a quibus labello aurantiaco calceoliformi omnino invertito inter alia differt.

Planta 5-10 cm. alta gracilis tuberidiis tenuissime elongatis. Caulis basi squamis 1-2 circumdatus. Folia 2-3 in dimidio caulis inferiore distributa, ad 3 cm. longa, circ. 4 mm. lata, anguste lanceolata, acuta, longiuscule petiolatim angustata, basi tantum breviter vaginantia; bracteae ad medium caulis 1-2, circ. 5-10 mm. longae lineari-lanceolatae. Spica circ. 1.5 cm. longa, 6-9-flora, bracteis lanceolatis acutis ovarium vel nunc flores aequantibus. Sepala subaequalia textura tenuia late oblonga obtusa circ. 1.5 mm. longa. Petala ovata obtusa 1 mm. longa. Labellum sepalis aequilongum carnosulum calceoliforme in flore evertit dorsale aurantiacum, calcare brevissime saccato. Gy-

nostemium brevissimum ad medium petalorum attingens ovatum locellis antherae angustis subparallelis, polliniis anguste cylindricis caudiculo brevioribus atque glandula minuta praeditis; staminodia parvula sed distincta. Ovarium cum pedicello brevi 3 mm. longum.

"West China :—Kari Pass, Mekong-Yangtze divide, Yunnan, in open stony pasture. Lat. $27^{\circ} 40'$ N. Alt. 10,000 ft. Plant of 2-4 inches. Flowers fragrant, tipped dull orange. August 1914." G. Forrest. No. 13,110.

Herpysma longicaulis, Lindl.

"West China :—Western flank of the Shweli-Salween divide, Yunnan, on humus-covered boulders in shady forests. Lat. $25^{\circ} 20'$ N. Alt. 7-8,000 ft. Plant of 12-18 inches. Flowers yellow. November 1912." G. Forrest. No. 9378.

Not previously recorded from China.

Ione scariosa, King et Pantling.

Sunipia scariosa, Lindl.

"West China :—Shweli Valley, Yunnan, on trees and rocks. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 12-16 inches. Flowers yellowish? June 1912." G. Forrest. No. 8305.

Not recorded hitherto from China.

Kingiella taenialis, Rolfe.

Doritis taenialis, Benth. : *Aerides taeniale*, Lindl.

"West China :—Shweli-Salween divide, Yunnan, epiphytic on rocks and trees. Lat. $25^{\circ} 30'$ N. Alt. 6-7,000 ft. Plant of 6-9 inches. Flowers white and lake-purple. June 1918." G. Forrest. No. 17,543.

"Also Shweli Valley at 8,000-ft. August 1917." G. Forrest. No. 15,794.

Not previously recorded from China.

Liparis malleiformis, W. W. Sm. Sp. nov.

Species cum magnitudine habituque *L. longipedis*, Lindl. a qua bulbo brevi, labello omnino diverso differt.

Pseudobulbi approximati 3-3.5 cm. longi, anguste ovoidei. Folia plerumque duo, anguste oblanceolato-oblonga, circ. 25 cm. longa, ad 2.5 cm. lata, acuta vel acuminata, longe petiolatim angustata. Scapus erectus, folia aequans vel paululo longior; pars florifera circ. 10 cm. longa multiflora; pedunculus ebracteatus latissime alatus. Bractee florales 5-9 mm. longae ovaria pedicellata aequantes. Flores mediocres flavi fragrant. Sep-

ala circ. 4 mm. longa lineari-oblonga, acutiuscula. Petala sepalis subaequilongia linearia. Labellum e basi cuneata in laminam submalleiformem expansum circ. 3.5 mm. longum sed 5 mm. latum antice breviter mucronatum, a medio decursum, callis obsoletis. Columna circ. 3 mm. longa leviter curvata. Fructus circ. 8 mm. longus obovoideus.

"West China :—Shweli-Salween divide, Yunnan, on boulders in open situations. Lat. $25^{\circ} 30'$ N. Alt. 7–8,000 ft. Plant of 9–14 inches. Flowers yellow, fragrant. August 1918." G. Forrest. No. 17,679.

Apparently the same is Henry No. 11,820A in Herb. Edin. from Mengtze at 5,000 ft.

Liparis Parishii, Hook. f.

"West China :—South end of Tengyueh Valley, Yunnan, in dry open pasture. Lat. 25° N. Alt. 6,000 ft. Plant of 6–16 inches. Petals, sepals, and labellum deep chocolate-maroon, rostellum orange-yellow. July 1912." G. Forrest. No. 8829.

"Western flank of the Tali Range, in shady situations in mixed forests. Lat. $25^{\circ} 40'$ N. Alt. 10,000 ft. Plant of 1–2 ft. Flowers deep crimson and yellow. September 1913." G. Forrest. No. 11,559.

Not recorded from China.

Listera flabellata, W. W. Sm. Sp. nov.

Species tantum cum *L. dentata*, King et Pantling comparanda a qua labello diverso recognoscitur.

Quoad habitum atque magnitudinem speciei citatae persimilis. Folia similiter. Inflorescentia brevior flexilis. Rachis puberula atque bracteae eis socii subsimiles. Flores parvi virides. Labellum flabelliforme circ. 3.5 mm. diametro textura tenuissimum, margine dentato-pectinatum, dentibus in cilia longa excurrentibus, lamina nervulis conspicuis in dentes abeuntibus flabellatim pererrata; in *L. dentata* labellum carnosum reniforme linea mediana incrassata praeditum.

"Upper Burma :—Valley of the Chawng-maw-hka, at 8,000 ft. Flowers green. Amongst undergrowth on steep slopes beneath bamboos. July 1919." F. Kingdon Ward. No. 3414.

Listera micrantha, Lindl.

"Upper Burma :—Western spur of Imaw Bum. Alt. 10,000 ft. Rooted in humus amongst the scanty undergrowth of the Conifer forest. Flowers white. July 1919." F. Kingdon Ward. No. 3359.

Not previously recorded from Burma.

Listera pinetorum, Lindl. var.

Floribus ex collectore albidis a typo discrepat.

"Upper Burma :—Feng-shui-ling camp, 7-8,000 ft., in rain forest undergrowth, in deep shade on wet banks. Flowers white, labellum with dark green stripe down the centre. June 1914." F. Kingdon Ward. No. 1652.

Listera pinetorum, Lindl. var.

Columna brevissima a typo recedit.

"Upper Burma :—Feng-shui-ling camp, 7-8,000 ft., on mossy banks by streams or amongst shorter undergrowth in rain forest. Flowers green. June 1914." F. Kingdon Ward. No. 1631.

These two orchids are closely allied to *L. pinetorum*, Lindl., *L. longicaulis*, King et Pantling, and *L. Wardii*, Rolfe. They come nearest to the first and show but slight variation from that species which does not appear to have been previously recorded from Burma.

Listera unguiculata, W. W. Sm. Sp. nov.

Species affinis *L. dentatae*, King et Pantling; labello dentato-pectinato congruit sed labello ipso ad medium in lobos late falcatos diviso differt.

Planta 20-40 cm. alta. Caulis sub foliis glaber ad 10 cm. altus. Folia duo opposita, cordata, obtusiuscula, circ. 3 cm. longa, circ. 2 cm. lata. Pedunculus 8-12 cm. longus bracteis raris ornatus furfuraceo-pubescent. Racemus 5-15 cm. longus 10-25-florus rhachi furfuraceo-pubescente; pedicelli 2-5 mm. longi; bractee floriferae lanceolatae circ. 2 mm. longae. Flores virides. Sepala subaequalia ovato-lanceolata. Petala lanceolata circ. 2 mm. longa. Labellum circ. 6 mm. longum, 5 mm. latum, ambitu obovatum, ad medium fissum in lobos late falcatos margine dentato-pectinatos; unguis medio dentibus duobus patentibus triangularibus 1 mm. longis notatus; discus linea media incrassata pererratus; sinus inter lobos ambitu obovatus. Ovarium 2 mm. longum. Columna circ. 1 mm. longa.

"Upper Burma :—Hpimaw pass, in deep forest shade where there is little undergrowth at 10-11,000 ft. Flowers green. August 1914." F. Kingdon Ward. No. 1875.

"Upper Burma :—Laktang, in thin bamboo forest, growing on steep banks at 8-9,000 ft. Flowers pale green, column cream. July 1919." F. Kingdon Ward. No. 3350.

This species is well distinguished by the remarkable labellum shaped like a pair of pincers.

Microstylis khasiana, Hook. f.

"West China :—Divide between the Shweli and Tengyueh valleys, in thickets and rocky shady situations. Lat. 25° 10' N. Alt. 6-7,000 ft. Plant of 4-8 inches. Flowers deep purple-lake. July 1912." G. Forrest. No. 8627.

New to China.

Odontochilus yunnanensis, Rolfe.

"Upper Burma :—Laking-hka valley, in limestone gorges, on wet shady banks under shrubs and trees. Alt. 4-5,000 ft. Flowers canary-yellow. 1914." F. Kingdon Ward. Nos. 1886, 1922.

New to Burma.

Orchis Wardii, W. W. Sm. Sp. nov.

Species ex affinitate *O. spathulatae*, Reichb. f. atque rhizomate elongato similiter munita; habitu multo robustiore, foliis haud longe petiolatis vulgo duobus evolutis labello omnino diverso notata.

Planta ad 23 cm. alta. Rhizoma validum elongatum horizontaliter repens. Caulis vaginis tubulosis 1-2 obtusis basi praeditus bifolius. Folia in partem petiolarem vix discretam caulem amplectantem angustata; lamina 11-14 cm. longa, ad 5.5 cm. lata, late elliptica, apice rotundata vel breviter acutata. Spica circ. 3 cm. longa plerumque 5-6-flora; bracteae inferiores fere 4 cm. longae supra decrescentes floribus multo longiores. Sepala subaequalia 8-9 mm. longa maculis purpureis notata; lateralia falcato-ovata obtusiuscula; dorsale ovatum cucullatum subobtusum. Petala circ. 7 mm. longa ovato-lanceolata apice obtusa. Labellum sepalis aequilongum ovatum apice obtuse angustatum, marginibus valde erosum atque corrugatum, vix trilobum, minutissime papillatum; calcar ovario paulo brevius cylindricum fere rectum. Pollinia anguste pyriformia, caudiculis brevibus, glandulis parvis in bursa rostellari celatis; staminodia parva; stigmata in fovea coalita.

"West China :—At Atuntzu and Doker-la on the Tibetan frontier, Yunnan. Alt. 11,000 ft. On open screes. June 1913." F. Kingdon Ward. Nos 447, 589.

Oreorchis discigera, W. W. Sm. Sp. nov.

Ex affinitate *O. micranthae*, Lindl. a qua structura labello longe recedit; etiam affinis *O. Rolfei*, Duthie sed foliis solitariis, disco labelli majore differt.

Pseudobulbus circ. 2 cm. longus, ovoideus, basi fibrosus. Folia solitaria, lineari-lanceolata, ad 30 cm. longa, ad 2.5 cm.

lata, multinervia, infra petiolatim angustata; basi vaginata. Scapus ad 25 cm. altus, a latere pseudobulbi oriens, vaginis elongatis 2-3 praeditus; pars florifera 4-6 cm. longa, circ. 15-flora; bracteae circ. 5 mm. longae fere ad summum ovarium pertinentes lineari-lanceolatae acutissimae. Flores cum pedicello circ. 1 cm. longi. Sepala lateralalia circ. 6 mm. longa, falcato-ovata, acutiuscula; dorsale lanceolatum, circ. 7 mm. longum, lateralibus angustius, acutum. Petala fere 6 mm. longa sepalis lateralibus subsimilia, viridi-brunnea, intus purpureo-striata. Labellum circ. 5 mm. longum, trilobum, brevissime unguiculatum, album, purpureo-maculatum, lobis lateralibus parvis auriculaeformibus, intermedio obovato apice obscure lobulato ad basin disco magno bivalviconchiformi praedito; calcar nullum. Columna circ. 4 mm. longa, curvata, basi dilatata et concava; pollinia 4.

"Upper Burma:—At Feng-shui-ling; terrestrial orchid amongst rank undergrowth on a bank in bamboo forest (rain forest) at 8-9,000 ft. Flowers greenish-brown, petals striped with purple inside, labellum white, mottled with purple. June 1914." F. Kingdon Ward. No. 1640.

A species well distinguished from all but *O. Rolfei*, Duthie by the peculiar disc on the labellum. The disc resembles an open bivalve shell.

Otochilus alba, Lindl.

"West China:—In the Shweli Valley, Yunnan, on cliffs and boulders. Lat. 24° 42' N. Alt 6,000 ft. Epiphytic plant of 9-14 inches. Flowers white, tinged orange at base. February 1918." G. Forrest. No. 16,168.

"Also on hills east of Tengyueh. Lat. 25° N. Alt. 7-8,000 ft. January 1913." G. Forrest. No. 9493.

New to China.

Otochilus Forrestii, W. W. Sm. Sp. nov.

Species affinis *O. porrectae*, Lindl. a quo sepalis latiusculis, labelli lobis lateralibus ad medium gynostemium attingentibus haud acutis, lobo intermedio late elliptico divergit.

Pseudobulbus in specimine aliquatenus manco circ. 3 cm. longus, 1.2 cm. latus, diphyllus. Folia in petiolum 1-2 cm. longum attenuata, in spec. nostro 11 cm. longa, circ. 2 cm. lata, lanceolata, acutata, nervis quinque (quam aliis indistinctis) magis conspicuis. Racemus proteranthus flexuosus circ. 8-florus foliis brevior. Bracteae cito deciduae non visae. Sepalum dorsale oblongum circ. 14 mm. longum 4 mm. latum, apice acutatum; lateralalia dorsali similia subfalcata. Petala sepalis aequilonga, linearia, 1 mm. lata, acuta, patentia. Labellum

basi saccatum; lobi laterales ad medium gynostemium attingentes, falcato-oblongi, obtusiusculi circ. 6 mm. longi; lobus intermedius late ellipticus, 8 mm. longus, 5-5.5 mm. latus, apice abrupte acutatus. Gynostemium circ. 12 mm. longum.

"West China:—Hills to the east of Tengyueh, Yunnan, on rocks in side valleys. Lat. 25° N. Alt. 7-8,000 ft. Epiphytic plant of 2-4 ft. Sepals white, tinged dull orange exterior; petals white; rostellum and labellum dull apricot-orange. December 1912." G. Forrest. No. 9371.

This species is closely akin to *O. porrecta*, Lindl. but the latter differs widely in the structure of the lip. See King and Pantling in Annal. Roy. Bot. Gard. Calc. viii, 142, t. 198. The measurements given by Kränzlin in Pflanzenreich—Orchidaceae—Coelogyninae p. 162 accord however poorly with Pantling's figure already cited.

Phajus sp.

Species ex affinitate *P. maculati*, Lindl.; quoad columnam villosulam cum ea specie congruit sed bracteis multo minoribus, floribus laxioribus sepalis minoribus, pedicellis longioribus, fructu haud globoso-ovoideo recedit.

Pseudobulbi non visi. Folia 20-30 cm. longa, circ. 6 cm. lata, lanceolata, apice acuminata, basi petiolatim angustata, in sicco papyracea, plicata, utrinque glabra. Scapus saltem 30 cm. altus multiflorus; bractea circ. 1 cm. longae plus minusve oblongae concavae obtusiusculae pedicellos subaequantibus ovario multo breviores. Flores flavi. Sepala 2.3-2.5 cm. longa, circ. 1 cm. lata, oblonga, obtusa. Petala subsimilia angustiora. Labellum sepalis subaequale lobis lateralibus angustis intermedio ei *P. maculati* subsimili; calcar 1 cm. longum subacutum. Columna crassa 1.5 cm. alta parte anteriore villosula. Ovarium 2-2.5 cm. longum costatum.

"Upper Burma:—In the Naung-Chaung Valley at 6-7,000 ft.; growing in clumps on leafy soil; on shale rock by steep cliffs in forest, deep shade and damp. Flowers yellow, labellum fringed with brown. July 1914." F. Kingdon Ward. No. 1739.

The hairy column and yellow flowers distinguish this species from all those of the area except *P. maculata*, Lindl. The material is unfortunately somewhat scanty and does not permit of a completely adequate analysis. If not an abnormal form of *P. maculata*, it is a new species.

Pholidota articulata, Lindl.

"West China:—Flank of volcanic mountain to the north-west of Tengyueh, Yunnan, on rocks. Lat. 25° 10' N. Alt. 6-7,000

ft. Epiphytic plant of 6-8 inches. Sepals and petals pinkish-rose; labellum the same, with a deeper shade of orange-pink down centre towards base; fragrant. June 1912." G. Forrest. Nos. 8304, 8320.

"Shweli Valley. Lat. 25° N. Alt. 6,000 ft. Flowers pinkish-orange. July 1912." G. Forrest. Nos. 8817, 18,586. New to China.

Pholidota Convallariae, Hook. f.

"West China :—Lava bed west of Tengyueh, Yunnan, on rocks. Lat. 25° N. Alt. 5,000 ft. Plant of 9-15 inches. Flowers creamy-white, fragrant. May 1912." G. Forrest. No. 7799.

New to China.

Pholidota imbricata, Lindl.

"West China :—Yung-peh mountains, Yunnan, on trees and cliffs. Lat. $26^{\circ} 42'$ N. Alt. 8-9,000 ft. Epiphytic plant of 6-9 inches. In fruit. September 1918." G. Forrest. No. 17,149.

Apparently not recorded from China.

Pholidota sp.

Species affinis *Ph. calceatae*, Reichb. f. et *Ph. Convallariae*, Hook. f. et *Ph. yunnanensi*, Rolfe a quibus labello 4 mm. longo bilobo lobis rotundatis apice emarginato distingui videtur.

"Upper Burma :—Salween Valley above Kunatong, 5-7,000 ft. Small tuberous orchid on trees and rocks. January 3rd, 1914." F. Kingdon Ward.

This appears to be a distinct species but the material is scarcely adequate for description.

Pleione scopulorum, W. W. Sm. Sp. nov.

Species affinis *P. Hookerianae*, (Lindl.) T. Moore a qua pseudobulbis diphyllis inter alia distinguitur; foliis synanthis, labello 7-fimbriato-nervoso, antice minute erosodenticulato appropinquat.

Pseudobulbi ovati circ. 1.5 cm. longi, fere 1 cm. crassi, annulo parvo praediti, diphylli. Folia ad 15 cm. longa, circ. 1.5-2 cm. lata, lanceolata, breviter acuminata, basi longe petiolatim angustata, in sicco membranacea, multinervia, nervis tribus tantum prominentibus. Scapus foliis fere omnino evolutis synanthus et ea subaequans, erectus, uniflorus, basi vaginis tubulosis membranaceis tandem in fibras parallelas solutis circumdatus;

bractea anguste obovata vel suboblunga, obtusa, circ. 2 cm. longa, vix ad summum ovarium attingens. Flos subnutans laete roseus. Sepala anguste ovata, circ. 2.5 cm. longa, 9 mm. lata, acuta. Petala sepalis aequilonga, oblonga, acutiuscula, vix angustiora. Labellum e basi latissime truncata obscure trilobum, lobis lateralibus rotundatis medio truncato, circ. 2.5 cm. longum, ad 3 cm. latum, antice eroso-denticulatum, nervis mediis 7 fimbriatis. Columna 1.7 cm. alta.

"West China :—Mekong-Salween divide, Yunnan, on ledges of cliffs and humus-covered boulders in shady situations. Lat. 28° 12' N. Alt. 9,000 ft. Plant of 6-9 inches. Flowers bright scarlet-rose, labellum darkest. July 1917." G. Forrest. No. 14,230.

Risleya atropurpurea, King et Pantling.

"Upper Burma :—Ridge of Naung-Chaung, Nwai divide, on granite ridge about 10,000 ft. In deep shade of bamboo forest in damp leafy soil. Flowers dark green, almost black. July 1914." F. Kingdon Ward. No. 1780.

A rare monotypic genus previously recorded from the Sikkim Himalaya at 13,000 ft.

Saccolabium acutifolium, Lindl.

"West China :—Hills to the north of Tengyueh, Yunnan, on rocks in pine forest. Lat. 25° 15' N. Alt. 7,000 ft. Epiphytic plant of 6-12 inches. Corolla fleshy; petals and sepals dull deep olive-yellow with large blotches of crimson-lake. Labellum deeply pouched, saccate, with similar markings, lighter coloured and fringed round margin. May 1912." G. Forrest. No. 8549.

"Shweli Valley, Yunnan, in open situations on trees. Lat. 25° 20' N. Alt. 6,000 ft. Epiphytic plant of 6-8 inches. Flowers yellow, spotted deep purple; fragrant. August 1917." G. Forrest. No. 15,906.

New to China.

Saccolabium gemmatum, Lindl.

"Upper Burma :—Htawgaw, valley of Naung-Chaung, Lashi country, at 5,000 ft., forming dense matted tufts in trees (alders). Flowers purple, petals cream-tipped. May 1914." F. Kingdon Ward. No. 1556.

Apparently new to Burma.

Sarcanthus pallidus, Lindl.

"West China :—Lava bed west of Tengyueh, Yunnan, in open situations on lava rocks. Lat. 25° N. Alt. 4-4500 ft. Epi-

phytic plant of 2 ft. Flowers, sepals and petals deep purple-maroon; labellum white, flushed purple. August 1919." G. Forrest. No. 18,284.

"Szemao, Yunnan, East mountains, at 6,000 ft.; on cliffs." A. Henry. No. 13,080.
New to China.

Sarcopodium fuscescens, Lindl.

"West China :—Hills to the north of Tengyueh, Yunnan, on rocks. Lat. $25^{\circ} 10' N$. Alt. 7,000 ft. Epiphytic plant of 6–12 inches. Flowers dull yellow, labellum deep lake. July 1912." G. Forrest. No. 9047.

New to China.

Sarcopodium rotundatum, Lindl.

"West China :—Lava bed to west of Tengyueh, Yunnan, epiphytic on rocks. Lat. $25^{\circ} N$. Alt. 5,000 ft. Plant of 6–12 inches. Sepals and petals dull olive-yellow, slightly veined rose on exterior; rostellum yellowish-white; labellum yellowish-white with a margin of deep crimson-lake; fragrant. May 1912." G. Forrest. No. 7770.

"Shweli Valley, Yunnan, on trees in shady situations. Lat. $25^{\circ} N$. Alt. 5–6,000 ft. Epiphytic plant of 6–9 inches. In fruit. May 1912." G. Forrest. No. 8043.

"Shweli-Salween divide, Yunnan, on rocks and trees. Lat. $25^{\circ} N$. Alt. 9,000 ft. Epiphytic plant of 2–3 ft. Flowers olive-yellow and brown with maroon markings, fragrant. April 1914." G. Forrest. No. 12,366.

"Shweli Valley. Lat. $25^{\circ} 40' N$. Alt. 5–6,000 ft. Creeping epiphytic plant of several feet. Sepals and petals creamy-white, labellum slightly margined and marked brown. July 1919." G. Forrest. No. 18,120.

New to China.

Stauroopsis polyantha, W. W. Sm. Sp. nov.

Species affinis *S. undulatae*, Benth. a quo inflorescentiis elongatis multifloris nunc ramosis, floribus fere duplo majoribus differt; *S. shanica*, Phillimore et W. W. Sm. etiam affinis caulem laevem racemumque pauciflorum habet.

Caulis ad 60 cm. longus ut in *S. undulata* verruculosus. Folia plerumque 10–11 cm. longa, 1.5–2.5 cm. lata, oblonga, obtusa, inaequaliter retusa, basi vix angustata. Pedunculi foliis oppositi vel alterni, 10–25 cm. longi, validi, rigidi, bracteis vaginiformibus remotis instructi. Racemi ad 30 cm. longi, nunc basi ramosi, multiflori, bracteis ovatis obtusis cucullatis 5–10 mm. longis muniti. Flores circ. 6–7 cm. diametro albi roseo-

suffusi vel flavido-brunneo-maculati vel ad labellum violaceo-purpurei. Sepala petalaeque ad 3.5 cm. longa, oblanceolata, apice acutata, reflexa, marginibus undulatis. Labellum fere 2 cm. longum, basi columnae adnatum; hypochili auriculae rotundatae columnam amplexantes; pars labelli adaxialis cymbiformis, pars abaxialis latere compressa carnosa submalleiformis. Columna brevis.

"Upper Burma:—Kachin Hills; 3,000 ft.; epiphytic in forest. April 1913." F. Kingdon Ward. No. 207.

"West China:—Shweli Valley, Yunnan, on trees. Lat. $25^{\circ} 20'$ N. Alt. 6,000 ft. Epiphytic plant of 1-2 ft. Flowers white with yellow-brown markings, flushed rose exterior; fragrant. May 1913." G. Forrest. No. 12,039.

"Upper Burma:—Taping Valley, on trees in jungle. Lat. $24^{\circ} 30'$ N. Alt. 2,500 ft. Epiphytic plant of 2 ft. Flowers white, flushed rose exterior. April 1917." G. Forrest. No. 13,729.

"West China:—Shweli Valley, Yunnan, on trees. Lat. $25^{\circ} 20'$ N. Alt. 6-7,000 ft. Epiphytic plant of 2 ft. Flowers white with labellum violet-purple; fragrant. June 1917." G. Forrest. No. 15,806, 17,973.

Tainia minor, Hook. f.

"West China:—Shweli-Salween divide, Yunnan, in shady situations on the margins of thickets. Lat. $25^{\circ} 10'$ N. Alt. 7,000 ft. Plant of 12-16 inches. Flowers yellow. August 1918." G. Forrest. No. 17,652.

New to China.

"Upper Burma:—Laktang; 7-8,000 ft. Outer perianth lobes dull brownish-yellow, with fine stripes. Lip bright yellow. Flowers nodding. In rain forest, growing in leaf-mould in deep shade. June 1919." F. Kingdon Ward. No. 3229.

Apparently not recorded for Burma.

Vanda Bensoni, Veitch et Reichb. f.

"West China:—On the outskirts of the lava-bed west of Tengyueh, Yunnan, on trees. Lat. 25° N. Alt. 5,000 ft. Epiphytic plant of 12-14 inches. Flowers thick, fleshy and fragrant. Ground colour of sepals and petals dull olive-yellow, irregularly veined and netted purplish-lake; labellum a darker shade. Rostellum similar. May 1912." G. Forrest. No. 7665. March 1913. No. 9728.

Not previously recorded from China.

Zeuxine affinis, Benth.

"West China:—Shweli-Salween divide, Yunnan, in open situations on the margins of bamboo brakes. Lat. $25^{\circ} 30'$ N.

Alt. 8,000 ft. Plant of 4-8 inches. Flowers bright orange-yellow. August 1913." G. Forrest. No. 11,914.

Apparently new to China.

Zeuxine inverta, W. W. Sm. Sp. nov.

Species anomala; structura floris cum *Zeuxine* satis quadrat sed flos resupinatus; folia in hac specie ad squamas reducta.

Planta 7-15 cm. longa, 2 mm. crassa, erecta, glabra, rhizomate elongato pauci- et brevi-ramoso circ. 2 mm. crasso. Caulis squamis amplexicaulibus 6-9 membranaceis 5-7 mm. longis plus minusve approximatis (vaginis foliorum in *Zeuxine* normalium subsimilibus) bene praeditus et interdum subcelatus. Spica circ. 2.5 cm. longa, 5-7-flora, glabra; bracteae 8-9 mm. longae, ovato-lanceolatae, membranaceae; flores resupinati 13-14 mm. longi aurantiaci. Sepala lateralialia falcato-ovata, obtusa, circ. 6 mm. longa; sepalum dorsale multo minus circ. 4 mm. longum obtusum cum petalis cohaerens concavum. Petala lineari-lanceolata, falcata, circ. 4 mm. longa, acuta. Labellum columnae adnatum sepala paululo excedens apice circ. 4 mm. latum; unguis circ. 3 mm. longus angustatus marginibus erectis integris; lobus terminalis bilobulus segmentis divaricatis subrotundis margine irregulariter erosulis; saccus basalis brevissimus callis duobus praeditus. Columna brevis bialata; stigmata duo lateralialia; anthera ovata acuta. Ovarium circ. 9 mm. longum glabrum.

"West China :—Hills to the north-west of Têngyueh, Yunnan, in shady situations amongst rhododendrons. Lat. 25° N. Alt. 7,000 ft. Plant of 3-6 inches. Flowers orange. July 1912." G. Forrest. No. 8551.

A very peculiar plant. The flowers are resupinate—the labellum forming a kind of hood over the flower. The form of the labellum is quite that of *Zeuxine* and not of *Hetaeria* which has a superior lip.

Zeuxine nervosa, Benth.

"West China :—Tali Range, Yunnan, in shady situations amongst scrub. Lat. 25° 40' N. Alt. 11,000 ft. Plant of 9-14 inches. Flowers green. May 1914." G. Forrest. No. 12,382.

Not recorded from China.

Zeuxine pumila, King et Pantling.

"Upper Burma :—Naung Chaung Valley, at 8-9,000 ft., on leaf mould in deep shade of forest. Flowers white. 1914." F. Kingdon Ward. No. 1722.

New to Burma.