Some New Plants from Japanese Mountains.

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With Plate CXLV.

THE new plants described here—of which specimens are deposited in the Herbarium of the Royal Botanic Garden, Edinburgh—were mostly collected on the mountain-group of Yûparo-dake, in the Island of Yezo. These mountains, which are of palaeozoic formation and of considerable height, reaching some 6000 ft. from sea-level, had hardly been explored from the botanical point of view until Mr. H. Yanagisawa made ascents in 1912 and again in the following year.* His collection is excellent, and contains a number of plants of great interest. Amongst others, I may perhaps mention the occurrence of the following plants which have either not been known from Yezo, or are really worth recording :—

Alsine arctica, Fenzl.
A. verna, Bartl., var. *borealis*, Fenzl.
Anemone narcissiflora, Linn., var. *villosissima*, DC.
A. Taraoi, Takeda, var. *nipponica*, Takeda, in Journ. Bot., 1910, p. 226.
Angelica multisecta, Maxim.
Arcterica nana, Makino, in Tôkyô Bot. Mag., 1906, p. 85.
Arenaria Katoana, Makino, ibid., 1905, p. 88.
Arnica unalaschkensis, Less.
Artemisia norvegica, Fries.
Bryanthus Gmelini, D. Don.
Bupleurum longifolium, Linn., var. *aureum*, Wolf, subvar. *brevi-involucratum*, Wolf; cf. Takeda, in Tôkyô Bot. Mag., 1910, p. 177; and Journ. Linn. Soc. xlii (1914), p. 467.
B. triradiatum, Adams.

* Mr. T. Ishikawa made an ascent in 1896 and did some plant-collecting, although that was not his object.

[Notes, R.B.G., Edin., No. XXXIX, Jan. 1915.] A
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Calamagrostis urelytra, Hack., var. *parvigluma*, Takeda, Tôkyô Bot. Mag., 1910, p. 37.
Carex flavocuspis, Fr. et Sav.
C. hakkodensis, Franch.
Draba japonica, Maxim.
Dryas octopetala, Linn.
Gentiana Kawakamii, Makino.
G. nipponica, Maxim.
Hedysarum obscurum, Linn., var. *neglectum*, Trautv.
Hierochloë alpina, Roem. et Schult.
Lactuca dentata, Makino, var. *alpicola*, Makino, ibid., 1913, p. 29.
Lagotis glauca, Gaertn.
Macropodium pterospermum, Fr. Schm.
Mertensia rivularis, DC., var. *japonica*, Takeda.
Microstylis monophyllos, Lindl.
Patrinia sibirica, Juss.
Peucedanum multivittatum, Maxim.; cf. Takeda, ibid., 1910, p. 177.
Phyllodoce nipponica, Makino, ibid., 1905, p. 131.
Platanthera Makinoi, Yabe; cf. Takeda, l.c., p. 136.
P. Takedai, Makino, ibid., 1903, p. 120.
Polygonum polymorphum, Ledeb., var. *ajanense*, Rgl. et Til. forma *glabrescens*, Takeda, l.c., p. 176.
Polypodium lineare, Thumb., var. *ussuriense*, C. Chr. (=*P. coraiense*, Christ).
Primula yuparensis, Takeda, in Notes Roy. Bot. Gard., Edin., xxxvii (1913), p. 94, tab. xxv.
Sanguisorba canadensis, Linn., var. *media*, Maxim.
Stellaria florida, Fisch., var. *angustifolia*, Maxim.; cf. Takeda, in Tôkyô Bot. Mag., 1910, p. 12.
Swertia perennis, Linn.
Thlaspi japonicum, Boiss.
Tofieldia Okuboi, Makino; cf. Takeda, in Tôkyô Bot. Mag., 1910, p. 317.
Triselum subspicatum, Beauv.
Veronica Schmidtiana, Rgl. α *typica*, Makino; cf. Takeda, in Journ. Linn. Soc. xlii (1914), p. 481.
V. serpyllifolia, Linn.
Viola crassa, Makino.
Woodsia ilvensis, R. Br.

Mt. Arakawadake, on which my new *Astragalus* was found, is of palaeozoic rock, and is nearly 10,000 ft. in altitude.* This is one of the most interesting mountains in Central Japan, but as yet has been explored very little indeed. In its alpine

* According to the latest survey, 9994 feet.

and subalpine regions one sees, among others, the following interesting plants :—

Alsine arctica, Fenzl.
Arctous alpina, Nied.
Campanula pilosa, Pall., var. *dasyantha*, Herd.
Cryptogramma Stelleri, Prantl.
Draba Sakuraii, Makino, var.
Lloydia alpina, Salisb.
Macropodium pterospermum, Fr. Schm.
Oxyria digyna, Hill.
Pedicularis verticillata, Linn.
Polystichum lachenense, Bedd.; cf. Makino, ibid., 1904, p. 16.
Potentilla Matsumurae, Th. Wolf.
Rubus pseudo-japonicus, Koidz.
? *Salix Nakamurana*, Koidz., in Tôkyô Bot. Mag., 1913, p. 96; et in Matsum. Icon. Koishikaw., vol. i, sub tab. 75, Sept. 1913.
Saussurea kai-montana, Takeda, forma *minor*, Takeda.
Saxifraga bronchialis, Linn.
S. bronchialis, Linn., var. *cherlerioides*, Engl.
Sibbaldia procumbens, Linn.
Veronica Stelleri, Pall.

The flora of Mt. Maëdake, on which I found the form of *Silene Keiskei* with pure white flower, is very little known. This gigantic mountain, of a little less than 10,000 ft. in height,* and also of palaeozoic rocks, is situated not very far from the one above mentioned. Its summit is densely covered with the straggling *Pinus pumila*, as in most cases in the high mountains of Central and Northern Japan. In the alpine region one comes across such plants as follows :—

Adenophora Lamarckii, Fisch.
Alsine arctica, Fenzl.
Arcterica nana, Makino.
Arctous alpina, Nied.
Campanula pilosa, Pall., var. *dasyantha*, Herd.
Cnidium Tachiroei, Makino.
Cornus canadensis, Linn.
Diapensia lapponica, Linn., var. *obovata*, Fr. Schm.
Draba Sakuraii, Makino, var.
Empetrum nigrum, Linn.
Euphrasia Matsumurae, Nakai.
Gentiana algida, Pall., var. *sibirica*, Kusnez.
Hedysarum esculentum, Ledeb.
Loiseleuria procumbens, Desv.

* 9940 feet.

Oxytropis japonica, Maxim.
Phyllodoce aleutica, Makino, ibid., 1905, p. 134.
P. nipponica, Makino.
Potentilla Matsumurae, Th. Wolf.
Saussurea kai-montana, Takeda, forma *minor*, Takeda.
Saxifraga bronchialis, Linn., var. *cherlerioides*, Engl.
Tofieldia Okuboi, Makino.

It may be of some interest to mention here, *à propos*, that in Japan the same species of plants are very frequently found on mountains of different rocks quite irrespective of chemical nature of soil. Their distribution seems to me largely to depend on the physical conditions of the locality. For example, *Dryas octopetala* grows on mountains of palaeozoic rock, of granite, or of andesite.

I may also mention here that most of the plants found on the high mountains of Hontô, or the main island of Japan, are of arctic character, and they are distributed over Yezo and the Kuriles, and some are also in Sakhalien. But, on the whole, the alpine flora of Central and Northern Japan has more intimate relationship to that of the Kuriles than that of Sakhalien. This fact probably indicates that La Pérouse Strait was formed earlier than Tsugaru Strait. It was first put forward by Blakiston * that Tsugaru Strait forms a decided line of demarcation of the faunas of Hontô and Yezo. It appears to me, however, that, botanically speaking, La Pérouse Strait is the primary, and Tsugaru Strait the secondary line of demarcation.†

Aconitum yuparense, Takeda (figs. 1–4).

Tuber napiforme, fuscum. *Caulis* elatus, bipedalis, rectus, superne flexuosus et pilis albis crispulis hirsutus. *Folia* inferiora longe-petiolata, superiora brevi-petiolata, petiolo ciliato, omnia 5-palmati-partita, basi cordata, margine ciliata, lobis late ovalibus ternato-trifidis, laciniis plus minus divergentibus, lanceolatis linearilanceolatisve, media et superiora aperte cordata, suprema minus laciniata, utrinque ad nervos pilis albis pubescentia. *Inflorescentia* racemosa, racemis terminalibus et axillaribus. *Racemus* abbreviatus, densus, subcorymbiformis, 4–5-florus, rectiusculus. *Pedunculi* erecti, 1.5–2.5 cm. longi, pube alba hirti; bracteae superiores palmati-partitae, majusculae pedunculo longiores; bracteolae infra medium suboppositae, lanceolatae. *Flores* magni, 4.5 cm. longi, teneri, extus tenuiter pubescentes, intense violacei; *galea* ampliato-fornicata, 3 cm. longa, dorso subaequaliter parabolica, antice breviter rostrata;

* Blakiston, Zoological Indications of Ancient Connection of the Japan Islands with the Continent, in Trans. As. Soc. Japan, xi (1883), pp. 126–140.

† Cf. Takeda, The Flora of the Island of Shikotan, in Journ. Linn. Soc., xlii (1914): in particular, pp. 445–446.

sepala media ampla, 2 cm. longa lataque, intus longe pilosula ; *sepala inferiora* elliptica, obtusa vel acutata, circa 2 cm. longa, 1 cm. lata ; *nectaria* cum ungui gracili, apice curvato, glabro, fere 3 cm. longa, cuculo permagno, elongato, supino, calcare arcuato, apice rotundato, labio dilatato, emarginato. *Staminum* filamenta lanceolata, supra medium bidentata, exinde subfiliformia, pilosa, antheris rotundatis fuscis. *Carpella* 4, pubescentia, stylo ovario paulo breviore, rectiusculo.

Quoad staturam *A. kamtschatico*, Pall. simile, a quo bracteis palmati-partitis, basi aperte cordatis, bracteolis infra medium pedicelli nascentibus nec subapicalibus, floris colore, galea fornicata et antice producta nec sphaerico-conica, sepalis inferioribus multo latioribus distinguitur.

HAB.—Alpine region, Yuparo Mountains, Yezo (H. Yanagisawa).

Astragalus (Phaca, Hemiphragmium) **arakawensis,** Takeda (figs. 16–20).

Multicaulis, *caule* 15–20 cm. alto, flexuoso, ramosissimo, pubescenti pilis albis cum nigris mixtis. *Folia* densa, internodiis longiora, 5–7 cm. longa, foliolis 5–7-jugis, brevi-petiolulatis oblongo-ellipticis, 10 mm. longis, 3–4 mm. latis, retusis vel emarginatis, supra glabris, subtus pallidioribus, plus minus albo-pubescentibus, stipulata, stipulis lanceolato-subulatis, ciliolatis, 3 mm. longis. *Pedunculi* erecti vel adscendentes, folium valde superantes, pubescentes, 10–12 cm. longi. *Racemi* elongati, circa 10–flori, bracteis minutis, hyalinis, apice acutis semi-barbatis. *Flores* parvi, 12 mm. longi, leucophaei, carina apice violaceo-picta, brevi-pedicellati. *Calyx* campanulatus, 5 mm. longus, pubescens, pilis albis et nigris mixtis, lobis brevibus acutis. *Vexillum* obovatum, emarginatum, circa 10 mm. longum, 4 mm. latum. *Alae* vexillo aequilongae, oblongae, apice semi-mucronatae, obtusae, basi auriculatae, unguiculatae, ungue lamina breviore. *Carina* alis multo brevior, 7 mm. longa, basi auriculato-sagittata. *Stamina* carinae aequilonga, basi connata, filamentis inaequilongis, antheris ellipticis flavis. *Ovarium* breviter stipitatum, stipite 1 mm. longo, adpresse pubescens, stylo curvato, ovario aequilongo, stigmate aurantiaco. *Legumen* breviter pedicellatum, oblongo-ellipticum, membranaceum, parce pubescens, 12 mm. longum, dorso profunde sulcatum, sub-biloculare, 4–6-spermum.

Arcte affinis *A. shiroumaensi*, Makino, sed ab eo differt planta robustiore, caule flexuoso, dense ramoso, stipulis angustioribus, acutis nec obtusis, foliolis subtus pallidioribus, pedunculis longioribus, racemis elongatis, stigmate aurantiaco nec albo, legumine biloculare.

HAB.—Mt. Arakawadake and along the upper valley of the Arakawa where the seed has been carried down by water, Prov. Shinano (H. Takeda. August 1913).

Gentiana (Amarella) **yuparensis,** Takeda.

Caulis 8–17 cm. altus, simplex vel pauciramosus, 4-lineatus, glaber. *Folia* infima spathulata, media oblonga, superiora oblongo-ovata, vel ovata, omnia obtusa, glabra. *Flores* pauci, pro planta magni. *Calyx* leviter hirtellus, corollae tubum superans, tubo brevi, 5 mm. longo vel breviore, lobis valde inaequalibus, acutis, tubum valde superantibus. *Corolla* 3 cm. longa, quinque-fida, intus corona fimbriata, tubo cylindrico, limbo duplo longiore, albido, minute denseque violaceo-punctato, limbo intense violaceo, lobis ovalibus, acutis. *Ovarium* stipitatum, stipite calycis tubum aequanti.

Affinis *G. noricae,* A. et J. Kerner (Fl. Exsicc. Austr.-Hung., no. 2190), calyce corollae tubum superanti, corolla cylindrica nec campanulata, tubo limbo duplo longiore dignoscitur. A *G. Amarella,* Linn. floribus majoribus, calyce corollae tubum valde superanti, lobis inaequalibus, ovario stipitato facile distinguitur.

HAB.—Alpine region of Yuparo Mountains, Yezo (H. Yanagisawa. 8th August 1913).

Krascheninnikowia heterantha, Maxim.,* var. **linearifolia,** Takeda.

Differt a typo praecipue foliis valde angustioribus linearibus.

Planta sub anthesi humilis, 6–10 cm. alta. *Folia* omnia linearia, media et superiora 3–4.5 cm. longa, ad 3 mm. lata. *Pedunculi* folio breviores.

HAB.—In shady woods, Mt. Tsukuba, Prov. Hitachi (H. Takeda. 1st May 1904).

Saussurea chionophylla, Takeda (figs. 5–7).

Planta depressa. *Caulis* 7–8 cm. altus, solitarius, simplex, plus minus angulatus, parce arachnoideo-tomentosus, dense foliatus. *Folia* majuscula, in sicco subcoriacea, ovata, cordata, acuta, circumcirca subduplice serrato-dentata, adulta supra glabrata subtus dense niveo-tomentosa, 5–7 cm. longa, 4–5 cm. lata, inferiora longe (ita ut lamina ipsa) superiora breviter petiolata, suprema multo minora, subsessilia. *Inflorescentia* terminalis, oligocephala. *Anthodia* circiter 5, subsessilia, ovoidea, 10 mm. longa, fere 8 mm. diametro; *squamis involucri* quadriseriatis, imbricatis, majusculis, omnibus adpressis, nigro-fuscis, extimis ovatis, apicem versus subciliatis, mediis ellipticis, acutis, intimis longioribus, oblongo-lanceolatis, albo-ciliatis, dorso

* For a revision of this genus, see Kew Bull. (1913), no. 2.

glabris; receptaculo nudo. *Corolla* 11 mm. longa, tubo limbum aequanti, limbo ad quatuor partes 5-fido, segmentis linearibus, obtusis; pappi serie externa perpauca, circ. 2 mm. longa, serie interna ad 10 mm. longa, corolla breviore. *Achenium* (immaturum) ad 5 mm. longum, fusco-nigrum, leve.

Affinis *S. discolori*, DC., a qua caule valde depresso, foliis crassioribus latioribusque, squamis involucri majoribus, receptaculo non paleato distinguenda.

HAB.—Alpine region of Yuparo Mountains, Yezo (H. Yanagisawa. 8th August 1913).

Saussurea Yanagisawae, Takeda (figs. 5–7).

Planta omnino plus minus arachnoideo-pubescens, pygmaea. *Caulis* subcrassus, 10 cm. circiter altus, simplex, paucifoliatus. *Folia* in sicco crassiuscula, supra praesertim marginem versus pilis multicellularibus glandulosis parce vestita, ovalia vel anguste ovalia, apicem versus acuminato-attenuata, basi cuneata, in petiolum alatum plus minus decurrentia, margine paucidentata, dentibus callosis, plus minus (et plerumque retrorsum) curvatis, basilaria longe (ita ut lamina ipsa) cetera breviter petiolata, 3–4 cm. longa, 1.5–2 cm. lata. *Inflorescentia* terminalis, dense corymbosa, multicephala. *Anthodia* fere 10, brevi-pedunculata, cylindrico-campanulata, 7–8 mm. diametro; squamis involucri subquinque-seriatis, imbricatis, majusculis, inaequilongis, omnibus adpressis, fusco-nigricantibus, dorso pilosulis, apice villosulis, margine ciliatis, extimis oblongo-ovatis, acutatis, mediis ovatis, cuspidatis, intimis late lanceolatis, paulo longioribus; paleis receptaculi $\frac{3}{4}$ involucri aequantibus, anguste subulatis. *Corolla* 12 mm. longa, tubo limbo aequilongo, limbo ad duas partes 5-fido, segmentis linearibus, obtusiusculis; pappi serie externa subnumerosa, $\frac{1}{5}$–$\frac{1}{3}$ internae aequilonga, serie interna 10 mm. longa, corolla breviore. *Achenium* (immaturum) 4–5 mm. longum, nigro-fuscum, leve.

S. alpina, DC. affinis, sed ab ea foliorum forma, anthodio minore, floribus minoribus differt.

HAB.—Mt. Ashpetnupuri, Yezo (H. Yanagisawa. 5th August 1913).

Saxifraga (Boraphila) **laciniata,** Nakai et Takeda (figs. 21–22).

Rhizoma crassum, obliquum, *scapo* erecto, nudo, pilis glanduliferis parce obsito. *Folia* uti videtur e sicco carnosula, pilis glandulosis parce vestita, ciliata, oblongo-cuneata, basin versus sensim attenuata, 1–2 cm. longa, 4–8 mm. lata, apice plus minus rotundata, aequaliter inciso-dentata, dentibus acutis. *Inflorescentia* corymboso-paniculata, 3–12-flora; bracteae oblongo-lanceolatae, integrae, infima oblongo-cuneata,

tridentata, ciliolata. *Pedicelli* filiformes, floribus duplo triplove longiores, puberulenti. *Calycis laciniae* ovatae, obtusae integrae, glabrae, plus minus coloratae, 2–3 mm. longae, semper reflexae. *Petala* oblongo-ovata, luteo bi-maculata, longe unguiculata, cum ungui 5 mm. longa. *Stamina* filamento petalis duplo breviore, filiformi, apicem versus attenuato nec clavato, antheris purpureis, in specimine fructifero erecto. *Ovarium* ovatum, stylo brevissimo coronatum. *Capsula* colorata, ad medium usque dehiscens.

S. unalaschkensi, Sternb.* arcte affinis, sed ab ea praecipue foliis oblongo-cuneatis nec obovato-cuneatis, bracteis pedicello multo brevioribus, filamentis subulatis nec clavatis, antheris purpureis nec flavis, stylo brevissimo nec longo differt.

HAB.—Alpine region of Mt. Nutap-kam-ushpe, Yezo (H. Koidzumi. July 1913), and of Yuparo Mountains, Yezo (H. Yanagisawa. 8th August 1913).

It is very interesting to know that this species occurs also on Chang-pai Mountains, on the boundary between Corea and Manchuria. The first specimens were collected by James and recorded by him as *S. stellaris*.† The same specimens have been identified later by Komarov as *S. stellaris* var. *comosa*,‡ perhaps on account of their small size. Neither identification is, however, correct, since the specimens exactly represent our new species. Some more specimens of the same plant have been collected by Mr. T. Mori, teacher at Seoul, in August 1913, on the same mountains.§

Silene Keiskei, Miq. forma **minor**, Takeda || lusus, **leucantha**, Takeda.

Differt ab aliis flore albissimo. Flores saepe diametro 3 cm. et paulo ultra.

HAB.—Subalpine region, Mt. Maëdake, Prov. Shinano (H. Takeda. August 1913).

var. **procumbens**, Takeda.

Differt a typo caulibus elongatis, usque ad 10 dm. longis, procumbentibus, saepe apice ad nodos radicantibus. Flores mediocres rosei.

HAB.—Mt. Myôgisan, Prov. Kôtsuke (T. Yamanaka).

* Engler (Monogr., p. 148) has reduced *S. unalaschkensis* to *S. davurica* as a variety. These two are, however, to be retained as distinct species. In *S. unalaschkensis* the calyx is reflexed, whereas in the other it is erect or erect-patent; the leaf is glabrous and only ciliate in the former, and it is densely covered with multicellular hairs in the latter. The flower is slightly larger in the former than in the latter.

† James, The Long White Mountains, p. 456 (1880).

‡ Kom., Fl. Manch., ii, p. 414 (1904).

§ Cf. Nakai, in Tôkyô Bot. Mag., 1914, p. 305.

|| Takeda, ibid., 1910, p. 63.

Trisetum leve, Takeda.

Culmus circa 30 cm. altus, tenuis, binodalis, levis. *Vaginae* internodiis paulo breviores, leves. *Ligula* 5 mm. longa, anguste ovata, acuta, integra levis. *Laminae* lineares vaginis suis aequilongae, 3 mm. latae, glabriusculae, acutae. *Panicula* lanceolata, plus minus nutans, effusa, 15 cm. longa, rhachi ramisque levibus, ramis 2-nis, ad medium ramulosis, ramulis subnumerosis, scaberulis, 2–5-spiculatis. *Spiculae* lanceolatae, 7–8 mm. longae, pallide purpurascentes, 3-florae, flore terminali minore perfecto. *Glumae steriles* lanceolatae, leves vix carina superne scaberulae, I^{ma} uninervia, 4 mm. longa, II^{da} subtrinervia, nervis lateralibus obscuris, 5 mm. longa. *Gluma fertilis* 4 mm. longa, anguste elliptica, tenui-membranacea, levis, inferne 3- superne 2-nervia, apice irregulariter erosula, arista infra medium exserta, tenui, stricta nec torta nec geniculata, scaberula, 3–5 mm. longa, callo pilis glumae dimidium fere aequantibus parce obsito. *Palea* glumam aequans, linearilanceolata, binervia, apice bidentula. *Rhachillae* 2 mm. circiter longae, pilis longis densiuscule barbatae.

T. flavescenti, Beauv. quoad staturam plus minus simile, a quo arista tenui stricta satis distinguendum.

HAB. — Yuparo Mountains, Yezo (H. Yanagisawa. 9th August 1913).

EXPLANATION OF PLATE CXLV.

Illustrating Mr. Tadeka's paper on Some New Plants from Japanese Mountains.

FIGS. 1– 4.—*Aconitum yuparense*: 1, Hood, cut vertically, with nectary inside, ×1.5. 2, Middle, and 3, lower sepal, ×1.5. 4, Stamen, ×4.

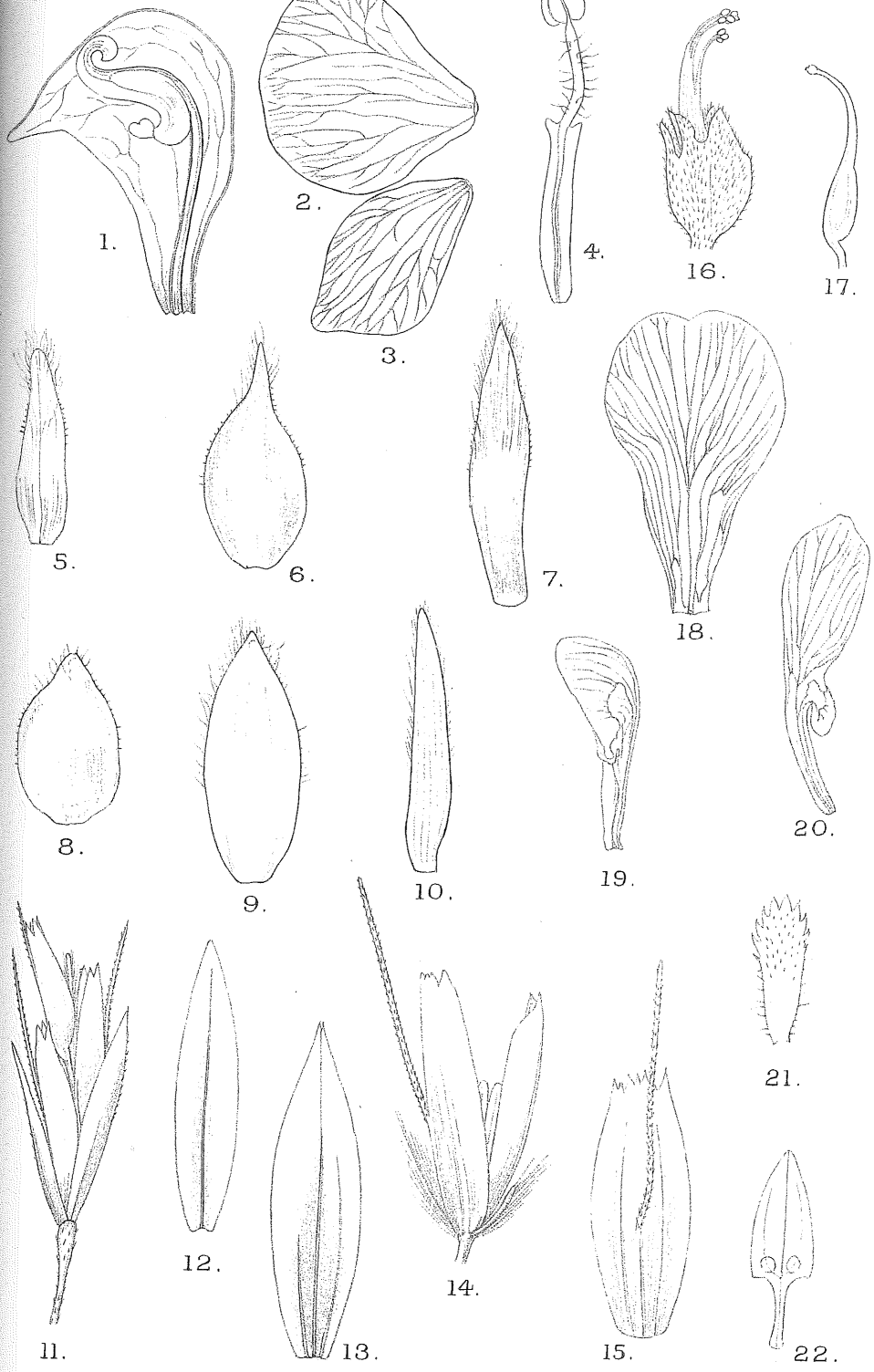
FIGS. 5– 7.—*Saussurea Yanagisawae*: 5, Outermost, 6, middle, and 7, innermost scale of involucre; all ×4.

FIGS. 8–10.—*Saussurea chionophylla*: 8, Outermost, 9, middle, and 10, innermost scale of involucre; all ×4.

FIGS. 11–15.—*Trisetum leve*: 11, Spikelet, ×6. 12, Lower, and 13, upper sterile glume, ×10. 14, Flower, ×10. 15, Fertile glume, ×10.

FIGS. 16–20.—*Astragalus arakawensis*: 16, Calyx and androecium. 17, Pistil. 18, Standard. 19, Keel. 20, Wing. All ×4.

FIGS. 21–22.—*Saxifraga laciniata*: 21, Leaf, natural size. 22, Petal, ×6.



Takeda del. Huth London.