

ART. XXIII.—*Enumeration of the Plants of Dr. Parry's Collection in the Rocky Mountains*, (continued from vol. xxxiii, p. 411); by A. GRAY: with Supplements, by G. ENGELMANN and A. GRAY.

WE are happy to state that Dr. Parry, assisted by Mr. E. Hall, is now again in the Rocky Mountains, and at the last accounts was about to ascend Pike's Peak. An interesting botanical collection may be expected.

222. *Sambucus racemosa*, L. Apparently just the European plant, and a glabrous state of *S. pubens*, Michx.

223. *Symphoricarpus montanus*, H.B.K. New to our flora; well marked by its elongated corolla. *S. glaucescens*, H.B.K., appears, in probably authentic specimens, not to be really different.

224. *Lonicera involucrata*, Banks.

225. *Viburnum pauciflorum*, Pylaie.

226. *Vaccinium cæspitosum*, Michx. Just like the White-Mountain plant. "Strictly alpine."

227. *Vaccinium Myrtillus*, L. var. *microphyllum*, Hook. Fl. Bor. Am. Surely a remarkable variety of *V. Myrtillus*, the flowers as small in proportion as the leaves. According to Dr. Parry, it is the "usual alpine form, growing in closely branched masses, in the shade of stunted evergreens, taking the place of 228, which is found lower down, in pine woods. Fruit small, purplish, without bloom, mild and rather insipid in taste." Dr. Hayden gathered it on the Black Hills of the Platte.

228. *Vaccinium Myrtillus*, var. ? The branchlets less strongly angled, and the leaves less reticulated and toothed than in the European *V. Myrtillus*. In the flowers, &c., it is as if intermediate between that species and *V. cæspitosum*. Fuller specimens, and the fruit, are wanted.

229. *Pyrola minor*, L. Collected by Fendler (No. 644) as far south as Santa Fé.

230. *Pyrola chlorantha*, Swartz. Dr. Hooker is right in his suspicion that the Greenland plant of Dr. Kane, referred by Durand to *P. chlorantha*, is *P. grandiflora*; but he is quite wrong, as I think, in referring *P. chlorantha* to *P. rotundifolia*, of which *P. grandiflora* is evidently a mere variety.

231. *Pyrola (Moneses) uniflora*, L. "In deep pine woods."

232. *Pyrola rotundifolia*, L. var. *uliginosa*. (*P. uliginosa*, Torr.) "In moist, shady woods; flowers rose-color." This is certainly connected with *P. rotundifolia* through *P. asarifolia*. To the synonyms of *P. rotundifolia*, Dr. Hooker might have added *P. occidentalis*, R. Br., *P. bracteata*, Hook., *P. picta*, Hook., &c., but should exclude, as I suppose, both *P. chlorantha* and *P. elliptica*.

233. *Pyrola secunda*, L.

234. *Gaultheria Mirsynites*, Hook. A rare and peculiar plant.

235. *Mimulus luteus*, L. A slender form.

236. *Collinsia parviflora*, Dougl.

237. *Veronica alpinus*, L.
238. *Gerardia aspera*, Benth. Valley of the Platte.
- 239, 240, 241. *Castilleia pallida*, Kunth. With red bracts, therefore verging to *C. miniata*, Dougl., which I conclude to be only a red-bracted variety of *C. septentrionalis*, Lindl., which is the form of *C. pallida*, with long, well-developed galea. For a revision of the genus, see Supplement III, infra.
242. *Castilleia pallida*, Kunth; nearer the type of the species (*C. Sibirica*, Lindl.) and *C. occidentalis*, Torr.
245. *Castilleia pallida*; the taller and broader-leaved form with longer galea, like the plant of the White Mountains of New Hampshire, *C. septentrionalis*, Lindl.
243. *Castilleia breviflora*. *Euchroma breviflora*, Nutt. in herb. Acad., Philad.
244. *Castilleia integra*, Gray, l. c.
246. *Castilleia linariifolia*, Benth. The same as Fremont's plant.
247. *Orthocarpus luteus*, Nutt.
248. *Pedicularis racemosa*, Benth. in Hook. Fl., &c. Fine specimens of a rare and interesting species. "Grows in patches near the limit of trees. Leaves dark-green and shining. Flowers yellowish-white. July, August."
249. *Pedicularis bracteosa*, Benth. l. c. "Near the foot of alpine ridges; rare."
250. *Pedicularis Groenlandica*, Retz. Obs. 4, t. 1. *P. surrecta*, Benth. l. c.; a form with larger flowers and longer beak. Torrey was quite right, as it appears, in referring this plant to *P. Groenlandica*. Dr. Parry's specimens well accord with the figure of Retz, except that the beak is perhaps a little longer. Bourgeau collected it in the Saskatchewan district with the beak no longer than Bentham states it to be in the Greenland plant. In the Rocky Mountains it is "not uncommon on the borders of subalpine marshes, or of high alpine ridges; in the former stations tall and slender; in the latter shorter and stronger; flowers reddish-purple."
251. *Pedicularis Parryi*, (sp. nov. sect. *Rhyncolophæ*, Bunge, seu *Edentularum*, inter *Unciatas* et *Scapiformes*, Benth.): glaberrima; caule ultra-semipedali subnudo; foliis lineari-lanceolatis pectinato-pinnatipartitis petiolatis, caulinis 1-3 parvulis; segmentis linearibus acutis (ad summum 3 lin. longis) cartilagineo-serrulatis; bracteis parvis trifidis; floribus plurimis breviter pedicellatis in spicam angustam subconfertis; calycis membranacei 5-striati demum subinflati breviter 5-dentati dentibus lanceolatis integerrimis intus lanulosis; corollæ sordide flavæ galea angusta apice incurva sensim in rostrum longiusculum emarginatum haud denticuliferum subdecurvum labium inferius (lobis eroso-crenulatis) multo superantem producta; filamentis glaberrimis. "On alpine ridges. Flowers of a dirty or faded yellow," about half the size of those of the Siberian *P. compacta*; the shape and size of the beak nearly that of *P. ornithorhynca*, which is apparently *P. pedicellata*, Bunge (*P. subunda*, Benth.). Spike naked, 2 to 4 inches long; the lower flowers rather sparse, on pedicels of  $1\frac{1}{2}$  to 2 lines in length. The nearest affinity of the species is with *C. compacta*, Bunge, which is larger in all its parts, and

leafy-stemmed, the cauline leaves sessile, their much larger segments pinnatifid or incised, the flowers of the dense spike sessile, the calyx more inflated, the lower lip of the corolla nearly equalling the galea, and two of the filaments slightly bearded.

252. *Pedicularis procera*, (sp. nov. *Bicuspidatarum*): caule 1½–3-pedali crasso foliato superne cum spica densiflora 9–18-pollicari molliter pubescente; foliis glabris pinnatipartitis, (radicalibus sæpe sesquipedalibus pinnatisectis), segmentis lanceolatis laciniato-pinnatifidis, lobis serratis vel incisis; bracteis e basi ovato-lanceolata lineari-elongatis, inferioribus pectinato-pinnatifidis flores superantibus; calyce subæqualiter 5-fido, lobis lanceolatis integris tubo subdimidio brevioribus; corollæ (ultrapollicaris sordidæ virido striatæ) galea apice cucullata erostri truncata bidentata labium sub-patentem breviter trilobum vix æquante. “Shaded hill-sides, not uncommon in scattered localities.” Collected also by Fremont in 1845, and in the Sandia Mountains further south, by Dr. J. M. Bigelow; but only in fruit. A striking species, quite distinct from any other known to me.

253. *Pedicularis Sudetica*, Willd., var. “High alpine; rare.” The specimens accord very well with *P. Sudetica*, especially with Russian-American specimens, except the deeply emarginate summit of the galea is almost or quite edentulate. Bunge describes them as “breves triangulares basi latos;” but they are often subulate. I fancy that *P. nasuta* of Kamtschatka is very near Dr. Parry’s plant. *P. Kanei*, of Durand, from Arctic Greenland, does not belong to *P. Sudetica*, as Dr. Hooker supposed, but to *P. lanata*, Willd.; which again, contrary to Bentham and Dr. Hooker, I must regard with Bunge as clearly different from *P. hirsuta*. It is much nearer another species which Dr. Hooker refers to *P. Sudetica*, viz. *Langsdorffii*, with which it has been confused, but it is perfectly edentulate. The teeth of the latter, however, are inflexed, and so may escape observation. All the continental American “*P. hirsuta*” I have seen belongs to *P. lanata*. All these species are well discriminated by Bunge in Ledebour’s *Flora Rossica*.

254. *Synthyris plantaginea*, Benth. Wholly below the alpine region. The same as Fendler’s No. 582. Radical leaves mostly obtuse or rounded (rarely at all cuneate) at the base; scape multibracteate. Flowers all short-pedicelled; sepals ovate, obtuse, villous-ciliate, becoming nearly glabrous with age. Corolla pale, very deeply 2-parted or even divided, the upper lip cuneate-obovate, entire or obscurely erose, a little exceeding the calyx, twice the length of the 3-lobed lower lip. Stigma capitellate.—The species of the genus need a complete revision, which I am unable now to attempt. In *S. Houghtoniana*, which I formerly had in cultivation, a great diversity was observed in the calyx, (varying from 2–3-parted to 5-parted), corolla, (2–4-parted, as described in the Manual, but the lips or divisions nearly of equal length, the lower not seen very short, as described in the Prodrômus), stamens (either two or four), and even the ovary, which is occasionally tricarpellary.

255. *Synthyris alpina*, (sp. nov.): spithamæa; foliis radicalibus ellipticis seu ovalibus nunc subcordatis creberrime crenatis mox glaberrimis; scapo superne folioso-bracteato; spica brevi densa; sepalis lanceolatis extus præsertim ad margines cum bracteis longissime villosis; corolla

bipartita, labio superiori latissimo eroso, inferiori multo minori 2-3-partito, lobis angustis; stigmatate capitato. "Growing in crevices of rocks, on the dividing ridge, at the elevation of 10,000 feet. Very different from No. 254, strictly confined to the high alpine region, with glossy foliage and a neat spike of pale blue flowers." Leaves  $1\frac{1}{2}$  to 2 inches long, on slender petioles, rather strongly crenate, a little fleshy, very smooth, or early becoming so, as also the lower part of the scape. Bracts on the upper part of the scape ovate or in the spike lanceolate, sessile, and ciliate with very long woolly hairs. Spike only an inch long in flower, very dense, and very woolly; flowers nearly sessile; the corolla larger and more exerted than in *S. plantaginea*. Sepals in flower lanceolate and acute or acutish; but in a fruiting specimen broader and obtuser. Only two stamens seen, which, as in other species, are almost hypogynous.

256. *Chionophila Jamesii*, Benth. "On bare or grassy ridges of the snowy range, July. Flowers pale cream-color." A most interesting re-discovery, enabling us nearly to complete the account of this well-marked genus. The only known original specimen, and a very scanty one, is in the Hookerian herbarium, to which it was contributed by Dr. Torrey, mixed with *Pentstemon Jamesii*, and no specimen is extant in his own herbarium. But I presume that Dr. Parry's excellent specimens are of the same species, notwithstanding the striking discrepancies. The calyx, which gives the character to the genus, is gamophyllous almost to the summit, with 5 broad and short nearly equal teeth, considerably ampliate, thin, membranaceous, or even scarious. Corolla tubular, slightly dilated upwards, nearly twice the length of the calyx, and with a sort of palate to the lower lip very densely bearded. The original specimen must be in poor condition if this beard was overlooked. Sterile filament much smaller and shorter than the others, smooth. Stigma small, obtuse and entire. Radical leaves in the larger specimens 2 or 3 inches long, lanceolate-spatulate. Scape 2 to 4 inches high, puberulent. Flowers solitary in the axils of the small floral leaves, on very short and ebracteolate pedicels.

257. Vide after 261, 262.

258. *Pentstemon acuminatus*, Dougl. in Bot. Reg. t. 1285, var. *P. nitidus*, Dougl., Benth. *P. Fendleri*, Gray in Pacif. R.R. Rep., 2, p. 168, t. 5. "A wide-spread, variable species, with pale glaucous leaves and palish or bright blue flowers." Bentham describes *P. acuminatus* as with "filamento sterili filiformi glabro." But Lindley, in Bot. Reg., where the species was published, says "apice leviter pilosum, aduncum;" and his figure represents a large state of what I must consider the polymorphous species one form of which I published as *P. Fendleri*, and which is certainly *P. nitidus*. *P. cyananthus*, Hook. Bot. Mag., which in the Botany of the Mexican Boundary I had referred here, is however figured as having hairy anthers, like those of *P. glaber*, and with such a corolla as the latter has, but with narrow sepals. It may be a very well developed form of *P. glaber*, var. *alpinus*.

264. A narrow-leaved variety of the foregoing, clearly of the same species; "from plains east of Denver, with numerous bright blue flowers and narrow linear leaves." Similar specimens from Eureka, Mr. How-

ard, but only a span high, as well as others before me, (among them Geyer's No. 154, and some of Hooker's *P. acuminatus*, var. *minor*, from Carlton House), manifestly connect this species with *P. cæruleus*, Nutt., the oldest of all these names. *P. secundiflorus*, Benth., is another connecting form.

259. *Pentstemon glaber*, Pursh, var. *alpinus*. *P. alpinus*, Torr. in Ann. Lyc., N. Y. Only an alpine form of the next, with more attenuated sepals, the particular shape of which is inconstant in the genus. Dr. Parry remarks: "no doubt a variety of *P. glaber*, being almost exactly a dwarfed representative of that elegant species; and its alpine situation would sufficiently account for its stunted size."

260. *P. glaber*, Pursh, (*P. erianthera*, Fraser, Nutt.) "Common on dry hill-sides along the valley of Clear Creek; a splendid species, its large, brilliant, inflated, blue corolla streaked with reddish-purple stains." The name first published, with a character, ought to be restored for this species; since the anthers are but slightly hairy, in comparison with those of the section *Erianthera*, and are frequently glabrous, except a ciliation or mere denticulation at the margin of the valves. The beard at the top of the sterile filament is sometimes almost wanting, and sometimes sparsely extended downwards. I cannot doubt that the figure of *P. speciosus* in Bot. Reg., t. 1270, represents this species, and, returning to an old opinion in this regard, should reduce that to the present species.

261, 262. *Pentstemon glaucus*, Graham in Edinb. Phil. Jour. July, 1829, p. 348; Lindl. Bot. Reg. t. 1286. "Rather abundant at the foot of alpine ridges, above the limit of trees; the taller specimens from a lower elevation in the valley of Clear Creek. The more common form has pale cream-colored flowers with greenish stripes, and pale green leaves; there is a more rare, purple-flowered variety; both quite bilabiate." Small specimens of this are found in James's collection, mixed with *P. Jamesii*, Benth., and formerly confounded by Dr. Torrey with *P. albidus*,—to both of which they have some resemblance. The species, however, is more allied to *P. gracilis*, Nutt.; but it has a more inflated corolla even than *P. pubescens*, with which Bentham confounded it. The specific name is far from distinctive or good.

257. *Pentstemon humilis*, Nutt. in Herb. Acad. Philad.; apparently a reduced, alpine variety of *P. glaucus*, with shorter and rather less amplicate corolla. Specimens collected at Eureka by Mr. Howard (in herb. Acad. Philad.) ally Dr. Parry's plant with the *P. gracilis*, as figured in the Botanical Magazine. According to Dr. Parry it is: "the common mountain species, growing in tufts on rocky places; flowers bright deep blue; leaves glossy and bright green; plant varying from 3 inches to a foot in height."

263. *Pentstemon procerus*, Dougl. About a span high, and it is seldom very much taller. There was doubtless some mistake in the imposition of this name; but it is surely only a variety of *P. congestus*, with purple-blue flowers.

265. *Pentstemon albidus*, Nutt. A common species of the plains. *P. pumilus*, Nutt., is perhaps an alpine state of this. But Fremont's specimens, referred to *P. pumilus* by Bentham, appear to belong to a

remarkably dwarf and tufted, unpublished species, *P. cæspitosus*, Nutt., which Dr. Parry has detected the present season, and sent in a letter.

266. *Campanula Langsdorffiana*, Fischer.; Trauttv. & Meyer, Fl. Ochot., p. 60. *C. heterodoxa*, Bong. Fl. Sitch., an Vest.? Probably also *C. adscendens*, Vest, as it seems to be more allied, except in the size of the flowers, to *C. uniflora* than to *C. rotundifolia*. The calyx-lobes are linear-subulate from a broad base, nearly equalling the corolla, and more or less toothed. Additional specimens, needed to clear up the species, it is hoped may be obtained this summer. It is said to be "common in moist, grassy places on the borders of Upper Clear Creek. Flowers deeper blue than those of *C. rotundifolia*," far larger than those of the next.

267. *Campanula uniflora*, L.

268. *Campanula rotundifolia*, L.; alpine form, like that of the White Mountains of New Hampshire.

269. *Valeriana dioica*, L. (*V. sylvatica*, Richards., &c.)

270. *Galium boreale*, L.; a small form.

271. *Gilia spicata*, Torr. & Gray, ined. *Elaphocera spicata* and *E. affine*, Nutt. in herb. "Growing, with a deep tap-root, in the deep sandy bottoms of Bijou Creek, east of Denver. Flowers light cream-color or flesh-color; the whole plant exhaling a foetid smell, like bone-filings."

272. *Phacelia (Eutoca) sericea*, Gray, Man. "A handsome subalpine."

273. *Cuscuta cuspidata*, Engelm.

274. *Polemonium pulcherrimum*, Hook.; with lobes of the corolla rounder. A form of *P. pulchellum*. "A charming alpine plant, adorning the high slopes with its deep blue, nodding flowers; whole plant beset with resinous glands, exhaling a strong odor of musk."

275. *Polemonium cæruleum*, L. "At lower stations."

276. *Polemonium pulchellum*, Bunge; nearly *P. Richardsonii*, Hook. & Arn. "Growing in shade at the farthest limit of bushy tree growth. Flowers delicate faded blue." The limits of species (if such they be) in this genus are indeterminate.

277. *Ipomœa leptophylla*, Torr. Sand hills of the Platte; a characteristic plant of the plains.

278. *Eritrichium aretioides*, DC. *Myosotis nana*, Torr. in Ann. Lyc. N. Y., vix Vill. "Rooting in granitic sand at the highest elevations of the snowy range; flowers of the richest cærulean blue." In flower, and with a little of last year's fruit, which, if normal, will distinguish this from the European *E. nanum*. The corolla is a little smaller. I suppose it to be *E. aretioides* of Arctic Russian America, &c., the fruit of which is undescribed. This Dr. Hooker regards as an arctic state of *E. villosum*. But the mature nutlets of our plant are perfectly smooth, and naked on the margins of the very obliquely truncate back.

279. *Primula angustifolia*, Torr. in Ann. Lyc. N.Y. "Associated with the last. Flowers dull red, changing to purple." An interesting rediscovery of one of James's plants.

280. *Collomia linearis*, Nutt.

281. *Collomia gracilis*, Dougl.

282. *Gilia pinnatifida*, Nutt. ined. The same as No. 655, Fendler.

283. *Gilia (Ipomopsis) aggregata*, Spreng. *G. pulchella*, Dougl.

284. *Mertensia alpina*, Don.; a loosely paniculate, branching, evolute variety. "Common in the valley of Clear Creek, on gravelly banks, growing in irregular clumps, 12 to 18 inches high; flowers dull blue, in May and June."\*

285. *Mertensia Sibirica*, Don. pro parte. *Pulmonaria Sibirica*, Linn. & Pursh, quoad syn. Gmel. *Lithospermum denticulatum*, Lehm. Asperif. *L. Sibiricum*, Ledeb. Fl. Alt., & Ic. Pl. Fl. Ross. t. 207. *Pulmonaria denticulata*, Roem. & Schult., Cham., &c. *Mertensia denticulata*, Don., DC., Ledeb. Fl. Ross. *Pulmonaria ciliata*, James, Torr. in Ann. Lyc. N. Y. 2, p. 224. *Mertensia ciliata*, Don., &c. Besides the greater smoothness, which is variable, this is distinguished from *M. paniculata* by the much shorter and blunt segments of the calyx, and the leaves are glaucescent beneath. No doubt the Linnæan name must be restored to this (the *Pulmonaria Sibirica* of Pallas resuming the name of *M. Pallasii*, Don.); for it is clearly the plant of Linnæus, and perhaps Pursh's from Canada (but more probably that is *M. paniculata*), and I suspect that Lehmann described his *Lith. denticulatum* from Siberian specimens. Certainly it is not known from Eastern "North America," unless from Labrador. H. Engelmann gathered it at Bridger's Pass in the Rocky Mountains, but my specimens have *M. paniculata* intermixed. Redowskian specimens from Kamtschatka, distributed by Chamisso, are of the present species. It is, writes Dr. Parry, "the common brookside *Mertensia*, found everywhere along the margins of ice-cold, dashing streams, up to the snow-line, delighting in situations where its pale foliage and delicate blue flowers are bathed in the spray. It grows to the height of 1½ to 3 feet; the stems succulent, the lower radical leaves large and cordate."

286. *Mertensia paniculata*, Don. A reduced and alpine, glabrate state, with much less acute leaves, of that form of *M. paniculata* which answers to *Pulmonaria lanceolata*, Pursh, and *P. marginata*, Nutt. (*M. marginata*, Don., and *M. lanceolata*, DC.) "Moist, grassy places, on the slopes of alpine ridges; flowers bright alpine blue." *M. paniculata* ranges from Hudson's Bay to Lake Superior, New Mexico above Santa Fé (626, Fendler) and northwestward. The foliage, calyxes, &c., vary, as in other species, from smooth or glabrous to hirsute, but the narrow and acute segments of the deeply 5-parted calyx are always hispid-ciliate. It obviously includes *M. corymbosa* and *M. pilosa*, Don., the *Lithospermum corymbosum* of Lehmann. Dr. Hooker has not seized the characters which distinguish the species from the foregoing.

287. *Mertensia alpina*, Don. *Pulmonaria alpina*, Torr. in Ann. Lyc. N. Y. "The small-flowered alpine *Mertensia*; flowers dull blue."

288. *Eritrichium glomeratum*, DC. Very fine specimens. "Common on gravelly hill-sides and rocky places from the foot of the mountains to the upper valleys."

289. *Phacelia circinata*, Jacq.

290. *Echinosperrum floribundum*, Lehm. In fruit.

291. *Eritrichium crassisepalum*, Torr. & Gray, in Pacif. R.R. Exped. 2, p. 171. A young state, with broad leaves.

292-294, vacant.

\* For a revision of the species of *Mertensia*, see Supplement, IV.

295. *Lithospermum pilosum*, Nutt. ex char. This is Fendler's No. 626 and Wright's 1562.

296. *Heliotropium* (*Euploca*, Nutt.) *convolvulaceum*, Gray.

297. *Paronychia*, n. sp. apparently, "—a single patch only, found rooting in a sandbar on Upper Clear Creek," not in sufficient good condition for description. We look for better specimens this year.

297. *Phlox Hoodii*, Richards, var. *foliis rigidioribus vix lanatis*. *P. rigida*, Benth.? *P. brevifolia*, Nutt. in Herb. *P. muscoides* and *P. bryoides* of Nuttall both belong to *P. Hoodii*.

299. *Gilia* (*Leptodactylon*) *pungens*, Benth.

300. *Silene acaulis*, L.

301. *Dracocephalum parviflorum*, Nutt. "The only representative of Labiatæ in the mountain region."

302. *Salvia Pitcheri*, Torr. Prairies in Kansas. This must be the *S. elongata* of Dr. Torrey in James's collection. It is intermediate between *S. azurea* and *S. farinacea*,—two *Salvias* which would seem to be distinct enough.

303. *Scutellaria resinosa*, Torr. in Ann. Lyc. N. Y. Upper Platte.

304. *Gentiana Parryi*, sp. nov., Engelm. in Trans. St. Louis Acad., 2, p. t. 10. "Near the foot of alpine slopes." This is, says Dr. Engelmann, "a very handsome species, growing in tufts, each stem bearing several large, purplish-blue flowers with bifid folds, and enclosed by a pair of boat-shaped bracts. Leaves rounded, fleshy, glaucous. Nearly allied to *G. calycosa* and *G. Menziesii*, which, however, have single flowers, without the calyculate bracts peculiar to our species, and to the Siberian *G. septemfida*, with long folds slit into numerous bristling lobes." Engelm. The plant of Kreuzfeldt, in Gunnison's Expedition, referred to *G. affinis* in the second volume of the Pacific Railroad Report, is of this species, but with narrower leaves, and Fremont's No. 360 (1845) is a small-leaved form of it, which also occurs in Mr. Howard's collection (Herb. Acad. Philad.), in one instance with a six-lobed corolla.

305. *Gentiana frigida*, Hænke, var. *algida*, Griseb. "Abundant on high alpine slopes, in moist places, growing in small tufts among Grasses and Carices." "Apparently an intermediate form between the European *G. frigida* and the Siberian *G. algida*. Stems lower than in the latter, only 4 or 5 inches high; the leaves narrower; flowers fewer and closely sessile; calyx often partly slit; lobes of the corolla very acute, greenish blue, reddish-brown in the dried state, punctate, the folds truncate and crenate." Engelm. This is also in Mr. Howard's collection. New to America, but found as near as Kamtschatka.

306. *Gentiana prostrata*, var. *Americana*, Engelm. l. c. t. 9, fig. 10-15. "A very small form, single or with few horizontal branches, 1-1½ inches high, found with No. 309. Distinguished from the European and Asiatic forms by the small, 4-parted deeply blue flowers, nearly entire folds, and oblong-linear capsule, attenuated at the base into a short stipe. Chamisso collected the same form in Russian Arctic America." Engelm.

135. *Gentiana humilis*, Stev., Engelm. l. c. fig. 1-5. *G. Fremontii*, Torr. in Frem. Rep. "Along the moist grassy banks of Upper Clear Creek, with *Polygonum viviparum*, almost hidden among the grass. Whole plant succulent, fragile, of a pale sickly color: flowers greenish



with white folds."—"Many leafy, one-flowered, erect or ascending branches, 2-5 inches high, from the base. Distinguished from the allied species, and especially from *G. prostrata*, by its larger rosulate lower leaves, which, as well as the oblong-linear cauline leaves, are cuspidate and often mucronate. The capsules on the taller branches are more or less exsert, on the lower ones I find them often enclosed, or bursting sideways through the integuments. Siberian specimens are absolutely identical with the Rocky Mountain plant." *Engelm.*

307. *Gentiana acuta*, var. *stricta*, Griseb. "Rather common in shady pine woods and moist places on Upper Clear Creek. In shaded places the leaves are pale-green on both surfaces, broad and mostly obtuse; the flowers very pale-blue; in more open localities the leaves are dark-green above, pale below, narrower, the upper most acute, the flowers darker." "Stems a foot high, leaves 1-1 $\frac{3}{4}$  inches long, 3-7 lines (the lower ones) wide. Flowers about  $\frac{1}{2}$  inch long, always 5-parted; lobes of calyx very unequal, the two longer and broader ones exceeding the tube of the corolla; lobes of the corolla acutish or almost obtuse, half as long as the tube. From Drummond's northern specimens in Herb. A. Gray, our form is distinguished by the less acute leaves, and especially by the larger calyx. A specimen from Lower Canada in Herb. A. Gray, probably representing Michaux's plant, has very acute leaves, smaller flowers, a more regular 4-parted calyx, and very acute lobes of the corolla. The very nearly allied *G. Amarella* of northern Europe has the corolla much less deeply divided, with quite obtuse lobes." *Engelm.*

309. *Gentiana acuta*, var. *nana*, Engelm. in Transact. St. Louis Acad., 2, t. 9, fig. 6-9. "In the higher alpine regions, together with *G. prostrata*, in masses of *Silene acaulis*." "A diminutive form, 1 $\frac{1}{2}$ -2 inches high; flowers few, smaller; lobes of 4-5-parted corolla obtuse; beard consisting of few distinct fibres." *Engelm.* This, from the obtuse lobes of the corolla, would appear to confirm Dr. Hooker's view that *G. acuta* is a form of *G. Amarella*, represented in Lapland by *G. lingulata*, Ag. Some specimens distributed with No. 309 are the ordinary *G. acuta* in a depauperate form, with acute lobes to the corolla.

308. *Swertia perennis*, L.

310. *Frasera speciosa*, Dougl. "A very strict and small-flowered form, with ternate, linear-lanceolate, 7-9-nerved cauline leaves, and linear elongated lobes of calyx rather exceeding the corolla. Fendler's New Mexican specimens (No. 686) have large and obtuse radical leaves (12-16 inches long, 4-5 inches wide); even the cauline leaves are broadly oval, only the uppermost being lance-linear; the inflorescence is loose, and the flowers much larger. Dr. Parry's plant resembles more the figure in Hooker's flora. The cup uniting the base of the stamens is ciliate on its edge in this species. *Frasera Carolinensis* has large, obovate-spatulate, feather-veined radical leaves." *Engelm.*

311. *Primula Parryi* (sp. nov.): *P. nivalis* formæ eximie similis, nisi foliolis involucri subulatis seu linearibus quam pedicelli elongati triplo brevioribus; calyce glanduloso (lobis lato-lanceolatis acutis) tubum corollæ rubræ adæquante; corollæ lobis rotundatis obcordato-bifidis.—Limb of the corolla an inch in diameter. Pedicels one to nearly two inches long. This magnificent Primrose needs to be compared with Ledebour's

*P. pycnorhiza* (a very rare and little known species from the Caucasus, which, however, seems too like *P. algida*), and it doubtless lies between that species and *P. nivalis*: but it can hardly be referred to either, although possibly, all these species may be found to merge in one. Dr. Parry remarks that "This fine species is quite constantly met with on the borders of alpine streams near the snow line; its knotted fibrous roots matted together, and constantly bathed in ice-cold water. Its usual height about 12 to 18 inches: flowers of a deep *carmine red* (fading to purple), with a slight primrose odor; leaves glossy on the upper surface, pale green. It flowers in July. It must be quite extensively diffused in its peculiar localities, and it is a wonder it has not been found before. In my sketch map I have named one mountain stream *Primrose Creek*, on account of the abundance of this plant."

312. *Dodecatheon Meadia*, L. A slender, few-flowered variety of this polymorphous species.

313. *Androsace septentrionalis*, L. Both alpine and in the valleys.

314. *Phacelia Popei*, Torr. & Gray in Pacific R. R. Rep. 2, p. 172, t. 10. "Whole plant of a brownish-green color, often robust, 8 to 15 inches high."

315. *Eriogonum umbellatum*, Torr. in Ann. Lyc. N. Y., 2, p. 241, & in Sitgreaves, Rep. t. 12. Flowering specimens: flowers bright yellow, as they are in Hayden's and other specimens.

316. The same as 315 in fruit; the perianth changed to pale yellow turning brownish.

318. The same species, apparently, as the two foregoing, but the flowers in the fine and well preserved specimens are obviously white or cream color. Which form is the original of James's collection, I am unable now to determine. Torrey's figure, in Sitgreaves' Expedition is a good one, but there is nothing answering to it in the letter-press. The rays of the umbel are more numerous, slender, and simple in all these specimens than in Hooker's figure of *E. stellatum*; but a Douglasian specimen appears to belong to this species.

317. *Eriogonum flavum*, Nutt.

319. *Eriogonum alatum*, Torr.

320. *Eriogonum annuum*, Nutt.

321. *Eriogonum effusum*, Nutt. Flowers white: those of *E. microtheca*, Nutt., are yellow.

322. *Polygonum tenue*, Michx. Hillsides, near Central City.

323. *Montelia tamariscina*, Gray? male plant.

324. *Euphorbia marginata*, Pursh.

325. *Croton* (*Hendecandra*) *muricatum*, Nutt.

326. *Frælichia Floridana*, Moq.

327. *Cycloloma platyphyllum*, Moq.

328. *Eurotia lanata*, Moq. *Diotis*, Pursh.

329. *Euphorbia hexagona*, Nutt.

330. *Euphorbia petaloidea*, Engelm.

331. *Solanum rostratum*, Dun. *S. heterandrum*, Pursh.

332. *Polygonum viviparum*, L.

333. *Polygonum Bistorta*, L., var. *oblongifolium*, Meisn.

334. *Oxyria digyna*, R. Br. "Common in the alpine region; the specimens collected are from a lower elevation, and are large."

335. *Asclepias verticillata*, L., dwarf form.
336. *Abronia* (*Tripterocalyx*) *cycloptera*, Gray.
337. *Abronia fragrans*, Nutt., figured in the second volume of the Pacific Rail Road Reports.
338. *Acer glabrum*, Torr., var. *A. tripartitum*, Nutt.
339. *Betula alba*, L. var., *glutinosa*, forma *latifolia*, Regel, or nearly.
340. *Alnus viridis*, DC.
341. *Salix glauca*, L. Masc.
342. *Salix cordata*, Muhl. ?
343. *Salix reticulata*, L. (*S. sericea*, Pursh.) Alpine.
344. *Salix discolor*, Willd.
345. *Populus tremuloides*, Michx.
346. *Lloydia serotina*, Reich. *Anthericum*, L.
347. *Calochortus venustus*, Benth., ex Torr. The species greatly need revision and diagnosis.
348. *Streptopus amplexifolius*, DC.
349. *Leucocrinum montanum*, Nutt. in Gray, Melanth., p. 110. A rare plant, one of the many which go to demonstrate the futility of an ordinal separation of the *Melanthiæ* from the *Liliaceæ*. Also collected by Mr. Howard. The specimens in both cases not in good state for examination.
350. *Allium cernuum*, Roth.
351. *Zygadenus glaucus*, Nutt.
352. *Corallorhiza innata*, R. Br.
353. *Listera cordata*, R. Br.
354. *Calypso borealis*, Salisb. In spruce woods; not uncommon.
355. *Platanthera obtusata*, Lindl.
356. *Platanthera hyperborea*, Lindl. To this, as I suspected long ago (in Ann. Lyc. N. Y., when endeavoring to distinguish this species from the next), belongs the *Habenaria dilatata* of Hooker's Exot. Fl., t. 95. "Flowers greenish."
357. *Platanthera dilatata*, Lindl. *Orchis dilatata*, Pursh. *Habenaria dilatata*, Gray, in Ann. Lyc. N. Y. "In subalpine swamps." Flowers white. Since my observations upon these two species, made almost thirty years ago, I have often, like other botanists, when superficially examining dried specimens, been tempted to re-unite them. This Dr. Hooker has recently done, in his memoir of Arctic Plants. It is quite as easy to err in combining as in unduly separating species. Having recently examined the two alive, in view of their arrangements for fertilization, (which I may elsewhere describe), I would now state that the structure and disposition of their genitalia and the shape of the gorge of the flower is so different, that, while *P. dilatata* (like its congeners in general) can rarely if ever self-fertilize, *P. hyperborea* readily does so, much in the manner of *Ophrys apifera* as recently illustrated by Darwin; the former has almost parallel anther-cells, with a narrow stigmatic surface and a sort of trowel-shaped beak between their bases and below, within the narrow gorge, made by the erect position and connivence of the base of the labellum and other petals, are the large and elongated, linear-oblong, viscid discs or glands. In *P. hyperborea* the labellum, spreading from the base, leaves an open gorge, the more exposed stigma is broad and transverse (as figured by

Sir Wm. Hooker in Exot. Fl., t. 95, under the name of *Habenaria dilatata*), the glands are smaller and orbicular, the beak wanting, the anther-cells more divergent, and, from the curvature of the flower, more overhanging, and the stalks of the pollinia very attenuated and weak. Thus disposed, the pollinia very commonly fall out of the anther-cells while the tip of the labellum is still engaged under the point of the upper sepal and petals, or even in the closed buds; and when the labellum is disengaged and becomes recurved, or even before, the pollinia are apt to topple over and fall upon the broad stigma beneath.\* That our *P. dilatata* is the *Orchis dilatata* of Pursh I am assured. Our green flowered species should be re-compared with the Iceland *P. hyperborea*, and with this the Iceland *Orchis Koenigii* (described originally by Retz as with "labio tripartito," but referred by Linnæus to *O. hyperborea*, and annexed by Lindley to a probably quite different species from Unalaschka) should be collated.

358. *Juncus castaneus*, Sm.; an alpine form.  
 359. *Juncus triglumis*, L. With the last.  
 360. *Juncus arcticus*, var. *gracilis*, Hook.? Alpine; too young.  
 361. *Juncus Menziesii*, R. Br. ex Hook.  
 362. *Luzula parviflora*, DC.  
 392. *Luzula spicata*, DC., var., approaching *L. Peruviana*. Alpine.  
 363. *Poa alpina*, L.? "At the foot of the snow banks; July."  
 364. *Munroa squarrosa*, Torr. *Crypsis*, Nutt. Deep sand beds, east of Denver.  
 365. *Calamagrostis sylvatica*, Trin. "Dry bottoms of Clear Creek; July."  
 368. A purple variety of the above (nearly *C. purpurascens*, R. Br.), in an older state. "Alpine; August."  
 366. *Muhlenbergia gracilis*, Trin. *Calycodon montanum*, Nutt. Pl. Gamb., ex Thurber.  
 367. *Aira cæspitosa*, var. *arctica*, Trin. *Deschampsia brevifolia*, R. Br. Alpine.  
 369. *Buchlœe dactyloides*, Engelm.; both sexes of the Buffalo-Grass. "Plains of the Platte."  
 370. *Boutelona oligostachya*, Torr.  
 371. *Eriocoma cuspidata*, Nutt. *Stipa membranacea*, Pursh.  
 372. *Aira cæspitosa*, L. "Alpine ridges."  
 373. *Festuca rubra*, L. Too young; "alpine ridges."  
 374. *Poa laxa*, Hænke.  
 375. *Poa nemoralis*, L., or one of the species referable to this. "Alpine ridges."

\* Another North American Orchid, which self-fertilizes, and that without the aid of insects, is *Gymnadenia tridentata*. In this the anther-cells dehisce while the flower-bud is still unopened, and some of the packets of pollen (in this species easily separable from their connections) will be found to have reached stigmatic surfaces, here unusually situated; and I have found an abundance of pollen-tubes to be produced, before the flower had opened. Yet the arrangements for the removal of the pollinia by insects are as perfect as in the species which depend upon insect-aid, and while a portion of the pollen-packets fall away at an early period, the rest remain attached in the usual manner. The plant requires, and will well reward, a critical study.

379. *Poa andina*, Nutt. in herb. Acad. Philad. "Upper Clear Creek."  
 376. *Poa arctica*, R. Br.? (*P. flexuosa*, Wahl.); a form of *P. laxa*?  
 "Alpine ridges."  
 377. *Trisetum subspicatum*, Beauv. "Alpine ridges."  
 378. *Bromus Kalmii*, Gray, Man. "S. Clear Creek; July."  
 380. *Festuca ovina*, L. "Alpine."  
 381. *Triticum ægilopoides*, Turcz. Perhaps a variety of *T. caninum*,  
 as Ledebour has it. "Alpine."  
 382. *Phleum alpinum*, L. "Subalpine."  
 383, 387, 389. *Carex atrata*, L., var. *nigra*, Boott. (*C. nigra*, All.), ex-  
 cept that the perigynia are light-colored. From the var. *ovata*, Boott  
 (*C. ovata*, Rudge), they differ in the sessile and crowded spikes.  
 384. *Carex rigida*, L.  
 385. *Carex incurva*, Lightf., with a dense, globular head.  
 386. *Carex capillaris*, L.  
 388. *Carex aurea*, Nutt.  
 390. *Carex lanuginosa*, Michx. S. Clear Creek.  
 391. *Carex festiva*, Dewey. S. Clear Creek.  
 393. *Carex bromoides*, Schk.? Too young.  
 394. *Woodsia obtusa*, Torr. "Subalpine."  
 395. *Cystopteris fragilis*, Bernh.  
 396. *Allosorus* (*Gymnogramme*) *acrostichoides*; referred by Sir Wm.  
 Hooker to *A. crispus*. "Alpine."  
 397. *Notochlaena dealbata*, Kunze. Near Idaho.

[Concluding observations in next number.]

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ART. XXIV.—Abstract of a discussion of the Horizontal Component of the Magnetic Force, from observations made at the Girard College Observatory, Philadelphia, in the years 1840-'41-'42-'43-'44-'45; by A. D. BACHE, LL.D., F.R.S., Mem. Corr. Acad. Sc. Paris, Sup't. U. S. Coast Survey.

PART IV.—Investigation of the eleven (or ten) years period and of the disturbances of the horizontal magnetic force.

IN the full paper, notes of all the changes in the instruments from accidental derangement or otherwise, and of the corrections applied, follow this statement, as an introduction to Table No. I, which contains the recapitulation of the monthly mean readings of the bifilar magnetometer, corrected so as to present a continuous series and with the observed temperatures.

IN applying the results, by equations of the form involving the change of temperature and of epoch, the latter changes including the loss of magnetism in the bar and the change of the horizontal force of magnetism, it was found expedient to omit the results of the first year of the series. The remaining four years results gave 16.5 scale divisions for the monthly effect of the change of magnetic horizontal intensity, and of the magnet-