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On the flora of the Kuram Valley &c., Afghanistan

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On the Flora of the Kuram Valley, &c., Afghanistan. By J. E.
T. AITCHISON, F.L.S., Surgeon-Major H.M. Bengal Army.
[Read February 19, 1880.]

I. GENERAL OBSERVATIONS ON THE FLORA AND ON THE
DISTRICTS TRAVERSED.

1. *Introductory Remarks.*

IN the winter of 1878 I accompanied the troops under General (now Sir Frederick) Roberts's command during the advance of the Kuram Field Force into the Kuram Valley, at the taking of the Péwarkotal, and during its further advance to near the Shutar-Gardan. From what I then saw of the country it appeared to me to be an interesting one in a botanical point of view; and therefore, early in 1879, I proposed to the Quartermaster-General, Major Collett, that it might prove advantageous to science if some one were appointed to accompany the column in the contemplated advance on Kabul. General Roberts at once recommended the proposal to superior authority, which ultimately resulted in my being attached to this force as botanist. I made my arrangements, and joined the force at Kuram on the 14th of April, from which date I commenced to make my collections in earnest. Peace having been proclaimed, no further advance took place. I therefore directed my investigations to the flora of the portion of the country enclosed within the red line traced on the map before you (exhibited at reading of paper).

Owing to the massacre in Kabul, and the simultaneous move of the troops to the front, my plans, for the latter end of the season, had to be altered. My collections had to be hurriedly packed and conveyed out of the country, and many of my museum and living specimens were left behind on account of the difficulty of obtaining carriage; besides it seemed probable that my services as a medical officer would again be required to accompany the army, so that the great point was to succeed in getting my collections deposited in safe keeping. I therefore accompanied them by hurried marches to Thal, and there meeting General Roberts returned by his orders to Alikhél, from which the advance of the army was taking place. Here I received further orders from the General, which were to proceed to England and there collect what information I could during the winter to assist me in the continuance of my work on my return to the force this spring. I arrived in England with my collections on the 29th November, and since then have been at work with them at the Kew Herbarium; and had it not been for the assistance I obtained there, the information I now lay before you could not have been prepared within the time placed at my disposal, as I have to leave England during the first week in March.

To the late much-lamented General Munro I am indebted for the identification and naming of my grasses (this, I believe, was one of the last works on which he was engaged previous to his death); to Mr. Boeckeler for naming my Carices; to Mr. Baker, of the Kew Herbarium, for naming and identifying Leguminosæ and Petaloidæ; to Mr. C. B. Clarke for the naming of my Compositæ; and to Mr. Hemsley for the great assistance he afforded me in working with me daily. When it is known that my collection consists of 15,000 specimens, belonging to 950 species, some idea can be entertained of the hard work it has entailed upon all engaged upon it, especially when it is taken into consideration that the time was so limited.

2. Geography and General Conformation of the Country.

The collection of plants, regarding which I now write, was made during the summer of 1879 in Afghanistan territory, along the left bank of the Kuram river from Thal to Pêwârkotal, and thence upon the higher plateaux, the basins of the Karaia and Hazârdarakht rivers, tributaries of the Kuram.

Before describing its botanical features I deem it of import-

nance to give a short outline of the geography and general conformation of the country. To secure, therefore, a ready comprehension of the subject, I shall divide the area over which I have botanized into three sections:—The first comprising that portion of the valley of the Kuram river which lies between Thal and Badishkhél; the second, the left bank of the Kuram from Badishkhél to Péwárkotal; the third, the basins of the Karaiá and Hazárdarakht rivers from Péwárkotal to Serátigah. It will be found that these three geographical sections are coincidentally three fairly distinct botanical areas, each having a flora more or less peculiar to itself.

Valley of the Kuram river between Thal and Badishkhél.—The altitude of Thal above the sea-level is 2500 ft., and that of Badishkhél 4000 ft., the distance between the two localities being about 50 miles. The road followed runs along the left bank of the river, occasionally, however, crossing spurs of conglomerate. The course of the river from Badishkhél is south, slightly east; its bed is wide and shallow, in some places being nearly a mile broad; but at Thal, where the spurs of conglomerate approach on both sides and some igneous rocks also occur, it becomes considerably contracted, making it extremely dangerous to ford at any time.

From Badishkhél to Péwárkotal.—The course of the Kuram river in this district is almost due east, until reaching Badishkhél, where it suddenly bends to the south. On its right bank it is skirted by a set of low hills scarcely reaching 7000 ft. in elevation. The left bank is likewise at first skirted by similar low hills, along which the road runs. The valley on this side becomes gradually more open, owing to the hills of the Safed-Koh range receding, as it were, from the river, leaving extensive open plains, until at length the distance between the hills and the river attains to fully 8 miles at Kuram, widening still more towards the west.

Kuram is a large village and fortress situated on the left bank of the river, at an altitude of nearly 4800 ft., and is about 20 miles west of Badishkhél. A good view of this part of the country is obtained from the Darwazagai pass, situated 6 miles to the south of Kuram, and at an altitude of nearly 5000 ft. From this point of view the river is seen flowing sluggishly in several channels from west to east, through richly cultivated land watered by irrigation. Beyond the cultivation extend vast plains composed of numerous fan-shaped masses intersected by the channels of

the many streams which form the tributaries of the Kuram from the north. These plains gradually ascend until they are lost in the low hills which form the bases of the Safed-Koh range. These again rapidly rise to an average of 14,000 ft., the two highest peaks occupying the extreme ends; that on the east, called Karaiá, is 15,400 ft., and that on the west, called Sikarám, is 15,600 ft. in height. From the southern shoulder of the latter a spur runs to the south, reaching almost as far as the Kuram river: this is the Pówárkotal range, forming the western boundary of this area, which for the future will be alluded to as the *Kuram District*.

Basins of Karaiá and Hazárdarakht rivers.—The Pówárkotal range on its eastern aspect presents a precipitous face to the depth of nearly 1500 ft. The summit of the road leading across this range is called the Pówárkotal, or pass of the Pówár, and is 8500 ft. in height. Another spur runs from Sikarám to the west, ending in a peak called Matúngé, about 12,700 ft. in height. The country enclosed within these two ranges constitutes the basin of the Karaiá river, and is known as the *Hariáb District*. At Alikhél, distant some 18 miles from the Pówárkotal, the Karaiá river joins the Hazárdarakht at an elevation of 7000 ft. The river formed by the union of these two streams subsequently falls into the Kuram. The Hazárdarakht river rises from the western base of Mount Sorátígh; at first its course is north-east for 15 miles, then to the south-east for the same distance, when it joins the Karaiá river, as already stated, at Alikhél.

3. *Vegetation of the road from Thal to Badishkhél.*

The general aspect of the country between Thal and Badishkhél is not a promising one for the botanist. The low hills are bare and treeless, covered with a small meagre jungle, which, however, becomes thicker and of a greater height in the hollows of the country and ravines, where it is protected from the climate and where more moisture is present. Along the river-banks there are a few trees with a large grass; and here, in the vicinity of the river or along irrigation channels, we come across some cultivated trees.

The following shrubs constitute the greater portion of the jungle on the hills:—*Acacia modesta*, *Tecoma undulata*, *Sageretia Brandrethiana*, *Gymnosporia spinosa*, a form of *Zizyphus vulgaris* resembling *Z. nummularia*, *Ehretia aspera*, *Withania coagulans*,

Periploca aphylla, *Adhatoda Vasioa*, several *Grewia*, and *Chamærops Ritchieana*.

In the somewhat sheltered localities and ravines *Reptonia buxifolia* occurs as a small dense tree with very dark green foliage. This completely replaces *Olea cuspidata*, Wall., which here, except in sacred groves, is not to be found. *Pistacia integerrima* also occurs, and occasionally *P. cabulica*, a tree quite new to me, with some bushes of *Dodonæa*.

On the banks of the river are to be found a *Tamarix*, *Dalbergia Sissoo*, *Nerium odorum*, a *Saccharum*, *Zizyphus Jujuba*, and *Z. oxyphylla*, with the following cultivated trees:—*Morus alba*, *Salix aomophylla*, another *Salix* (near *babylonica*), and *Melia Azederach*. Frequently occurring as scandents, amongst the above, are seen *Cocculus Leaba*, *Asparagus* sp., and *Ephedra* sp.

The village of Thal, at an altitude of 2500 ft., is situated in a hollow surrounded by low hills. Thus sheltered from the cold winds of winter, its climate approximates that of the Punjab, to which also its flora assimilates—as, in addition to the plants already mentioned, *Salvadora oleoides* occurs as a tree, and at one locality *Ricinus communis* is common: *Capparis aphylla*, a typical Punjab form, however, does not exist.

As one ascends the river, Punjab hot-country types, such as *Dalbergia* and *Calotropis*, accompany one as far as Ahmad-i-Shâma, and are then lost; and here a more northern flora is first observed, in cultivated trees of *Platanus*, walnut, *Celtis*, and the vine as an enormous climber. The changes in the hill-jungle take place much more gradually; *Acacia modesta* is the first to be left behind, its place becoming occupied by a small bush (*Caragana*), with patches of *Ebenus stellata*.

On reaching the more open valley surrounding the village of Hâzar Pîr, *Chamærops Ritchieana* is seen for the first time in its full growth, not merely as a handful of leaves attached to a large creeping root, which represents its form on Mt. Tilla and the Salt Range, but developed into a bush of from five to seven feet in height, close masses of which extend for miles across the open plateaux. Frequently, too, it may be seen occurring as a branching tree of from 15 to 25 ft. in height, but then usually when in the vicinity of other trees or buildings.

Here, also, in the rich alluvial soil of the fields, are great clumps of old myrtle, which, from its peculiarly local growth, though occurring in numerous patches, is suggestive of cultivation.

On approaching Badishkhél, *Sophora mollis*, a true Punjab and Salt-Range form from an altitude of 2000 ft., *Daphne oleoides* and *Cotoneaster nummularia*, outer Himalayan forms from 5000 ft., are seen to mix with the jungle, and at length to form its greater proportion, and they continue characteristic almost to 10,000 ft., in whatever direction I have travelled. Other Salt-Range forms which have been hitherto gradually associating themselves with the above become here more frequent, namely:—*Convolvulus lanuginosus*, growing in hummocks, *Onosma echinoides*, *Salvia Moorcroftiana*, *Astragalus polyacantha*, and *Otostegia limbata*.

The cultivation up to Badishkhél is similar to that of the Kohat district, or to such portions of the Punjab as are cultivated by irrigation. *Sorghum vulgare* and *Penicillaria spicata* as field crops cease to occur beyond this limit.

At Badishkhél I noticed one large tree of *Pyrus variolosa* which was not cultivated. It is to be found probably in some of the valleys in this neighbourhood, as the natives seem well acquainted with it.

4. *Vegetation of the road from Badishkhél to the village of Kuram.*

The valley is much contracted until it turns fairly to the west, when it rapidly widens, admitting of greatly increased cultivation along the banks of the river. I would here remark that there is no cultivation in the whole Kuram district without irrigation.

The hills on either side of the river consist of boulders, shingle, and conglomerates, interspersed with much broken-up limestone, having on the surface little or no soil, and being scantily clad with a dwarf stunted jungle. This jungle consists chiefly of *Zizyphus vulgaris*, *Periploca*, *Sageretia*, *Daphne*, *Sophora*, *Cotoneaster*, *Punica*, *Dodonæa*, *Chamærops*, *Withania*, *Otostegia limbata*, *Astragalus polyacantha*, and amongst them the new types (8) *Caragana? ulicina* and *Xiphion Stocksii*, remarkable for its handsome deeply purple-coloured flowers, and in its extending its habitat from this to the Hariáb district. *Convolvulus lanuginosus* covers the more open and stoneless ground in great beds, with an occasional *Eremostachys* (No. 16), a handsome yellow-flowered species. Near villages, plane-trees from 12 to 16 ft. in girth, *Melia Azederach* (attaining 8 ft. 6 in. in girth)

Zizyphus, *Morus*, *Elæagnus*, and *Diospyros*, of ordinary size, are all numerous.

On approaching Kuram, gardens become more common around villages, and enclosing them hedges are composed of *Elæagnus* and *Buddleia crispa*, Benth. Between the fields *Ficus caricoides* and an occasional *Celtis* occur. In the fields themselves *Tulipa stellata* is to be seen, from its typical form gradually changing to what it is impossible to distinguish from *T. chrysantha*, Boiss., the deeper yellow form being more common on the dry conglomerate formation. In clay-fields *Morera Sisyrinchium* abounds, and amongst stems and under bushes, wherever a little soil may have accumulated, the turnip-rooted *Nepeta* with its pretty purplish flowers constantly appears.

5. *Vegetation of the Kuram Plains.*

Beyond the cultivation to the north extend the Kuram plains, the vegetation of which I shall now describe. These plains, formed from mountain débris deposited to a great depth, are in summer totally devoid of water, whether from permeation or rain. In winter they are covered with snow to a greater or less extent; and, being also exposed to the extreme heat of a subtropical sun, alternating with blasts of cold wind from the snow-clad hills, their flora must be limited and of a peculiar type.

The plants which occur most frequently are:—*Othonopsis intermedia*, a large-flowered yellow composite, with fleshy vertical leaves; *Stachys parviflora*, in a very woolly state; *Gypsophila Stewartii*, occurring in small dense prickly tufts, which in its spring costume is of a mossy green colour, thickly covered with purplish flowers; several *Astragali*, namely, *anfractuosus*, *decemjugus*, *hippocrepidis*, *loucocephalus*, *polyacanthus*, *psilacanthus*, *strobiliferus*, *kuramensis*, Baker, *anganus*, *ptilocephalus*, Baker, and *susianus*, Boiss., var. (this last occurs in dense clumps, which present a very showy appearance when in full blossom, owing to its bright pink corolla); two new species of *Onobrychis*, viz. *dasycephala*, Baker, and *microptera*, Baker, with very handsome flowers; a large-flowered *Scabiosa* (no. 82), also probably new, and equally common with it *Scabiosa Olivierii* and *Aster altaicus*. Where there is much clay and fewer stones *Gymnandra armena* carpets the ground with its exquisite little flowers; it is common from this to the Péwarkotal, where it will be again noticed. *Thymus Serpyllum* and *Convolvulus lanuginosus* are common, and here and there the large

yellow flowers of *Scorzonora mollis* are to be seen, apparently for its maintenance collecting a supply of moisture in its bulbous roots.

In the more sheltered parts and hollows are to be found some occasional patches of *Ebenus stellata*, *Buddleia crispa*, with a stunted unrecognizable *Berberis*, and our steady friends the *Sophora*, *Daphne*, *Cotoneaster*, and *Perowskia*. In the deep cuttings of the winter torrents, on their shady side, *Isatis tinctoria*, with its large cabbage-like leaves, appears conspicuous: it is well known, being employed in dyeing by the natives; indeed this fact guided me in recognizing the plant. Besides these *Salvia glutinosa* and *S. rhytidea* occur (both handsome in their way, and usually in the very centre of the dry watercourse), *Verbascum Thapsus* and *V. eriantha* are common, the latter more prominent from its branching inflorescence.

To certain localities on these plains water is conducted from long distances and run into tanks, where it is collected for the use of the cattle and sheep which graze in their vicinity. Attempts have been made to obtain water by digging wells, but, owing to the great depth of the gravel-deposit, these efforts have always ended in failure.

6. *Vegetation of the Flanks of the Safed Koh.*

Along the base of the Safed-Koh range numerous valleys are seen debouching upon these plains. At these openings, and where the water from the outcoming streams can be utilized for cultivation, the largest villages of the Kuram district occur. The most important of these is Shálizán, situated about ten miles north-west of Kuram at an altitude of 6300 feet. It is composed of several small villages occupying either side of the Durban stream, the size of each village depending upon the amount of water available for cultivation. Until one has actually seen the arboreous and field cultivation that exists here, it is impossible to credit it, reminding one more of some of the best parts of Kashmir than what one would expect so near to the sterile plains just alluded to.

This extreme fertility is no doubt due to the richness of the soil, abundance of water, the favoured position (sheltered, as it is, from the predominating bleak winds by the closely encircling hills), and to the resulting mildness of its climate.

The characteristic trees found here are:—the Oriental plane,

having a girth of from 14 to 25 feet, one old tree measuring 33 feet; the walnut, many trees of which average 12 feet, and there is one exceptional tree 17 feet; the Amlok (*Diospyrus Lotus*), very numerous, tall, but of no great girth. These, with an occasional large mulberry, form extensive groves spread irregularly through the villages, the plane being grown for its shade and shelter, the walnut and "Amlok" for their fruits, which form a considerable portion of the food of the inhabitants during winter.

Orchards are common, and contain the following trees, viz. apricot, plum, apple, grape, quince, and *Elæagnus*. From all of these fairly good fruit is obtained, but not equal to that imported from the Kabul direction. The pear, peach, pomegranate, and cherry are exceptional. I do not remember having met with the almond cultivated.

In gardens and near shrines *Rosa damascena*, *R. Webbiana*, *R. Eglanteria*, *Iris pallida*, and *Althæa rosea* are cultivated, with *Melia Azederach*, the olive, *Celtis*, and an *Elæagnus*, the flowers of which are sweetly scented.

The soil yields two crops during the year, the first being barley, wheat, and clover, the second rice, maize, and one of the millets. Cotton is only grown in the more southern parts of the district to the east of Kuram. Tobacco and opium may be considered garden produce.

The clover cultivated is *Trifolium resupinatum*, the seed of which is obtained from the Hariáb district, because that produced in the Kuram district, it is said, does not germinate.

In the wheat-fields, growing as if it were a weed, and considered as such by the natives, is what has been identified as *Secale Cereale*, (common rye). This in time almost extirpates the wheat, and is considered injurious as food. It does not occur in fields of barley, because that crop ripens before the seed of the rye can come to maturity. As vegetables the natives cultivate onions, beetroot, turnips, radishes, brijjals, red pepper, pumpkins, cucumbers, melons, and water-melons. The whole of the land irrigated is carefully terraced; and in many places, to protect the water-channels or to guide the streams towards these channels, willows are planted; those in the Kuram district are *S. acmophylla* and a species near *babylonica*, and occasionally *Populus alba*, with its variety *denudata*. Hedges are common, usually consisting of *Prunus*, *Elæagnus*, and sometimes, but rarely, of *Zizyphus vulgaris*, which for this purpose is much more common near Kuram. Under the

shade of the cultivated trees, *Stipa sibirica* is profuse, and is well known as a grass poisonous to horses and cattle. It occurs in similar localities throughout the Kuram district, extending as far west and up to the Póvárkotal.

The directly southern exposure of the Safed-Koh range up to an altitude of 7500 feet is devoid of forest, and nearly bare of any thing like an undergrowth. The few occasional trees which are to be found consist solely of *Pistacia integerrima* and *P. cabulica*; and forming the little scrub-jungle, there are our companions throughout, the *Daphne*, *Sophora*, *Punica*, *Cotoneaster*, a *Berberis*, *Borchemia*, a variety at least (if not a new species) of *Cotoneaster nummularia*, *Rhamnus persica*, *Rhus Cotinus*, *Syringa persica*, *Caragana brevissima*, and frequently mixing with them *Morina persica*. On all other exposures, except that directly facing the south, or when in the vicinity of water, a luxuriant vegetation exists, amongst which are many Himalayan forms. Here we first meet with *Quercus Ilex*, from a shrub to a large tree, which is found growing in dry localities, often in isolation, as will be hereafter seen; also *Fothergilla involucrata*, largely employed in the construction of wattle and dab houses and of fences; *Cotoneaster baillaris*, *Buddleia*, *Desmodium tiliifolium*, *Jasminum officinale* and *J. revolutum*, *Lonicera quinquelocularis*, *Abelia triflora*, *Viburnum cotinifolium*, *Rhamnus purpureus* and *R. dahuricus*, with patches of *Amygdalus*. Creeping through the above occurs *Rosa Webbiana*, *R. moschata*, and *Dioscorea deltoidea*, several *Asparagi*; and close on the ground, in thick clusters, *Smilax vaginata* and *Hedera Helix*, which, curiously enough, does not attach itself to the trunks of trees. Occasionally *Polygonatum multiflorum* and *P. verticillatum* are to be met with. In the more open and dry localities, but still near water, as along irrigation channels, occur *Indigofera Gerardiana*, *Plectranthus rugosus*, and *Perowskia atriplicifolia*, which is met with frequently in great masses by itself, and when in full blossom presents a most attractive appearance.

7. Vegetation of the Valleys of Safed Koh.

To give an idea of the vegetation of the interior of these hills, I shall allude to a few of the more characteristic forms which occur in the flora of the Shéndtoi valley, which opens out upon the plains about four miles to the east of Shálizán. In the ridges and ravines which intersect the country between Shálizán and

the Shéndtoi valley, *Prunus Jacquemontii* and *Berberchia*, sp., are very characteristic. On the left bank of the Shéndtoi river, at the mouth of the valley, lies the village of Katskallé, consisting of some fifteen to twenty houses. Owing to the limited supply of water in the river during the hot months, much of the land here lies uncultivated, and ruins of villages are to be seen scattered about. The bed of the stream here has an altitude of nearly 6800 feet. The entrance up the valley leads through a deep narrow gorge with overhanging precipitous cliffs of great height, consisting chiefly of limestone and slate. Here, on the right bank of the stream, the rocks are seen covered with moss-like masses of *Selaginella sanguinolenta*, *Dionysia tapetodes*, both Siberian types, a new *Saxifraga*, *Aster Amellus*, prominent from its large white flowers; and, hanging from the crevices in bunches, a luxuriant undescribed grass (*Avena oligostachya*, Munro, MS.).

As the valley widens largish trees of the walnut in a wild state occur, and with it *Euonymus fimbriatus*, *Rhamnus purpureus* and *R. dahuricus*, *Fothergilla*, *Staphylea emodi*, and *Syringa emodi*, with pure white flowers. It is curious to note that the last-named plant occupies always a higher position than its congener *S. persica*, and that the two never seem to mingle. At about 8000 feet, *Prunus Padus*, *Taxus baccata*, *Pinus excelsa*, *Abies Smithiana*, and *Quercus Ilex* begin to form a forest. At 9000 feet *Quercus Ilex* disappears, to be replaced by *Q. semecarpifolia*, which in this valley attains to a great size. There is one tree lying cut close to the old encampment of the 23rd Pioneers, which measured 18 feet in circumference and 100 feet in length before any considerable branch was given off.

On the ridges the forest is increased by *Abies Webbiana*; no Deodar or *Juniperus excelsa* occur in this valley. From 8000 to 10,000 feet the valley is characterized by the number of its ferns, signifying a certain humidity of climate not to be met with in any other part of the country visited. The following frequently occur:—*Cystopteris fragilis*, *Asplenium septentrionale*, *A. viride*, *A. Trichomanes*, *A. varians*, *A. fontanum*. The most remarkable Fern collected, however, was *Nephrodium rigidum*, Desv., which now for the first time has been undoubtedly proved to be an Afghan form. This is here very profuse under the shelter of trees or between large boulders. At an elevation of 10,000 feet, *Aspidium Proscottianum* and *Nephrodium barbigerum* are not uncommon; the form of the latter which occurs here seems to unite the two species *N. barbigerum* and *N. Brunonianum*. On the rocks occa-

sionally at 7000 feet, but more commonly from 8000 to 9000 feet, occurs *Rhododendron affghanicum*, a new species, remarkable from the fact of its being a native of a country hitherto considered as unlikely to yield Rhododendrons, far less any new species. It is poisonous to goats, and is reluctantly handled by the natives.

Ulmus campestris, as a good-sized tree, occurs up to 9000 feet; its wood is valued for making the rough wooden dishes used by the people. Amongst the forest, from 10,000 feet to a little above this limit, *Betula Bhojpattra*, with *Pyrus Aucuparia* and *P. lanata*, are not uncommon. The bark of the *Betula* is not employed for any economic purpose.

8. *Vegetation of Safed Koh at elevations of 8000-11,000 feet.*

The following shrubs and herbs occur at about 10,000 feet, chiefly in the bed of the valley:—A new species of *Pertya*, a common bush (a rare Japan and Chinese genus), called *P. Aitchisonii* by C. B. Clarke; *Lonicera sericea* and *Myrtillus*; and in the clefts of the limestone rocks, *Wulfenia Amhorstiana* and a *Veronica* near *Teucrium*, both remarkable for their respective forms of bright inflorescence; several *Silenes*, *Primula rosea*, *Geranium Wallichii* and *nepalense*, *Impatiens amphorata*, and some species of *Pedicularis*. At and a little above this height, also in the clefts of the rocks, more particularly at a place known as the Marble gorge, *Isopyrum grandiflorum* and *Polypodium clathratum* of Clarke are found. Amongst turf, at 11,000 feet, *Caleianthemum kashmirianum*, *Aconitum Napellus* var. *rotundifolium*, with *Botrychium Lunaria*, occur in great abundance, and about the same place, but on moss-covered stones, *Cryptogramma crispa*.

The limit of forest is usually reached at 11,000 feet; in favoured localities, however, single trees not unfrequently exist up to 12,000 feet. *Pinus excelsa* and *Abies Webbiana* are the two trees which alone occur as dwarf specimens at the highest altitude. Here a bush-jungle begins gradually to replace the forest trees, chiefly composed of *Salix elegans*, *S. grisea*, with another new *Rhododendron*, a large spreading shrub resembling *R. campanulatum* in its mode of growth, and remarkable for the heavy aromatic odour emitted from its leaves. The natives wear occasionally a bunch of these leaves stuck in their turban in lieu of flowers, and when dried

employ them as snuff. These bushes in some localities form such dense thickets that it is almost impossible to work one's way through them. Occasional bushes of *Ribes Grossularia* and *R. rubrum* may be seen on the margin of the forest, where also *Juniperus communis* occurs in great flattened isolated patches. *Rheum Moorcroftianum* is common on exposed ridges formed of loose débris, and with it, but more generally in the hollows, *Polygonum rumicoides*. The bush-jungle rarely ascends beyond an altitude of 12,000 feet, whence, to the crest of the Shéndtoi ridge, which is at its lowest 12,000 feet, there is little or no vegetation except a species of *Draba*, *Allium senescens*, and *Rheum Moorcroftianum*, with a few grasses and a *Carex*.

9. *Vegetation from Shálizán to the Péwárkotal.*

Two miles above Shálizán the Durban river is joined on its right bank by the Gaudháo stream, which has its source from the eastern spurs of Sikárám. On its left bank is the village of Kaiwás, in the hills to the north of which, at an altitude of 10,000 feet, and under the western shade of some huge rocks, I obtained *Clematis Robertsiana*, a new and handsome species with the largest flowers of the genus. Beside it, but growing on the face of the rock, *Potentilla Collettiana*, also a new species with *Sibbaldia*-like leaves and brilliant yellow flowers, and *Eritrichium sericeum* in great beauty. In this valley, and to the west of it, there is no *Taxus baccata*; the *Deodar* and *Juniperus excelsa* occur as isolated trees, but rapidly increase towards the west, where they form forests. At the junction of the two streams and between them is situated the village of Karríkalla, on the lands of which it is said some crops are raised without irrigation, viz. barley, wheat, *Setaria*, and *Panicum*.

From Shálizán to the Péwárkotal, a distance of some fifteen miles, the first part of the road lies along the edge of the low hills, which are here composed of a coarse slate. From amongst these springs of water issue at intervals, but which, in reaching the gravel and conglomerate formation, suddenly disappear. At some of these spring-heads I found *Epipactis veratrifolia*, a small *Peristylus*, with *Primula denticulata*, var., and *Androsace incisa*. On the eastern exposure of these hills, and in the vicinity of springs, I noticed the plane-tree occurring as if naturalized, and which did not seem to spread downwards following the water, whilst the younger trees occurred higher up the hill, in

places where they could never have been planted, to an altitude of 7000 feet. The same peculiarity I observed in Kashmir on the western face of the Tukt-i-Sulimán. There is a sacred grove of trees surrounding a shrine at one of the largest of these springs, in which is a *Cupressus sempervirens* of great height and measuring 6 feet in circumference, forming a landmark to the surrounding country. Here also are some magnificent trees of a distinct form of *Populus nigra*, the leaves of which are miniature ones. This I subsequently found in great numbers cultivated in the Hariáb district. It occurs as a tree fully 100 feet in height, with a girth of 10 feet 6 inches. The road now crosses over some of the plain country until it reaches the Afghan cantonment of Habíbkalla, situated at an altitude of 6550 feet. From this the road leads westward to the Péwárkotal, crossing, in the immediate vicinity of Habíbkalla, the bed of the Spíngháó river, close to which is a large cultivated *Populus alba*, 10 feet in girth. From this point the road at first passes through nearly three miles of cultivation, belonging to the village of Péwár; it then winds amongst spurs and ravines chiefly of limestone. Here commences a thicket of stunted *Quercus Ilex*, upon the branches of which two species of *Viscum* grow, with a few other shrubs, the most interesting amongst them being a new yellow rose, its first appearance, *Rosa Ecce*, mihi, a stiff upright bush; and climbing over the *Quercus Ilex*, *Lonicera Griffithii*, one of the grandest things, when in flower, that I have seen here, the contrast being very fine between the enormous bunches of rose-pink flowers and the dark green foliage of the oak. Of course *Sophora*, *Cotoneaster*, and *Daphne* still occur, but in greater luxuriance. Under the dense shade of the oaks, and growing close into the roots, is a species of *Cephalanthera*, which is very common. At 7000 feet occasional trees of *Deodar* and *Juniperus excelsa* are to be seen; and on the precipitous ascent to the Kotal these two trees soon form, with *Quercus Ilex*, a forest; and on the roadside one or two specimens of *Fraxinus Moorcroftiana* are passed. Only when close to the top of the ascent do *Abies Smithiana* and *Pinus excelsa* join the forest.

The Péwárkotal having been reached, a dense forest is seen to occupy its ridges, consisting chiefly of *Deodar* with *Abies Smithiana* and *Pinus excelsa*. In certain localities, as on the crests through the most dense part of the forest, *Abies Webbiana* occurs, and *Juniperus excelsa* is common on the more northern and open

exposures. There is little or no undergrowth; if any, it consists of *Quercus Ilex*, or more generally of *Q. semecarpifolia*, with occasional shrubs of *Sophora*, *Daphne*, and *Cotoneaster*. The drainage from the west of the P  w  rkotal, as previously mentioned, falls into and forms the Karaia river, so that the Hari  b district is now entered upon. To the north, between the Sp  n-gh  kotal and the P  w  r, the ridges of the hills are found to be separated by small meadows resembling in miniature the "mergs" of Kashmir. These are covered with a thick close sward consisting chiefly of *Gymnandra stolonifera* and *Cousinia racemosa*, which latter seems to be kept down to this tufted form by the grazing of sheep. Here early in the season, from under the melting snow, *Merendera persica* grows plentifully. On the left bank of the Karaia river there is little or no cultivation; on the right bank, however, there is a considerable amount, owing to the country being much more open, consisting of a numerous succession of plateaux.

10. Vegetation of the Hari  b District.

The climate of the Hari  b district, owing to its altitude, is much colder and drier than that of the Kuram, with a more severe winter. The land produces but one crop during the year, viz. of wheat, barley, maize, rice, two millets (*Setaria italica*, *Panicum miliaceum*), pulses (*Ervum Ervilea*, *Phaseolus vulgaris*, *Glycine Soja*), carrots, and clover (*Trifolium resupinatum*), a few of the Cucurbitace  , and a little tobacco. Near villages are orchards of apricot, plum, and apple, with a few walnut-trees. Gardens are unknown; hence there are no vegetables. The palm, *Celtis*, *Diospyros*, and vine do not grow at this altitude; but occasionally a few mulberry-trees of no great size are to be seen. Cultivated along water-courses for their protection, *Salix* sp. near *sericocarpa*, Anders., a large tree with weeping branches; *S.* sp., a small tree or large bush; and *S. angustifolia*. The two latter are also quite wild in the streams which run down from the hills, but not so in the open river-bed. Along with these *Populus nigra*, var., is by no means uncommon, cultivated, and perhaps wild. Near villages hedges are common of *Elaagnus*, *Rosa anserinaefolia*, *R. Eglanteria*, *R. canina*, and more rarely of *Hippophae*: climbing over them one very frequently meets *Bryonia dioica*, a western form which extends as far east as Lahul in the Himalaya.

On the outskirts of villages, *Hyoscyamus niger*, *Conium macula-*

tum (for the first time found east of Persia), *Onopordum Acanthium* (an enormous thistle), and *Solanum dulcamara* (growing, as in Britain, through hedges). On uncultivated clay-fields are found *Matricaria disciformis*, *Carum Bulbocastanum*, and a variety of the latter (a favourite food of the wild pig, which is productive of much destruction to cultivated crops when it occurs plentifully amongst them), *Artemisia Tournefortii* (remarkable for its tall *Cannabis*-like appearance), with *Xanthium Strumarium*. The uncultivated ridges and plateaux of conglomerate formation in the open country are covered with a scanty dwarf vegetation consisting of the following:—*Juniperus excelsa*; *Amygdalus eburnea*, occurring in great clusters, and when in flower, the bushes being leafless at the time, presenting a lovely mass of peach colour, and hence well worth cultivating; *Cratægus Oxyantha*, seen sometimes as a good-sized tree, but then near villages or in fields; *Rosa Ecæ*, several *Berberis*, the *Daphne*, *Sophora*, and here both the forms of *Cotoneaster nummularia*. *Phlomis kashmiriana*, when in full bloom, is extremely attractive. A *Trichodesma*, probably a new species, has magnificent large blue borage-like flowers. *Sophora alopecuroides* is found in profusion, but only at one locality, and that near Alikhél; *Scutellaria*, no. 537, is very characteristic from its long tubular yellow flowers tipped with purple; *Lactuca orientalis* and *L. viminea* are both very common and remarkable for their woody and apparently leafless stems; *Cousinias* are also common, *C. racemosa* being here the most frequent; *Aster altaicus*, *Carduus acanthoides*, *Pterocephalus speciosus* (a very handsome plant), with *Scabiosa Olivieri* and *Atractylis cuneata*, are characteristic, together with several *Artemisicæ*.

Growing abundantly throughout this scrub-jungle, and readily detected in the early spring from the vivid green of its leaves, and later on by the brilliancy of its yellow flowers, is *Eremurus aurantiacus*, a plant which may be considered as the vegetable proper of the Hariáb district. Also growing among the roots of many of these bushes are *Anemone biflora* with exquisite flowers, *Arum Griffithii*, and, following them a little later in the season, *Fritillaria imperialis*, *Tulipa stellata*, and *T. chrysantha*, with several *Gageas*, besides everywhere *Isatis tinctoria*. Near Biánkhél, a large village on the right bank of the Karaia about four miles to the north-east of Alikhél, is a piece of meadow-land watered by many springs, on which I found several localized plants:—*Geranium*, sp., no. 600, *Gentiana aquatica*?, *Glaux maritima*, *Erythræa*

ramosissima, *Ononis arvensis*, *Triglochin palustre*, *Orchis latifolia*, *Primula denticulata*, *Tussilago Farfara*, *Swertia petiolata*, and *Ophelia cordata*. Near this *Taraxacum montanum* is found, as well as in one or two other localities.

Under the shelter of forests, chiefly along the lateral ravines in which the tributaries of the Karaia flow, a variety of shrubs and other plants are found which are more or less local; as, for instance, *Prunus Jacquemontii*, *Ribes orientale* and *R. Grossularia*, *Lonicera Griffithii*, *Fraginus Moorcroftiana*, two species of *Ephedra*, and a *Leptorhabdos* near *virgata*. In the forest near the Péwárkotal *Eremostachys speciosa* is occasionally met with—a Central-Asian type, a very woolly plant with large yellow flowers on a shortened spike almost growing from the root-stock. Under *Picea Smithiana*, apparently parasitical upon it, *Hyppopytis lanuginosa*; and on limestone débris *Althæa rosea*. I here first found a *Nepeta* near *teucrifolia*, which extends from this throughout the Hariáb district to Káratígah. *Phlomis spectabilis*, on the margin of the forest near the cantonments, is extremely handsome; and underneath the trees, where one would expect little to grow, *Astragalus verticillatus* (collected also on the exposed southern face of the lower hills near Shálizán), with *A. rhizanthus*, is very characteristic, and which at first, on finding the leaves only, I mistook for a Rubiaceous plant.

The rocks of the Hariáb district are covered with the following plants:—*Dionysia tapetodes*, being the most characteristic, from its frequency and moss-like habit and its profusion of bright yellow flowers (some of the plants of this seem to have reached a great age, as I have seen a woody root-stock over 6 inches in circumference); *Parietaria officinalis* and *P. debilis*; *Campanula* sp., no. 541; *Seseli sibiricum*, remarkable for its stiff erect appearance, generally found in the most inaccessible localities; *Microrhynchus aspleniifolius* and *Asplenium Ruta-muraria*, which latter may be considered the only fern of the Hariáb district up to 11,000 feet, although in one instance on limestone I picked up a good specimen of *Ceterach*, and heard of a species of *Adiantum* near water at Alikhél. Specimens of *A. Trichomanes* and *A. septentrionale* are very uncommon.

11. *Vegetation of the spurs of the Péwárkotal, Alikhél, and around Sikarém up to an altitude of 13,000 feet.*

On the spurs of the Péwárkotal between Zabardastkalla and
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Alikhél, and on the hills between Sikarám and Matúngé up to nearly 10,000 feet, the forest becomes much thinner, and is greatly altered in appearance, owing to the occurrence of *Pinus Gerardiana**. All the more open parts of the country when there is forest is now covered chiefly with this pine, deodar, and *Juniperus excelsa*; the other trees—viz. *Pinus excelsa*, *Abies Webbiana*, and *Picea Smithiana*—occurring rather in the interior of the hills, or on the ridges which reach an altitude of 10,000 ft. Gerard's pine is distinguished at once by the peculiar character of its trunk and branches, which much more resemble those of a stout stunted beech than of a pine. The bark is of light grey colour, which, on close inspection, presents a generally mottled appearance of various hues, produced by the irregular manner in which the outer layers are shed. It is celebrated for its edible nuts, largely used as food by the natives, and which are an article of export from other parts of the country to India.

Along the range which extends westward from Sikarám to Matúngé I obtained a new species of *Eremurus* (a very fine plant with large hollow leaves) and a *Chorispora* near *tenella*, DC.

On two occasions I explored the Hazárdarakht river as far as Káratíghah on the road towards Kabul; and during my first visit I ascended one of the peaks of Serátíghah, the highest of which has an altitude of 13,600 feet. The distance between Alikhél and Káratíghah is about twenty-five miles, the road leading along the bed of the Hazárdarakht stream. The valley of this river nearly as far up as Rokían is open and well cultivated; beyond this, however, it suddenly becomes contracted, and any little cultivation there may be occurs in the lateral valleys, and not along the main stream. Beyond Drékalla cultivation ceases. The altitudes of the above localities are:—Rokían, 7550 feet; Drékalla, 8000 feet; Káratíghah, 9400 feet. On this route the following plants were collected:—Near Alikhél, on the plateaux of the river, *Ruta acutifolia*, DC.; near Rokían, *Acer*, probably *campestre*, a medium-sized tree, but neither flower nor fruit were seen: this is the only *Acer* I have obtained. As a tall woody shrub overhanging the river, no. 852, *Amygdalus* sp., the fruit of which, in its colour and appearance, resembles less the fruit of the almond than the peach. At Drékalla in one locality there exists a scrub-jungle consisting of *Juniperus excelsa*, several *Caragana*, *Sophora*, both forms of *Cotoneaster nummularia*, *Daphne*, *Amygdalus eburnea*, *Rosa Ecæ*,

* Ten feet in girth by forty in height is an exceptional tree.

two or three species of *Berberis*, a little *Quercus Ilex*, *Lonicera Griffithii*, with several *Artemisias*. Amongst the stony débris on the ridges above the river *Rheum Ribes* is very common; but, strange to say, I could procure no specimens of *R. Moorcroftianum*. Near the rhubarb, *Convolvulus pseudocantabrica* and the two *Eremuri* were common. On the banks of the river, close to the angle near Drékalla, *Hyoscyamus pusillus*, *Isatis tinctoria*, *Cousinia microcarpa*?, and *C. minuta* are frequent, with one specimen of *Hyoscyamus reticulatus*. From Drékalla to Káratígah the stream-bed is very narrow; and here on both sides a purely deodar and *Juniperus excelsa* forest exists without any undergrowth. These deodars are remarkable for the peculiar style of their growth; they are extremely tall, over a hundred feet, with excellent timber, having very short thick-set lateral branches not over 4 or 5 feet in length, and have nearly the same average length all the way up the stem. Covering the ground under this forest are masses of *Ferula Jaeschkiana* and *Prangos pabularia*; both of these were obtained on the hills between Síkarám and Matúngé, but in small quantity.

On the 19th of July I ascended Serátígah, following up a ravine to the south-west. The ascent was very gradual to 11,000 feet; the forest up to this point contained only deodar and *Juniperus excelsa*. Along the watercourse the two species of *Eremurus* were in full seed, and the leaves of *Rheum Ribes* (but not the other rhubarb) in their autumnal tints were common; but not a single specimen of the fruit of the rhubarb could I obtain. *Ferula Jaeschkiana* and *Prangos* were equally common. The former of these has extremely handsome fruiting stems with large masses of fruit all of a deep reddish purple, but much insect-eaten, so that it was nearly impossible to collect sound fruit. Amongst these, *Hordeum caducum*, Munro, was in abundance, and is the fodder-grass of these parts, together with *Stachys* sp., no. 817, *Carex divisa*, with a very woody nearly leafless Composite (*Tanacetum* sp., no. 820), and *Arnebia endochroma*, H. f. & T., remarkable for its flowers varying from a greenish yellow to a deep purple-black.

The forest completely disappears at 11,000 feet, and is replaced with flat masses of *Juniperus communis*, interspersed with great hillocks of *Acantholimon*, enormous ones of *Onobrychis cornuta*, *Gypsophila Stewartii*, and no. 225 a, a larger form, which may prove to be another species. In the shelter of these occurred

a spinous form of *Cicer soongaricum*, and a woody miniature tree-like *Polygonum*, *P. biaristatum*, n. sp. This peculiar lumpy and hummocky form of vegetation only exists up to 12,000 feet, above which the hills are perfectly bare, and any thing that does grow has to be diligently sought for in the crevices of rocks, or in their shelter.

In broken loose débris at 12,500 feet, I found for the first time *Lamium rhomboideum*, with its lovely pink flowers and its handsome soft woolly leaves. At the summit of the peak (13,000 feet) there are found amongst the rocks, *Cystopteris fragilis* (the only fern collected, with the exception of *Asplenium Ruta-muraria*, since leaving Alikhél), with *Oxyria reniformis*, *Valeriana dioica*, *Lonicera glauca* (so close and creeping, that it was very difficult to obtain fragmentary specimens); a very handsome glaucous-leaved *Ligusticum*, probably a new species; and in the clefts of the rock *Isoopyrum thalictroides* in great perfection and fine flower. On débris a species of *Draba*, no. 825, with *Alyssum persicum*.

12. Vegetation of the Spurs around Sikarám.

I made several excursions along the southern and western slopes of Sikarám, on one occasion ascending as high as 13,000 feet. Subsequently I ascended the main hill up to 15,000 feet, and a ridge to the north which overlooks a small lake to a height of 14,700 feet. Except on the northern slopes and in sheltered valleys, all the snow had disappeared. On the top of Sikarám itself there was no snow in August, but I was informed that a large bed existed on its northern slope. In ascending along the bed of the Kurézghar stream at 9000 feet, I collected *Carex vulgaris*, *Allium robustum*, *Astragalus tephrosioides*, an extremely handsome tall-growing plant, which throws out shoots of from 3 to 4 feet in length from a large woody root-stock. From Sergal the forest was very fine, consisting nearly altogether of deodar and *Juniperus excelsa*, with occasional trees of *Pinus excelsa* and *Abies Webbiana*. On the ridge over the left bank of the Kurézghar stream one or two trees of *Pinus Gerardiana* occur; but this is its eastern limit. On the Pévár ridge it does not get further east than two miles to the south of Zabardastkalla. In the deodar forest there is no undergrowth. On the dry limestone soil under the trees *Pedicularis*, no. 487, is very common; and as the forest begins to thin off, owing to altitude, *Onobrychis cornuta* is common in dense circular bushes, which, with *Juniperus com-*

munis, recurva, and *Rhododendron Collettianum*, form the brushwood beyond the limit of forest. Amongst this brushwood occur several species of *Acantholimon*, *Astragalus psilacanthus*, *Onobrychis spinosissima*, several *Artemisias*, numerous *Cousinias*, *Tenacetum* no. 280, *Linum perenne*, both *Macrotomias*, *Leontopodium*, two or three species of *Anaphalis*, and *Poa bulbosa*, *P. laxa*, *Bromus* near *erectus*, growing through the juniper-bushes, *Lilium polyphyllum*, and under their protection *Gentiana* no. 932. Amongst the stones *Sempervivum acuminatum* is very profuse. On gravelly soil on the exposed ridges *Allium*, no. 734, occurs; in loose rubble *Scrophularia*, no. 919, a dwarf species, the branches of which lie close to the ground, with flowers large in proportion to the plant.

At the upper limit of trees, in ascending the ridge above the Shéndtoi to the east of Sīkarám, willows are seen to form the greater part of the brushwood. On Sīkarám and on the range to its west, owing no doubt to the excessive dryness of the climate, willows do not exist, the *Rhododendron* alone being found, with the new bush types of *Onobrychis* and *Astragalus*.

At spring heads on moss-covered stones, at an altitude of 11,000 feet in occasional localities, the following plants occur:—*Codonopsis ovata*, a *Campanula*, *Inula rhizocephaloides*, *Parnassia ovata*, *Orchis latifolia*, *Primula purpurea* and *P. denticulata*, *Ophelia cordata* and *O. petiolata*, with *Sedum Ewersii* on the overhanging rocks. Among the boulders in the stream-bed *Oxyria reniformis* is by no means uncommon.

From 12,000 to 14,000 feet the following plants occur, but only in patches, otherwise the hill-side appears destitute of vegetation:—*Delphinium Brunonianum*, when in full flower very effective; *Rheum Moorcroftianum*, but no *R. Ribes*; *Bupleurum* sp., no. 929, and *Astragalus*, no. 924 (near *A. confertus*), both very close-growing and carpeting the ground. In the clefts and on the sides of rocks, *Pleurospermum corydalifolium*, *Valeriana petrophila*, *Isopyrum grandiflorum*, *Ligusticum* no. 821. Amongst broken débris, *Nepeta* no. 917, *Lamium rhomboideum* and *Aster heterochaeta*, with lovely purple flowers, and the following grasses:—*Poa flexuosa*, *Piptatherium laterale*, *Festuca ovina*, and *Koeleria cristata*.

At 14,000 feet, *Oxygraphis*, a new species, the leaves and flowers of which seem to be a favourite food with the snow-pheasant, as it was almost impossible to get perfect specimens on account of its being invariably eaten over. In the shelter of the boulders

Primula purpurea was very profuse, and with it *Gypsophila sedifolia*, with several *Draba*, and occasionally in tufts *Brachypodium tartaricum*. At the highest altitudes the following plants occurred—*Potentilla monanthes* and *P. sericea*, with a *Draba*. Another proof of the extreme dryness of the climate is the total absence of Anemones, which at these altitudes in Kashmir occur in abundance.

The only ferns obtained were *Asplenium Ruta-muraria*, up to an elevation of 11,000 feet, and *Cystopteris fragilis*, up to an elevation of 13,000 feet.

13. *Plants cultivated for Food.*

Cereals.—Up to the time of the British occupation cultivation was limited to the actual wants of the people as food, with perhaps a slight surplus for barter; at least, such was the opinion I formed after numerous conversations with the natives, as well as from my own personal observation. The chief causes of this were, no doubt, insecurity of property, due to the constant occurrence of blood-feuds, the inhabitants being afraid to cultivate except in the immediate vicinity of their villages, and to the inadequate supply of water, an increase of which could not be obtained without incurring extra labour upon works which might never prove profitable. In the whole Kuram and Hariáb districts there is not a single water-course to be compared with the works commonly found in Ladák. No sooner, however, had the British occupation of the Kuram Valley taken place than every bit of land which the villagers were capable of placing under immediate cultivation was at once begun to be worked upon, and persons who had left the country were recalled by their friends to return and till their fields.

The land is rich and good, and, as a rule, those very arid plains already spoken of only require water and labour to convert them into green fields. With a very little trouble and care taken to avoid waste, twice the amount of land could be cultivated with the water already available. For instance, the hills to the north of Shálizán consist of slate, which has been lately worked by Europeans, and found to be of good quality and unlimited in quantity; and if this slate were employed in the construction of the water-channels, it would assist in economizing the water which is at present wasted, owing to its running over a gravelly soil. As an example of how a good supply of water is allowed to go to waste, at an elevation of 8000 feet, in the Shéndtoi ravine, the stream of that name, where 4 feet broad and 2 feet deep, is allowed to lose itself in a mass of boulders and shingle, whilst the villagers

of Katskallé at the mouth of the gorge were losing their crops from deficiency of water.

In the Kuram district, as elsewhere stated, two crops are obtained during the year—the first consisting of barley, clover, and wheat, the second of rice and Indian corn. Rice taking a longer time to mature, rotates with barley and clover, both of which are early and quick crops. Indian corn follows wheat. The natives manure their fields well, the cow-dung not being, as in India, employed as fuel. Rice is the staple crop, and is not cultivated above 7500 feet. The germination of rice-seed in the seed-nurseries is supposed to be hastened by shading with the young branches of *Adhatoda Vascia* and *Sophora mollis*. The next crop in importance to rice is, I think, Indian corn, as the people of these parts prefer the bread made from it to that of wheat, and which is always made with ferment—a custom which does not obtain to the east of the Indus. I think there is good reason for their preference, as Indian corn-flour is always pure, whereas the wheat-flour of the country is half rye.

I was much struck by seeing in the wheat-fields a plant which I subsequently identified as *Secale cereale*, or common rye. The natives assert that this is a weed, and accidentally occurs amongst the wheat against their wish, but that it is not found amongst barley, which is easily explained by the fact that it takes a much longer period to ripen than barley. The grains of the wheat and rye are very like, and no attempt is made to separate them before they are sown; and it is so common among the wheat as in many cases to predominate. Besides rye, two other weeds commonly occur with the wheat, viz. *Avena fatua* and *Lolium temulentum*. Occasionally after eating wheaten bread, persons are seized with symptoms of narcotic poisoning, and, if not attended to, have been known to die. The natives invariably attribute these symptoms to the seeds of one of these three weeds, and will pick them out from amongst the suspected wheat, in support of their assertion. Wheat, barley, and Indian corn are cultivated in the Hariáb district up to very nearly 9000 feet. Rice is husked in the usual manner in a large mortar with a wooden pestle, or sometimes in mills by cattle power. In the larger villages there are numerous water-mills for grinding the other cereals; frequently, however, hand-mills are also resorted to. I have not seen the Amaranths cultivated*.

* The cultivated fruit-trees and principal vegetables are enumerated at p. 9, *antea*.

14. *Indigenous Plants for Food &c. in use.*

Having mentioned the plants which are cultivated in the Kuram valley, I will now describe such as are employed by the people as a substitute for these or together with them. *Eremurus aurantiacus* is the sole vegetable upon which the inhabitants of the Hariáb district depend for fully two months of the year. The leaves are simply cut off the root-stock, if I may so call it, as close to the ground as possible, leaving the stock intact, but for which the plant would long ago have been extirpated. This as a vegetable was considered very good by the army, and boys brought daily baskets' full of leaves into camp for sale. It resembles in flavour no other vegetable I ever tasted, it being hard and crisp without being either tough or fibrous, and it might prove under cultivation a welcome addition to our limited list of spring vegetables. The young shoots of asparagus are collected and cooked, as are also the leaves of the cultivated fig, of *Carum Bulbocastanum* (not the tubers), and, lastly, the rhizomes of *Polygonatum verticillatum*. Between Badishkhél and Thal the stems of *Boucerosia Aucheri* and the young flowering shoots of *Chamærops Ritchiana* are eaten raw, as are also the roots of the turnip-rooted *Nepeta*, which occurs from near Badishkhél to Káratígah. It is curious to note that the bark of this root is flavoured like the turnip, whereas the heart of the bulb has the flavour of fresh almonds. The leaf-stalks of both rhubarbs, of wild onions, the leaves of the common clover (*Trifolium resupinatum*), and the stems of the young flowering shoots of an *Orobanche* which is parasitical upon *Artemisia* are all eaten raw. The stems of the last have not much flavour, but are cool and crisp.

The following Fungi are collected and eaten cooked:—*Morchella esculenta*, *Agaricus campestris*, *Helvella crispa*, and *Hydnum coralloides*; as a precautionary measure the natives recommend them to be cooked with a mixture of fat.

In addition to the cultivated fruits, there are also eaten:—*Berchemia*, here called "Mamáhúea," the name given to a *Sageretia* further east; *Chamærops Ritchiana*, which is sold in the market at Thal, and there called by the same name as dates; *Pyrus lanata*, Don, called by the same name as that given to the fruit of the *Diospyros*; wild plums, blackberries, berberries, *Elæagnus*, strawberries, gooseberries, and *Prunus Padus*, the two latter being called "wild grapes." The nut of the wild almond, the fruit of the pomegranate, and the wild walnut are all uneatable. Mulberries are

not wild, nor have I seen the hazel as a shrub. In the Hariáb district large quantities of gum exude from the stems of the plum and apricot, which is collected and eaten.

15. *Fodder for Animals.*

In addition to the straw of the cereals and pulses, clover (*Trifolium resupinatum*) is cultivated, and the wild oats and weeds from the field are collected and given to animals. Grass is generally so scarce that the natives supplement it with the young shoots and stems of *Periploca aphylla* to the east of Kuram, and to the west with the foliage of *Quercus Ilex*, especially the variety that is devoid of spines—the two latter affording fodder for camels chiefly; and in the Hariáb district the young branches of the willows are largely resorted to for fodder for both cattle and sheep. The ashes obtained by burning branches of *Ephedra* are mixed with tobacco for the purpose of chewing, or with snuff to intensify its action, and the dried and powdered leaves of *Rhododendron Collettianum* as snuff.

16. *Medicines and other Vegetable Products.*

The following plants are employed as medicines for internal use:—The berries of *Ribes orientale*, the fruit of *Rhamnus dahuricus*, the roots of *Daphne oleoides* when boiled, and the dried root of *Euphorbia*, sp. (no. 380), are all employed as purgatives, being more or less common household remedies. The last goes by the name of the vomit-weed, and is also used for that purpose. The fresh milk from its leaves blister the hand when collecting it.

As local applications the castor-oil is cultivated in the gardens at Kuram for the sake of its leaves, which are employed in poulticing. The roots of two species of *Arnebia*, viz. *A. endochroma* and *A. speciosa*, are used to relieve toothache and earache. The gum-resin which exudes from the flowering stems of *Ferula Jaeschkiana* is applied to wounds and bruises. At Alikhél a native brought me the stems of a plant which he said was a rare and valuable medicine, calling it "Mam-i-ran"; on examination it proved to belong to some species of *Geranium*, probably *G. Wallichianum*. The root-stocks of *Valeriana Wallichii* are collected and sent to Gandamak for export to India, to be used as a perfume. The juice of the leaves of *Delphinium Brunonianum* is employed to destroy ticks in animals, but chiefly when they affect sheep.

Poisons.—The following plants are known to be poisonous to the natives, viz. *Datura*, *Hyoscyamus*, *Cannabis*, *Atropa lutescens*, and *Solanum Dulcamara*, and, as already mentioned, one of the three weeds found amongst wheat, viz. rye, wild oats, or *Lolium*. The plants poisonous to animals are:—*Stipa sibirica*, a very common grass under the shade of trees and in their vicinity, near Shálizán and similar localities; its poisonous qualities are recognized by the cattle of the country, which never touch it; *Rhododendron afghanicum* is poisonous to goats and sheep.

Oils.—As far as my observations have gone, no oil-seeds are cultivated, nor is any oil extracted from the kernels of the apricot or walnut. The only substance in the country which the natives call oil is a crude tar obtained by distillation from the roots of a conifer. Splinters from the green wood of *Pinus excelsa*, or portions from the roots of *P. Gerardiana*, are employed in place of lights, the pieces of the roots going by the name of Chirágh, meaning lamp. In lieu of vegetable oils for food, the melted fat of the tail of the large-tailed sheep is used.

Charcoal.—This is usually made from the softer pine-woods to save trouble, although the blacksmiths know well that the harder woods yield a better article.

The tears of resin exuding from the bark of *Pinus excelsa* and leaves of *P. Gerardiana* are collected and used for various purposes.

Soap.—The large roots of *Saponaria Griffithii* are collected and employed as soap for washing purposes.

Dyes.—The *Isatis tinctoria* is largely used a local dye; its native name means the "Dye-plant." At the Mussulman festival of the Id, at which hard-boiled eggs are indispensable, the roots of a *Rubia* are employed to give them a bright red colour.

17. Forests.

The forests are extensive and very fine; they contain splendid timber, the chief of course being that of the deodar, which some years ago was exported by the Kuram river to Bunnor. At present the drawback to its exportation is the distance of the forests from the river; this, however, might be easily overcome by the introduction of wooden tramways, such as are already in use in some of the Indian forests. The natives do not employ timber of any size in their buildings, and are not particular as to the kind. Their doors are usually made of deodar,

at a ruinous expense of timber. As a rule, they scarcely ever for their own uses cut down a large tree; and throughout the forests of this district few or no trees are seen partially burnt, as is so commonly the case in Kashmir. When this does occur it is in localities where Afghan or British soldiers have been encamped. I believe the cause of this immunity to be due to the unsafe condition of the country, for benighted travellers who would, do not dare to light a fire lest it might betray their presence.

The following are the measurements of some of the exceptionally large trees which I have seen:—plane tree, in circumference, 33 feet, walnut 17 feet, deodar 21 feet, *Celtis* 16 feet, *Quercus semecarpifolia* 13 feet, *Populus nigra*, var., 10 feet 6 inches.

Near the village Kaiwás, on the road to the forests, I saw timber slides of rather a rude construction for bringing down from the hills poles for roofing houses. Most of the houses are built on the "wattle and dab" principle, and for their construction the stems of *Fothergilla*, *Cotoneaster bacillaris*, *Quercus Ilex*, and willow are usually employed. Household utensils, viz. large platters, bowls, and spoons, are made from the wood of *Ulmus campestris* (called the "carpenter's tree"), of the poplar, willow, and walnut, indiscriminately. The handles of their farm implements, such as axes, hoes, &c., are made from *Cotoneaster bacillaris*, *Fothergilla*, and *Fraxinus*. The small rolling-pin with which is beaten out the leaves of the *Chamærops* into a coarse fibre is always made of a piece of *Quercus Ilex*. Their usual walking-sticks consist of *Cotoneaster bacillaris*; and the wands carried by the priests, or "mollahs," are of the wild almond, and held sacred. For clogs the wood of *Pinus Gerardiana* is preferred but they are also made of the wood of other pines. For making baskets, a particular willow, near *Salix viminalis*, is cultivated in the Hariáb district. The bark of *Caragana ambigua*, Stocks, in entire circular pieces, is used to encircle and keep firm the wooden sheaths of the long Afghan knife. In addition to this being a strong material for the purpose, its bright golden brown colour gives it, when fresh, an ornamental appearance. Portions of the stem of *Arundo*, sp., are employed to hold charges of gunpowder, and are arranged in a row round the waist, as is the custom in carrying breech-loading cartridges.

Fibres.—The leaves of *Chamærops Ritchieana* torn into strips are

the material of which all rope, twine, or string is made in the Kuram valley. As already stated, this plant only occurs as stunted specimens to the east; therefore the whole of the material employed for making rope is imported into the country from the south of the river. The sandals worn by the people in place of shoes are also all made from this, the leaves undergoing in this instance the simple process of damping and beating sufficient to produce a coarse fibre. Any other materials employed to make rope are exceptional; the most common is goat's hair, next the bark of the elm, by merely damping and twisting. The twine which is used for the slow match of their matchlocks is made from the fibre of the bark of the young shoots of the elm, dipped in a solution of saltpetre. The exfoliating epidermis of *Juniperus excelsa* and *Lonicera quinquelocularis* in the Hariáb district is employed when a rather soft than strong material is required, as for making pads for placing under loads when carried. I was informed that from Serátigáh a grass was obtained which made an excellent rope; but the best rope of all, and most valued by traders, is that made from the roots of a small spinous shrub collected in the Logar valley. Owing to the difficulty of extracting the root the following plan is pursued:—A string is first tied lightly round the crown of the root to a long stick, one end of which is used as a lever, the other as the fulcrum; the root breaks away in lengths of from one to two feet.

Barks.—The bark of the birch, *Betula Bhojpatra*, is not employed, nor are its uses known.

Bees and Sericulture.—In every village near the hills in this country bees are largely kept by the people, honey and wax being important articles of traffic. Honey is used in place of sugar, which is very expensive.

Sericulture is carried out on a very small scale, the silk produced being employed solely for home consumption.

II. LIST OF THE PLANTS COLLECTED, WITH NOTES AND
DESCRIPTIONS OF NEW SPECIES.

DICOTYLEDONES.

1. RANUNCULACEÆ.

978. *Clematis grata*, Wall.

Shálizán, 6000 feet.

733. *C. Robertsiana*, Aitchison et Hemsley, n. sp. Fere omnino *C. alpina* (*Atragene alpina*, L., var. β , Ledebour, Flora Altaica, ii. p. 377), sed floribus citrinis pæne duplo majoribus, sepalis longe acuminatis, petalis vel staminibus petaloideis anantheris nullis, etc.

Frutex sarmentosus, præter flores cito glabrescens, ramis gracilibus angulatis usque 4-5-pedalibus. *Folia* longiuscule petiolata, laxè biternatim secta; foliola petiolulata, membranacea, ovato-lanceolata, lateralia sæpissime obliqua, omnia 1-2½-pollicaria, plus minusve grosse mucronulato-serrata, terminalia interdum tripartita, lateralia bipartita. *Flores* citrini, ampli (sepalis usque ad tripollicaribus), terminales, solitarii, longe pedunculati, cernui; pedunculi 3-5-pollicares; sepala 4, sparsim pilosula, venosa, lanceolata, longe acuminata, acuta vel obtusiuscula; petala vel stamina petaloidea ananthera nulla; stamina pilosula, exteriora longiora et subpetaloidea; filamenta omnia dilatata. *Achenia* sessilia, novella longissime sericeo-villosa, matura non visa.

Shálizán stream, June 1879; hill north of Kaiwás, at 10,000-11,000 feet, profuse, July 1879. A handsome semiscandent shrub, with flowers of a pale lemon colour, from 3 to 5 inches in diameter. It is an exceedingly interesting species, forming a connecting-link between *Atragene* and *Clematis* proper, having almost exactly the foliage and flowers (though much larger) of the Central-Asian variety of *C. (Atragene) alpina*; but the flowers are destitute of petals or antherless staminodes, a character in which it appears to differ from all the varieties of the plant in question. Furthermore, although *C. alpina* has such a wide area of distribution, it has not hitherto been found within the limits of Boissier's 'Flora Orientalis;' neither is it known to occur in the Himalayan region. The North-American *C. (Atragene) verticillaris* resembles our plant in having no petals or petaloid antherless staminodes.

718, 614. *C. graveolens*, Lindl.

Common at 7000 feet; July.

118, 101. *Anemone biflora*, DC.

From Kuram to Alikhél, under bushes, at 6000 to 8000 feet; April.

463. *A.* sp. nov.

From 8000 to 10,000 feet; June and July.

599, 727. *Thalictrum minus*, L., var. *glandulosum*, Koch.

Hills at Kaiwás and Karchátal, 10,000 to 12,000 feet; May to July.

0. *T. minus*, L., var. *flexuosum*, Benth.

Alikhél, 7000 feet, profuse.

428. *T. minus*, L., var.

Sháлизán to Bíánkhél.

415. *Callianthemum cachemirianum*, Camb.

Hills, Shéndtoi, at 10,000 feet, from melting snow; end of May.

134. *Adonis æstivalis*, L.

Corn-fields, Habíbkalla, 6500 feet, common; March to May.

102. *Ranunculus falcatus*, L., var. *orthoceras*.

Alikhél; April; 8000 feet.

744, 459. *R. hirtellus*, Royle.

From 8000 to 11,000 feet, common; May and June.

416. Large-flowered variety of *R. hirtellus* (*nepalinus*, Jacquem.) from Shéndtoi; May.

18. *R. lætus*, Wall.

Moist ditches and fields, Alizai, Kuram, Habíbkalla; April and May.

6. *R. arvensis*, L.

Fields, Sháлизán to Habíbkalla; April to June.

598. *R. divergens*, Jordan.

On grass-meadows, Karchátal, 10,500 feet, profuse; June.

452. *R.* sp. near No. 28744 of C. B. Clarke's K ashmir herbarium.

Kotalmerg; May.

0. *R. lætus*, Wall., var.

955. *Oxygraphis*, sp. nov.

On shingly débris, where there were no other plants, from 12,000 to 14,000 feet, Mt. Síkarám; August.

406. *Caltha palustris*, L.

Shéndtoi, 9000 feet; May.

0. *Isopyrum anemonoides*, Kar. et Kir.

Serátígah, on rocks at 13,000 feet; July.

0. *Isopyrum grandiflorum*, *Fisch.*
Mt. Síkarám, 13,000 to 14,000 feet, on rocks, profuse; August.
0. *I. grandiflorum*, *Fisch.*, var.
Mt. Síkarám; August; 13,000 feet.
802. *I. sp.*
Marble rocks, Shéndtoi, at 10,000 feet; July.
376. *Aquilegia vulgaris*, *L.*, var. *pubiflora*?
From 9000 to 11,000 feet, Shéndtoi.
0. *A. vulgaris*, var. *Moorcroftiana*, *Wall.*
732. *A. vulgaris*, var. *fragrans*, *Benth.*
Kaiwás, 12,000 feet; July.
0. *A. sp. nov.*
A dwarf species, that may be new, from Mt. Síkarám, 10,000 to 14,000 feet; August.
- 559, 575. *Delphinium uncinatum*, *Hook. f. & Thoms.*
Alikhél, stony ground, bare hills, common, 8000 feet; June.
957. *D. Brunonianum*, *Royle.*
Mt. Síkarám, bare side of hill and ridges at 14,000 feet, common; August.
862. *D. sp. near D. tuberosum*, *Auch.*
In meadows from 8000 to 11,000 feet, Alikhél, Káratígah, Spíngbáo. A very beautiful plant. July.
1001. *Aconitum napellus*, *L.*, var. *rotundifolia*, *Kar. et Kir.*
Amongst grass in meadows at 10,000 feet, Shéndtoi; end of August.

2. BERBERIDÆ.

726. *Berberis callibotrys*, *Bienert.*
Hills above Kaiwás, 11,000 feet; a large bush; July.
- $\frac{176}{5}$. *B. orthobotrys*, *Bienert.*
Near Sergal, 9000 to 11,000 feet; August.
490. *B. cretica*, *L.*
Between Sergal and Síkarám, 8000 to 10,000 feet.
499. *B. sp.*
Base of Síkarám; June.
176. *B. sp.*
Habíbkaalla; May. This is the common *Berberis* between Kuram and Habíbkaalla.

0. *Berberis* sp. With peculiar swollen fruit.
Drékalla; August 17th.
0. *B.* sp.
Shálizán; June 18th.
0. *B.* sp.
Hill near Kaiwás, 10,000 to 11,000 feet.
0. *B.* sp.
On dry hilly ground behind village of Shálizán; 7000 feet;
May.
0. *B.* sp.
At Kuram Fort; April.
385. *Podophyllum Emodi*, *Wall.*
At 10,000 feet, up the Shéndtoi gorge; May.

3. PAPAVERACEÆ.

- 138, 272. *Papaver dubium*, *L.*, var. *lævigatum*.
Kuram to Alikhél, in fields from 6000 to 9000 feet; May and
June. A very uncommon plant. Curious to see how scarce
the poppies are here in comparison to their abundance in the
Kashmir fields.
860. *Glaucium fimbriigerum*, *Boiss.*
On dry stony soil near Zabardastkalla; July.
242. *Rœmeria rhœadiflora*, *Boiss.*
Fields near Kuram; April; rare.
- 242a. *R. hybrida*, *DC.*
Fields near Shálizán; very rare.

4. FUMARIACEÆ.

183. *Hypocoum procumbens*, *L.*
In fields from Kuram to Alikhél, not uncommon; May and
June.
- 95 and 121. *Corydalis*, sp. near *C. rutafolia*, *Sibth.*
Common in the forests at roots of trees and bushes; April.
789. *C. meifolia*, *Wall.*
From 10,000 to 11,000 feet, Shéndtoi ravine, amongst large
boulders, profuse; July.
210. *Fumaria parviflora*, *Lamk.*
By no means common in fields, 6000 to 10,000 feet; May.

5. CRUCIFERÆ.

894. *Nasturtium officinale*, Br.
Profuse wet ground near spring, Péwárkotal, 8500 feet; July.
276 and 690. *N. palustre*, DC.
Common, sides of streams, Shálizán; June.
0. *Barbarea vulgaris*, Br., var. *taurica*, DC.
Shálizán to Bíánkhél; from 6000 to 9000 feet, not uncommon;
June.
154. *B. vulgaris*, Br. = *Griffith*, *Afghan*. no. 1458.
Habíbka, common.
97. *Arabis nuda*, Béláng.
Alikhél; April.
- 97a. *A. nuda*, var. (hirsute pods).
77. *A. amplexicaulis*, Edgew.
Shéndtoi; May.
120. *A. sp.*
Alikhél; April 19th.
822. *A. sp.* Flowers white.
Serátigah, at 13,000 feet; July.
141. *A. sp.?*
Shálizán; April 25th.
547. *A. sp.?*
Alikhél; June 9th.
279. *Cardamine Impatiens*, L.
Very common near water from Kuram to Shálizán; May.
142. *Alyssum minimum*, Willd.
Common on stony ground from Thal to Habíbka; April.
826. *A. persicum*, Boiss.
Serátigah; July 19th.
0. *A. campestre*, L.
Alikhél; June 9th.
107. *A. sp.*
Alikhél; April 18th.
825. *Draba sp.*
Serátigah, 11,000 to 13,000 feet; July.
464. *D. sp.*
Shéndtoi, 11,000 feet, close to snow; May 31st.

0. *Draba* sp.
Síkarám, 13,000 feet; August 14th.
0. *D.* sp.
Síkarám, 11,000 to 15,000 feet; August 7th.
0. *Malcolmia africana*, *R. Br.*
Common, Alikhél; July.
- 149 and 57. *Sisymbrium Sophia*, *L.*
Very common from Kuram to Habíbkaalla; April.
0. *S. himalaicum*, *Hook. f. & Thoms.*
0. *S. strictum*, *Hook. f. & Thoms.*
Shéndtoi; July 8th.
- 12, 209, 200. *S. Wallichii*, *Hook. f. & Thoms.*
Alizai; April 4th.
135. *S. Columnæ*, *Jacq.*
Shálizán; March 25th.
216. *S. Lceselii*, *L.*
Shálizán; May.
91. *S. Aliaria*, *Scop.*
Shálizán to Habíbkaalla; April.
206. *Conringia* sp. near *C. perfoliata*, *Crantz.*
Habíbkaalla; May.
67. *Erysimum repandum*, *L.*
Kuram; April.
475. *E.* sp.
Between Alikhél and Sergal; June.
402. *Brassica campestris*, *L.*
Most likely an escape from cultivation. Shéndtoi; May.
129. *Capsella Bursa-pastoris*, *L.*
Very common everywhere near cultivation; April.
- 182, 58. *Lepidium Draba*, *L.*
Profuse in fields amongst crops; May.
- 94, 621. *L. latifolium*, *L.*
Shálizán, fields; June 26th.
139. *Thlaspi arvense*, *L.*
Common, Kuram to Shálizán; April.
454. *T. cardiocarpum*, *Hook. f. & Thoms.*
Under pine-trees, Péwáarkotal, not common; May.
116. *T. alpestre*, *L.*
Very common, Shálizán to Alikhél; April to June.

78, 251. *Isatis tinctoria*, L.

Very profuse, from Kuram to Serátígah. Employed as a dye-stuff, its native name "Ranjowah" meaning "the dye." All summer.

532. *Pachypterygium* sp.

Near Alikhél; June.

181. *Neslia paniculata*, Desv.

Common in fields at Habíbkalla; May.

280. *Euclidium syriacum*, R. Br.

Shálizán; May.

190. *E. tataricum*, DC.

Alikhél, common; April to June.

622. *Raphanus Raphanistrum*, L.

Shálizán; June.

211. *Chorispora tenella*, DC.

Habíbkalla; May.

133. *C. tenella*, var.?

Shálizán to Habíbkalla; April.

597. *C.* sp. near *C. Bungeana*, Fisch. & Mey.

At 11,500 feet up the Karchátal ravine.

6. CAPPARIDÆ.

637. *Cleome iberica*, DC.

On dry stony hot soil near Shálizán; June.

.7. RESEDACEÆ.

359. *Reseda luteola*, L.

Shálizán, stony ground, not uncommon; May to July.

8. VIOLACEÆ.

729. *Viola biflora*, L.

The yellow violet, common on all the hills above 10,000 feet, from Serátígah to the hills opposite Kuram; July to August.

0. *V.* sp.=16 *Kashmir collection*, 1877.73, 166. *V. Patrinii*, DC.

Very common, sweetly scented, from 6000 to 8000 feet, Kuram to Alikhél.

89, 155. *V. serpens*, Wall.

Common in April at low elevations.

500, 119. *Viola* sp.

This is a very marked species whilst growing, at once recognizable, both from the locality where it grows in the shade of fir forests, and the distinct markings of its veins on the leaves.

9. POLYGALÆE.

249. *Polygala abyssinica*, *Fres.*

Common in damp localities, Kuram, Kaiwás, and Shálizán; April to July.

192. *P. Hohenackeriana*, *Fisch.*

Not common, stony ground, Habíbkalla.

284. *P. sibirica*, *L.*

Damp soil along watercourses and near spring-heads at Shálizán; May.

10. CARYOPHYLLÆE.

0. *Dianthus fimbriatus*, *Bieb.*

At Sergal, stony ground; August.

0. *D. crinitus*, *Sm.*

Near Shálizán; July 12th.

638. *D.* sp.

Alikhél; July 22nd.

938. *D.* sp.

Síkarám; August 7th.

0. *D.* sp.

Shálizán; June 23rd.

856. *D.* sp.

Zabardastkalla; July 15th.

225. *Gypsophila Stewartii*, *Thoms.*

A spinous-leaved densely tufted herb, occurring in small hummocks profusely all over the country from Kuram to Alikhél and Serátígah, covered, in May, with a mass of small flowers; very attractive when first seen.

148. *G. floribunda*, *Boiss.*, var. β =1643, *Griffith.*

225 a. *G.* sp.

Probably a different species from the last; the flowers and leaves much larger, and the inflorescence laxer. Síkarám and Serátígah, above 10,000 feet; July and August.

531. *G. alsinoides*, *Bunge*, = *Stocks*, no. 970.

Alikhél; June,

961. *Gypsophila*, sp. near *G. sedifolia*, Kurz.

Flowers white with pink veins; at 14,000 feet, Síkarám; August.

526. *Saponaria Griffithii*, Boiss.

A semiprostrate perennial with large roots that are collected and employed in lieu of soap, called "*Zannah*." It is one of the few herbs that grow under pine-trees; June to August.

278. *S. Vaccaria*, L.

Common weed amongst corn, Kuram and Shálizán; May and June.

544. *Silene inflata*, Sm.

Common in woods from 8000 to 10,000 feet, Karchátal, Ali-khél, Bíánkhél; June.

144. *S. conoidea*, L.

A field-weed, profuse; April to June.

O. *S. Moorcroftiana*, Wall.

Síkarám, 10,000 feet and above; August 7th.

433. *S.* sp. = *Griffithii*, no. 1640 (see *Lychnis cabulica*, Boiss.).

Petals lemon-yellow, with a very viscid reddish-brown calyx; Shéndtoi; June 31st.

473. *S.* sp.

Very common from the base of the Pévárkotal to Alikhél; June.

O. *Lychnis* sp. near *L. macrorhiza*, Royle.

My specimens have three styles; Síkarám, 11,000 feet; August.

O. *L. indica*, Benth., var. *fimbriata*.

Shéndtoi; July and August.

372. *Cerastium vulgatum*, L., var.

Shéndtoi, not common amongst débris, dry locality; June 21st.

205. *C. dichotomum*, L.

In localities common at Habíbkalla and Shálizán.

O. *Stellaria crispata*, Wall.

Shéndtoi; July 8th.

214. *S. media*, L.

A weed, everywhere in fields, road-sides, wet ditches from Thal to Alikhél; April to August.

793. *S. Webbiana*, Wall.

From 11,000 to 14,000 feet amongst dwarf juniper; July.

555. *Stellaria* sp.

With great massive rootstocks; Hariáb district in pine-forests, not uncommon. June to August.

404. *S. bulbosa*, *Wulf.*

Shéndtoi, in the forest at 11,000 feet; June.

269. *Arenaria Meyeri*, *Boiss.*

A stiff, erect, harsh annual, on dry stony country, occasional; May.

495. *A. foliosa*, *Royle.*

In great masses at the base of Síkarám, 11,000 feet; June.

0. *A. Griffithii*, *Boiss.?*

Specimens without fruit, at 11,000 feet, Karchátal ravine; June.

300. *A. serpyllifolia*, *L.*

Common form, Shálizán.

584. Variety of the same from Karchátal; June.

373. Variety from Shéndtoi.

477. *A.* sp.

On a woody rootstock, in dry clay soil, near Zabardastkalla.

11. PORTULACÆÆ.

902. *Portulaca oleracea*, *L.*

Common near damp soil, Shéndtoi; July.

12. TAMARISCINÆÆ.

Tamarix sp.

A small tree or large shrub, common along the banks of the Kuram river from Thal to Walli Mahomed-Kalla. No specimen was collected.

252. *Myricaria germanica*, *Desv.?*

Along the streams that lead into the Kuram river, near the Fort of Kuram; April.

13. HYPERICINÆÆ.

627. *Hypericum perforatum*, *L.*

Shálizán and Shéndtoi, very common; June and July.

944. *H. scabrum*, *L.*

Síkarám, 10,000 feet, on dry shingle; August.

65. *H.* sp.

A small shrub with medium-sized flowers, hanging from cliffs near Kuram; April.

613. *H.* sp.?

14. MALVACEÆ.

635. *Althæa rosea*, Cav.

Occasional on stony ground, but in some localities, as in the vicinity of the Péwârkotal, profuse; seems quite wild, but it is cultivated upon graves and near Fakirs' huts. Rose-coloured and white; June.

693. *A. officinalis*, L.? = *Griffith*, no. 1273.

A very common tall shrub in the vicinity of cultivation, often forming parts of natural hedges that occur between fields. Shálizán and Kuram; June and July.

208. *Malva rotundifolia*, L.

Everywhere amongst stones, from 5000 to 7000 feet.

840. *Hibiscus Trionum*, L.

In fields, profuse, from Kuram to Alikhél; July and August.

15. LINÆÆ.

959, 525. *Linum perenne*, L.

On dry stony soil, common from Kuram to Alikhél, and up to 14,000 feet on the hills; May to August.

16. GERANIACEÆ.

761. *Geranium Wallichianum*, Sweet.

Large bluish flowers. Amongst bushes and grass and boulders where there is moisture, from 8000 to 10,000 feet. The rhizomes of this plant were brought to me (said to be from some hills thirty miles off) as "Mam-í-ran," a good medicine for sore eyes. This, no doubt, is a local substitute for the true Mam-í-ran, viz. the roots of *Coptis Teeta*, Wall.

281, 220. *G. nepalense*, Sweet.

On open grassy spots, very common; May and June.

600, 868. *G.* sp.

Grassy spots, near springs, local about Bíánkhél; July.

836. *G.* sp. (White var. of 600.)

143, 90. *Erodium cicutarium*, L.

Very common, Kuram to Habíbkalla; May to June.

909. *Oxalis corniculata*, L.

Everywhere from Thal to Habíbkalla; flowers five months.

1005. *Impatiens amphorata*, Edgw.

From 9000 to 10,000 feet in very moist localities; flowers rose-pink and yellow; Shéndtoi; August.

587. *Impatiens* sp. = 1251 and 1252, *Griffith*.

Very common amongst the shingly beds of streams at 7000 feet; June.

653. *I.* sp. near *I. racemosa*, *Wall.*

Small, white, minute flowers. Very common with 587 in stream-beds; June and July.

17. RUTACEÆ.

838. *Ruta acutifolia*, *DC.*

Local at Alikhél in cultivated fields, 7500 feet; July. Leaves vertical.

636. *Peganum Harmala*, *L.*

In certain localities very common, but very local. Remarkably frequent on graves. Shálizán; June.

18. MELIACEÆ.

334. *Melia Azedarach*, *L.*

A small tree; usually cultivated in sacred localities; not seen further west than Túrai. An occasional escape along footpaths. Called "Daráchk."

19. CELASTRINEÆ.

375. *Euonymus fimbriatus*, *Wall.*

A small tree, common in the deep gorges of Kaiwás and Shénd-toi, from 8000 to 10,000 feet; occasional in the hills to the north of the Hariáb district, usually near water.

20. RHAMNEÆ.

650. *Zizyphus vulgaris*, *Lamk.*

At Shálizán a small shrub struggling for existence, and most probably introduced for hedges, for which it is now employed; not uncommon near the river between Thal and Kuram.

337. *Berchemia lineata*, *DC.*

A small shrub, very much browsed by cattle; common at 7000 to 8000 feet; Shálizán, Kaiwás, and to the east. The fruit is collected largely and eaten by the people; it is called "Mahmannab," the name applied round Peshawur to the fruit of species of *Sageretia*.

357. *Rhamnus persicus*, *Boiss.*

A common shrub from Thal up to hot hill-sides near Shálizán.
O. R. sp., flowers only = 357?

703. *Rhamnus dahuricus*, *Pall.*

A small tree, amongst thick undergrowth near moisture, from 7000 to 8000 feet; not uncommon in the woods near Shalízán, Shéndtoi, Kaiwás, but not further west; fruit employed as a purgative by the natives.

379. *R. purpureus*, *Edgew.*

A common tree-shrub near Shéndtoi and Shálízán.

915. *R. sp.* = No. 7, *Strachey & Winterbotham.*

Síkarám, 10,000 to 11,000 feet; August.

759. *Sageretia*, *sp.*

Specimens poor, and all collected from one small browsed bush. Apparently new. Near Shálízán.

21. AMPELIDÆ.

Vitis vinifera, *L.*

A large scandent vine is grown in all the orchards, and allowed to climb over the largest trees; there are two varieties of fruit, a white and a purple. Only in one garden did I see small bushes of a variety trained as standards from 3 to 4 feet high; this yielded a small green seedless grape. From the Logan valley and the vicinity of Cabul grapes were brought in large quantities across the passes for sale amongst the troops; some were very fine in quality. Along with the grapes, plums, apples, and a few pears were also brought.

22. SAPINDACEÆ.

853. *Acer* *sp.* near *A. campestre*, *L.*

A small tree, collected only in the valleys on the Hazárdarakht river in July and August, and not in fruit. The natives described a similar tree with much larger leaves as occurring in the vicinity.

Dodonæa viscosa, *L.*

Occurs in some quantity to the south or right bank of the Kuram river, on the hills opposite the Fort of Kuram, and at the Darwazaghai pass, where I saw it. It is common from Thal to near Kuram on both banks of the river, but it does not extend west of Kuram in this locality. (No specimens.)

400, 396. *Staphylea Emodi*, *Wall.*

A large shrub, collected only in some of the deep gorges of the Shéndtoi ravine, from 8000 to 9000 feet; June and July.

23. ANACARDIACEÆ.

233, 342. *Rhus Cotinus*, L.

A large shrub, common on the lower hills at Shálizán, from 7000 to 8000 feet; April.

38, 234. *Pistacia integerrima*, Stewart.

On the lower hills near Shálizán, not common; April. Common between Thal and Kuram near the river, but only as individual trees.

17, 361. *P. cabulica*, Stocks.

An occasional tree from Thal to Shálizán, usually not large. At Shálizán there was a quite sound tree 30 feet high, and 9 feet in circumference at 4 feet from the ground; at 6 feet the trunk divided into large branches.

528. *P.* sp.

A large woody bush in a forest of *Juniperus excelsa* near Bíánkhél, at 8500 feet; June.

24. LEGUMINOSÆ.

682. *Ononis arvensis*, L., var. *spinosa*.

Shálizán and Bíánkhél, at 6500 to 8000 feet, in moist meadowland and sides of streams, common; June and July.

468. *Trifolium resupinatum*, L.

Largely cultivated, both near Kuram as well as in the Hariáb district. Curiously enough, the Kuram people all depend upon the higher district near Sergal and Ballút, and not to their own crops, for their seed. Called "Shantal."

152. *T. pratense*, L.

Common everywhere in dampish localities. Not cultivated.

19. *T. repens*, L.

Forming a portion of all pasturage near moisture from Alizai to Alikhél. Not cultivated.

1212. *T. fragiferum*, L.

Occasional with *T. repens* at Shálizán.

482, 875. *Trigonella polycerata*, L.

Common near Zabardastkalla; June and July.

712. *T. pubescens*, Edgew.

Not common, Kaiwás.

193, 236. *T. Emodi*, Benth.

Common from Kuram to Alikhél; April to July.

795. *Trigonella corniculata*, L.

Common; July.

681. *Melilotus alba*, L.

Shálizán.

699. *M. officinalis*, Willd.

Very common in cultivated ground and fields from Kuram to Alikhél; June and July.

31, 665. *M. lupulina*, L.

Shinnak, Kuram, and Shálizán, common; April to June.

355. *M. sativa*, L.

A very common field-weed. Not cultivated now, nor could any one tell me if it was formerly. It is certainly cultivated in the Punjab, where it is also a weed. Common from Shálizán to Alikhél; May and June.

2, 137, 649, 610. *Lotus corniculatus*, L.

Very common in moist meadows and on sides of watercourses from Thal to Alikhél; April to June.

340, 630. *Indigofera Gerardiana*, Wall.

A dense shrub up to 4 feet, profuse around Shálizán, forming natural hedges around the fields by growing densely along the sides of the watercourses that divide them; also from Kuram to 7000 feet in the watercourses and low moist thickets; not in the Hariáb district.

511. *Colutea arborescens*, L.

A tall thin shrub, met with in the Hariáb district only, where it is very common, and remarkable both for its inflorescence and for the large inflated pods, which give it its local name, meaning "bellows;" June and July.

286. *Caragana brevispina*, Royle.

On dry hills, amongst scattered scrub, at 7000 feet, around Shálizán; May.

549, 1220. *C. ambigua*, Stocks.

A large shrub, in size of wood and appearance of bark very like laburnum. Bark employed by the Afghans in the form of rings to slip over and hold the sheaths of their long knives in position in lieu of brass-work; the surface takes a good polish, and when new resembles bronzed leather. The wood is called "Jirrél." Alikhél, Káratigab, and the hills north of Hariáb district at 9000 to 11,000 feet. From native accounts there is none of it east of Spíngháo. Baker thinks *C. ulicina*, *ambigua*, and *brevispina* may be three varieties of one species. I am of the same opinion.

835. *Caragana grandiflora*, *Bieb.*

A large shrub, Káratigah; July.

8. *C. ulicina*, *Stocks?*

This very distinct shrub, which much resembles a dwarf *Acacia modesta*, is only from 2 to 3 feet in height. I first mistook it for *Acacia modesta* dwarfed by climate. Very common from Ibrahimzai, along the road up the right bank of the Kuram river, to the Darwazaghai pass; not uncommon from Alizai to Badishkhél. It is a low country, from 4000 to 7000 feet.

1219. *C. arborescens*, *Lamk.*

Bíánkhél and along the Léliddar stream.

1218. *C. (Chesneya) acaulis*, *Baker*, n. sp. *Herba* perennis, acaulis, rhizomate lignoso gracili elongato. *Folia* rosulata, imparipinnata, facie parce dorso dense persistenter albo-sericea, foliolis 7-9 obovato-cuneatis sessilibus 4-8 lin. longis apice obtusis vel truncatis minute cuspidatis, rachi subpollicari, petiolo brevi, stipulis parvis lanceolatis albo-sericeis. *Pedunculus* fructiferus 12-15 lin. longus. *Calyx* 6-9 lin. longus, tenuiter albo-canescens, tubo cylindrico, dentibus lanceolatis tubo duplo brevioribus. *Corolla* pollicaris, vexillo 6 lin. lato extus sericeo sordide purpurascens intus luteo, alis vexillo paulo brevioribus, carina obtusa alis paulo brevioribus. *Legumen* lineare, 2-2½ poll. longum, leviter recurvatum, rigidum, mucronatum, tenuiter canescens, seminibus circiter 20 reniformibus compressis.

Allied to *C. cuneata*, *Baker*, in 'Flora of British India,' vol. ii. p. 117, from which it differs by its fewer leaflets and solitary flowers. It has a dense fibrous rootstock much out of proportion to the few leaves and solitary pedunculate flowers, not more than 2 or 3 inches at the most in length. The interior of each flower is golden yellow, the exterior a dead grey-purple. On dry hot hill-sides, Shálizán and Habíbkalla; April and May.

42. *Astragalus anfractuosus*, *Bunge.*

Shinnak, Sadatkalla, and Kuram; April.

586. *A. coluteocarpus*, *Boiss.*

In the pine-forest up the Karchátal ravine, at about 9000 feet; June.

174, 76. *A. decemjugus*, *Bunge.*

Profuse in the fan country near Habíbkalla on shingle; May.

241. *A. graveolens*, *Ham.*

Very common near watercourses. Kuram and Shálizán; April to June.

80, 61, 52, 184, 53. *A. hippocrepidis*, *Benth.*

Very profuse from Kuram to Habíbkalla; April and May.

1213. *Astragalus infestus*, Boiss.

Bíánkhél; July.

916, 435. *A. leucocephalus*, Grab.

Among débris, Síkarám, 12,000 feet, Péwárkotal, 8500 feet, between Shálizán and Habíbkalla, 6500 feet.

1216. *A. murinus*, Boiss.?

Habíbkalla to Péwárkotal.

23. *A. polyacanthus*, Royle.

Shinnak; April. (A Punjab Salt-range plant.)

485, 451. *A. psilacanthus*, Boiss.

Common from Kuram to Zabardastkalla and Síkarám; April to July.

436, 81. *A. purpurascens*, Bunge.

From Habíbkalla to Síkarám at 15,000 feet; April to August.

1214. *A. raphiodontus*, Boiss.

Zabardastkalla; July.

441, 237. *A. rhizanthus*, Royle.

Abundant in pine-forests at Péwárkotal; May and June.

434. *A. strobiliferus*, Royle.

Shálizán to Habíbkalla.

502. *A. tephrosioides*, Boiss.

West base of Síkarám. A tall (3 feet) herbaceous stem from a thick perennial rootstock. Only one plant of this collected with several stems from the rootstock. June.

421. *A. verticillaris*, Bunge.

From 6000 to 8000 feet; profuse in pine-forests on Péwárkotal along with 441. The verticillate leaves give the plant a very ru-biaceous look.

924. *A. (Hypoglottis) immersus*, Baker, n. sp. *Herba* perennis, dense caespitosa, rhizomate valde ramoso. *Folia* imparipinnata, pallide viridia, dense albo-hispida, foliolis 13-15 oblongo-lanceolatis acutis 1-2 lin. longis, rachis 3-6 lin. longa, petiolo brevi, stipulis lanceolatis. *Pedunculus* interdum pollicaris. *Racemi* subumbellati, 3-4-flori, pedicellis brevissimis, bracteis minutis subulatis. *Calyx* 1½ lin. longus atro-viridis, pilis albidis paucis adpressis vestitus, tubo infundibulari, dentibus parvis lanceolatis. *Corolla* cærulea, calyce duplo longior, alis vexillo paulo brevioribus. *Legumen* oblongum, turgidum, acutum, 3 lin. longum, distincte stipitatum, tenuiter albo-canescens, sutura nullo modo inflexa, seminibus 3-4 parvis reniformibus duplo longioribus quam latis.

A near ally of *A. confertus*, Benth., of West Tibet. From 12,000 to 14,000 feet, Síkarám; a very minute plant; August.

818, 1004. *Astragalus* (*Phaca*) *microdontus*, Baker, n. sp. *Herba* perennis, caulibus elongatis ramosis tenuiter adpresse albo-pubescentibus. *Folia* viridia tenuissime pubescentia, foliolis 11-21 lineari-oblongis vel oblongis obtusis 6-12 lin. longis distincte petiolulatis, rachi 2-4-pollicari, petiolo brevi, stipulis parvis linearibus. *Racemi* densi 2-3 poll. longi, saepe secundi, pedicellis 1-1½ lin. longis, bracteis magnis membranaceis oblongo-lanceolatis cito deciduis. *Calyx* viridis, subglaber, 2 lin. longus, tubo oblongo, ore obliquo subintegro ciliato. *Corolla* primum pallide lutea, demum purpurascens, calyce duplo longior. *Legumen* glabrum, lineare, compressum, 5-6 lin. longum, 1½-2 lin. latum, ad apicem et basin angustatum, perfecte biloculare, stipite calyce longiore, seminibus 6-8.

Closely allied to the West-Himalayan *A. chlorostachys*, Lindl. Remarkable for the almost complete suppression of its calyx-teeth. Shéndtoi, 7000 to 10,000 feet.

238, 710. *A.* (*Hypoglottis*) *Kuramensis*, Baker, n. sp. *Herba* perennis, caulibus elongatis pilis mollibus patentibus albidis tenuibus vestitis. *Folia* viridia, facie glabra, dorso et margine tenuiter laxe pilosa, foliolis 21-31 oblongis obtusis distincte petiolulatis 6-9 lin. longis, rachi interdum semipedali, petiolulis brevissimis, stipulis magnis connatis membranaceis persistentibus. *Racemi* multi, densi, sessiles, axillares, 1½-2 poll. longi, pedicellis brevissimis, bracteis lanceolatis. *Calyx* viridis, demum brunnescens, 5-6 lin. longus, tenuiter laxe pilosus, dentibus linearibus tubo æquilongis. *Corolla* lutea, calyce paulo longior. *Ovarium* distincte stipitatum, dense albo-sericeum, ovulis pluribus. *Legumen* ignotum.

A neighbour of *A. cashmirensis*, Bunge, and *A. Munroi*, Benth. Kuram, April; also at 10,000 feet, July.

488, 510. *A.* (*Hypoglottis*) *rhizocephalus*, Baker, n. sp. *Herba* perennis, acaulis, dense albo-pilosa. *Folia* pallide viridia, pilis multis patentibus albis molli bus tenuibus vestita, foliolis 25-31 obovatis obtusis vel emarginatis 3-4 lin. longis breviter petiolulatis, rachi 2-3-pollicari, petiolo subpollicari, stipulis magnis membranaceis. *Flores* numerosi, in capitem globosum sessilem aggregati, pedicellis brevissimis, bracteis linearibus. *Calyx* 6-7 lin. longus, densissime albo-pubescentis, dentibus lineari-subulatis tubo æquilongis. *Corolla* lutea, calyce paulo longior. *Ovarium* stipitatum, dense albo-sericeum, ovulis pluribus. *Legumen* haud visum.

Near *A. erionotus*, Benth., Bunge, No. 187. Sergal to Bíánkhél and Síkarám; May and June. In pine-forests, Bíánkhél.

75. *A.* sp. near *A. ayanus*, Benth.

Habíbkalla; March.

1215. *A.* sp. near *A. horridus*, Boiss.

Sergal to Bíánkhél.

167. *Astragalus Susianus*, Boiss., var.

Kuram and Habíbkalla, most profuse; corolla lovely bright pink. Very characteristic on the dry gravel soil of the fan country.

A. (Calycophysa) ptilocephalus, Baker, n. sp. Fruticulosus, nanus, ramosissimus, foliorum delapsorum rachibus pungentibus persistentibus armatus. *Folia* condensata, pallide viridia, pilis albis adpressis tenuiter canescentia, foliolis 8-10 lanceolatis acutis rigidulis complicatis subsessilibus erecto-patentibus 3-4 lin. longis, rachi subpollicari pungente, petiolo brevi, stipulis latis membranaceis petiolo longe adnatis. *Flores* multi, radicales, dense capitati, pedicellis subnullis, bracteis parvis membranaceis lanceolatis vel linearibus. *Calyx* semipollicaris, densissime albo pilosus, basi antice rotundatus, dentibus subulatis plumosis tubo duplo longioribus. *Corolla* lutea vel vetustate purpureo tincta, calyce vix longior. *Ovarium* sessile, dense pilosum, ovulis paucis. *Legumen* ignotum.

Allied to *A. Susianus*, Boiss. Same locality as above; flowers lemon-yellow.

109, 191, 476, 556. **A. (Cercidothrix) cerasinus**, Baker, n. sp.

Herba perennis, acaulis, inermis, dense caespitosa. *Folia* pallide viridia, pilis hispidis adpressis albis brevibus dense canescentia, foliolis 13-19 subsessilibus orbicularibus vel obovatis 2-4 lin. longis minute cuspidatis, rachi 1-2-pollicari, petiolo elongato, stipulis parvis lanceolatis. *Pedunculus* $\frac{1}{2}$ -2-pollicaris, albo-canescens. *Racemi* pauciflori, pedicellis brevissimis, bracteis parvis deltoideis persistentibus. *Calyx* 4 lin. longus, tubo cylindrico atro-viridi pilis brevibus adpressis dense canescente, dentibus parvis linearibus. *Corolla* luteo-cerasina, calyce duplo longior. *Legumen* cylindricum, sessile, 9-10 lin. longum, obscure albo-hispidum, perfecte biloculare, 7-8-spermum.

Closely allied to the European *A. incanus*, L. Zabardastkalla and Alikhél; April to June.

482. **A. (Hypoglottis) luteo-cæruleus**, Baker, n. sp. *Herba* perennis, acaulis, inermis, dense caespitosa. *Folia* pallide viridia, utrinque pilis albis multis hispidis adpressis vestita, foliolis 26-29 oblongo-lanceolatis subsessilibus 2-6 lin. longis, rachi 1-2 $\frac{1}{2}$ -pollicari, petiolo 6-12 lin. longo, stipulis lanceolatis. *Pedunculus* gracilis, 2-5-pollicaris, pilis adpressis albis vestitis. *Racemi* capitati, 6-12-flori, pedicellis brevissimis, bracteis parvis foliaceis lanceolatis persistentibus. *Calyx* 4-5 lin. longus, pilis multis elongatis albidis et nigris ascendentibus vestitus, dentibus linearibus tubo æquilongis. *Corolla* luteo-cærulea, 6-7 lin. longa. *Legumen* oblongum, turgidum, stipitatum, 4-5 lin. longum, puberulum, sutura ventrali introflexa, seminibus 8-10.

Allied to the European *A. depressus*, L. West base of Sikarám; June.

54. *Ebenus stellata*, Boiss.

A large shrub, covered with enormous harsh-looking spines, that prove quite pliant to the touch, and very silky leaves giving it the general appearance of a *Hippophaë*. Common from Badish-khél to Sadatkalla, and thence in occasional patches to near Sháli-zán cantonments.

240. *Glycyrrhiza glandulifera*, Wald. & Kit.

Kuram; April.

489. *Onobrychis cornuta*, Desv.

From Sergal to the west base of Síkarám, about 9000 to 11,000 feet; June. Forms immense hedgehog-like, intensely matted gregarious masses, perfectly rounded, as if clipped. Flowers white or purple.

68, 86, 186. *O. (Hymenobrychis) dasycephala*, Baker, n. sp. *Herba* acaulis, perennis, radice elongata lignosa. *Folia* rosulata, imparipinnata, utrinque dense persistenter albo-sericea, foliolis 9-11 sessilibus, 3-4 lin. longis oblongis vel obovatis obtusis vel subacutis, rachi subpollicari, petiolo subpollicari, stipulis linearibus. *Pedunculus* 2-3-pollicaris, albo-canescens. *Racemus* dense 20-30-florus, bracteis lanceolatis, pedicellis brevissimis. *Calyx* 4-5 lin. longus, dense molliter albo-sericeus, tubo campanulato, dentibus lineari-subulatis tubo multo longioribus. *Corolla* 6-7 lin. longa, vexillo obovato 5-6 lin. lato luteo lineis rubris percurso, alis parvis luteis, carina lata vexillo æquilonga. *Legumen* lanosum, oblongo-reniforme, dispermum, 6-7 lin. longum, faciebus alveolatis breviter spinosis, margine angusto corneo dentibus multis inæqualibus lanceolatis acuminatis $\frac{1}{2}$ -1 lin. longis armato.

Allied to *O. dealbata*, Stocks. Very profuse on stony ground in the fan country, Kuram to Habíbkalla; April and May.

51, 85, 263. *O. (Hymenobrychis) microptera*, Baker, n. sp. *Herba* perennis, acaulis vel breviter caulescens. *Folia* imparipinnata, breviter albo-hirsuta, foliolis 13-15 oblongis acutis 3-4 lin. longis breviter petiolulatis, rachi $1\frac{1}{2}$ -2 poll. longa, petiolo elongato, stipulis lanceolatis. *Pedunculus* 1-3-pollicaris. *Racemus* floriferus subluxus, $1\frac{1}{2}$ -2 poll. longus, fructiferus 3-4-pollicaris, pedicellis brevibus, bracteis parvis linearibus. *Calyx* $1\frac{1}{2}$ lin. longus, pubescens, tubo campanulato, dentibus linearibus tubo longioribus. *Corolla* 3-4 lin. longa, albidâ, lineis rubellis decorata, vexillo obovato fauce lutea, alis parvis lanceolatis, carina obtusa vexillo æquilonga. *Legumen* orbiculari-reniforme, mono-spermum, tenuiter albo-araneosum, 4 lin. longum, faciebus profunde alveolatis haud spiniferis, margine angusto albedo membranaceo erosodenticulato.

This should be placed between species 47 and 48 in Bois-

sier's 'Flora Orientalis.' Badishkhél to Habíbkalla, all the fan country, profuse; April.

168. *Onobrychis* sp.
Habíbkalla; April.

512, 484. *O.* sp. near *O. heterophylla*, C. A. Mey.

Profuse in the Hariáb district, dry stony soil, Sergal, Zabardastkalla, Bíánkhél; June.

1217. *O. (Dendronobrychis) spinosissima*, Baker, n. sp. Nana, fruticosa. *Folia* rosulata, basi petiolis rachibusque vetustis spinescentibus crecto-patentibus dense cincta æqualiter pinnata, pallide viridia, albocanescens, foliolis oblongis 5-6-jugis $1\frac{1}{2}$ -2 lin. longis, rachis vix pollicari stricta apice pungente, petiolo brevi, stipulis parvis lanceolatis membranaceis. *Racemi* 1-3-flori, pedunculi radicali brevissimi, pedicellis subnullis. *Calyx* 1 lin. longus, pubescens, tubo campanulato, dentibus deltoideo-cuspidatis tubo longioribus. *Corolla* rubello-purpurea, 4-5 lin. longa. *Legumen* dimidiato-orbiculare, monospermum, 4 lin. longum, faciebus arcuatis, margine exalato.

Allied to the Persian *O. arnacantha*, Bunge. From 9500 to 12,000 feet on Síkarám; forms dense masses, but not nearly so firm or so hedgehog-like as 489.

661. *Lespedeza sericea*, Miq.

In stony places from 6000 to 7000 feet, Shálizán, common; June.

786. *Hedysarum astragaloides*, Benth.

Shéndtoi at 10,000 feet; flowers pink; July.

810. *Desmodium tiliæfolium*, G. Don.

Amongst the low scrub, altitude 7000 feet, near Shálizán and Shéndtoi, not very common; July.

740. *Cicer soongaricum*, Steph.

Kaiwás, at 10,000 feet, profuse near forest; July.

819. *C. soongaricum*, Steph., var. *spinosum*.

Serátigah, at 11,000 feet; July.

3, 714, 591. *Vicia sativa*, L.

A very common weed in corn-fields, Mandúri, Kaiwás, and Karhátal, at 3000 to 9000 feet.

188, 554, 506, 580. *Ervum Ervilia*, L.

Cultivated throughout the Hariáb district extensively, and a little near Habíbkalla; is frequently an escape.

294. *Lathyrus Aphaca*, L.

Profuse as a field-weed from Kohat to Káratígah; May and June.

581. *L. sphæricus*, Retz.

A field-weed; very common at Karchátal.

691, 910, 666. *Glycine Soja*, Sieb. & Zucc.

Largely cultivated in the Kuram district, occasionally in Hariáb, also frequent as a weed in cultivated ground; June.

973. *Phaseolus vulgaris*, L.

Cultivated as a field-crop near Rokian; August.

566. *Sophora* (*Goebelia*) *alopecuroides*, L.

Only collected at one locality near Alikhél, on dry stony clay-soil at 7200 feet, and there it was profuse; June and July.

93. *S.* (*Edwardsia*) *mollis*, Royle.

From Kohat, Thal, and Kuram, through the Hariáb district to Káratígah, profuse, from 2000 to nearly 10,000 feet, in pine-forests.

25. ROSACEÆ.

419. *Prunus Amygdalus*, Baill.

A small tree, occurring in gregarious patches in certain localities from near the Shéndtoi ravine to Káratígah. Said to be quite common by the natives, and well known to them; called by the same native name as the cultivated almond, "*Bédám*." The fruit is not eaten. The stems are employed as rods to carry in the hand by the priests, but are not used as we do walking-sticks; they are considered more or less holy. In orchards a tree or two of the almond may exist; but I never saw it, nor is it cultivated, to my knowledge, in the Kuram valley.

852. *P.* sp. near *P. Amygdalus*, Baill.

The form of the fruit is quite different from that of 419, being longer and more flat. The surface of the fruit resembles that of the peach in texture and colour; and the nut is quite distinct from that of 419. The whole shrub resembles more what one might consider a wild form of the peach than that of the almond. Collected only in the Hazárdarakbt ravine, fruiting in July.

108. *P. eburnea*, Spach ? = *Griffith*, no. 1212.

A small stiff scraggy shrub which covers the whole of the open stony ground from Zabardastkalla to Alikhél; particularly characteristic of the country. Flowers in April, before the leaves. The profusion of rose-pink flowers on the light-grey stems of

what is then a leafless shrub gives a brilliant colouring to the bare stony country upon which it grows.

Prunus persica, *Benth. & Hook. f.*

Is sparingly cultivated in the Shálizán orchards in both forms, peach and nectarine.

P. armeniaca, *L.*

The apricot is cultivated largely in orchards up to 9000 feet. There are several forms of the fruit.

700. **P. Cerasus**, *L.*

The cherry. A few trees exist in the Kuram valley; I have seen two small ones at Shálizán, and I have been informed of others existing in other villages.

387, 317. **P. Jacquemontii**, *Hook. f. in Fl. Brit. Ind. ii. p. 314.* *Flores* rosei, foliis coætanei, solitarii, brevissime pedunculati, 8-10 lineas diametro; calycis tubus cylindricus, 3-4 lineas longus, extus glaber, intus parce pilosulus; lobi oblongi, rotundati, lineam longi, extus glabri, intus albo-pilosi; petala oblongo-elliptica, apice rotundata, 3-4 lineas longa, basi supra calycem glandula lineata notata; stamina 25-, 30 petalis duplo triplove breviora; ovarium glabrum; stylus exsertus.

An extremely common shrub from Shálizán to Alikhél. When the fruit is ripe and the bush is covered with it, which is usually the case, it forms a very pretty object in the landscape. It would be worth cultivating for ornamental purposes.

702. **P. communis**, *Huds.*, var.

The cultivated plum. The specimens were collected from trees near Kaiwás in July, that may be escapes; but apparently this tree seems to spread through the woods in the lower hills at from 7000 to 9000 feet very easily. About 20 feet high, 4 feet girth. Fruit yellow or red, resembling poorer specimens of garden fruit.

807. **P. communis**, *Huds.*, var.

A cultivated plum, round and flattened at the ends, like a large greengage, but slightly purplish in colour and very watery when ripe; not fleshy, and having an extremely thin skin that completely separates from the pulp. Shéndtoi, in an old orchard, 7000 feet. Both the above plums are grown in the orchards of all the large villages of the Kuram valley, but less so in those of the Hariáb district.

387. **P. Padus**, *L.*

A small tree, not very common from 7500 to 9000 feet in the

Shéndtoi and Gandháo villages. It is well known to the natives for its fruit, and, curiously enough, is called by a name very similar to that in use in Kashmir, from the likeness of the hanging fruit to a small bunch of grapes, "Angúrak."

674. *Spiræa vestita*, *Wall.*

Common near running streams, Shálizán; June.

674a. *S. vestita*, *Wall.*, forma depauperata.

Collected in the Spíngháo ravine; July.

386. *S. sorbifolia*, *L.*

Profuse in water-channels in the hills from 7000 to 9000 feet.

540, 331, 232. *S. brahuica*, *Boiss.*

Very common in Kuram, Alikhél, and Shálizán.

804, 422. *Rubus niveus*, *Wall.*, var. *Aitchisoni*, *Hook. fil.*

A fine rasp-like shrub, common at the upper limit of trees, growing amongst low shrubs and large boulders, and having an orange-red fruit as large as the fruit of the ordinary brambles, which is fleshy and good to eat. Shéndtoi ravine; July.

471. *R. fruticosus*, *L.*, var.

Common in the vicinity of Shálizán in natural hedges around the fields and sides of water-channels.

0. *R. fruticosus*, *L.*, var.

At Shálizáu; August.

765. *R. purpureus*, *Bunge.*

Not uncommon around fields, from 8000 to 9000 feet; July.

696. *R. lasiocarpus*, *Sm.*

Shálizán; June.

422. *R. leucanthus*, *L.*

At Shálizán; May.

762. *Geum urbanum*, *L.*

Occasional at from 7000 to 8000 feet, near water, Shálizán; July.

282. *Fragaria indica*, *Andr.*

Common on stony ground, road-sides, and at foot of walls, Shálizán.

224. *F. vesca*, *L.*

Very common from Kuram to Alikhél up to 10,000 feet.

747. *Potentilla Sibbaldi*, *Haller.*

On the hills, generally at 10,000 feet, on open stony ground profuse; June and July.

728. *Potentilla* (§ *Fragariastrum*) *Collettiana*, *Aitchison et Hemsley*, n. sp. Nana, caespitosa, foliis confertis trifoliolatis omnino argenteo-sericeis, foliolis obovato-oblongis apice truncatis et tridentatis basi cuneatis, pedunculis brevibus 1-4-floris, floribus parvis aurcis, receptaculo achæniisque sericeo-hirsutis.

Herba perennis, caespitosa, nana, tota adpresse sericeo-argentea, caudice crasso elongato, pedunculis vel caulibus floriferis gracilibus, 1-3-pollicularibus, paucibracteatis, 1-4-floris. *Folia* densissime conferta, petiolata, trifoliolata; foliola sessilia, obovato-oblonga; 6-9 lineas longa, basi cuneata, apice truncata tridentata; petiolus usque ad sesquipollicaris; stipulae angustae, petiolo longae adnatae, parte libera brevi lineari acuta. *Flores* aurei, 6-8 lineas diametro, longiuscule pedicellati; calycis laciniae 10, ovato-oblongae, vix acutae, alternae paullo breviores; petala elliptica, utrinque rotundata, 2½-3 lineas longa, laciniis calycis paullo longiora; discus carnosus, annularis, breviter lobatus; stamina circiter 20, petalis dimidio breviora; filamenta glabra; receptaculum hirsutum. *Achenia* circiter 15, immatura undique longe hirsuta.

Allied to *P. curviseta*, Hook. f., and *P. libanotica*, Boiss. Forms a woody rootstock, with large, extremely silky, slightly 3-toothed leaves. Growing from the face of overhanging rocks at an elevation of 10,000 to 11,000 feet, forming a very handsome rock-plant with its masses of yellow flowers. SÍkarám and Kaiwás.

687. *P. fragarioides*, *L.*, var. *pumila*.

Shálizán; June.

595. *P. fragarioides*, *L.*, var. *Gerardiana*.

Common, Karchátal, Kaiwás, Shálizán; May, June, July.

583. *P. multifida*, *L.*

At 11,000 feet, not common, Karchátal; June.

967. *P. sericea*, *L.*, var.

At 14,000 feet on the crests of the hill above the lake; August 14th.

153. *P. reptans*, *L.*

Common from 5000 to 7000 feet.

800. *P. argyrophylla*, *Wall.*

A splendid plant, collected only in one locality, just at the limit of trees, from 11,000 to 11,500 feet, springing up from amongst other low-growing shrubs. Shéndtoi; July.

954. *P. monanthes*, *Lindl.*

At 15,000 feet, SÍkarám, amongst stony débris; August.

5. *P. supina*, *L.*

Stony localities with moisture, from Thal to Habíbkalla, profuse.

974. *Agrimonia Eupatorium*, *L.*

Common on sides of watercourses from 6000 to 7000 feet.

1211. *A. pilosa*, *Ledeb.*

Near water, sides of fields, and in hedgerows, common; Shálizán.

185. *Poterium Sanguisorba*, *L.*

Most common on the margins of watercourses near fields.

333 *Rosa damascena*, *Mill.*

In all gardens, cultivated for ornament, not for rose-water; June.

326. *R. Eglanteria*, *L.*

In hedges around gardens and at holy shrines; Biánkhél, Shálizán; May and June.

309. *R. anserinæfolia*, *Crepin* (non *Boiss.*).

From the vicinity of Shálizán; profuse near streams, not cultivated. Briar-scented.

0. *R. anserinæfoliæ*, *Boiss.*, var. *cabulica* = *Griffith*, *Afghan*. no. 1203.

Sergal at 8500 feet, common. Indigenous.

398. *R. macrophylla*, *Lindl.*

More commonly met with in the interior of the hills, or at 8500 feet, along the Hariáb district.

343. *R. Webbia*, *Wall.*

A small erect shrub in dry stony localities, chiefly Hariáb district, but also occasional in the fan country about Shálizán; June.

472. *R. moschata*, *Mill.*

Occurs not rarely about 7000 feet in wooded localities and in the vicinity of water, climbing over trees and covering them with a sheet of blossom; flowers in June. Is also cultivated.

04. *R. canina*, *L.*, var.

Very common in hedgerows; flowers in May.

425. *R. canina*, *L.*, var.

Shálizán; May.

165. *R. Ecæ*, *Aitchison*, *MSS.*, n. sp. Humilis, ramosissima, aculeatissima, aculeis in ramis floriferis homomorphis rectis rigidis basi valde dilatatis, foliis parvulis 5-9-foliolatis parce glandulosis, floribus aureis solitariis infra 1 poll. diametro, fructu globoso glabro nitido laciniis calycis reflexis coronato.

Fruteæ erectus, 3-4-pedalis, ramosissimus, aculeatissimus, ramis gracilisculis, junioribus ruberrimis, glabris; aculeis in ramis floriferis homomorphis, confertis, rectis, rigidis, basi valde dilatatis, primum ruberrimis, usque ad semipollicaribus. *Folia* in ramulis lateralibus brevissimis unifloris conferta, 6-12 lineas longa, 5-9-foliolata, subtus præcipue parce glandulosa; foliola subcoriacea, ovato-oblonga obovata vel interdum fere rotundata, 2-3 lineas longa, serrulato-dentata; stipulæ inconspicuæ. *Flores* aurei, vix 1 poll. diametro, breviter pedunculati; calycis segmenta lanceolata, integerrima, vel apicem versus interdum paucidentata, reflexa, petala fere æquantia, extus primum glandulosa, intus albivillosa; petala obovato-oblonga basi lata; achænia villosissima, stylis liberis apice tantum glabris. *Fructus* globosus, 3-4 lineas diametro, glaber, nitidus, laciniis calycinis reflexis coronatus, graciliter pedunculatus.

A very distinct species, remarkable for the small size of its yellow flowers and for the very broad bases of its homomorphous prickles, resembling closely in this respect the Central-Asian *R. platycantha*, Schrenck. It differs from the section *Eglanteriæ*, as defined by Boissier, 'Flora Orientalis,' ii. p. 669, in not having dimorphic spines, and appears to be intermediate between the *Eglanteriæ* and Boissier's section *Elymaiticæ*.

A small erect stiff shrub; stems covered with extremely numerous straight prickles varying in size; leaflets 5 to 9, very small; flowers yellow, scarcely 1 inch in diameter; fruit small, globose, reddish, erect. A very common and characteristic shrub from Habîbkalla to Alikhél, forming, with *Amygdalus eburnea*, the greater part of the scrub on the stony ridges of the Hariâb district. Named after Mrs. Aitchison.

Pyrus Malus, L.

Several varieties of apples are cultivated in the orchards; none, however, very good.

P. communis, L.

I have never seen any fruit, and very occasionally a pear-tree in the gardens.

P. sp.

A middle-sized tree near Badishkhél; only one tree, not cultivated.

742. P. lanata, Don.

A small tree in the forests at 8000 to 10,000 feet, up the Shéndtoi and Gandháó ravines. The fruit is eagerly sought by the shepherds, and called by them "Amlok," the same name as that applied to the fruit of *Diospyros*.

792. *Pyrus Aucuparia*, *Gart.*

Amongst the shrubs at the limit of forest, or nearly so, in the Shéndtoi gorge, at from 10,000 to 11,000 feet, not common; July.

0. *Cratægus Oxyacantha*, *L.*

With very large fruit; may be a variety. A common shrub at 8000 feet round Shálizán; usually forms a good tree in the Hariáb district.

325. *Cotoneaster bacillaris*, *Wall.*

A large shrub, the wood of which is in much request for the handles of farm instruments, staves, and bows. Forms a great part of the scrub within the hills from 7000 to 8500 feet. Scarcely occurs in the Hariáb district.

204. *C. nummularia*, *Fisch.*

Occurs from the vicinity of Thal, along the whole road as far as Alikhél, making up largely with *Sophora* and *Daphne* the scrub vegetation of the stony arid spots. These three plants seem to withstand a great amount of variation of temperature.

363. *C. nummularia*, *Fisch.*, var. *tomentosa*.

This, I have no doubt, is a distinct species. The upper surface of the leaves is extremely glabrous, whilst their under surface is excessively tomentose. The habit of the plant is very different from the type. It occurs only at about 8000 feet, and does not ascend to the Hariáb district.

182. *C. vulgaris*, *L.*, var. ? *Fere omnino glabra, ramis gracillimis, floribus parvis.*

A very graceful tall shrub with lax corymbose pink inflorescence. Only collected in July, at 10,000 feet, in the high forest up the Shéndtoi gorge.

0. *C. sp.* Probably the as same 782.

Collected at Kaiwás; July.

26. SAXIFRAGACEÆ.

163. *Saxifraga ligulata*, *Wall.*

On damp rocks at from 8000 to 10,000 feet; profuse. In spring the flowers are greatly worn behind the ear by young men and women of the villages.

383. *S.* (§ *Kabschia*, *Engler*) *afghanica*, *Aitchison et Hemsley*, n. sp.

Cæspitosa, pygmæa, foliis oblongis dense imbricatis, caulibus floriferis vix pollicaribus glandulosis sæpissime trifloris, floribus majusculis pallide purpureis, petalis obovatis quam stamina longioribus, seminibus oblongis pilis brevibus debilibus sparsim instructis.

Herba perennis, cæspitosa, caulibus densissime foliosis interdum usque tripollicaribus sed sæpissime vix pollicaribus. *Folia* dense imbricata, carnosa, oblonga, 3-4 lineas longa, obtusa, supra parce foveolata, margine anguste cartilaginea, infra medium ciliata, caulina spatulata vel lineari-oblonga, glandulosa; caules floriferi glandulosi, vix pollicares, sæpissime triflori. *Flores* pallide purpurei, circiter 6 lineas diametro; calycis glandulosi segmenta oblonga, obtusa; petala obovata, 5-nervia, staminibus longiora; styli elongati, demum divergentes. *Capsula* globosa; semina minuta, oblonga, pilis brevibus debilibus sparsim conspersa.

Near *S. Kotschyi*, Boiss., but differing in the colour and size of the flowers, in the relative length of the petals and stamens, and in the seeds, as well as in the cymes being almost constantly three-flowered. A very characteristic rock-plant, covering stones like rich moss; would prove very effective in a rockery. The flower is a grey-purple, and extremely large for the short mossy stem; it is borne on a peduncle of an inch in length. Chiefly met with in the Shéndtoi gorge at from 7500 to 11,000 feet. Flowers from May to July.

943. *Parnassia ovata*, Ledeb.

In grassy spots at the exits of springs, altitude 9000 to 11,000 feet; common in the vicinity of Síkarám; August.

413. *Ribes Grossularia*, L.

Very profuse at the base of Síkarám and westward to Serítigah, in certain localities, amongst thin forests, altitude 9000 to 10,000 feet. In one or two villages of the Hariáb district it is employed as a hedge-plant. The fruit is much superior to that produced in Ladák.

128. *R. orientale*, Poir.

A very common shrub in rocky dry situations throughout the Hariáb district up to an altitude of 11,000 feet. The berries, called "*Alksiswérai*," are considered an excellent purgative taken one or two at a time.

0. *R. rubrum*, L. var.

A handsome leafy bush at 9000 to 11,000 feet, under trees in the forest, Shéndtoi gorge; August, in fruit.

27. CRASSULACEÆ.

456. *Crassula* sp.

On rocks in the Shéndtoi gorge, common; June.

538. *Cotyledon* (§ *Umbilicus*) *tenuicaulis*, Aitchison et Hemsley, n. sp.

Perennis, minima, foliis radicalibus rosulatis oblongo-spathulatis vix

semipollicaribus, caulibus floriferis extrarosularibus gracillimis glanduloso-puberulis, floribus roseis vel purpureis parvis dichotomo-cymosis, corollæ lobis longe acuminatis apiculatis erectis tubo paullo longioribus.

Herba perennis, gracillima caulibus floriferis glanduloso-puberulis 2-4-pollicaribus. *Folia* radicalia et caulina inferiora rosulata, carnosa, obovato-spathulata, 2-4 lineas longa, prium albo-furfuracea, caulina superiora minima, linearia, appressa. *Flores* pallide rosei, 2-2½ lineas longi, dichotomo-cymosi; calycis glanduloso-puberuli lobi ovati, obtusiusculi, semilineam longi; corollæ obsolete puberulæ lobi longe acuminati, apiculati, carinati, tubo longiores; stamina inclusa; filamenta filiformia. *Carpella* glabra.

This differs from all other species of the section *Rosularia* in its small size, slender habit, and small flowers.

Alikhél; June.

243. *Cotyledon (Umbilicus) papillosa*, Aitchison et Hemsley, n. sp.

Humilis, ramosa, foliis confertis carnosis obovato-spathulatis glabris, ramulis floriferis floribusque dense glanduloso-papillosis, floribus numerosis parvis albo-roseis, corollæ lobis erectis carinatis apice apiculatis breviter recurvatis dorso papillosis tubo paullo longioribus.

Herba perennis, 3-4-pollicaris, basi ramosa, ramulis floriferis graciliusculis floribusque dense glanduloso-papillosis. *Folia* carnosa, in ramis sterilibus conferta, sed vix rosulata, in ramis floriferis sparsa et sursum gradatim minora, inferiora glabra vel cito glabrescentia, obovato-spathulata, usque ad 8 lineas longa, superiora lineari-oblonga, papillosa. *Flores* albo-roscei, numerosi, ad 2½ lineas longi, cymosi, breviter pedicellati; calycis glanduloso-papilloso lobi lanccolato-oblongi, obtusiusculi; corolla calyce fere duplo longior, extus glanduloso-papillosa; lobi erecti, carinati, paice breviter recurvato-apiculati; stamina 10, inclusa; filamenta filiformia; squamæ parvæ, subquadrato-oblongæ. *Carpella* glabra.

In habit this resembles the Sikkim *C. obovata*, which has larger, yellow, less numerous flowers. Kuram; April.

851. *Sedum asiaticum*, DC.

Serátigah, altitude 13,000 feet; July.

0. *S. rosulatum*, Edgew.

936, 1000. *S. Ewersii*, Ledeb.

Profuse in rocks from 9000 to 12,000 feet.

469. *S. pachyclados*, Aitchison et Hemsley, n. sp. Perenne, nanum, glaberrimum, rhizomate crasso sæpissime ramoso, ramis (caudiculis auct.) apice tantum foliosis, ramulis floriferis axillaribus brevissimis paucifloris, foliis rosulatis parvis carnosis apice sæpe 3-5-dentatis, floribus stramineis mediocribus.

Herba perennis, nana, omnino glaberrima, rhizomate crasso usque ad 5-pollicari sæpissime ramoso; rami ad 3 lineas diametro, apice tantum

foliosi; ramuli floriferi axillares, 6-12 lineas longi, 2-10-flori. *Folia* carnosae, rosulatae, obovato-spathulatae vel suborbicularia, 3-5 lineas longa, apice saepe 3-5-dentata, caulina obovata basi soluta. *Flores* stramineae, 4-5 lineas diametro, brevissime pedicellatae; sepalae subcarnosae, oblongae, obtusae, petalis $\frac{1}{3}$ - $\frac{1}{2}$ breviorae, basi haud productae; petala tenuia, oblongo-spathulata, obtusae, subtrinervia; stamina 10, alterna petalis adnata, filamentis filiformibus petalis paullo brevioribus. *Carpella* subinflata, longe rostrata, oligosperma; semina matura non visa.

This species is very distinct from all others that we have seen. Profuse in rocks between Shálizán and Shéndtoi; June and July.

937. *Sedum adenotrichum*, Wall.

At 11,000 feet, Sikarám; August.

935. *Sempervivum acuminatum*, Dene.

Very profuse on the ascent to Sikarám and to Serátigah, on stony débris at 10,000 to 12,000 feet; August.

28. HAMAMELIDEE.

291. *Parrotia Jacquemontiana*, Dene.

A very abundant shrub, occurring in the interior of the hills and forming much of the low dense shrub-jungle which grows in the damper localities and northern exposure of these hills from 7500 to 9000 feet (if so much). The long slender stems and pliant branches are much employed in making the wicker-work of which most of the houses in the villages consist, and which are plastered over with clay, also as handles for ordinary farm implements axes, &c.

29. MYRTACEÆ.

47. *Myrtus communis*, L.

Occasionally met with in local dense clumps on cultivated land. In all cases the bushes seem very old, and most probably had been planted beside graves. Very common in this form near Ibrahimzai, Alizai, and Badishkhél, villages on the Kuram river, from 3500 to 4000 feet in altitude. Not seen near Kuram. I never met with solitary bushes.

30. LYTHRACEÆ.

0. *Ammannia senegalensis*, Lamk. ~

In rice-fields at Shálizán, August; very common.

0. *Punica granatum*, L.

A common wild shrub, forming part of the scrub of the outer hills at from 6500 to 7000 feet; not in the Hariáb district.

31. ONAGRACEÆ.

1008. *Epilobium angustifolium*, *L.*

A very handsome and characteristic plant at 10,000 to 11,000 feet, near moisture.

781. *E. angustifolium*, *L.*, var. *brachycarpum*.

In similar localities to the above ; August.

875. *E. hirsutum*, *L.*, var. *sericeum*.

Very common from Kuram to Habíb-kalla, up to 7000 feet, in wet localities.

939. *E. roseum*, *Sch.?*

Síkarám, in stony beds of streams at 11,000 feet.

651. *E. tetragonum*, *L.*

Very common around Shálizán ; July and August.

0. *E.* sp.

Shálizán ; June.

32. CUCURBITACEÆ.

3. *Cucumis Melo*, *L.*, var.

The specimens collected were of the form usually occurring as a weed all over the dry hot fan country, sides of fields, &c. Melons, water-melons, cucumbers, and gourds are very largely cultivated from Thal to the foot of the Pévárkotal ; scarcely any of these, except a cucumber, in the Hariáb district.

533. *Bryonia dioica*, *Jacq.*

A most extensive weed, covering the hedgerows in the Hariáb district. Specimens of this plant were collected by the Rev. Mr. Jaeschke in Lahul, and are in the Kew Herb., but were overlooked by Mr. C. B. Clarke in his monograph of the order in the 'Flora of British India.'

33. UMBELLIFERÆ.

472 a. *Eryngium cæruleum*, *Bieb.?*

At Shálizán ; May.

427. *E. Billardieri*, *Delar.*

Shálizán, very common ; June.

0. *Bupleurum falcatum*, *L.*, var. *linearifolium*.

Kaiwás, very common and generally all over the district above 4000 feet alt. ; June.

0. *B. falcatum*, *L.?*

Alikhél ; July.

929. *Bupleurum* sp.

A very abundant, creeping, close-growing plant amongst stones at 12,000 to 14,000 feet, Sikarám; August.

663. *Apium graveolens*, L.

Very common at about 7000 feet, along banks of watercourses and at spring-heads on rocks, Shálizán; June.

417. *Conopodium* sp.

Shálizán; June.

513. *Carum Bulbocastanum*, Koch (= *Stocks*, 1056).

Profuse, Bíánkhél, under bushes at from 2000 to 3000 feet; June. This plant also occurs in large quantity in the Rawul Pindée district of the Punjab.

478. *C. Bulbocastanum*, Koch, var.

Zabardastkalla, in fields, profuse; June. Wild pigs cause great injury in fields where this and the last species are prevalent as weeds by uprooting the tubers.

296, 248. *C. copticum*, Benth.

Cultivated more or less in small patches of garden ground, mixed up with several other vegetables. Very common, either as an escape or spontaneously, from Thal to Alikhél; May and June.

895, 991. *Pimpinella diversifolia*, DC.

Péwárkotal and Shéndtoi at an altitude of 8500 feet, profuse under trees; July and August.

752. *P.* sp.?

Shéndtoi, in dry stony spots; July.

846. *P.* sp.

Drékalla, very rare in certain localities amongst the broken débris of stones; July.

772. *Chærophyllum reflexum*, Lindl.

Shéndtoi, profuse in grassy wet ground associated with *Pedicularis*, *Primula*, *Caltha*, &c., at 9000 feet; July.

592. *Scandix Pecten-Veneris*, L.

Fields, not common, Karchátál; June.

873. *Seseli sibiricum*, Benth.

Very common and prominent on large rocks, Alikhél and Sergal; August.

514. *Conium maculatum*, L.

Bíánkhél only, round the village; June. This plant had not previously been collected so far east.

311. *Fœniculum vulgare*, Gaertn.

Cultivated as *Carum copticum* is, and, like it, often an escape, or probably indigenous.

854. *Prangos pabularia*, Lindl.

Serátigáh, at 9000 feet, very common; also Drékalla. July was far too late to collect this plant, as I could scarcely get even a few leaves. I found no fruit.

821. *Ligusticum* ?

Not uncommon from 11,000 to 15,300 feet, Serátigáh, Síkarám, &c., in clefts of rocks. Very late in flowering, not in good flower, and no sign of fruit August 4th. The Goorkhas would eat it, and said they knew what it was quite well; they upset all my arguments on the subject by telling me they had on their hills every plant we saw, besides thousands of others.

992. *Selinum papyraceum*, C. B. Clarke.

Shéndtoi, in moist ground, 9000 feet; August.

953. *Pleurospermum (Hymenolæna) corydalifolium*, Aitchison et Hemsley, n. sp. Glaberrimum, caule cavo subsimplici, foliis radicalibus amplis longe petiolatis bipinnatisectis, segmentis secundi ordinis profunde palmatisectis, segmentis ultimis angustis acutis vel obtusiusculis, involucri sepiissime bibracteolato, umbella composita 3-7-radiata, bracteolis plurimis amplis integris quam pedicelli longioribus bracteisque albis, fructus immaturi jugis primariis alatis.

Herba erecta, 9 poll. usque ad bipedalis, omnino glaberrima, caule erecto cavo subsimplici tenuiter striato. *Folia* oblonga vel rhomboidea, bipinnatisecta, lamina usque ad 6-pollicari; segmenta secundi ordinis subrhomboidea, profunde palmatisecta; segmenta ultima angusta, acuta vel obtusiuscula; petiolus teres, basi tantum dilatatus, foliorum radicalium usque ad 8-pollicaris; vaginæ foliorum supremorum bracteæ et bracteolæ albæ. *Umbellæ* compositæ, 3-7-radiatæ, maximæ 2½ poll. diametro; radii usque ad sesquipollicares, striati; involucri bracteæ sepiissime 2, interdum 3, inæquales, oblongæ, integræ, 3-9 lineas longæ et usque 3 lineas latæ, adscendentes; umbellulæ multifloræ; pedicelli graciles, breves; bracteolæ pulchræ, præter costam viridam albæ et interdum roseo tinctæ (more *Astrantia*) ovato-ellipticæ, integræ, pedicellis longiores. *Flores* albi, majusculi; calycis dentes majusculi, acuti; petalæ equalia, orbicularia, apice inflexa; discus maximus, carnosus, margine undulatus; styli longiusculi, demum reflexi. *Fructus* immaturus ovato-oblongus, subteres, jugis primariis distincte alatis; valliculæ univittatæ ?

This species is nearest to *Hymenolæna Lindleyana*, Klotzsch in Reise Pr. Waldem., Bot. p. 150, t. 49; *Pleurospermum stellatum*, Benth., var. *Lindleyana*, C. B. Clarke in Fl. Brit. Ind. ii.

p. 705, but it is very different from it in foliage and the bracts of the involucre. The large white involucre makes this a most attractive plant. It is common from 9000 to 14,000 feet on shelving rocks and in dampish localities, Sīkarām, Shéndtoi; August.

743, 744. *Pleurospermum (Hymenolæna) pulchrum*, *Aitchison et Hemsley*, n. sp. Elatum, glaberrimum, caule solido sæpe ramoso, foliis mediocribus bipinnatisectis, segmentis ultimis pinnatifidis acutis, caulnorum vaginis bracteis numerosis bracteolisque albo vel roseo marginatis, umbellis umbellulisque multiradiatis, bracteis reflexis sæpissime trifidis, fructu ovato-oblongo a latere leviter compresso, jugis primariis alatis, valleculis univittatis, seminibus liberis sulcatis.

Herba erecta, 2-3-pedalis, omnino glaberrima, caule erecto sæpe ramoso solido pro genere gracili tenuiter albo vel purpureo-striato folioso. *Folia* fere æqualiter triangularia vel rhomboidea, subternatim bipinnatisecta, lamina 2-3 poll. longa et lata; segmenta secundaria rhomboidea, pinnatifida; segmenta ultima acuta; petiolus gracilis, basi tantum dilatatus, usque 4-pollicaris, sursum gradatim angustior; foliorum caulnorum vaginæ bracteæ et bracteolæ albo vel roseo marginatæ. *Umbellæ* compositæ, multiradiatæ, maximæ 4 poll. diametro; radii usque ad 2½ poll. longi, tenuiter sulcati et furfaracei; bracteæ numerosæ, amplæ, 6-12 lineas longæ, reflexæ, sæpissime trifidæ; umbellulæ multifloræ; pedicelli graciles, breves; bracteolæ reflexæ, lanceolatæ, acutæ, interdum trifidæ, pedicellis paullo longiores. *Flores* albi vel roseo tincti, majusculi; calycis dentes minuti, acuti; petala æqualia, suborbicularia, apice inflexa; discus maximus, carnosus, margine undulatus; styli longiusculi, demum reflexi. *Fructus* ovato-oblongus, ad 3 lineas longus, a latere leviter compressus, rugosus, jugis primariis distincte alatis; valleculæ univittatæ, vittis tenuissimis; semina undique libera, facie interiore sulcata.

A very distinct species, especially in its tall stature and slender habit. Not common under rocks at from 8000 to 12,000 feet; July and August.

834. *Ferula Jaeschkeana*, *Vatke*.

This plant may be said to cover the ground in the thin forests on the road between Drékalla and Káratigab, yet with rare exception did I find it in fruit, owing to my being too late in the season. These forests should be visited in June. It is common enough on all the hills to the north of the Hariáb district, at 10,000 to 11,000 feet.

848, 930, 738, 948. *Peucedanum* sp., = *Griffith*, 1108.

Common on stony ground at from 9000 to 12,000 feet, Kaiwás, Drékalla, and Sīkarām; August.

760. *Heracleum* sp. near *H. candicans*, *Wall*.

Near water, sides of fields, common at 7000 feet; July.

880, 906. *Daucus Carota*, L.

Specimens from cultivation. Cultivated as a field crop in the Hariáb district up to 9000 feet; the produce, however, is poor. No 906 is undoubtedly the wild state, as this plant was collected by me occasionally throughout the hills and fields from 7000 to 9000 feet. July and August.

679, 907. *Caucalis Anthriscus*, Scop.

Fields, very common, Shálizán; June to August.

226, 505. *C. latifolia*, L.

Very common in the Hariáb district, June to August; Kuram, April.

34. ARALIACEÆ.

164. *Hedera Helix*, L.

Very common in the moist woods, but chiefly trailing on the ground, scarcely ever climbing trees; not noticed in the Hariáb district. Fruit yellow or reddish.

GAMOPETALÆ.

35. CAPRIFOLIACEÆ.

230, 290. *Viburnum cotinifolium*, Don.

A very common shrub from 7000 to 9000 feet in the Kuram district; not uncommon on the outer edge of forests in the Hariáb district; May and June.

341. *Abelia triflora*, R. Br., var. *parvifolia*.

A very common dense shrub from 7000 to 10,000 feet, Kuram district; June to July. Not in Hariáb.

731, 466. *Lonicera alpigena*, L.

A large shrub, from 10,000 to 11,000 feet alt.; not uncommon in Kaiwás and Shéndtoi; July.

830. *L. glauca*, Hook. f. & Thoms.

At Serátigah, 13,000 feet, where it grows in fissures of rocks, which renders it very difficult to get good specimens. Flowers lemon-yellow.

535. *L. Griffithii*, Hook. f. & Thoms.

A magnificent climber, with very handsome rose-coloured flowers; common from the base of Péwárkotal, alt. 7000 feet, to Alikhél and Káratigah; July and August.

494. *Lonicera microphylla*, Willd.

West base of Sikarám, from 10,000 to 12,000 feet. Flowers whitish yellow, fruit bright red; June to August.

393. *L. Myrtillus*, Hook. f. & Thoms.

From 9000 to 14,000 feet, in Shéndtoi and Sikarám. Flowers waxy white, fruit orange-red.

1221. *L. obovata*, Royle.

A woody close-growing shrub, Sikarám, at 10,000 to 12,000 feet. Fruit deep purple.

739. *L. orientalis*, Lamk.

At 12,000 feet on hills north of Kaiwás; July.

509, 162, 550. *L. quinquelocularis*, Hardw.

A large shrub, almost a tree in some places. Very common from 7000 to 9000 feet, forming much of the low scrub on northern exposures and in shaded localities. It sheds the external layers of its bark in long fibrous strips resembling coarse hemp-fibre; this is collected and employed as rope, but has little or no strength. Only suitable for stuffing mattresses and such purposes. Flowers largish, yellow; April to June. Kuram and occasional in the Hariáb district.

1222. *L. sericea*, Royle. (*L. purpurascens*, Jacq.)

Shéndtoi, at 10,000 feet; August.

36. RUBIACEÆ.

552. *Callipeltis Cucullaria*, Stev.

Alikhél, profuse under shrubs and stony ground; June.

628, 256. *Rubia cordifolia*, L.

A very common weed in hedges all over the country, always in damp localities, from Kuram to Alikhél; May and June.

629, 351, 563. *R. Kotschyi*, Boiss.

In similar localities to the former and as common. The roots are employed in colouring hard boiled eggs for religious feasts;

156, 37. *Galium Aparine*, L.

Hábíbkalla; April.

0. *G. tricornis*, L.

Shálizán; June.

797. *G. asperifolium*, Wall.

Shéndtoi, at 10,000 feet; July and August.

401. *Asperula odorata*, L.

Very common at 9000 feet from Shéndtoi and Kaiwás; May and July.

467, 366. *A. Cynanchica*, L.

Hanging in great bunches from the damp rocks in Shéndtoi gorge; also common near Kaiwás, 7000 to nearly 9000 feet.

618. *A. pycnantha*, Boiss.

A large climber, Shéndtoi; June.

631. *A.* sp.

Shálizán, in woods; June.

517. *Crucianella glomerata*, Bieb.

Profusely covers the dry stony soil on exposed ridges, Bíánkhél.

37. VALERIANÆ.

829. *Valeriana dioica*, L.

Serátigah, at 13,000 feet, not common; July.

380. *V. Wallichiana*, DC.

Profuse, Shéndtoi, at 9,000 feet. Its large rootstocks are collected for their scent and exported. Also Kaiwás; July.

192. *V.* sp., = *Griffith*, no. 759.

Common under bushes at Alikhél in April.

956. *V. petrophila*, Bunge.

Síkarám, at 14,000, on shady rocks; August.

98. *V.* sp.

Alikhél, amongst shrubs; April.

219, 59. *Valerianella*, sp., = *Stocks*, 891.

Very common on dry stony soil, Kuram district, to 6000 feet.

38. DIPSACACEÆ.

420. *Morina persica*, L.

Very common up to 9000 feet, on exposed bare pieces of hill-side. Flowers rose-pink. My specimens unite *M. Wallichiana*, Royle, with *M. Persica*, L.

746. *M. Coulteriana*, Royle.

At and above 11,000 to 13,000 feet this yellow-flowered species quite replaces *M. Persica*, which grows at a lower altitude, and never ascends fairly up to the region of this plant.

658. *Cephalaria syriaca*, Schrad.

Shálizán; June.

642, 641. *Cephalaria* sp.

Shálizán; June.

551. *Scabiosa Olivierii*, *Coult.*

Common in dry stony localities from Kuram to Alikhél; May and June.

707. *S.* sp.

Kaiwás; July.

82. *S.* sp.

Extremely profuse everywhere, from Kuram all over the dry country to Alikhél and Káratígah; May and June.

883. *S. (Pterocephalus) afghanica*, *Aitchison et Hemsley*, n. sp., =761 and 856, *Griffith.* Suffruticosa, caespitosa, nana, ramis brevissimis, foliis viride puberulis spathulatis et integerrimis vel lyrato-pinnatifidis, capitulis breviter pedunculatis vel sessilibus sæpe 18-25-floris, involucello truncato, calycis aristis 17-18.

Suffrutex densissime caespitosus, 1-3 poll. altus, ramis procumbentibus crassis. *Folia* conferta, sessilia, spathulata, integerrima vel anguste lyrato-pinnatifida, 6-15 lineas longa, minute puberula, viridia. Capitula solitaria, terminalia vel pseudo-terminalia, sæpe 18-12-flora, sessilia, vel pedunculo usque ad pollicari; involucri bractæ 9-11, pubescentes, lanceolatae, biseriatæ, floribus breviores. *Flores* lilacini, exteriores bilabiati, interiores tubulosi, 5-dentati; receptaculum pilosum; involucellum sericeo-hirsutum, truncatum; calycis aristæ 17-18, plumosæ, corollæ fere æquilongæ; corollæ extus hirsuta.

Allied to *Pterocephalus Parnassi*, Spreng., and *P. Pinardi*, Boiss., from both of which it is readily distinguished by its almost glabrous foliage and other characters. Very local, but gregarious in great patches. Biánkhél, Sergal, west base of Síkarám, alt. 9000 feet. Has a very large purple handsome inflorescence for a small stunted woody-rooted plant.

39. COMPOSITÆ.

1237. *Solidago Virga-aurea*, *L.*

Shéndtoi, 8000 to 9000 feet, common; July.

994. *Myriactis Wallichii*, *Less.*

Profuse at 8000 to 10,000 feet; Shéndtoi; August.

244. *Aster altaicus*, *Willd.*

One of the most common plants in the dry country from Thal to Alikhél, all through the summer and late into winter; November 1878. The flowers vary greatly in size.

812. *Aster Amellus*, L.

A very handsome plant, hanging from clefts of rocks, from 7000 to 8000 feet.

951. *A. Heterochæta*, Benth.

Common on rock débris from 13,000 to 14,000 feet, on ridges of Sîkarám. Flowers a fine purple, large; August.

901. *A. roseus*, Stev. ?

Shálizán, near water; July.

963. *Erigeron acris*, L., var. *alpina*, Lamk.

Profuse on rocks at 10,000 feet (above 67th Regiment encampments) at the foot of Sîkarám.

496. *E. andryaloides*, C. B. Clarke.

Base of Sîkarám, common in pine-forests at 10,000 to 11,000 feet; June.

292. *E. monticola*, Wall.

Shálizán, in fields; May.

784. *E. multiradiatus*, Benth.

In dry beds of streams, amongst stones, at 9000 to 10,000 feet; August.

1236. *Brachyactis robusta*, Benth.

Common in moist places at 8000 to 9000 feet, Shéndtoi; August.

920. *B. pubescens*, Aitch. & Clarke (*Conyza pubescens*, DC.).

On stony ground, Péwárkotal, and ascending Sîkarám; August.

4. *Blumea Wightiana*, DC.

A common herb near water, on moist clay-banks; odour menthoid.

1224. *Filago arvensis*, L.

Bíánkhél; August.

778. *Leontopodium alpinum*, Cass.

Common on exposed hill-sides, from 10,000 to 14,000 feet.

914. *Anaphalis tenella*, DC.

Sîkarám, at and above 11,000 feet.

1225. *A. virgata*, Thoms.

Common from 9000 to 13,000 feet, Shéndtoi, Kaiwás, and Sîkarám; August.

1223. *A. sp.* near *A. Falconeri*, C. B. Clarke.

Large pink-flowered species, common with the last.

801. *A. sp.*

Shéndtoi; July.

564. *Phagnalon acuminatum*, Boiss.
At Alikhél; June.
- 229, 298. *P. denticulatum*, Dene.
At Shálizán, amongst stones; April and May.
266. *Gnaphalium crispatum*, Delile.
Kuram; April.
- 200, 253, 283, 567. *G. luteo-album*, L., var. (*G. confusum*, DC.)
Common from Kuram to Alikhél, usually on wet rocks; May and June.
976. *Inula Caspia*, Blume.
Alikhél, profuse; August.
942. *I. rhizocephaloides*, C. B. Clarke.
At spring-heads, appearing amongst grass; common from 8500 to 11,000 feet; August.
987. *Carpesium cernuum*, L., var. *pubescens* (sp., Wall.).
In orchards, Shálizán; August.
268. *Xanthium Strumarium*, L.
Profuse in fields in the Hariáb district; August.
1228. *Siegesbeckia orientalis*, L.
A common field-weed at Shálizán; August.
7. *Eclipta alba*, Hassk.
Near water, Mandúrí; April.
- 660, 982. *Bidens pilosa*, L.
Shálizán, on open stony ground; June.
972. *B. tripartita*, L.
In fields between Alikhél and Drékalla.
- 60, 245. *Achillea leptophylla*, Bieb.
Profuse on occasionally inundated clay soils, Sadatkalla and Kuram; April.
675. *Chrysanthemum Parthenium*, Benth.
Near Shálizán; June and July.
479. *Matricaria disciformis*, DC.
A profuse weed in fields all over the Hariáb district; June.
593. *M. suaveolens*, L.
In fields at Karchátal; June.
572. *Tanacetum millefoliatum*, Fisch. & Mey.
Very local in the Hariáb district; June and July.
820. *T.* sp. = *Griffith*, no. 941.
A very woody shrub from 10,000 to nearly 13,000 feet, Serátigah, Sergal, and SÍkarám.

865. *Artemisia Absinthium*, *L.*

Extremely common from Kuram and Shálizán to Alikhél; July.

1231. *A. parviflora*, *Roeb.*

Common in the plain country from Kuram to Habíbkalla; July.

1232. *A. persica*, *Boiss.*

Sergal, from 10,000 to 11,000 feet; August.

872. *A. scoparia*, *Wald. & Kit.*

Profuse shrub, 8000 to 9000 feet, Hariáb district.

984. *A. Tournefortiana*, *Reich.*

Grows to the height of nearly 7 feet. Common in the fields of the Hariáb district and occasional about Shálizán; does not flower until September.

173. *Tussilago Farfara*, *L.*

Common in the Hariáb district; April to July.

996, 773. *Senecio chrysanthemoides*, *DC.*

Shéndtoi, from 8000 to 10,000 feet, amongst grass in open spots. Very local, and giving distinct coloured patches to the hill-sides; July and August.

546. *S. coronopifolius*, *Desf.*

Alikhél; June.

1230. *S. pallens*, *Wall.*, var. *violacea*.

Not uncommon at 8000 to 9000 feet, from Kaiwás to Shálizán.

1229. *S. sisymbriiformis*, *DC.*

Amongst stones in water near Sergal, not common; August.

833. *Ligularia persica*, *Boiss.*

Káratígah at 9000 feet. Spike of inflorescence very handsome.

77. *Othonnopsis intermedia*, *Boiss.*

The characteristic shrub of the Kuram plains and dry water-courses. It has vertical leaves, and the flowers are produced all the summer.

522. *Atractylis cuneata*, *Boiss.*

Profuse, in the Hariáb district only, at 7000 to 9000 feet; flowers in August.

683. *Arctium Lappa*, *Willd.*

A weed in orchards at Shálizán; June.

1233. *Cousinia microcarpa*, *Boiss.* ? = *Griffith*, no. 3269.

At Drékalla; August.

837. *Cousinia minuta*, Boiss.

Drékalla; July.

1226. *C. multiloba*, DC.=Griffith, nos. 3327 & 3326.

At Biánkhél, common to 9000 feet.

1234. *C. sp.* (probably the same as 1226).

850. *C. racemosa*, Boiss.

The most common *Cousinia* at 8000 to 11,000 feet, from Kuram along the dry country and on the Mergs at the Kotal.

923. *C. sp.*

Common from 9000 to 11,000 feet, Síkarám. A species between *C. multiloba*, DC., and my 921.

921. *C. sp.* :

This is an extremely woolly form. Síkarám, from 10,000 to 14,000 feet, on stony ground.

922. *C. sp.*

Síkarám, 11,000 to 13,000 feet. The leaves on drying become quite yellow, as if a dye had become matured in the process of drying.

971. *C. sp.*, near *C. heterolepidis*, C. Koch.

On fields near Alikhél; August.

362. *C. sp.* near *C. microcarpa*, Boiss.=Griffith, 3271.

A dry hot-country form from Kuram to Shálizán and Habí-kalla, amongst stones.

221, 301, 706. *Carduus acanthoides*, L.

Common everywhere in fields from 5000 to 9000 feet.

751, 877. *Cnicus argyranthus*, DC.

Kaiwás and Shálizán to Shéndtoi. It is a moist-country plant, also met with in great luxuriance in the Murree Himalaya.

698. *C. arvensis*, Hoffm.

A common field-weed in the Hariáb district, and occasional round Shálizán; June.

970. *C. horridus*, Bieb.

Amongst débris at Drékalla, at 8500 feet, growing to 5 feet in height.

871. *Onopordon Acanthium*, L.

Hariáb district only. A large plant surrounding village filth-pits.

319, 888, 913. *Saussurea hypoleuca*, Spreng.

One of the few plants to be found growing freely under pine-

trees. Hariáb district and occasional near Shálizán; July and August.

29, 470. *Centaurea Calcitrapa*, L.

Common from Rohat to Shálizán, and I think in the Hariáb district; April to June.

160, 836. *C. depressa*, Bieb.

In corn-fields, from Kuram to Káratigah; April to July.

633. *C. Picris*, Pall.

In fields both at Sergal (8500 feet) and Shálizán, common; August.

1227. *C. virgata*, Lamk.

Between Zabardastkalla and Drékalla.

1235. *Carthamus oxyacantha*, Bieb.

Péwárkotal; August.

399. *Ainsliæ aptera*, DC.

In damp forests from 8000 to 9000 feet; Shéndtoi.

721, 392. *Pertya Aitchisoni*, C. B. Clarke, n. sp. Foliis integris glabris, capitulis in ramis lateralibus abbreviatis sessilibus quasi racemum simplicem terminalem densiusculum efformantibus, phyllariis obtusis albide lanatis, achenio glabro glandulis stipitatis minutissime insperso, pappo albo.

Frutex. Folia alterna, sub capitulis aggregata. Pappus fructus tempore albus. Quoad cætera cum *P. scandente*, Schultz-Bip. in Bonplandia, 1862, t. 10, congruens.

Differunt:—

(α) *P. scandens*, Schultz-Bip. l. c., foliis lanceolatis denticulatis, capitulis in ramis brevibus divaricatis solitariis terminalibus 5-floris, phyllariis acutis fere glabris, achenio piloso, pappo proventu roseo-rufescente.

(β) *P. ovata*, Maxim. Mém. Biol. viii. 8, foliis ovatis denticulatis, capitulis in ramis elongatis solitariis terminalibus 15-floris, phyllariis acutis fere glabris, achenio sericeo, pappo proventu rufescente. Franch. et Savat. Enum. Pl. Jap. i. 265 errant; folia enim in his 3 speciebus alterna sunt.—C. B. CLARKE.

A common shrub from 3 to 4 feet in height, with willow-like leaves and long slender branches. Common at 9000 to 11,000 feet, forming the undergrowth on the margins of forests. Also hanging from shady rocks, Kaiwás and Shéndtoi; July and August. This genus was previously only known from Japan.

324, 616. *Cichorium Intybus*, L.

Kuram and Shálizán, common, not Hariáb district; May and June.

518. *Koelpinia linearis*, *Pall.*

Profuse on hot exposed gravel soil near Bíánkhél.

805. *Picris hieracioides*, *L.*

A profuse field-weed at Katskallé, 7000 feet; July.

945. *Crepis Kotschyana*, *Boiss.*

On the Sergal stream at the base of Síkarám, alt. 8500 feet; August.

839, 859. *C.* sp. near *Youngia glauca* (Edgw.).

Very common from Alikhél to Drékalla; July.

312. *C.* sp.

Shálízan; June.

562. *C.* sp.

Alikhél; June.

79, 32. *Taraxacum Dens-leonis*, *Desf.*

Common from Badishkhél to Habíbkalla.

966. *T. montanum*, *C. A. Mey.*

At Sergal and between Rokian and Drékalla, very local. An extremely woolly plant; the leaves appear first, dying as the plant flowers and fruits; August.

450. *T. parvulum*, *Wall.?*

In all pine-forests in the Hariáb district, common at 8500 feet.

997. *Prenanthes* sp. near *P. levigata*, *Wall.*

From 9000 to 11,500 feet, in damp woods at Shéndtoi. Flowers a lovely purple.

717. *Lactuca auriculata*, *DC.*

A profuse weed on the margins of fields at Shálízán &c.; flowers late in August.

$\frac{997}{1}$. *L.* sp.

1225. *L. orientalis*, *Boiss.*

Very common sticky plant on stony ground in Hariáb district.

999. *L. rapunculoides*, *C. B. Clarke.*

Common.

884. *L. viminea*, *Link.*

Very profuse in the Hariáb district along with *L. orientalis*; both are very characteristic plants; July.

329. *L.* sp. near *L. polycephala*, *C. B. Clarke.*

At Shálízán, on hot dry stony places, common; May.

35, 303. *Sonchus arvensis*, L.

Common up to 9000 feet, from Badishkhél.

306, 673, 704. *S. asper*, L.

Common in the vicinity of Shálizán and Kuram.

589. *Microrhynchus asplenifolius*, DC.

Profuse on rocks, Karchátal; June.

672. *M. secundus*, Royle.

Not common, Shálizán; June.

83, 178. *Tragopogon junceum*, Wall.

Common under pine-trees, Habíbka, Serátigah, Síkarám up to nearly 14,000 feet, and Kuram; April to August.

84, 112, 123, 187. *Scorzonera mollis*, Bieb.

From Kuram up to 12,000 feet on Síkarám, also profuse on the Kuram plains, where it has a large tuberous root. April.

504. *Composita*, sp.

Radical leaves only. Síkarám; June.

40. CAMPANULACEÆ.

784. *Odonopsis ovata*, Benth.

Spring-heads in moist meadow-ground at the base of Síkarám and near Kaiwás, altitude 10,000 feet, common; July and August.

297, 669. *Campanula colorata*, Wall. = Griffith, no. 694.

Common near Shálizán and Habíbka on dry walls and stones; May and June.

530. *C. Griffithii*, Hook. f. & Thoms.

Common, Hariáb to Drékalla. A small stiff erect plant on open ground in stony soil; June and July.

0. *C. evolvulacea*, Royle.

Karchátal; June.

$\frac{941}{A}$. *C.* sp.

Síkarám, from 11,000 to 12,000 feet; August.

541. *C.* sp.

Alíkhél, characteristic of clefts of rocks with *Dionysia* &c.; June.

941. *C.* sp.

Common from Shéndtoi to Sergal and Síkarám; July and August.

41. ERICACEÆ.

457. *Rhododendron afghanicum*, *Aitchison et Hemsley*, n. sp. Humilis, foliis mediocribus subtus lepidotis, pedunculis longiusculis 10-15 aggregatis, calyce inæqualiter 5-partito, segmentis brevibus rotundatis, corolla campanulata omnino glaberrima, lobis tubum æquantibus; staminibus 10 exsertis; ovario 5-loculare, stylo a basi abrupte curvo quam stamina paullo breviora.

Frutex venenatus, humilis, supra rupes repens et radicans, ramis junioribus minutissime lepidotis. *Folia* petiolata, coriacea, sempervirentia, lanceolato-oblonga, $1\frac{1}{2}$ - $2\frac{1}{2}$ -pollicaria, obtusa, supra glabra, subtus lepidota, lepidibus orbicularibus peltatis. *Flores* albo-virides, racemoso-corymbosi, longiuscule pedunculati, corymbis 10-15-floris ante anthesin bracteatibus; bracteæ pluriseriatæ, rotundatæ, mucronatæ, ciliolatæ, exteriores haud minores; calyx 5-partitus, lepidotus, segmentis inæqualibus rotundatis; corolla campanulata, 5-6 lineas longa et lata, omnino glaberrima, lobis tubum æquantibus; stamina 10, exserta, filamentis filiformibus, infra medium longiuscule barbatis; ovarium 5-loculare, stylo a basi abrupte curvo, quam stamina paullo breviora. *Capsula* lepidota, ovato-oblonga, circiter 4 lineas longa.

In its principal features this is allied to *R. lepidotum*, from which it essentially differs in its inflorescence as well as in the details of less prominent characters. Abundant from 7000 to 9000 feet at Shéndtoi and Kaiwás; June and July. A poisonous shrub, with campanulate corolla and long bent style.

344. *R. Collettianum*, *Aitchison et Hemsley*, n. sp. Fruticosum, pluripedale, foliis mediocribus subtus furfuraceo-lepidotis, pedunculis brevibus sæpissime 8-12 aggregatis, calyce inæqualiter 5-partito, segmentis late oblongis ciliatis, corolla hypocraterimorpha, tubo recto intus omnino piloso; staminibus 10 inclusis; ovario 5-loculare, stylo brevissimo.

Frutex graveolens, innocuus, 4-7-pedalis, ramis junioribus fulvis furfuraceo-lepidotis. *Folia* petiolata, coriacea, sempervirentia, lanceolato-oblonga, sæpe 2-3-pollicaria (specimen Griffithianum paullo longiora), obtusiuscula, supra primum parce lepidota sed cito nuda et nitida, subtus fulva, furfuraceo-lepidota. *Flores* albi, roseo tincti, corymbosi, breviter pedunculati, corymbis sæpissime 8-12-floris ante anthesin bracteatibus; bracteæ pauciseriatæ, lepidotæ, ciliatæ, rotundatæ, mucronatæ, exteriores minores; calyx 5-partitus, furfuraceo-lepidotus, segmentis inæqualibus oblongis longe ciliatis; corolla hypocraterimorpha, usque ad 10 lineas longa, extus glaberrima, lobis rotundatis, tubo recto quam lobi duplo longiore, intus omnino piloso; stamina 10, tubo inclusa, filamentis leviter barbatis deorsum incrassatis; ovarium 5-loculare, stylo brevissimo, stigmatibus maximo capitato. *Capsula* furfuraceo-lepidota, oblonga, circiter 3 lineas longa, calyce persistenti vestita.

In most of its characters this species closely approaches *R. Anthopogon*, from which, however, it differs in its larger stature, larger straight flowers, ten stamens, and in the tube of the corolla being hairy all over the inside. From 10,000 to nearly 13,000 feet at Shéndtoi to ridges of Sîkarám, commencing at near the limit of trees, and, mixed with masses of juniper, forming thicket. Has a long salver-shaped corolla and a short style.

42. MONOTROPEÆ.

912. *Hypopithys lanuginosa*, Nutt.

Growing under, and probably parasitical upon, the roots of *Abies Smithiana* at Péwârkotal, altitude 8500 feet; August.

43. PLUMBAGINEÆ.

813. *Acantholimon* (§ *Staticopsis*) *Munroanum*, *Aitchison et Hemsley*, n. sp. Foliis brevibus demum patentibus subulatis, scapis quam folia nunc brevioribus nunc paullo longioribus monostachyis, spicis densis, spiculis 2-7 unifloris tribracteatis, bracteis exterioribus ovato-orbicularibus semicupularis margine latiuscule scarioso-hyalinis, bracteis interioribus oblongo-ellipticis calyce triente brevioribus.

Suffrutex cæspitosus, usque ad pedalis, ramis elongatis. *Folia* rigida, demum patentia, subulato-acerosa, 6-9 lineas longa, margine minutissime scaberula. *Flores* congesti spicati; scapus nunc foliis brevior paullo longior; spicæ breves; spiculæ 2-7, unifloræ, tribracteatae; bractæ exteriores, præter margo latiuscule scarioso-hyalina coriaceæ, ovato-orbiculares, semicupulares, mucronatæ; bractæ interiores oblongo-ellipticæ, præter costam scarioso-hyalinæ, calyce tertio parte breviores; calyx infundibuliformis, tubo extus hirsuto sulcato, limbo albo atro-costato, costis haud excurrentibus; ovarium glabrum.

Allied to *A. libanoticum*, Boiss., *A. Echinus*, L., &c. Serátígah, forming immense consolidated hummocks; 10,000 to 13,000 feet, July.

0. *A.* (§ *Tragacanthina*, *Bunge*) *leptostachyum*, *Aitchison et Hemsley*, n. sp. Foliis æstivalibus longiusculis adscendentibus gracilibus semiteretibus acerosis. Scapus gracili pleiostachyus, spicis laxiusculis, spiculis 1-6 sæpissime 1-floris, bracteis similis glumaceis elongatis mucronatis præter costam crassam scarioso-hyalinis quam calyx paullo brevioribus.

Suffrutex usque ad 3-pedalis, dense ramosus, ramis graciliusculis rectis elongatis. *Folia* heteromorpha, vernalia carnosula, brevia, lata, recurva, persistentia, æstivalia gracilia, semiteretia, acerosa, 1-1½ poll. longa, adscendentia, obsolete puberula. *Flores* parvi, interrupte spicati; scapi 2-4-pollicares, graciles; spiculæ 1-6, sæpissime (an semper?) 1-floræ; bractæ similes oblongo-ellipticæ, mucronatæ, præter costa crassa sca-

rioso-hyalinæ, calyce paullo breviores; calyx anguste infundibuliformis, glaber, limbus albus purpureo-costatus, costis haud excurrentibus; ovarium glabrum.

Drékalla; July.

Acantholimon (§ *Armeriopsis*, Boiss.) *calocephalum*, *Aitchison et Hemsley*, n. sp. Foliis brevibus patentibus crassis plano-triquetris acerosis, scapis quam folia brevioribus, spicis densissimis unilateraliter evolutis, spiculis usque 12 sæpissime trifloris, bracteis exterioribus maximis orbicularibus concavis margine tantum hyalinis, bracteis interioribus late obovato-ellipticis quam calyx paullo brevioribus.

Suffrutex cæspitosus, pedalis et ultra, ramis crassiusculis dense foliosis. *Folia* crassa, coriacea vel fere lignosa, linearia, acerosa, usque ad 9 lineas longa, plano-triquetra, minute albido punctata (puncta lacrymæ calcis?) margine minutissime scaberula, patentia, scapo longiora. *Flores* congesti, capitato-spicati; spicæ densissimæ, unilateraliter evolutæ, usque pollicares; spiculæ usque ad 12, distichæ, 2-5-floræ, sed sæpissime 3-floræ; bracteæ exteriores coriaceæ, amplæ, orbiculares, concavæ, mucronatæ, purpureo vel roseo zonatæ, margine anguste hyalino-membranaceæ; bracteæ interiores fere omnino hyalinæ, roseo vel purpureo tinctæ, obovato-ellipticæ, calyce paullo breviores; calyx infundibuliformis, omnino glaber, atro-purpureo costatus, costis haud excurrentibus; ovarium puberulum.

Near *A. bracteatum*, Boiss., but differing in its very shortly pedunculate spikes and quite coriaceous coloured outer bracts. Síkarám, forming immense hummocks, 11,000 to 13,000 feet.

44. PRIMULACEÆ.

130, 521. *Primula denticulata*, Sm.

Bíánkhél; April.

352. *P. denticulata*, Sm. var.

Sháлизán; May.

462. *P. rosea*, Royle.

Shéndtoi ravine, at 9000 to 10,000 feet, very local.

960. *P. purpurea*, Royle = *Griffith*, no. 699.

Profuse from 11,000 to 15,000 feet on all the higher hills, Síkarám.

169. *Androsace incisa*, Wall.

At 7000 to 8000 feet from Sháлизán to Habíbkalla, not uncommon.

925. *A.* sp.

At 13,000 feet on Síkarám; a very minute woolly plant.

323. *Androsace* sp.

Very common through the woods from Shálizán up to 9000 feet, and occasional in the Hariáb district.

131, 132, 874. *Dionysia tapetodes*, Bunge.

Profuse everywhere on shaded rocks from the Shéndtoi at 7000 feet to Káratígah. Very characteristic as a rock-plant. In flower April to June, according to elevation and exposure.

725. *Cortusa Matthioli*, L.

In shaded localities whether by trees or stones, the plant varying much in size. From 9000 feet in the Shéndtoi ravine, Kaiwás, and on Síkarám up to nearly 12,000 feet, common.

642. *Lysimachia dubia*, Ait.

An abundant weed around fields at Shálizán; June.

604. *Glaux maritima*, L.

Common in low grass, damp ground at Bíánkhél; June.

318. *Anagallis arvensis*, L.

The red-flowered form, Shálizán, not a common weed; June.

45. EBENACEÆ.

150. *Diospyros Lotus*, L.

A large tree, extensively cultivated in the Kuram district for its fruit; not met with in a wild state. It does not occur in the Hariáb district.

46. OLEACEÆ.

626. *Jasminum officinale*, L.

Shálizán, in the small jungle within the hills at about 8000 feet, common; June. Not found in Hariáb.

289. *J. revolutum*, Sims.

In similar localities to the above; also not occurring in the Hariáb.

722. *Syringa Emodi*, Wall.

A common shrub from nearly 8000 to 9000 feet; never occurs as low down as *S. persica* so as to mix with it. The flowers are always pure or greenish white, never purple.

188, 356. *S. persica*, L.

A very common shrub on the low and outer hills near Shálizán up to nearly 7500 feet; never quite reaches the altitude of *S. Emodi*. I have never seen these species growing together.

O. Fraxinus Moorcroftiana, Wall.

From a stout woody bush to a good-sized tree. On the ascent to Péwarkotal and occasionally all over the Hariáb district to Drékalla and Káratígah.

258. Olea cuspidata, Wall.

A cultivated tree in the Kuram district wherever I have seen it. It does not occur in the Hariáb district. Between Badishkhél and Thal not common, except in groves, where there can be no doubt it has been cultivated. From Ibrahimzai and across by the inland road to the Darwazaghai pass it is common as a wild tree, but on the pass itself is found in cultivated groves only. The Afghans have a superstitious veneration for this tree.

47. ASCLEPIADEÆ.

582. Vincetoxicum sp.=No. 7, T. Thomson's collection.

About 8000 feet, at Biánkhél and Kaiwás, on open stony hot slopes; June, July.

44. Cynanchum humile, Falc.=No. 920, Stocks.

Shinnak, at about 3000 feet; April.

O. Periploca aphylla, Dene.

Common, but no specimens collected.

48. LOGANIACEÆ.

189. Buddleia crispa, Benth.

A large shrub, common on the sides of fields from near Badishkhél, through the whole Kuram valley, up to 7000 feet; not in the Hariáb district. Inflorescence very handsome.

49. GENTIANACEÆ.

354. Erythræa ramosissima, Pers., var. caspica, Fisch.

Very local. Shálizán, on sides of irrigation-channels in shade of rock; at Biánkhél. A very slender plant with white flowers; July and August.

697. E. Centaurium, L.

Shálizán; June.

881. Gentiana aquatica, L.?

Only one small specimen found, Biánkhél; July.

932, 1003. G. sp.=61 of Jaeschke's collection in Lahul.

Síkarám, at 12,000 feet, on dry soil in the shelter of creeping juniper; Shéndtoi, at 10,000 feet, profuse.

876. Swertia petiolata, Royle.

Common at Biánkhél and Sergal; July and August.

979. *Ophelia cordata*, *Don*.

Common at Shálizán and Shéndtoi; August.

977. *O. cordata*, *Don*, var.

Alikhél to Bíánkhél; August.

0. *O. Dalhousiana*, *Griseb*.

Shéndtoi, also in the vicinity of Shálizán along irrigation-streams, common; August.

50 BORAGINÆÆ.

662. *Heliotropium europæum*, *L*.

Shálizán, in dry stony soil; June.

11. *H.* sp.

A very large single-flowered species, Alizai; April.

864. *Trichodesma* sp.

A very handsome large blue-flowered species; Alikhél.

197, 117, 106. *Omphalodes* sp. = *Griffith*, no. 564.

Common from Habíbkalla to Alikhél; April and May.

900. *Cynoglossum furcatum*, *Wall*.

Habíbkalla; July.

579. *C. glochidiatum*, *Wall*.

Kuram to Kaiwás; April to July.

576. *Paracaryum anchusoides*, *Benth. & Hook. f.*

Hariáb district, common; July.

0. *P. glochidiatum*, *Benth. & Hook. f.*

Shéndtoi gorge at 10,000 feet; August.

0. *Echinosperrnum barbatum*, *Lehm.?*

At Zabardastkalla; June.

198. *E. Lappula*, *L.?*

Alikhél; June.

0. *Eritrichium sericeum*, *Royle*.

From 11,000 to 13,000 feet, on rocks, Síkarám, Kaiwás; July and August. A small plant with a very large turquoise-blue flower.

397. *Craniospermum parviflorum*, *Dcne*.

Very common at Kaiwás and Shéndtoi, from 9000 to 11,000 feet, in damp woods.

140. *Rochelia stellulata*, *Rehb*.

Shálizán, common amongst stones under bushes; April.

145, 217. *Asperugo procumbens*, L.

A common field-weed from Badishkhél to Habíbkalla; April.

507, 569, 858. *Anchusa Milleri*, Willd.

Hariáb district, Sergal and Biánkhél; June, July.]

483, 230. *Nonnea nigricans*, DC.

Hariáb district to Karátígah; June, July.

136. *Lithospermum arvense*, L.

Shálizán to Alikhél; May.

338. *L. officinale*, L.

Shálizán; May.

0. *L. officinale*, L., var. = *L. erythrorhizon*, Sieb. & Zucc.

Shálizán; May.

720. *Arnebia (Macrotomia) speciosa*, Aitchison et Hemsley, n. sp.

Perennis, tota planta hispido-pilosa, caulibus erectis usque ad bipedalibus simplicibus, foliis lineari-lanceolatis trinerviis, floribus densissime cymosis, cymis in racemum laxum elongatum dispositis, calycis segmentis primum corollam fere æquantibus fructiferis longe accrescentibus, nuculis maturis non visis.

Herba perennis, omnino longe hispido-pilosa (pili in vivis virides in siccis aurei), caulibus erectis simplicibus usque ad bipedalibus. *Folia* lineari-lanceolata; inferiora 6-10 poll. longa, 3-5 lineas lata; superiora gradatim breviora et basi rotundata, omnia prominente trinervata, obtusiuscula. *Flores* densissime cymosi, breviter pedicellati; cymæ 5-9-floræ, in racemum laxum distichum elongatum (6-12 poll.) dispositæ; calycis segmenta lineari-lanceolata, primum corollam fere æquantia, fructifera longe accrescentia usque sesquipollicaria; corolla hypocraterimorpha, 10-12 lineas longa, extus hirsuta, intus glabra, nuda, lobi breves rotundati. *Nuculæ* (maturæ) nobis ignotæ, abortu sæpe 1 vel 2, semiovatæ, dorso laminatæ, rugosæ.

Hills above Kaiwás, on exposed ridges from 9000 to 12,000 feet; July.

824, 498. *A. (Macrotomia) endochroma*, Hook. f. & Thoms.

On Sikarám and Serátígah, altitude 10,000 to 12,000 feet, on dry exposed soil. Employed as medicine by the natives.

28. *Onosma echioides*, Sm.

Shinnak; April.

45, 235. *O.* sp. = 997 *Stocks*, = 530 *Griffith*.

From Shinnak to Kuram; April.

51. CONVULVULACEÆ.

989. *Ipomæa (Pharbitis) Nil*, Roth.

Common round villages, and may be a garden escape, Shálizán; August.

40. *Calystegia* sp.

Bracts large, otherwise very like *Convolvulus arvensis*.

247, 299. *Convolvulus arvensis*, L.

A common weed of cultivation, Kuram and Shálizán.

348. *C. lineatus*, L. = *Griffith*, no. 676.

Common on stony ground from Kuram to Alikhél, growing very close against the ground.

15. *C.* sp. near *C. lanuginosus*, Desv., = nos. 408 & 72, Salt-range plants.

From Alizai to Habíbkalla, very characteristic over the open plains from 4000 to 6000 feet, in large raised very woolly patches, almost forming hummocks. (It is curious to notice that the white silky wool of this species, as also of others, and of *Buddleia crispa*, becomes a bronze-brown colour in the Herbarium.)

847. *C. pseudocantabrica*, Schrenck.

Common on the hills at Drékalla from 9000 to 10,000 feet; also Alikhél. The flowers in colour resemble those of *C. arvensis* exactly. July.

676. *Cuscuta Epithymum*, L. ?

On *Thymus Serpyllum*, L., at Shálizán; June.

654, 855. *C. planiflora*, Ten. ? = *Griffith*, no. 686.

From Shálizán to Káratigah, on *Perowskia atriplicifolia*, Bth.; June and July.

52. SOLANACEÆ.

861. *Solanum Dulcamara*, L.

Common in hedges at Zabardastkalla and Alikhél; July

0. *S. Melongena*, L.

Cultivated by the natives for the fruit, which is cooked as a vegetable.

314. *S. nigrum*, L.

Common from Kuram to Alikhél.

0. *S. tuberosum*, L.

The potato was not cultivated in the Kuram valley previous to 1879. It has been grown during the past year.

0. *Capsicum frutescens*, L.

Cultivated by the natives.

9. *Withania coagulans*, Dunal.

A very common shrub from Alizai to near Kuram.

766. *Atropa lutescens*, Jacq.

A large herbaceous perennial, very common in the Shéndtoi

ravine at 8000 feet, amongst shrubs and trees. The natives know it is poisonous.

624. *Datura Stramonium*, L.

Very common weed, villages from Thal to Shálizán; June. Known as poisonous.

481, 222. *Hyoscyamus niger*, L.

Very common in the Hariáb district in fields and villages, growing to 4 feet occasionally; June.

835. *H. pusillus*, L.

Common in the Hazárdarakht valley, Drékalla; July.

844. *H. reticulatus*, L.

At Drékalla, only one specimen; July.

988. *Nicotiana rustica*, L.

Cultivated at Shálizán. The only species found.

53. SCROPHULARINEÆ.

645, 440. *Verbascum erianthum*, Benth.

Very abundant on dry stony beds of mountain-streams, Kuram district, from 5000 to 7000 feet; June and July.

685. *V. Thapsus*, L.

Common everywhere up to 9000 feet in dry stony localities; June and July.

548. *Linaria venosa*, Lindl.

Alikhél, abundant in stony rocky soil; June and July.

264. *Scrophularia cabulica*, Benth.

From Badishkhl to Shálizán, not uncommon in clumps; April and May.

919. *S.* sp.

A dwarf species with extremely large flowers. Amongst rubble, at 12,000 to 14,000 feet, Sikarám; August.

461. *S.* sp. = *Griffith*, no. 618.

Common from Shéndtoi ravine to Péwárkotal and the Hariáb district; May and June.

811. *Wulfenia Amherstiana*, Benth.

Abundant on rocks in the Shéndtoi gorge and up the valleys of the Darban; July and August.

189. *Veronica agrestis*, L., var.

Habíbkalla.

0. *Veronica agrestis*, *L.*
Shálizán; May.
- 207, 213. *V. Anagallis*, *L.*
Kuram to Habíbkalla; April to June.
0. *V. bartsiaefolia*, *Boiss.*
Bíánkhél; June.
- 195, 664. *V. Beccabunga*, *L.*
Shálizán to Alikhél, abundant.
146. *V. biloba*, *L.*
Shálizán; April.
453. *V. biloba*, *L.*, var.
Péwárkotal; June.
202. *V. campylopoda*, *Boiss.*
Alikhél; May.
763. *V. sp.* near *V. Teucrium*, var. *minor*, *Trautv.*
A very handsome large blue-flowered species, hanging in bunches from rocks, from a woody rootstock; Shéndtoi and Darban; July and August.
975. *Leptorhabdos sp.* near *L. virgata*, *Benth.* = *Griffith*, no. 594.
Profuse under trees in Alikhél forests; August.
990. *Euphrasia officinalis*, *L.*
Shéndtoi, at 9000 feet; August.
0. *Pedicularis gracilis*, *Wall.*
Shéndtoi, common from 9000 to 10,000 feet; August.
769. *P. Hookeriana*, *Wall.*
Shéndtoi, wet marshy soil. Flowers cherry-coloured with splashes of white.
796. *P. pectinata*, *Wall.*
Shéndtoi; July.
735. *P. pectinata*, *Wall.*?
Hills near Kaiwás.
0. *P. tenuirostris*, *Benth.*
Shéndtoi; August.
779. *P. sp.* = no. 200 of Jaeschke's Lahul collection.
Shéndtoi, in meadows, 10,000 to 11,000 feet; July.
487. *P. sp.* = no. 504 H of J. L. Stewart's Hazara collection.
Base of Síkarám, Sergal, and Karchátal, in pine-forests on dry hill-sides, very common; June.

54. OROBANCHACEÆ.

287. *Phelipæa ægyptiaca*, Walp.

Under large trees in the Shálizán orchards, very common; May.

934. *Orobanche* sp.=4088 Distrib. Herb. Griffith.

Very common on two species of *Artemisia*, Hariáb district; June. The stems are eaten before the flowers expand, and are rather nice, crisp, and cool, with little or no flavour.

 $\frac{934}{A}$. *O.* sp. With 934.267, 893. *O.* sp.

At Bíánkhél on *Thymus Serpyllum*, common; July. Also at Shálizán in May.

55. ACANTHACEÆ.

908. *Strobilanthes alata*, Nees.

Very common at 7000 to 8000 feet in shaded moist localities, Shálizán, Darban, and Shéndtoi; July.

21. *Adhatoda Vasica*, Nees.

Shinnak to Badishkhél, a common shrub; April.

56. SELAGINEÆ.

94. *Gymnandra stolonifera*, Koch.

A small low herb that carpets the country in many localities with its lovely light-purple inflorescence (especially the "Mergs" on the Péwárkotal, but also the encampment at Alikhél), from Kuram to Alikhél; April and May.

57. VERBENACEÆ.

41. *Lantana* sp. very near *L. alba*, L., but flowers much smaller.

Shinnak; April.

639. *Verbena officinalis*, L.

Common everywhere from Thal to the Kuram district up to 7000 feet; April to July.

58. LABIATÆ.

806. *Plectranthus rugosus*, Wall.

A common shrub round the fields of Shálizán and towards Shéndtoi river; July.

620. *Mentha incana*, Willd.

Common in ditches from Badishkbél to Alikhél; June to August.

911, 686. *Origanum normale*, Don.

Meadow-land near moisture; common at Kaiwás and Shálizán; July.

72, 157. *Thymus Serpyllum*, L.

Everywhere on the plains of Kuram up to 9000 feet, Hariáb district; April and May.

840, 239. *Micromeria biflora*, Benth.

Very common from Thal to Alikhél; April to June.

713. *Calamintha Clinopodium*, Benth.

Shálizán, Kaiwás, and Katskallé; June and July.

$$\frac{713}{\Delta} \text{ C. sp.}$$
545. *C. debilis*, Bunge.

Alikhél; June. This is a species from the Altai collected by Ledebour.

644. *Perowskia atriplicifolia*, Benth.

An extremely common shrub from Kuram and the Hariáb district to Káratigab. When in flower it is very handsome; flowers usually lavender-coloured, but occasionally pure white.

594. *Salvia glutinosa*, L.

Spreads everywhere, and in greatest luxuriance in dry water-courses amongst large stones. Flowers orange-yellow. A very sticky plant. June to August.

20, 56, 180. *S. Moorcroftiana*, Wall.

From Thal to Habíbkalla; very common on exposed open plains up to 7000 feet; April and May.

36. *S. plebeia*, Br.

Shinnak, common; April.

474. *S. rhytidea*, Benth.

Common from Kuram to Alikhél, and remarkable for its handsome purple flowers, often with a good deal of white.

480, 260. *Ziziphora clinopodioides*, L.

From Habíbkalla to Alikhél, very common. A very handsome plant, and extremely strongly scented with peppermint.

407. *Z. tenuior*, L.

A minute abundant annual, very sweetly scented; grows in the shade of other bushes; Hariáb district.

1201. *Nepeta* sp.

Serátígah from 10,000 to 11,000 feet; shrubby; July.

715, 768. *N.* sp.

Shálizán and Shéndtoi, very tall; July.

933. *N.* sp. = *Griffith*, no. 514.

Péwárkotal; August.

612. *N.* sp. = variety of 933.

Péwárkotal, in woods; June.

447. *N.* sp. near *N. teucriifolia*, *Willd.*

Hariáb district to Káratígah. A very handsome plant with large lavender flowers. Péwárkotal, edge of pine-forests, very common; May.

634. *N.* sp. = *Griffith*, no. 4060, *Kew distrib.*

Kaiwás and Shálizán; July.

0. *N. calaminthioides*, *Benth.*

A profuse field-weed near Shálizán; June.

0. *N. discolor*, *Royle.*

Síkarám, at 14,000 feet, abundant.

55, 588. *N. raphanorhiza*, *Benth.*

Amongst bushes in pine-forests, from Badishkhél to Alikhél, very common, and eaten by the natives. The bark of the root has the flavour of turnip, but the heart tastes like nice crisp filberts.

841. *N. rugosa*, *Benth.*

At Drékalla; July.

917. *N.* sp. near *N. rotundifolia*, *Benth.*

Amongst débris from 12,000 to 14,000 feet, Síkarám; August.

667, 625. *N.* sp.

Shálizán; June.

573. *Dracocephalum* sp. near *D. origanoides*, *Steph.*, and *pinnatum*, *L.*

Biánkhél, Síkarám, and Serátígah from 9000 to 12,000 feet; June to August.

529, 260. *Lallemantia Royleana*, *Benth.*

From Kuram to Alikhél; April to June.

273. *Scutellaria linearis*, *Benth.*

From Thal to Kuram and Shálizán; May and June.

201. *S.* sp.

From Habíbkalla to Péwárkotal and Alikhél; May.

537. *S.* sp.

Very common at Alikhél in stony exposed soil amongst scrub.

617. *Brunella vulgaris*, L.

Along water-channels and moist localities. Common from Kuram to Shálizán.

346. *Marrubium vulgare*, L.

From Hazárpírziárat to Alikhél, occasional.

695. *Stachys floccosa*, Benth.

Near Shálizán; June and July.

275. *S. parviflora*, Benth.

Excessively common from Thal to Kuram, and characteristic of the Kuram plains; May.

817. *S.* sp.

Near Serátigah; July.

623. *Leonurus Cardiaca*, L.

Common near Shálizán; June.

212. *Lamium amplexicaule*, L.

Very common in most places; Kuram district up to 7000 feet.

831. *L. rhomboideum*, Benth.

The foliage of this is very handsome, as are the fine large flowers. It grows in stony débris from 4 to 6 inches in height, and is remarkable for its velvet-like woolly leaves, varying in colour. Altitude from 13,000 to 15,000 feet, Serátigah and Síkarám.

777. *Phlomis bracteosa*, Royle.

Shéndtoi at 8000 feet, amongst shrubs; the only locality; July.

565. *P. cashmeriana*, Royle.

One of the most common and characteristic plants of the low scrub of the Hariáb district, and not uncommon in plains of Kuram district; flowers large, rose-coloured; June and July.

708, 749. *P. spectabilis*, Falc.

On the edge of forest, Péwárkotal, and not uncommon in other places in the Kuram district at an altitude of 7000 to 8000 feet; July.

16. *Eremostachys* sp. = no. 103 p, J. L. Stewart's Peshaur collections.

A very handsome plant, with large yellow flowers. Alizai; April.

231. *E.* sp. May prove to be = 16.

Kuram; April.

486, 449. *Eremostachys speciosa*, *Rupr.* ?

Hariáb district only, in stony conglomerate soil; May and June. The large woolly yellow flowers in most cases grow directly from the base of the stock close to the ground.

615. *Teucrium Royleanum*, *Benth.*

A common weed around Shálizán and towards Shéndtoi; June.

147, 293. *Ajuga parviflora*, *Benth.*

Common between Shálizán and Habíbkalla; April and May.

27. *A. bracteosa*, *Benth.*

Shinnak; April.

59. PLANTAGINÆ.

179, 257. *Plantago lanceolata*, *L.*

Kuram district to 7000 feet; April.

516, 646. *P. major*, *L.*

Kuram and Hariáb districts, common; June.

MONOCHLAMYDEÆ.

60. ILLECEBRACEÆ.

585, 842. *Herniaria hirsuta*, *L.*

Hariáb district, common; June and July.

61. AMARANTACEÆ.

659. *Amarantus Blitum*, *L.*

Common on stony ground, Kuram district; June to August.

969. *A. frumentaceus*, *Roxb.* ?

On cultivated ground near Bíánkhél and Habíbkalla. I did not see it as a cultivated crop.

62. CHENOPODIACEÆ.

0. *Chenopodium album*, *L.*

Common at Shálizán.

879. *C. album*, *L.*, var. *candicans*, *Moq.* = *Griffith*, no. 1741.

Bíánkhél; July.

891. *C. album*, *L.*, var.

Bíánkhél to Péwáarkotal; July.

750, 899. *C. Botrys*, *L.*

Common, Kuram and Hariáb districts; a field-weed much collected and eaten as a vegetable, cooked; July.

980. *Chenopodium murale*, L.

Shálizán; August.

491. *C.* sp.

Sikarám, at 10,000 feet.

577. *Blitum virgatum*, L.

Common, Kuram and Hariáb districts, but more, especially so in forests of the Hariáb district where wood has been burnt; June and July.

63. POLYGONACEÆ.

767. *Polygonum amplexicaule*, Don.

Shéndtoi, abundant at 10,000 feet; July.

315. *P. aviculare*, L.

Shálizán; May.

0. *P. aviculare*, L., var.

Péwárkotal; August.

656. *P. Bellardi*, All., var. β . *patulum*, Meissn.

Shálizán; June.

657. *P. Convolvulus*, L.

Fields, Shálizán; June.

0. *P. dumetorum*, L.

Fields, Shálizán; June.

866. *P. glabrum*, Willd.

Fields, Shálizán; July.

986. *P. nepalense*, Meissn.

Shálizán; August.

215. *P. paronychioides*, C. A. Mey.

Everywhere at 5000 to 8000 feet; May.

1203. *P. perforatum*, Meissn.

Sikarám, at 12,000 feet.

794. *P. rumicifolium*, Royle.

Shéndtoi, at 10,000 feet, and up to nearly 12,000 feet amongst rhododendron and juniper, common. In Kashmir the young stems are eaten cooked.

816. *P. (Avicularia) biaristatum*, Aitchison et Hemsley, n. sp. Suffruticosum, prostratum, glabrum, ramis tortuosis, foliis parvis confertis subcoriaceis ellipticis, ochreis amplis bifidis longe biaristatis, floribus polygamis axillaribus solitariis binis sessilibus vel breviter pedicellatis.

Suffrutex glaber, omnino prostratus, contorte ramosus, ramis sæpe brevibus. *Folia* conferta, sessilia vel in petiolum brevissimum attenuata, sub-

coriacea, elliptica vel obovata, 2-4 lineas longa, sæpe abrupte breviterque acuminata; ochreae amplæ, bifidæ, longe biaristatæ. Flores rubri, polygami, axillares, solitarii vel bini, sessiles vel breviter pedicellati, 1-2 lineas diametro; perianthium 5-partitum; segmenta similia et subcarnosa vel 2 interiora tenuiora; stamina 8; filamenta basi dilatata; ovarium glabrum; styli teretes. *Nux* triquetra.

A very distinct species. Serátigah, at 12,000 feet; a dense woody miniature shrub.

655, 632. *Polygonum* sp.

Shálizán; June.

791, 952. *Rheum Moorcroftianum*, Wall.

Very common above 10,000 to 14,000 feet, from Shéndtoi westward to Serátigah.

539. *R. Ribes*, L.

From 8500 to 11,000 feet on the hills along the Hazárdarakht river. Eaten by the natives, and preferred by them to *R. Moorcroftianum*, although this is also eaten; they chew the raw stems as they travel.

465, 827, 940. *Oxyria reniformis*, Hook.

Common on all the hills at 10,000 to 13,000 feet, from Shéndtoi to Serátigah; July and August.

705. *Rumex nepalensis*, Wall.

Kaiwás; July.

1202. *R. orientalis*, Bernh.

Fields near Sergal, very common; August.

611. *R.* sp.

Péwárkotal, in woods; June.

302. *R.* sp.

Shálizán; May.

64. THYMELACEÆ.

10. *Daphne oleoides*, L.

From Hazarpírziárat, the Kuram, and Hariáb districts up to 11,000 feet in dry localities. As already stated, this, with *Sophora mollis* and *Cotoneaster nummulariaefolia*, are to be met everywhere forming part of the scrub. Camels will not eat this shrub except when very hungry. It is poisonous, producing violent diarrhœa. I feel certain that much of the mortality of camels in the Kuram division was due to the prevalence of this shrub. It was noticeable when camels were grazing that the *Daphne* was not touched until all the other scrub had been eaten.

668. *Thymelæa arvensis*, Lamk.

Very common near the Shálizán cantonments amongst small shingle along watercourses ; June.

638. *Wikstroemia virgata*, Meissn.

A very common shrub east of Péwárkotal at about 8000 feet, near moisture ; June and July.

519. *Diarthron carinatum*, Jaub. & Spach.

From Shálizán westward along the whole Hariáb ; June and July.

65. ELEAGNACEÆ.

22, 261. *Elæagnus angustifolia*, L.

From Shinnak to Alikhél. A cultivated tree with a large fruit, certainly not wild in Afghanistan.

288. *E. parvifolia*, Wall.

In the low-hill scrub near Shálizán up the Darban and Shénd-toi streams ; quite wild, as in Kashmir, but also cultivated.

1204. *E. angustifolia*, L., var.

A tall tree cultivated for its long racemes of strongly scented flowers, which come out before the leaves. Shálizán ; June.

524. *Hippophaë rhamnoides*, L.

Employed for hedges in the Hariáb district near Bíánkhél. I have not collected it in a wild state.

66. LORANTHACEÆ.

48, 87. *Viscum album*, L.

Commonly on olive at Badishkhél and Darwazaghái pass ; on *Quercus Ilex* at the base of the Péwárkotal ; not seen on any of the other trees on which it grows in Kashmir.

607. *V. articulatum*, Burm.

On *Quercus Ilex* at the base of Péwárkotal ; June. Also common at Murree on the same tree.

67. SANTALACEÆ.

339. *Thesium divaricatum*, Jan.

Shálizán, common on dry stony hot soil amongst *Peganum* and *Cleome* ; May.

68. EUPHORBIACEÆ.

71. *Euphorbia Chamæsyce*, L.

Shálizán ; June.

553. *Euphorbia falcata*, L.

Abundant in fields near Alikhél; June.

159. *E. Gerardiana*, Jacq.?

Shálizán, a field-weed; April.

558. *E. Szovitzii*, Fisch. & Mey.

Abundant in stony places near Alikhél; June.

380. *E.* sp. = my Kashmir collection, no. 94.

On the hills amongst shrubs at the limit of trees, 10,000 to 12,000 feet; June to August. Involucre large, very handsome, bright yellow.

520, 605. *E.* sp. = Griffith, nos. 352 and 415; related to *E. cornuta*, Pers.

Very common in dry clay-fields, Alikhél and Bíánkhél.

70, 177. *E.* sp. = Griffith's *Distribution* 4898.

Kuram district; April and May.

43. *E.* sp.

Shinnak; April. Involucre bright orange.

250, 274. *Andrachne telephioides*, L.

Shálizán and Kaiwás, not uncommon in stony ground; April.

Ricinus communis, L.

Cultivated in gardens at Shálizán. Near Thal it is quite wild, as also in the hills near Attock.

69. URTICACEÆ.

677. *Ulmus campestris*, Sm. var.

A large tree in the woods at 7000 to 9000 feet; not common. Well known to the natives, by whom the wood is much used, chiefly in making platters and small bowls.

403. *U.* sp.

Probably only a variety of *U. campestris*, but the leaves are much smaller; no flower or fruit seen. It is a more common but smaller tree than 677. The wood is used for the same purposes.

158, 349. *Celtis caucasica*, Willd.

Usually a cultivated tree near shrines and graveyards from Thal to the base of the Péwárkotal, but also quite wild on the lower hills along the Darban and Shéndtoi ravines; not seen in the Hariáb district. Under cultivation it has occasionally a very large trunk.

692. *Cannabis sativa*, L.

Kuram district and Shálizán, common. Is known by the natives to yield an intoxicating drug, though not employed by them. June.

364. *Morus alba*, L.

A cultivated tree in and near all gardens &c. in the Kuram district from Thal westward. I do not think I ever saw it in the Kuram district indigenous, but I may have overlooked it.

345, 13. *Ficus caricoides*, Roxb. = *virgata*, Roxb.

A small tree, or large shrub from Alizai to the Kuram district up to 6000 feet, usually near cultivation; April. Not seen in Hariáb.

305. *F. Carica*, L.

Most probably an escape from cultivation. Sides of water-courses and fields near the shelter of trees &c.; May.

223. *Urtica dioica*, L.

Habíbkalla; June.

458. *U. dioica*, L., var.

Shéndtoi; May.

1204, 1205, 1206, 716. *U. dioica*, L., var.543. *Parietaria debilis*, Forst.

In clefts of rocks at Alikhél and Hariáb district; not seen in Kuram; June.

542. *P. officinalis*, L.

In rocks, common, Kuram and Hariáb districts; June.

70. PLATANACEÆ.

50, 259. *Platanus orientalis*, L.

Not indigenous, but largely cultivated from Hazárpírziárat through the whole Kuram district. Only in one locality near Shálizán can I say it is naturalized, and, curiously enough, it is working up hill, where several trees of various sizes, mostly with very short trunks and stunted branches, may be seen. I noticed a similar fact in Kashmir on the western aspect of the Takht í Súlimán. In neither instance are there any signs of cultivation or of irrigation near where these higher trees are growing, nor could there ever have been, on account of the precipitous nature of the country.

71. JUGLANDACEÆ.

378. *Juglans regia*, L.

A cultivated tree in the Kuram district, very occasional at 7200 feet in the Hariáb. It occurs wild in the Shéndtoi and Darban ravines from 7000 to 9000 feet, but not in the Hariáb district. The walnut-groves of Shálizán surpass any thing of the sort I ever have seen; the trees average from 12 feet in circumference, and one is 17 feet, with splendid timber.

72. CUPULIFERÆ.

719. *Betula Bhojpattra*, Wall.

To the east of Sikáram at 11,000 feet, not common. The bark is not employed by the Afghans for any purpose, at least in this district.

25, 128, 87, 262. *Quercus Ilex*, L.

Common everywhere from 6500 to 9000 feet in the Kuram and Hariáb districts. Used largely as fodder for cattle, and the branches for fences and wattling houses; as fuel it burns fairly, even when green.

394. *Q. semecarpifolia*, Wall.

A large forest tree. I measured one 18 feet in circumference, with the trunk 100 feet before it divided. This had been cut down by the Afghan army just previous to our occupation of the Kuram district. Common from 9000 feet to the limits of trees (11,000 feet), in the Hariáb as well as Kuram district. The leaves afford good fodder for goats.

73. SALICINÆÆ.

49, 64, 365, 39. *Salix acmophylla*, Boiss.

Sadaṭkalla and Shálizán; April and May. Badishkhél; April. A large cultivated tree; but I found it in localities near Shálizán, where I doubted its being in cultivation.

111. *S. angustifolia*, Willd.

Alikhél; April. A large shrub, quite wild, and also cultivated round fields.

413. *S. elegans*, Wall.

A large shrub, just above the limits of trees, from 11,000 to 12,000 feet, Shéndtoi; July.

389. *Salix grisea*, Wall. = *Griffith*, nos. 1318 and 1319.

Shéndtoi, from 10,000 to 12,000 feet, common.

1208. *S. daphnoides*, Vill.

One specimen collected by Major Collett, Kuram valley (locality unknown).

574. *S. pycnostachys*, Anders.

A cultivated tree near the village of Ballút; no male flowers found.

$\frac{389}{A}$. *S. pycnostachys*, Anders.

Male flowers collected in Shéndtoi at 11,000 feet; May.

1207. *S. sp.* = *Griffith*, no. 1316.

Referred to by Brandis (For. Flor. p. 464) as a form between *S. Safsaf*, Forsk., and *S. acmophylla*, Boiss.

99. *S. sp.* near *S. seriocarpa*, Anders., and *S. babylonica*, L.

A large cultivated tree, with weeping branches; the young branches cut as fodder for cattle. Very common at Alikhél round fields, where it is planted to keep open the irrigation channels.

246. *S. sp.* near *S. babylonica*, L.

A large weeping tree cultivated at Kuram; April.

110. *S. sp.* near *S. viminalis*, L.

A shrub, wild and cultivated round fields for basket-work, and known as the "true willow" ("Asíl-á-walla").

254. *Populus alba*, L.

A cultivated tree near villages, very common in the Kuram district; occasional at Hariáb as at Alikhél.

350. *P. alba*, var. *denudata*.

A cultivated tree, with the same range as 254.

161. *P. nigra*, L., var. *afghanica*, Aitchison et Hemsley. Ramulis ultimis gracillimis, foliis parvis membranaceis ovato-rhomboides basi insigniter cuneatis, amentis femineis laxis gracilibus.

Arbor 100-pedalis, ramis adscendentibus, ramulis ultimis gracillimis. *Folia* graciliter petiolata, primum puberula, adulta membranacea, ovato-rhomboides, lamina sæpissime 1-1½-pollicaris, raro 1¾-pollicaris, basi sæpissime longe cuneata, apice breviter acuminata, margine crenato-denticulata; petiolus filiformis, usque ad pollicaris. *Amenta* feminea breviter pedunculata, bipollicaria, gracilia, laxa; perianthium cupulatum, obsolete lobatum, majusculum; capsula immatura ovata, pedicello subæquilonga.

With all the principal characters of *P. nigra* this has exceedingly slender branches, small leaves, and slender female catkins.

Possibly it may prove a distinct species; but in the absence of very complete materials we have not ventured to give it that rank. A large tree, fully 100 feet in height and 8 feet in girth; quite wild, also cultivated in the vicinity of Shálizán, but only at one shrine. In the Hariáb district it is common, cultivated, and apparently wild also; in fruit May.

74. GNETACEÆ.

126. *Ephedra* sp.

Alikhél, on rocks; April.

1209. *E.* sp.

Near Shálizán; June.

75. CONIFERÆ.

0. *Cupressus sempervirens*, *L.*

One celebrated tree, cultivated at a shrine near Shálizán, is 6 feet in circumference at 4 feet from the ground. No other seen in the country.

412. *Juniperus communis*, *L.*

On the hills above the limit of trees from 11,000 to 13,000 feet; from the hills behind Shálizán westwards to Serátigah; May and June.

114. *Juniperus excelsa*, *Wall.*

A very large tree, forming fully half the forests at 9000 feet in the Hariáb district; does not extend to the east of the Gandháo stream, except one or two cultivated spaces in a garden, or rather orchard, near the Shálizán cantonments. The bark exfoliates in long fibrous strips, which are collected and employed by the natives for making pads for carrying their water-jars on and for other similar purposes.

1210. *J.* sp. near *J. recurva*, *Ham.*

Síkarám, at 10,000 to 12,000 feet; August.

59. *Taxus baccata*, *L.*

As far west as the Gandháo stream and no further; occurs in the inner villages at 7500 to 9000 feet, where there is moisture.

171. *Pinus excelsa*, *Wall.*

This occurs as a fine tree from 8000 to 11,000 feet, but is met with occasionally as low as 7000 feet, and as a bush up to 12,000 feet in certain localities; in the hills of the Kuram district west-

wards to Serátígah along the whole range and spurs at the above altitude. To it is given the name "Nuhktár," a term applied to *Pinus longifolia* further west, of which I have not seen a single specimen. From Kohát *viâ* Thal to Serátígah.

113. *Pinus Gerardiana*, Wall.

A very handsome tree that does not branch as pines usually do, the trunk and branches being more like those of a well-formed oak. It is easily recognized at a distance by its nearly white ash-grey bark, which on close examination is seen not to be of one colour, but consists of patches of all tints, from light green to autumnal reds and brown; this is due to the peculiar way the bark exfoliates. It occurs from 7000 to 11,000 feet in the Hariáb district, but is unknown in the Kuram district, or as far north as the Péwárkotal, or its union with the base of Sîkarám. It is a common pine in Kóst. The nuts are a large article of diet amongst the villagers of the district in which the pine grows, and a luxury in N.W. India. The Kuram valley heretofore has not exported the nuts; those that reached Kohát were chiefly from the Kóst country.

127. *Cedrus Deodara*, Roxb.

A superb forest-tree from 7500 to 10,000 feet. Commences at the Spíngháo stream and covers the hills to the west of this, none, as far as I have seen, to the east, except an occasional tree in the Gandháo stream. I measured a tree 22 feet in circumference that must have been fully 150 feet high. It is curious to note that trees here all more or less run to trunk; the branches scarcely afford timber at all; and this is specially remarkable in the Hazárdarakht river, where the branches are extremely short and very small in calibre.

170, 785. *Abies Smithiana*, Wall.

A large tree, from 8000 to 10,000 feet, sometimes up to nearly 12,000 feet, struggling with *Pinus excelsa* for existence. Throughout the whole of the forests from the Kuram district to Serátígah; but in the Hariáb district, where it is extremely dry, it occurs rather more commonly at 9000 to 11,000 feet.

172. *A. Webbiana*, Wall.

A fine tree, at 8000 to 11,000 feet, in the forests of the Kuram and Hariáb districts; usually restricted to the ridges of the hills, always so in the Hariáb district.

MONOCOTYLEDONES.

76. PALMACEÆ.

0. *Chamærops Ritchieana*, Griff.

This occurs as a very stunted shrub in the conglomerate stony country to the north of the Kuram river, near Badishkhél. To the south of the river, from the Darwazaghai Pass to Hazárpíziárat, it grows in great luxuriance, and covers miles of the alluvial plains with a dense thicket. The fibre obtained by merely breaking the leaf is the usual material for rope in the Kuram and Hariáb districts. The leaves are made into baskets and mats.

77. AROIDEÆ.

776. *Arisæma abbreviatum*, Schott.

Common in hot exposed localities amongst stones at the very exit of the Shéndtoi river from the hills opposite Katskallé, ascending to 7000 feet.

125. *Arum Griffithii*, Schott.

Common under shrubs with *Anemone biflora*, from Kuram to Alikhél; April and May.

78. JUNCAGINACEÆ.

867. *Potamogeton oblongus*, Viv.

In rice-fields from Kuram to Alikhél; July.

79. ALISMACEÆ.

882. *Triglochin palustre*, L.

In moist meadows near Bíánkhél; July.

652, 619. *Alisma Plantago*, L.

Rice-fields, Shálizán, very common; July.

869. *Sagittaria sagittifolia*, L.

Rice-fields, common, Shálizán; July.

80. ORCHIDACEÆ.

570. *Orchis latifolia*, L.

In meadow-land from 7000 to 9500 feet, at heads of springs; common from the Shéndtoi to Sikarám and Alikhél; June to August.

780. *Goodyera repens*, R. Br.

Shéndtoi, from 9000 to 10,000 feet, in pine-forest; July. A common Gulmerg (Kashmir) species.

1238. *Liparis* sp.

Shéndtoi, in damp grassy spots from 9000 to 10,000 feet. In fruit only.

322. *Peristylus* sp.

Sháлизán, on the sides of irrigation-channels amongst grass and ferns under shade of rocks; altitude 7000 feet; May. Flowers green.

253. *Epipactis veratrifolia*, Boiss.

Between Sháлизán and Habíbkalla, along the low hills near springs; May and June. Flowers very handsome, orange, with green-yellow spots.

442. *Cephalanthera ensifolia*, Rich.

From 8000 to 9500 feet, at Péwárkotal and on hills along Shéndtoi; under trees, common; May.

439. *C.* sp.

Abundant under oak trees (*Quercus Ilex*) along the base of the Péwárkotal, at 6000 to 6500 feet; in fruit only; May.

81. IRIDACEÆ.

105. *Ixiolirion montanum*, Herbert.

From near Kuram to Habíbkalla, very common in some fields, but not general; April.

71. *Xiphion Stocksii*, Baker.

Very common in conglomerate soil from Badishkhél to Kuram, thence less so, and again very common in similar soil in the Hariáb district up to nearly 9000 feet.

227. *Iris ensata*, Thunb.

At Kuram near the river, common; April.

423. *I. Gúldenstædtiana*, Lepech.

In quantity on the hills above Sháлизán at 7000 feet, amongst grass near water-channels. Flowers nearly white, with a slightly primrose-yellow tinge.

1239. *I. pallida*, Lamk.

Cultivated in gardens, Sháлизán; May.

46. *Moræa Sisyrinchium*, Ker.

Very profuse in clay-fields near Badishkhél, and is, I think, the same plant of which I sent large quantities of bulbs from Kohát to Sahárapore.

82. DIOSCOREACEÆ.

332. *Dioscorea deltoidea*, Wall.

In the low-hill scrub from 7000 to 8000 feet, near Shálizán; not found in Hariáb.

83. SMILACEÆ.

701. *Smilax vaginalis*, Dcne.

In the low scrub in the interior of the hills near Shálizán, from 7000 to 8000 feet, very common.

84. LILIACEÆ.

228. *Allium capitellatum*, Boiss.?

A very small-flowered species at Kuram; April.

191. *A. Griffithianum*, Boiss.

From Kuram to Habíbkalla; April.

845. *A. neapolitanum*, Cyr.?

Only two large white, very handsome heads, collected near Drékalla; July.

503. *A. robustum*, Kar. & Kir.

West base of Síkarám at 9000 feet, Sergal river; June.

734. *A. sp.* near *A. senescens*, L.

It differs from the latter, a well-known Siberian species, by its more exerted stamens.

523. *A. umbilicatum*, Boiss.

Abundant in fields at Bíánkhél; June.

115 (ex parte). *Gagea filiformis*, Ker?

Alikhél; April.

115 (ex parte). *G. lutea*, Ker.

In the Péwár woods and meadows; April and May.

190, 255. *G. reticulata*, Ræm. & Schul.

From Kuram to Habíbkalla; April and May.

104. *G. setifolia*, Baker, n. sp. *Bulbus* parvus, globosus, tunicis multis siccis vestitus, fibris radicalibus multis flexuosis. *Folium* proprium radicale, semper solitarium, subulatum, glabrum, 3-6-pollicare. *Scapus* glaber, $\frac{1}{2}$ -3 poll. *Flores* 2-4, umbellati, bracteis 3 coarctatis, centrali 1-1 $\frac{1}{2}$ lin. lata, reliquis anguste linearibus, pedicellis brevibus vel elongatis glabris vel leviter albo-puberulis. *Perianthium* 4 lin. longum, segmentis lanceolatis acutis facie luteis dorso late viridibus. *Stamina* perianthio paulo breviora, antheris lineari-oblongis 1-1 $\frac{1}{2}$ lin. longis.

A small species, marked in the monophyllous group by its subu-

late leaves. No. 103 may be a depauperated form of the same plant; it has smaller flowers, narrower leaves and bracts, the primary bract placed often some distance on the peduncle below the inflorescence. At Alikhél; April.

103. *Gagea setifolia*, Baker, var.

Alikhél; April.

1241. *G. thesioides*, Fisch. The type and a bulbiferous variety.

Common at Alikhél and Péwáarkotal.

596. *Eremurus* (*Henningia*) *Aitchisoni*, Baker, n. sp. *Fibræ* radicales cylindricæ, interdum semipedales, 4-5 lin. diam. *Folia* exteriora squamæformia, membranacea, deltoidea, alba, lineis brunneis pluribus distinctis longitudinalibus percursa; interiora propria 6-12, linearia vel lanceolata, sesquipedalia, 6-21 lin. lata, glabra, deorsum medio fistulosa. *Scapus* teres, strictus, glaber, 3-4-pedalis. *Racemus* densus, floriferus subpedalis, expansus 2 poll. diam., fructiferus sesquipedalis et ultra, pedicellis strictis erecto-patentibus 9-15 lin. longis, bracteis magnis lineari-subulatis complicatis albis brunneo vittatis ciliatis. *Perianthium* infundibulare, pallide rubellum, segmentis oblanceolatis obtusis brunneo vittatis 1-1½ lin. latis. *Stamina* declinata, perianthio paulo breviora, antheris luteis subglobosis. *Stylus* filiformis, falcatus, longe exsertus, 8-9 lin. longis. *Capsula* globoso-trigona, 5-6 lin. diam., seminibus in loculo circiter 3 triquetris angulis angustissime alatis.

A very fine plant, of which the nearest ally is *E. robustus*, Regel, of Turkestan, which has lately been introduced into cultivation. Karchátal and at Drékalla, on ridges of the hills from 11,000 to 12,000 feet, common; June.

100, 544. *E. aurantiacus*, Baker.

This was described from a single indifferent specimen gathered by Griffith. Dr. Aitchison has got a fine suite of specimens, showing both flower and seed. It does not belong to the section *Henningia*, as was supposed, the fully-developed stamens being twice as long as the reflexing segments of the perianth. The capsule is globoso-trigonous, about ¼ inch in diameter, with 2-3 narrowly winged dull-brown triquetrous seeds in each cell. In the Hariáb district from 7000 to 9000 feet; one of the most common plants on rough stony ground. Alikhél; April; not seen in the Kuram district. The leaves largely used as a vegetable cooked. Flowers golden yellow.

96. *Fritillaria imperialis*, L.

Amongst rocks and stones in the Hariáb district, common from 7000 to 9000 feet. Flowers a deep brick-red.

1240. *Tulipa chrysantha*, Boiss.

I doubt this being distinct from *T. stellata*, Hooker; there are intermediate forms. This is a high-altitude form; the higher the plant goes, the more yellow and dwarf it becomes. I have seen the bulbs as woolly in the plains of the Punjab as any of these at 9000 feet, where the species is common.

40. *T. stellata*, Hook. Typical form.

Common from Badishkhél to Kuram; April.

62, 63. *T. stellata*, Hook., var.

Sadatkalla; April. Flowers bright yellow, outer segments more or less flushed with dark red on the back.

736, 918, 799. *Lilium polyphyllum*, Don, var.

Occasional on the hills from 11,000 to 12,000 feet, growing through the midst of juniper bushes, &c.; only one or two specimens found in each locality; Shéndtoi, Kaiwás, and Síkarám; July and August. Flowers not more than half as long as in the form figured by Elwes, much more tinted with claret-purple, the segments reflexing from halfway down, the bulb shorter with more numerous scales, and the capsule not more than half as long.

536. *Asparagus brachyphyllus*, Turcz.

At Alikhél and Shálizán; June.

14. *A. capitatus*, Baker, var.

Alizai. The young shoots are eaten.

327. *A. trichophyllus*, Bunge.

Round Shálizán, very common; May.

809. *Polygonatum multiflorum*, All

Shéndtoi; July.

741. *P. verticillatum*, All.

The Darbau and Shéndtoi ravines, altitude 8000 feet. The large roots are much sought after and eaten.

730, 737. *P. verticillatum*, All., var. *gracile*, Baker.

"Small slender form; leaves below the summit of the stem not more than two or three to a whorl." Under high rocks and, if any thing, of a higher altitude than 741 (to 11,000 feet). The roots are also very different

26. *Merendera persica*, Boiss.

From Kuram to Péwárkotal and meadows on the Spíngháó;

common at Hariáb. Flowers as the snow melts. Most of the flower-buds have on their external surface a slight purplish tinge, which is quite lost on the expansion of the flower. This plant extends to the Salt range, and as far south as Rawul Pindee and Thelum.

85. JUNCACEÆ.

603. *Juncus compressus*, L.

Moist meadow-land near Bíánkhél; June.

370, 678. *J. glaucus*, Ehrh.

Kuram and Hariáb districts, from 6000 feet, common; July and August.

578. *J. glaucus*, Ehrh. var.?

Bíánkhél; June.

86. CYPERACEÆ.

(Named by Dr. O. Boeckeler.)

684. *Cyperus longus*, L.

Common in rice-fields, Shálizán; June.

964. *C. flavescens*, L.

In glades near springs of water near Péwárkotal; August.

868. *Scirpus maritimus*, L., var.

In rice-fields round Shálizán, in profusion; July.

965. *S. setaceus*, L.

In the same localities as 964, in glades at Péwárkotal.

34, 601, 235. *Heleocharis palustris*, R. Br., var.

Shinnak, Kuram, and Bíánkhél; April to June.

745, 410. *Kobresia scirpina*, Willd.

Kaiwás and Shéndtoi, from 11,000 to 12,000 feet; May to July.

358. *Schoenus nigricans*, L.

Common near springs in loamy soil.

571. *Carex* sp.

Meadow-land near Bíánkhél; June.

1242. *C. Oliveri*, Boeck. MSS.

Bíánkhel.

1243. *C. alpina*, Sw.

Shéndtoi, at 11,000 feet; August.

418. *Carex cardiolepis*, *Nees*.
Shálizán, sides of fields, profuse; May.
1244. *C. cardiolepis*, *Nees*, var.
Katskallé, in dry localities, very common; May.
1007. *C. hirtella*, *Drej*.
Shéndtoi, common at 11,000 feet; August.
602. *C. nutans*, *Hochst*.
Bíánkhél, common; June.
724. *C. sempervirens*, *Vill.*, var.
Common on hills north of Kaiwás; July.
33. *C. hirta*, *L.*, var.
Shinnak; April.
501. *C. vulgaris*, *L*.
At the west base of Síkarám in moist grassy mould at 10,000 feet.
818. *C. divisa*, *L*.
Serátígah, at 10,000 feet, not common; July.
- 313, 508. *C. Aitchisoni*, *Boeck. MSS*.
Shálizán, Sergal, Bíánkhél, common from 6000 to 8000 feet; May and June.
- 92, 194, 493. *C. stenophylla*, *Wahlenb*.
West base of Síkarám, Alikhél, and Túrai, from 7000 to 10,000 feet, common; April to June.
870. *C. sp.*
Shálizán; June.

87. GRAMINEÆ.

(Named for me by the late General Munro.)

0. *Oryza sativa*, *L*.
Kuram and Hariáb districts, very largely cultivated up to 7500 feet.
1245. *Zea Mays*, *L*.
Cultivated up to 9000 feet, or nearly so, all through the country. The specimens in my herbarium were from Sergal, altitude 8750 feet, where no irrigation could be used and the fields were dependent upon rain; August.]
66. *Alopecurus agrestis*, *L*.
A common weed in old rice-fields, Kuram; April.

- 527, 196. *Piptatherum angustifolium*, *Munro*, *MSS.*
Common in pine-woods, Biánkhél, Alikhél; May.
430. *P. cærulescens*, *Pal. de Beauv.*
Shálizán, in fields, common; May.
328. *P. sp.*
Shálizán, in moist soil; May.
723. *P. sp.*, probably a state of No. 328.
Hills north of Kaiwás; July.
444. *P. sp.* near 328 and 723.
Common under trees, Péwárkotal.
891. *P. sp.* near *P. holciforme* and *P. molinioides*.
Péwárkotal; July.
947. *P. laterale*, *Munro in Herb. Griff.?*
On dry localities, Síkarám, at 12,000 feet.
896. *P. sp.*
Common at Péwárkotal.
1250. *Panicum miliaceum*, *L.*
Cultivated largely in the Hariáb district, and also in the higher fields of the Kuram district up to nearly 9000 feet.
843. *P. (Echinochloa) Crus-galli*, *L.*
Very common in rice-fields and damp clay soil, Hariáb district; July and August.
1247. *P. (Echinochloa) Crus-galli*, *L.*, var.
A very luxuriant grass in rice-fields, overtopping the rice; from Kuram to Hariáb district, common; August.
985. *Digitaria sanguinalis*, *Scop.*
Shálizán, common in sides of fields; August.
1248. *Setaria viridis*, *Pal. de Beauv.*
Shálizán, common on hot stony soil; June.
870. *S. glauca*, *Pal. de Beauv.*
Shálizán, in fields, common; July.
- 1249, 680. *S. italica*, *Kunth.*
Cultivated very extensively in the Hariáb district, in one or two localities almost to 9500 feet; also in the Kuram district chiefly at the higher localities.
892. *S. italica*, *Kunth*, var.
Cultivated fields.
904. *Gymnothrix flaccida*, *Munro*, var.
Fields round Shálizán and road-sides, common; July.

1246. *Pennisetum orientale*, Pers.
Shálizán; June.
890. *Lasiagrostis* sp. near *L. splendens*, Kunth.
From Kaiwás to Péwárkotal; July.
775. *L. Jacquemontii*, Munro (*Stipa Jacquemontii*, Jaub.).
Shéndtoi at 8000 feet; July.
445. *Stipa pennata*, L.
On exposed limestone rocks, Péwárkotal, common at 8500 feet; Bíánkhél, Alikhél, common in dry pine-forests.
- 753, 897. *S. sibirica*, L.
Everywhere from 7000 to 9000 feet, chiefly under the shade of trees, in small tussocks. This grass is well known to be poisonous to animals here, as in Kashmir. Scarcely present in the Hariáb district, but extends to Péwárkotal and its vicinity.
1252. *Agrostis* sp. near *A. ciliata*. "I believe an undescribed species, awned."—Munro.
Shéndtoi, 11,000 feet; August.
1253. *A.* sp. near *A. verticillata*, Vill. "A common Afghan plant," Munro.
Shéndtoi, profuse in fields; August.
885. *A. alba*, L.
Fields at Bíánkhél, common.
889. *Polypogon littoralis*, Sm.
On road-sides, common in the Hariáb district; July.
648. *P.* sp. near *P. littoralis*, Sm.
Shálizán; June.
832. *P. monspeliensis*, Desf.
Along streams from Drékalla to Káratígah, at 9000 feet; July.
- 689, 758. *Calamagrostis* sp. "I cannot distinguish it from *C. lanceolata* = Griffith's *Journal*, no. 441."—Munro.
Shálizán to Katskallé, on sides of fields; July.
887. *C. lanceolata*, Roth.
From Péwárkotal to Bíánkhél, common in wet places; July.
1251. *Deyeuxia* sp. near *D. varia*, Kunth. "I have never seen any specimens previously from India; perhaps a new species."—Munro.
From 9000 to 11,000 feet, Shéndtoi and Síkarám; August.

347. *Arundo Donax*, L.

In the vicinity of Kuram, common round fields and at the river. Frequently cultivated on graves and at holy shrines.

757. *Cynodon Dactylon*, Pers.

Kuram district, common; July.

277. *Chloris villosa*, Pers.

Common between Kuram and Shálizán, on shingle; May.

367. *Avena oligostachya*, Munro, MSS. "Certainly a good new species."

A curious grass, hanging in tufts from the clefts of the limestone and slate rocks of the Shéndtoi gorge, at from 7000 to 8000 feet.

24, 175. *A. fatua*, L.

Common throughout the fields from Shinnak to Habíbkalla. Weeded out from the corn and given as fodder to cattle before it is ripe. When ripe, its hairy seed is said to be hurtful to animals.

405, 497. *Poa* sp. near *P. lavis*, R. Br.

West base of Síkarám from 9000 to 10,000 feet, in pine-forests, also Shéndtoi; May.

647. *P. trivialis*, L.

Shálizán, common; June.

308. *P.* sp. near *P. trivialis*, L.

Shálizán; May.

295. *P.* sp. near *P. trivialis*, L.

Shálizán; May.

927. *P. bulbosa*, L.?

Shálizán, at 10,000 feet; August.

151. *P. bulbosa*, L.?, var. *vivipara*.

Habíbkalla and Shálizán, common; April.

931. *P. laxa*, Haenk.?

Síkarám, from 11,000 to 13,000 feet; August.

946. *P. flexuosa*?

At Síkarám, 12,000 feet; August.

905. *Eragrostis poæcides*, Pal. de Beauv., var.?

Shálizán, common in cultivated fields; July.

1257. *Melica* "sp. unknown to me," Munro.

Shéndtoi, above 9000 feet, common; August.

321. *M. Jacquemontii*, Dcne., var. *albens*.

At the roots of bushes near Shálizán; May.

1258. *Melica Jacquemontii*, *Dcne.*, var. *purpurea*.
Péwárkotal; August.
- 590, 958. *Koeleria cristata*, *Pers.*, var. *glaberrima*.
Common in fields at Karchátal, altitude 13,000 feet, in June,
and at Síkarám in August.
1258. *K. phleoides*, *Pers.*
Kuram to Shálizán; May.
1256. *Festuca duriuscula*, *L.*, var. *violacea*. "Collected by Griffith,
summit of Kohbába, 14,500 feet."
Síkarám, 13,000 feet; August.
949. *F. ovina*, *L.*
Síkarám, common at 12,000 feet.
429. *F. elatior*, *L.*
Shálizán, common in fields; May.
424. *F. elatior*, *L.*, var. *minor*.
Fields, Shálizán, common; May.
962. *Brachypodium tataricum*, *Munro*.
Sergal and Síkarám, amongst rocks and large stones, from 10,000
to 14,000 feet; August.
568. *Bromus Danthoniæ*, *Trin.*
Profuse at Alikhél; June.
1006. *B. sp.* near *B. asper*, *L.*
Shéndtoi, profuse from 11,000 to 12,000 feet; August.
755. *B. sp.* near *B. asper*, *L.*
In large tussocks, Shálizán and Kaiwás; July.
1254. *B. sp.* near *B. erectus*, *Huds.*
Síkarám, from 10,000 to 12,000 feet, common; August.
928. *B. sp.* near *B. erectus*, *Huds.*
Síkarám, at 12,000 feet, amongst stones.
814. *B. sp.* near *B. erectus*, *Huds.*
"Flowers few, spicules glabrous." Serátigah, at 9000 feet; July.
1255. *B. sp.*
Síkarám, from 11,000 to 13,000 feet; August.
- 270, 187. *B. sp.* near *B. squarrosus*, *L.*
Common amongst stones, Kuram, Shálizán, and Habíbkalla;
May.
837. *Lolium perenne*, *L.*
Fields, Kárátigah; July.

1261. *Lolium perenne*, *L.*, var. *aristata*.

Fields, Karchátal; June.

426. *L. temulentum*, *L.*

Very common in fields amongst the corn, in Hariáb and Kuram districts; May. It is considered poisonous, producing narcotic symptoms. Called "Mashta."

705. *Agropyrum* sp. near *A. semicostatum*, *Nees*.

Fields near Kaiwás; July.

803, 903. *A. semicostatum*, *Nees*.

Near Shálizán, Shéndtoi, and Síkarám, from 11,000 to 12,000 feet; July and August.

1259. *A. repens*, *Ræm. & Schul.*

Zabardastkalla; July.

886. *A. repens*, *Ræm. & Schul.*, var. *minor*.

Common in fields, Bíánkhél; July.

561. *A. orientale*, *Ræm. & Schul.* = *Griffith*, no. 413.

At Alikhél, amongst stones, very profuse; June.

310. *Secale cereale*, *L.*

Occurs nearly only in wheat-fields, and is considered a weed, not being purposely sown along with the wheat. In some fields it almost eradicates the wheat-crop. It is considered to have injurious properties when eaten as food. Shálizán, common weed in the Kuram and Hariáb districts; May.

754. *Elymus excelsus*, *Turcz.*

On damp embankments at 7500 feet, Shálizán and Kaiwás; July.

438. *Hordeum vulgare*, *L.*, var.

An escape, having been carried by birds or rats to the localities where it was found. Largely cultivated in the Kuram district, less so in the Hariáb district.

815. *H. caducum*, *Munro*.

Káratígah and Serátígah, from 9000 to 11,000 feet.

285, 316, 265. *H. murinum*, *L.*

On stony ground, from Kuram to Shálizán; April, May, and June.

1260. *H. hexastichum*, *L.*

Extensively cultivated, Kuram district; June.

560. *Ægilops caudata*, *L.*

Alikhél, amongst stones, very common; June.

981. *Saccharum spontaneum*, *L.*?
Shálizán, waste ground near fields; August.
71. *S.* sp. near *S. Griffithii*, Munro, MSS.
Kuram and Shálizán in dry waste courses; a large coarse grass;
May.
1262. *Anthistiria anathera*, *Nees*.
Shálizán, fields, common; August.
336. *Imperata cylindracea*, *Cyr*.
Shálizán, in moist ground bordering fields, very common; June.
- 1, 432. *Andropogon* sp.
Mandúrí, Shálizán, and Hábíbkalla, common on dry stony soil;
April. Lemon-scented.
756. *A. punctatus*, *Roxb*.
Sides of fields near Shálizán; July.
849. *Ischæmum hirtinodes*, *Munro*, MSS.
Drékalla, common at 9000 feet; July.

ACOTYLEDONES.

88. FILICES.

783. *Woodsia hyperborea*, *R. Br.*
Shéndtoi, amongst rocks at 10,500 feet; July.
- 408, 771, 609, 823. *Cystopteris fragilis*, *Bernh.*
The common fern in the lateral valleys of Kuram district, altitude 9000 feet; not in the Hariáb district except at an elevation of 11,000 feet; Síkarám, common altitude 11,000 to 13,000 feet.
1263. *C. fragilis*, *Bernh.*, var. *dentata*, *Hook.*
Shéndtoi; May.
74. *Adiantum Capillus-Veneris*, *L.*
Common near Kuram; April.
1264. *A. venustum*, *Don.*
Common in woods at 7000 feet from Shálizán to Kaiwás.
1265. *A. æthiopicum*, *L.*
Common on damp rocks and water-channels near Shálizán. This is new to the Himalayan region; it is found in the Neilgherries.
787. *Cryptogramma crispa*, *R. Br.*
Shéndtoi, on rocks from 9000 to 11,000 feet, common; July.

391. *Asplenium septentrionale*, Hoffm.
Shéndtoi, from 7000 to 11,000 feet.
374. *A. Ruta muraria*, L.
From Shéndtoi westward, on the rocks of the Hariáb district.
407. *A. viride*, Huds.
Shéndtoi, 9000 to 11,000 feet, very common.
411. *A. Trichomanes*, L.
Shéndtoi, altitude 7000 to 9000 feet.
409. *A. varians*, Hook. & Grev.
Shéndtoi.
- 1266, 371. *A. fontanum*, Bernh.
Shéndtoi and Sikarám, at 11,000 feet; August.
122. *A. Ceterach*, L.
Hariáb, only one locality, on rocks near Alikhél.
1010. *Aspidium Prescottianum*, Hook.
Shéndtoi, altitude 9000 to 10,000 feet, amongst stones, not common.
1009. *Nephrodium barbigerum*, Hook., var.
"This is a form between *barbigerum* and *Brunonianum*; they should doubtless be regarded as one species."—*Baker*. Shéndtoi, 9500 to 10,000 feet altitude.
790. *N. rigidum*, Desv.
This establishes beyond question *rigidum* as an Afghan species. A doubtful plant was gathered by Griffith.
- 788, 764. *N. rigidum*, Desv., var.
A very large, compound, broad-fronded form.
- 455, 384. *N. rigidum*, var. = Griffith's plant.
Doubtful between *N. rigidum* and *N. Filix-mas*.
All the above *Nephrodia* collected in the Shéndtoi ravine from 9000 to 11,000 feet in July and August.
382. *Polypodium Dryopteris*, L.
Shéndtoi, profuse under rocks, May.
798. *P. clathratum*, C. B. Clarke.
Shéndtoi and Kaiwás at 11,000 feet, very common; July and August.
1002. *Botrychium Lunaria*, Sw.
Shéndtoi, from 9000 to 10,000 feet, amongst grass, profuse.

89. LYCOPODIACEÆ.

369. *Selaginella sanguinolenta*, Spreng.

Shéndtoi range, from 7000 to 9000 feet, on rocks in great luxuriance. This is new to the Himalaya, being known before from Siberia and Kamschatka.

90. EQUISETACEÆ.

30, 320. *Equisetum elongatum*, Willd.

Shinnak and Shálizán, at 4000 to 7000 feet; April and May.

91. MUSCI.

950. *Bartramia fontana*, L.

West base of Síkarám near spring of water, at 11,000 feet, along with *Orchis*, *Codonopsis*, *Ophelia*, &c.

368. *Hypnum* sp. near *H. cupressiforme*.

Shéndtoi; May.

92. FUNGI.

1267. *Morchella conica*, Pers.

Appearing as the snow melts in the Shéndtoi gorge, 7000 feet; common under bushes.

Agaricus campestris, L.

Kuram district, common at 6000 feet.

Helvella crispa, Fr.

Common in the Shéndtoi ravine, from 7000 to 9000 feet; end of July. Eaten by the natives.

Hydnum coralloides, Scop.

Shéndtoi, at the limit of trees (11,000 feet) on rotten wood, growing from its surface like large masses of sponge, and not, as commonly in Kashmir, suspended from the upper part of the hollows of trees. Eaten by the natives. Collected end of August.

On the Flora of the Kuram Valley, &c., Afghanistan.—Part II.
By J. E. T. ATCHISON, F.L.S., Surgeon-Major H. M. Bengal
Army.

[Read June 16, 1881.]

(MAP, WITH PLATES I.-XXX.)

GENERAL OBSERVATIONS.

IN continuation of my paper (see vol. xviii. pp. 1-113) "On the Flora of the Kuram Valley," I have the honour now to lay before the Society the results of my further researches in that country during 1880. I regret to say that, although I landed in Bombay on the 1st of March, I was unable, owing to the delay caused in waiting for orders from Government, to commence work at Kuram until the 29th of May, at which date I was far too late for the spring vegetation. I proceeded to Kuram with the expectation that some of the troops would almost certainly cross, *viâ* the Shútar-gardan Pass, to Kabul, and that I should thus be able again to investigate that part of the country which already had proved so prolific in new types. None of the Forces, however, from the Kuram valley crossed the passes towards Kabul, nor was the Hariáb district occupied by our troops during the season, with the exception of the Pévár-kotal. Owing to these circumstances, my collections are not nearly so rich as last year's. I was, however, able to botanize some portions of new country with tolerably satisfactory results, obtaining several new species, and adding considerably to the material of many of the more interesting species of my last year's collections. Had more time been placed at my disposal, I should have been able to lay before the Society some further particulars respecting the geographical range of the more interesting species, illustrated by a set of analytical tables. I still hope, however, to be able at some future date to communicate this information.

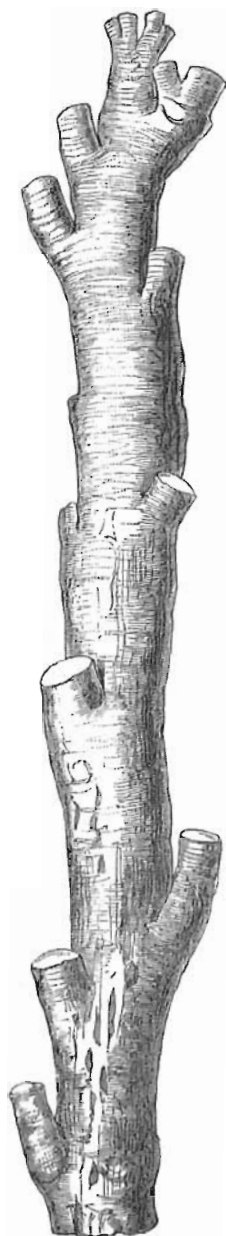
I here beg to thank all my friends at Kew for the assistance they have given me—Professor Oliver, Mr. Baker, who this year has again identified and named my Leguminosæ and petaloid Monocotyledons, Mr. C. B. Clarke, whose time I have so frequently broken in upon, Mr. Brown, and Mr. Hemsley, without whose

assistance, especially in the descriptions of the new species, the work could not have been completed so thoroughly and at such an early date.

The new ground I went over includes:—the low hills in the vicinity of Shinak and the country between that and Badish-khél, up to an altitude of over 5000 feet; similar hills to the south of the Kuram river, opposite Kuram; the valleys of the Zérán and Malána streams, up to their respective passes on the Saféd-koh range; the valley of the Darbán river, which is the eastern tributary of the Shálizán stream; and, lastly, some ground at the western base of Mount Síka-Rám towards the Tarúki-Kanda pass. During August and September I twice travelled over the subtropical region, viz. the portion of the country between Thal and Badish-khél, which gave me a further insight into its flora than it was possible for me to obtain last year.

Vegetation between Thal and Badish-khél.

Dalbergia Sissoo is common as a good timber-producing tree along the banks of the Kuram, as well as its numerous tributaries, as far north as the village of Jelamai, at the base of Mount Kákúta, and is certainly indigenous to the country. It is also seen as a protected, or even planted, tree at holy shrines and ziarets. I saw no specimens of either *Phoenix sylvestris* or *P. dactylifera* at Thal or beyond it northwards. *Ephedra ciliata*, a semiscandent shrub, the main stem of which has very peculiar lozenge-shaped markings, grows up through trees of 12 to 16 feet in height; it then spreads out its branches, hanging over the tree upon which it is scandent until it quite hides its support. It is usually dioecious; but female fertile flowers frequently occur amongst the staminate ones. *Periploca hydaspidis*, by no means common in this country, simulates *Ephedra ciliata* so closely that, unless there is flower or fruit by which to distinguish it, I should say that even museum-specimens of the two plants might easily be mistaken for each other. At Alizai I succeeded in procuring for the Museum at Kew a branching specimen of *Nannorrhops Ritchieana*, which I should not have been able to convey away, had it not been for the assistance I received from Lieut. F. Beauclerk, R.E., whom I here thank. The pro-



duction of branches by this palm is due, I believe, to the arrest of the large inflorescence. When one sees this palm as a tree 20 feet in height, and then in a branching condition (see woodcut), one can scarcely believe it to be the same species as that found in such a stunted, miniature state on Mount Tilla, in the Salt range, where also it is indigenous. Creeping over the palm (*Nannorrhops*) scrub, *Zehneria umbellata* is a very characteristic plant, remarkable for its extremely varied form of leaf. It is common all over India, and is enabled, no doubt, to live here through the rigorous winters from the protection its perennial root-stocks receive under the shelter of the dense palm-cover. Among the low shrubs on the Conglomerate formation I picked up a new species of *Teucrium*, a woody shrub about 2 feet in height, that seems very common, but which was difficult to find in flower. Near Shinak, *Buxus sempervirens* is found in some quantity as a large dense shrub, its wood being employed in making the bowls of pipes. I managed to procure a couple of pipes, one of which is fairly carved. Here I was informed that the old wood of *Rhus Cotinus* is used as a dye for wool-stuffs, chiefly used in making felts of an orange-red colour. In this part of the country, like *Edwardsia mollis* in the Kuram and Hariáb districts, the young leaves of *Adhatoda vasica* are largely collected and mixed with the grain in the rice-nurseries to hasten the process of germination by the heat generated during their decomposition. In writing of *Edwardsia*, I may just mention that I noticed in a paper lately read before this Society by Dr. Watt the following

Branching stem of *Nannorrhops Ritchiana*, Wendl., from a specimen in the Kew Museum. Drawn to scale half an inch to the foot.

statement:—"It is a remarkable fact that every plant exhibited the peculiarity of bearing an abundance of long filiform outgrowths proceeding from various parts of the plant." I have also found these growths to be present in nearly all the specimens of the plant in the Herbarium at Kew; and I have scarcely ever collected it without its being thus affected. On examination, these growths prove to be a form of gall, produced by the deposition of the ova of some insect whilst the leaves or fruit are in a very young state. This malformation is represented by a somewhat analogous condition in the horn-like processes developed on *Pistacia integerrima*, J. L. Stewart (Royle's specific name, *Kakra-singee*, for the gall-bearing condition of this species, signifies wild-sheep's horn)—and also again in Wallich's *Cerasus cornuta*, which has been identified as *Prunus Padus*, Linn.

The Grasses met with were nearly all species procured in the Punjab, and of the following genera:—Growing near water, *Arundo*, *Phragmites*, *Hemarthria*, *Saccharum*, and *Panicum*; in the dry stony country, *Gymnothrix*, *Pappophorum*, *Aristida*, *Chrysopogon*, *Andropogon*, *Heteropogon*, *Elionurus*, and *Pennisetum*. Those considered the best fodder grasses were *Panicum sanguinale* and *Panicum pabulare*, a new species, much collected by the villagers for their cattle, said to be superior to all. *Fingerhuthia africana*, Lehm., a very remarkable grass, heretofore only found in South Africa, occurs in luxuriance at the end of August or beginning of September, depending on the rainfall; it is a very pretty grass, in general habit resembling *Phalaris minor*, which is found in the Punjab, and some of the European species of *Phleum*. In the hills, both near Shinak and to the south, opposite Kuram, I collected an undescribed species of *Stactis*, viz. *S. Griffithii*, not handsome in its flower, but curious in the way it throws out buds from an underground perennial rhizome. At, and a little above, 5000 feet I collected *Quercus Ilex*, *Olea*, *Rhus* (two species), *Rhamnus persica*, *Dodonæa*, *Reptonia*, and *Buxus*. I sought for *Pinus longifolia*; but it does not appear to exist anywhere in the Kuram valley that I have explored; and I am of opinion that it is not to be found in Afghanistan, and in all probability not to the north or west of the Indus, except cultivated. I doubt if it was really this species that is mentioned by Dr. Stewart as having its lower limit at 9000 feet in the Sulimán

range. There are no Afghanistan specimens from Griffith in the herbarium at Kew. The specimens of the cultivated tree collected by him in a garden at Kándabár, and so named, belong to *Pinus halepensis*. Furthermore, it is extremely doubtful if the pine he speaks of as growing on the ridges of Káfristán at 6000 feet could possibly have been *P. longifolia*.

Vegetation between Badish-khél and Habíb-kalla.

Up to this point I had noticed that every native when drinking from a spring of water, usually made a fresh drinking-ladle from the leaf of the *Nannorrhops*; but here I was informed by the officers of the 5th N. I., that in the hills to the north and east of Badish-khél, along all the streams and in springs, bowls made from the bark of the apricot usually lay floating in the pools for general use. This custom I found extended as far west as the Zérán valley; but there the bark from the knots of the walnut constituted the usual public drinking-cup. It is a curious custom, showing either that only persons of the same brotherhood or of one caste traverse these parts, or that the people are more liberal than elsewhere, and do not object to drink from a cup that has already been used by others. On the conglomerate cliffs overhanging the Karmána stream, where it is crossed by the main road, a variety of *Hypericum cernuum* was collected; it is a bush from 2 to nearly 4 feet in height, with bright yellow flowers never white, but only half the size of the type. *Myrtle* is common along the watercourses, and not, as previously found, in isolated clumps. In the damp corners of what looked like old fields, or at least demarcated plots of land, near the British fort of Shálizán, I collected *Ophioglossum vulgatum*, where it was growing in some abundance. The most common grasses found on the shingle plains were *Chloris villosa* in great flat patches, mapping the ground (if I may so term the peculiarity of its growth), a few flower-heads occurring on each patch at irregular intervals throughout the whole summer, *Panicum sanguinale*, *Andropogon punctatus*, *commutatus*, and *laniger*, and *Anthistiria anathera*. Along the edges of the dry watercourses, and on the higher island-like plots of ground in the beds of these dried-up streams, *Saccharum Griffithii*, a great coarse stiff grass, occurring in

large tussocks, is very striking, owing to the absence of other vegetation generally than to any peculiarity of its own. Along the banks of the Zérán and Malána streams, and on the sides of the watercourses up to 6000 feet altitude, but not further west, *Iris ensata* is common, growing in clumps as in Kashmír, but certainly not in the same luxuriant profusion. At the base of the low hills, at an elevation of 6000 feet, extending westward nearly to the Shend-toi and eastward beyond Zérán, I met with a shrub, about 2 feet in height, growing in isolated, densely-matted, cushion-like masses. When first seen, it was covered with heads of bright rose-coloured flowers, which were greedily browsed by goats and sheep. It belongs to the Rubiaceae, and is the new genus *Aitchisonia* described by Mr. Hemsley. It is allied very closely to *Leptodermis*, and will probably have to be placed between that and the genus *Putoria*. Its leaves, when bruised, exhale an extremely fetid odour, a peculiarity common to the above-named genera. One of the more interesting features in this plant (*Aitchisonia rosea*) is that it is dimorphic; and, as far as we yet know, the dimorphism extends only to the styles, which in some flowers are long, in others short, the stamens remaining the same as to length and position.

At the village of Zérán, cultivated in a sacred grove, I this year came across one large old tree and several smaller younger ones of *Pinus halepensis*. It seems to be cultivated throughout Afghánistán from Kándahár to Jellállabád. I must say that I was disappointed at this pine not turning out a new species, for the sake of my friend Dr. Cattell, F.L.S., who in this Kábul expedition, as Surgeon to the 10th Hussars, was the first to send specimens to Sir Joseph Hooker at Kew, recognizing it as a different pine to the ordinary Himalayan ones. Sir J. D. Hooker, deceived by Griffith having sent cones of this with leaves of *P. excelsa*, at first supposed it to be a new species. He himself, however, discovered the mistake, and referred Dr. Cattell's specimens rightly to *P. halepensis* before receiving mine.

*Vegetation of the Valleys of the Zérán, Malána, and Darbán
Streams.*

On the ascent of the Zérán and Malána gorges, on the faces of

the precipitous cliffs, at an altitude of from 7000 to 8000 feet, a grass occurs which has extremely tough, elastic, hair-like leaves; and, owing to these properties, it is valued as bedding, being collected and brought as presents to the priests, who spread it on the floors of the rest-houses for the comfort of travellers. It is not found to the west of Malána. I regret that I could not get it in flower or fruit, and therefore am unable to say what it is; but from its general appearance I take it to be a species of *Stipa*. Besides being used as bedding, pieces of the turf bearing the long pendent leaves are hung up as tokens in the shrines, showing that the natives have also some religious superstition connected with the plant. East of Shálizán I saw no *Crataegus* or deodar; and in neither Malána nor Zérán gorges did I see any yew. It is noteworthy that large deodar forests exist on the northern face of the Saféd-koh range, notwithstanding the total absence of this tree in these valleys on the southern exposure. The indigenous walnut and *Quercus semecarpifolia* form the main feature of the forests in the Malána and Zérán valleys, from 7000 to 9000 feet, and occasionally as far up as 10,000 feet. That the walnut is wild here is proved both by the position it occupies in the forests and the formation of its fruit, which is quite different in shape from that of the cultivated tree, besides possessing an extremely thick shell with little or no kernel. It is also a significant fact that the natives designate the wild tree and fruit by a Púsbtu term, whereas to the cultivated fruit and tree the usual Persian name is applied. The birch, *Betula Bhojpattra*, is much commoner here than it is further west, and forms thin forests on the northern exposures of the valleys in the interior ranges of these hills—not maintaining its position solely on the ridges, as it does further west in the Shend-toi gorge, a circumstance which gives it its native name in those parts. Although the birch descends as low as 9000 feet, I have never seen it associated with the walnut, as the former is limited to the colder exposures, whereas the walnut prefers the warm nooks and outer valleys. Extending as far west as the Shend-toi at 7000 feet, I this year collected *Corydalis ramosa*, a plant employed medicinally by the natives for the treatment of eye-diseases, simply, I believe, because it has a yellow watery juice, as every plant with a yellow juice seems to be by them considered a sovereign medicine, and all are called indiscriminately

Mamírán. In the birch-forests of the Malána valley, at an elevation of nearly 10,000 feet, *Aralia cachemirica*, an eastern form, was common, and with it *Trillium Govanianum*, *Actæa spicata*, and *Aspidium Filix-femina*—all of which were not collected last year. On the ascent to the Nangrár Pass, at 11,000 feet, I picked up a couple of specimens of *Campanula aristata*. On the pass itself, chiefly, however, on the southern exposure, the main ridge was covered with a dense turf made up mainly of *Kobresia schænoides* and *K. scirpina*; and with them, but also extending to the west base of Mount Sika-rám, keeping to the same altitude, was *Papaver nudicaule*, with its brilliant orange-golden flowers, in great luxuriance. In the same turf, but in hollows where moisture collected, *Polygonum Bistorta* was found in abundance—the typical large-leaved form, as well as intermediate varieties down to a miniature state, though always with a thick distorted rootstock. It was not collected further west. In the Darbán valley, at 8500 feet, with a northern exposure, the vegetation was more of a West-Himalayan type, and corresponded to that met with at Murree at 7500 feet. The ivy was here first noticed supporting itself on the trunks of trees, this habit, no doubt, indicating the presence of more moisture. *Habenaria brachyphylla* was common in rich loam at the roots of some trees. *Rhododendron afghanicum* seems to be limited to the outer parts of the Shend-toi and Darbán valleys.

Vegetation of the Hariáb District.

The ridges of Mount Sika-rám above 8000 feet, where not covered with forest, present an extremely barren aspect, compared with similar heights in the Saféd-koh range, where grasses and green soft herbs and low shrubs form meadows, or what at a little distance look like them; whereas in the Hariáb district the soil is barren, and the herbs and shrubs that do exist are of a hard spinous nature, sparingly scattered over the stony soil. In addition to these spinous forms, *Umbelliferae* are frequently met with; and thus the characteristic Afghan flora becomes more apparent. I here collected:—8 species of *Cousinia*, 4 of which are new; 4 species of *Acantholimon*, all probably new; 6 species of *Onobrychis*, 4 of which are new; 27 species of *Astragalus*, 10 of which are new; 3 species of *Scabiosa*, 1 of

which is new; *Atractylis cuneata*, a true Afghan type, only found previously by Griffith; *Lactuca*, 6 species; *Centaurea*, 4 species; *Cnicus*, 4 species; *Artemisia*, 7 species; a new *Tanacetum*; *Gypsophila Stewartii*; and the following *Umbellifera*—*Angelica Strattoniana*, a new species, three new species of *Pleurospermum*, and *Ferula communis*. *Onobrychis cornuta* and *O. spinosissima*, together with some species of *Astragalus*, *Acantholimon*, and *Gypsophila* give a distinctive feature of their own to the country, due to their forming thorny masses of various sizes, from that of a hedgehog to 4 feet in depth and 18 feet in circumference—extremely pleasant to look upon when covered with a mass of soft green leaves and bright blossoms.

Miscellaneous.

The fig, *Ficus Carica*, is cultivated in some of the gardens at Shálizán, producing fair fruit. I met with a form of the cultivated pea, *Pisum sativum*, this year, both in the Hariáb and Kuram districts, grown as a field-crop; it resembled the small pea cultivated in Ladák. The stems and leaves of *Angelica Strattoniana*, *Ferula communis*, *Pleurospermum*, n. sp., and *Codonopsis* are eaten raw, as well as cooked, as relish to their bread by the natives. The leaves of *Othonnopsis intermedia* are commonly used as a substitute for soap. A yellow dye is extracted from the roots of *Jasminum revolutum*. The stocks of guns and pistols are usually made of walnut-wood; bows, chiefly employed for shooting with pellets, from the wood of *Euonymus*. I have only seen a few arrows; and these were made from the reeds of *Arundo Donax*. The roots and leaves of *Codonopsis* are made into poultices, and employed in the treatment of bruises, ulcers, and wounds. The crushed rootstocks of *Euphorbia Thomsoniana* are employed by the natives for washing their heads, and, when boiled, used as a purgative and emetic.

The following enumeration includes not only the additional species collected in 1880, but also notes on and the names of many of those collected in 1879, the names of which were either not determined or incorrectly given in my former paper. The numbers belonging to the two collections are always distinguished, those of 1879 having that year within parentheses, and separated from those of 1880 by the sign =.

LIST OF THE PLANTS COLLECTED, WITH NOTES AND
DESCRIPTIONS OF NEW SPECIES, ETC.

DICOTYLEDONES.

POLYPETALÆ.

RANUNCULACEÆ.

225, 340, = 733 (1879). *Clematis Robertsiana*, *Aitchison & Hemsley in Journ. Linn. Soc.* xviii. p. 29. (Plate II. figs. 1-5.)

Adde: Achenia matura sericea, longe caudata, caudis longe plumosis.

415. *C. orientalis*, *Linn.*, var. *obtusifolia*, *Hook. fil. & Thoms.*

In the Darbán gorge, on rocks, at an altitude of 7000 feet.

159. *Thalictrum minus*, *Linn.*, var. *majus*.

In the Hariáb district, on embankments on the sides of fields where there is moisture, at an altitude of from 7000 to 8000 feet.

186, 237, 332, = 463 (1879). *Anemone tetrasepala*, *Royle*.

Saféd-koh range, on the margins of forests, and in open grassy slopes on the inner hills, at an altitude of from 7000 to 10,000 feet. Not in the Hariáb district. In some localities it grows to fully 3 feet in height.

598 (1879). *Ranunculus* (§ *Euranunculus*) *afghanicus*, *Aitchison & Hemsley*, n. sp. Aff. *R. Aucherii*, foliis radicalibus reniformibus vel fere orbicularibus 2-5-fidis, lobis crenatis, foliis caulinis paucis 3-partitis, segmentis linearibus, acheniis valde compressis orbicularibus parcissime pilosulis breviter uncinato-rostratis.

Herba perennis, radicis fibris carnosis, cylindricis, fasciculatis. *Caules* erecti, 4-6 poll. alti, appresse pilosi, striati, sæpissime ramosi, 3-6-flori, ramis divaricatis. *Folia* radicalia longiuscule petiolata, glabra vel glabrescentia, crassiuscula, reniformia vel orbicularia, 1-1½ poll. diametro, 2-5-fida, lobis irregulariter crenatis; caulina 2-3, parva, sessilia, 3-partita, segmentis linearibus. *Flores* lutei, circiter 1 poll. diametro; sepala lata, obtusa, striata, pilosa, patentia, nec reflexa, margine hyalina colorata; petala 5, orbiculari-obovata, squama basilari orbiculari-obovata, magna; stamina numerosa. *Achenia* (matura non visa) numerosa, secus receptaculum elongatum cylindricum nudum inserta, parcissime pilosula, valde compressa, orbicularia, breviter uncinato-rostrata.—*R. divergens*, *Aitch. in Journ. Linn. Soc.* xviii. p. 30, non *Jord.*

In meadows, Karchátal, 10,500 feet. Not met with during the expedition of 1880.

93, 115. *Ranunculus Aucheri*, Boiss. in *Ann. Sc. Nat.* 1841, p. 351; *Fl. Or. i.* p. 34. Forma nana, 3-4-pollicaris.

Mount Síka-rám, June, on stony ground, at an altitude of from 11,000 to 13,000 feet. The plant varies in size from 3 to 9 inches. The sepals and petals persist; the latter increase in size, change in colour from a bright yellow to a livid brown, then crumpling up form a ball, the portions of which fall off on the fruit coming to maturity.

311. *R. aquatilis*, Linn.

Kuram district, in pools of water near the river, in water-courses, and flooded rice-fields, at an elevation of 5000 feet.

354. *R. Cymbalaria*, Pursh.

Péwár-marg; very local, on grassy slopes near springs of water, at 8000 feet.

123. *R. demissus*, DC.

On Mount Síka-rám, June, at an altitude of 13,500 feet.

116, =955 (1879). *Oxygraphis Shaftoana**, Aitch. & Hemsley, n. sp. (Plate III. figs. 1-5.) Foliis 3-partitis, scapo sæpissime 1-bracteato, petalis 5-8 latis.

Herba perennis, scaposa, glaberrima, 3-4 poll. alta, radicis fibris carnosis, 1-3 poll. longis. *Scapus* solitarius, 1-florus, 1-bracteatus, bractea integra vel trifida. *Folia* (primum subtus purpurea) longe petiolata, crassa, sub-carnosa, 3-partita, segmentis obovatis vel fere orbicularibus, usque ad 6 lineas latis, integris vel irregulariter dentatis. *Flores* lutei, circiter 1 poll. diametro; sepala persistentia, inæqualia, oblongo-orbicularia, obtusa vel rotundata; petala 5-8, late obovata, striata, persistentia. *Achenia* immersa, lævia, breviter rostrata.

Mount Síka-rám; on shingly débris, at an elevation of from 11,000 to 14,000 feet, very profuse. The petals are at first of a bright *Ranunculus*-yellow; these, with the sepals, increase in size, change colour to a yellow-green, then brownish, and lastly to a purple hue, wither, form into a ball round the fruit, and fall off with the fruit as it ripens.

802 (1879). *Isopyrum uniflorum*, Aitchison & Hemsley, n. sp. Aff.

I. cæspitosi, sed foliorum segmentis obovatis trifidis, floribus vix 6 lineas diametro, petalis suborbicularibus, stylis fere rectis, ovariis epapillosis. *Herba* cæspitosa, glaberrima, caudice petiolis vetustis dense vestito. *Scapus*

* Named after Capt. E. D. Shafto, R.A., who was killed at Kabul on the 16th October, 1879, by the explosion of part of the Kabul magazine.

1-florus, 2-bracteatus, folia vix superantes. *Folia* graciliter petiolata, 2-ternata, segmentis parvis, obovatis, sæpissime 3-fidis. *Flores* cæruleo-flavi, vix 6 lineas diametro; sepala ovato-orbicularia; petala concava, suborbicularia; ovaria glabra, stylis fere rectis. *Carpella* circiter 7, matura ignota.

In the Shend-toi valley, on the marble rocks, in July, at an elevation of 10,000 feet.

326. *Aquilegia* sp.

Shend-toi gorge, in the forest, at 8000 feet.

219, 362, =732 (1879). *A. pubiflora*, *Wall.*, var. ? *humilior*, *Aitch. & Hemslley*. Floribus majoribus, calcaribus longioribus fere rectis.

Along the Saféd-koh range westwards to the base of Mount Síka-rám, in crevices of rocks, at an altitude of from 10,000 to 12,000 feet.; flowers in June and July.

A very dwarf variety with extremely large handsome flowers.

263. *Actæa spicata*, *Linn.*

In the Malána valley, and on the inner hills of the Saféd-koh range, in birch forests, at an elevation of 9000 to 10,000 feet.

MENISPERMACEÆ.

513. *Cocculus Leæba*, *DC.*

From Thal to Kuram, in the arid hills on the face of conglomerate cliffs, at an elevation of 4000 feet. Common.

BERBERIDEÆ.

185. *Berberis vulgaris*, *Linn.*

Shend-toi gorge, in the woods at 9000 feet.

The rest of my specimens of *Berberis* are varieties of *Berberis vulgaris*, *L.*, and may be separated under three heads:—

a. Including the following numbers of distribution, 141, 224, =499 (1879), distinguishable from the others by the flowers being in racemes, and in having an oval long fruit, with a sessile stigma.

b. Numbers 49, =176, 176₂, 176₃, 176₆ (1879), including the specimens named *B. orthobotrys*, *Bienert*, ex herb. Bunge, last year; in which the flowers are subcorymbose, the fruit oval, and the stigma sessile.

c. Including the numbers 171, 176, 176₄, 252, 273, and =490 (1879). This includes the specimens that I named last year

B. calliobotrys, Bienert, ex herb. Bunge (of which I have not seen the fruit). The fruit of my specimens is spheroidal, and has the stigma supported on a distinct style.

PAPAVERACEÆ.

139, 280, 357. *Papaver nudicaule*, Linn.

From the Nangrár pass westwards along the Saféd-koh range to Mount Siká-ram, in the meadows on the ridges of the northern slopes, at an altitude of from 10,000 to 11,500 feet. Extremely abundant.

114, =95, 121 (1879). *Corydalis Griffithii*, Boiss.; *C. rutæfolia*, Hook. fil. & Thoms., non Sibth.

In the Hariáb district and on Mount Sika-rám, at an elevation of from 7000 to 12,500 feet.

At the lower elevation growing near the roots of trees and bushes, where it flowers long before the bushes have any leaves; flowers salmon-colour tipped with dark purple.

201, 289, =789 (1879). *C. pulchella*, Aitchison & Hemsley, n. sp. (Plate IV. figs. 1-3.) Foliis iis *C. meifoliae* simillimis sed glaucis, racemis laxioribus, bracteis amplis 3-pinnatisectis, calcarum quam petala paullo longiore, petalo postico aptero, pedicellis fructiferis insigniter recurvis.

Herba perennis, glaberrima, radice elongato-claviformi. *Caules* erecti, usque ad 10 poll. alti, basi tantum ramosi. *Folia* glauca, longiuscule petiolata, ovato-oblonga, 3-pinnatisecta, usque ad 6 poll. longa, segmentis ultimis brevibus angustissimis. *Flores* lutei, angusti, 6-8 lineas longi, laxiuscule racemosi; racemi 10-20-flori, bracteati; bracteæ elegantes, 6-12 lineas longæ, 2-pinnatisectæ, segmentis filiformibus; sepala minuta, dentata; petalum posticum galeatum, dorso apterum, calcarum curvo paullo brevius. *Capsula* oblonga, pedicellis arcu recurvis sæpius longior; semina 2-seriata, atra, nitida.—*C. meifolia*, Aitch. in Journ. Linn. Soc. xviii. p. 32, non Wall.

Along the Saféd-koh range, in the shingle between the boulders on the sides of alpine stream-beds, at an altitude of from 9000 to 11,000 feet.

The root of what seems to be one plant is made up of several pliant fibrous bundles all twisted round each other like the several strands of a rope. This was also brought to my notice, by the natives, in a species I collected near Dalhousie in the Western Himalaya at 8000 feet.

298, 324. *Corydalis ramosa*, Wall., var.

Kuram district, between boulders in the dry beds of streams, at 7500 to 8000 feet; not in the Hariáb.

CRUCIFERÆ.

74, 385. *Arabis taraxacifolia*, T. Anders.

From the Péwár to the base of Mount Síka-rám, at an altitude of from 8000 to 9000 feet; July.

120 (1879). *A. alpina*, Linn. ?

Ali-khél, 7000 feet.

Draba alpina, Linn.

After a careful examination of the large amount of material at my disposal, I have come to the conclusion that the whole of it may be regarded as *D. alpina*, Linn., under two forms:—

a. A rough, harsh plant, with thick, coarse leaves and large, but few, flowers in each corymb. This would include numbers 99, 126, =825, 1, 2, 3, 4, 6 (1879).

b. A slender, soft plant, with small, numerous flowers in a lax corymb. This includes numbers 112, 120, 122, 124, 126 a, b, and 464, 5 (1879).

Under a may be included the specimens of Griffith's plants, No. 1368, Cat. Distrib., collected at Koh-i-baba at from 14,000 to 15,000 feet, and named *D. Armenia*, Boiss.

206 (1879). *Conringia*, sp. Is *Conringia orientalis*, Andrz.

475 (1879). *Erysimum*, sp. Is *Erysimum asperulum*, Boiss. ?

532 (1879). *Pachypterygium*, sp. Is *Pachypterygium brevipes*, Bunge.

119=597 (1879). *Chorispora*, sp. Is *Chorispora Bungeana*, Fisch. & Mey.

Hariáb district, on the exposed ridges of hills, at an elevation of from 11,500 to over 12,000 feet.

The natives collect and eat the pods, which in flavour much resemble those of *Raphanus sativus*, L., var. *caudatus*.

The typical plant is from Altai, and differs from the Afghan specimens in the pods being much less constricted between the seeds.

CAPPARIDÆ.

517. *Polanisia viscosa*, DC.

Between Mandúri and Chapri, August.

320. *Capparis spinosa*, Linn.

Common from Thal to Kuram, on conglomerate rocks, from 2500 to 4000 feet.

VIOLARIEÆ.

86, 391, =500, 119 (1879). *Viola Patrinii*, DC., vars.

Hariáb, in pine forests, at an altitude of from 8000 to 9000 feet.

CARYOPHYLLEÆ.

1, 27, 173, 547, =638 (1879). *Dianthus crinitus*, Smith, vars.

From Thal to the Kuram district, on stony ground; but most profuse on the shingle plains of Kuram. Flowers white, sometimes roseate.

167, 351, 396, =938, 856 (1879). *D. fimbriatus*, Bieb.

Hariáb district, profuse on stony ground at an altitude of from 8000 to 9000 feet. Flowers white to an orange-red.

7, 31, 59, 352, =225, 225 a, 255 (1879). *Gypsophila Stewartii*, T. Thoms.

From the plains of Kuram westward to the Hariáb district, Mount Sika-rám, and Serátigah, from 4000 to over 10,000 feet in altitude.

The plant varies greatly in appearance, according to the altitude at which it grows: on the Kuram plains it grows very close and compact in dense clusters, which early in the season, when they are bright green, look like clumps of moss; at the higher altitudes it forms loose cushions from 6 to 8 inches in depth, and quite loses its moss-like appearance.

473 (1879). *Silene*, n. sp.?

From the village of Péwár to Ali-khél, at an altitude of 6000 to 7500 feet; June.

182, 212, 412, =443 (1879). *Lychnis* (§ *Melandrium*) *cabulica*, Boiss.

The specimen noted as *L. sp.*, near *macrorhiza*, Royle, is probably merely a stunted form of this.

288. *Cerastium Thomsoni*, Hook. fil.

On the Zérán pass from 11,000 to 12,000 feet, profuse; flowers large, white.

Stellaria glauca, Linn.

Collected by Major Collett (no. 96) on the Saféd-koh.

555 (1879). *Stellaria Kotschyana*, Fisch.

Hariáb district, not uncommon in pine forests, at 7000 feet; June to August.

Arenaria Griffithii, Boiss.

I have no doubt now that my specimens of 1879 are this plant.

ELATINEÆ.

497. *Bergia æstivosa*, Wight & Arn.

Between Alizai and Mandúri, on saline clay soil, forming a dense low scrub.

HYPERICINEÆ.

315, = 65 (1879). *Hypericum cernuum*, Roxb., var.

Flowers bright yellow, and half the size of the type.

613 (1879). *H. perforatum*, Linn.

MALVACEÆ.

426. *Abutilon Avicennæ*, Gaert.

Kuram, August.

604. *A. bidentatum*, Hochst.

Between Thal and Kuram, August.

541. *Hibiscus Solandra*, L'Hér.

At the north-west base of Mount Tór-gbar near Thal, above 2000 feet.

474. *H. Trionum*, Linn., var.

Between Shinak and Badish-khél, in rice-fields.

Has quite a different habit from the type, being an erect plant.

462. *Gossypium herbaceum*, Linn.

Cultivated from Thal to a little west of Kuram, but not above 4000 feet.

TILIACEÆ.

514. *Grewia populifolia*, Vahl.

From Thal to near Badish-khél, not above 3000 feet; flowers white.

512. *G. salvifolia*, Heyne.

From Mandúri to Chaprí, not above 3000 feet. Forms a rather large, woody bush over 12 feet in height; flowers orange-yellow.

520. *Grewia villosa*, Willd.

At the south-west base of Mount Tór-g'har, near Thal.

A very gregarious shrub, recognized at once by its large, villous, crustaceous fruit.

424, 476. *Corchorus olitorius*, Linn.

Occasional, from Thal to Kuram.

527. *C. trilocularis*, Linn.

Occasional from Thal to Kuram.

ZYGOPHYLLÆ.

428. *Tribulus terrestris*, Linn.

From Thal to Shálizán, on dry stony ground, common.

GERANIACEÆ.

217, 346, =600, 836, 878 (1879). *Geranium collinum*, Bieb.

Saféd-koh range and Hariáb district, amongst turf in swampy ground near springs, at an altitude of from 8000 to 10,000 feet. Flowers rose to rose-purple, sometimes white; roots carrot-colour, employed medicinally.

299, =1005 (1879). *Impatiens amphorata*, Edgew.

In the interior of the Saféd-koh range, at an altitude of 8000 to 10,000 feet. Flowers rose-colour, with the spur light yellow; stems glass-like, semitransparent; common; July and August.

45, 172, 347, =653 (1879). *I. brachycentra*, Kar. & Kir.

In the Kuram and Hariáb districts, in dry beds of streams, at an altitude of from 6000 to 8000 feet. Flowers very minute, white, produced during the heat of summer.

297, =587 (1879). *I. Lehmanni*, Hook. fil. & Thoms. Capsula linearis, gracilis, fere pollicaris, oligosperma.

Kuram district, on the stony margins of streams, at an elevation of from 6000 to 8000 feet, ascends to the lower limit of *I. amphorata*, Edgew., but never mixes with it. Flowers purple; stems opaque. A very common plant.

RHAMNÆ.

507. *Zizyphus Nummularia*, Wight & Arn.

From Thal to Kuram, up to 4000 feet.

It is usually met with as a spreading woody shrub, but occasionally forms a small tree. At Kuram it is found associated with *Z. vulgaris*, Lamk.

491. *Zizyphus oxyphylla*, *Edgew.*

Common along the banks of the Kuram river and its tributaries as far as Shinak, up to an altitude of 3000 feet.

It occurs as a large shrub, and in many cases it is almost arborescous.

106, 107, =915 (1879). *Rhamnus persica*, *Boiss.* Forma alpina, nana, disco glabro.

Saféd-koh range, at an altitude of 13,000 feet.

This seems to be an alpine form of *R. persica*, extending eastward to Garwhal.

319. *Sageretia Brandrethiana*, *Aitch.*

From Thal to Kuram, up to an altitude of 4000 feet.

759 (1879) is an extremely glabrous form of the same species.

SAPINDACEÆ.

853 (1879). *Acer*, sp.

Seems to be a variety of *A. monspessulanum*, *Linn.*

605. *Dodonæa viscosa*, *Linn.*

From Thal to the hills south of the Kuram river opposite Kuram, up to an altitude of 5000 feet.

400, 396 (1879). *Staphylea Emodi*, *Wall.*

The bark on the young stems is marked with splashes of white on a dark olive-green ground, resembling the markings on the skin of a snake; hence sticks of this shrub are carried by the natives as a protection against snakes. The same protective power is ascribed to them along the whole frontier, through Hazára to Kashmir, where they are similarly employed. As walking-sticks they are useless, owing to their being hollow and the wood very brittle.

ANACARDIACEÆ.

607, =233, 342 (1879). *Rhus Cotinus*, *Linn.*38 (1879). *Pistacia integerrima*, *J. L. Stewart?*606, =234 (1879). *P. mutica*, *Fisch. & Mey.*

The nuts are roasted and eaten.

17, 361 (1879). *P. mutica*, *Fisch. & Mey.*, var. *cabulica*, *Eng.*

=nos. 1268, 1269 Griffith, 1072 Stocks, 126 Bellow, in herb.

Kew.

528 (1879). *P.* sp.

Is near *P. Lentiscus*, *Linn.*

LEGUMINOSÆ*.

545. *Argyrolobium roseum*, *Jaub. & Spach.*

From Tór-ghar to Chaprí, common; closely appressed to the ground.

310. *Lotus tenuifolius*, *Reich.*

On the banks of the Kuram river, amongst pasturage, at an altitude of 4000 feet.

539. *Cyamopsis psoraloides*, *DC.*

Common between Tór-ghar and Chaprí.

522. *Tephrosia pauciflora*, *Graham.*

At Thal, growing amongst shingle; September.

453, 460. *Sesbania aculeata*, *Pers.*

Common from Thal to Kuram, in rice-fields, August.

238, 710 (1879). *Astragalus* (§ *Hypoglottis*) *kuramensis*, *Baker*, in *Journ. Linn. Soc.* xviii. p. 46. (Plate V. figs. 1-5.)

101, 373. *Astragalus* (§ *Acanthophaea*) *Ajfreidii*, *Aitch. & Baker*, n. sp. Suffruticosus, nanus, ramosissimus, pulvinatus, foliis densissimis pilis albidis hispidis adpressis tenuiter vestitis, stipulis minutis deltoideis, rhachibus pungentibus vetustis persistentibus, foliolis 2-3-jugis strictis linearibus complicatis apice induratis, floribus paucis ad axillas foliorum subsessilibus solitariis, calycis dentibus lanceolatis, quam tubus oblongus parce pilosus 3-4plo brevioribus, vexillo aurantiaco glabro quam calyx duplo longiore, legumine oblongo sessili uniloculari obscure piloso 3-4-spermo.

Suffrutex pulvinatus, radice elongata fusiformi lignosa, caulibus densissime aggregatis dichotome ramosis, 2-3 poll. longis, deorsum rhachibus duris ascendentibus foliorum delapsorum præditis. *Folia* novella densissima, ascendentia, 9-12 lin. longa, stipulis minutis deltoideis basi solum connatis, foliolis erecto-patentibus strictis, 2-3 lin. longis, facie canaliculatis. *Calyx* pallide viridis, 4 lin. longus, pilis adpressis albidis tenuiter vestitus, dentibus lanceolatis basi deltoideis 1-1½ lin. longis. *Corolla* aurantiaca, vexillo oblongo unguiculato, 8 lin. longo, 2 lin. lato, alis oblanceolatis, quam vexillum distincte brevioribus, carina 6 lin. longa, alis brevioribus. *Legumen* sessile, oblongum, uniloculare, 4-5 lin. longum, seminibus 3-4 griseo-brunneis transversaliter oblongis.⁹

Remarkable for its dwarf, densely tufted habit, very crowded leaves with pungent points both to the rhachises and leaflets, and few flowers not protruding out of the dense masses of stems and foliage.

On the spurs of Mount Síka-rám and the Larkarai pass, at an altitude of from 10,000 to 12,000 feet. Flowers greenish yellow.

* For the identification of the Leguminosæ and the description of the new species, I am indebted to Mr. J. G. Baker, F.R.S.

This plant very much resembles the furze (*Ulex*) in miniature; it is not very common, or it is easily overlooked, as I did not collect it during 1879.

25, = 167 (1879). *Astragalus* (§*Calycophysa*) *congestus*, *Baker*, n. sp.

Fruticulosus, nanus, ramosissimus, foliis densissimis dense pilosis, rhachibus pungentibus vetustis persistentibus, stipulis magnis petiolo adnatis apicibus liberis deltoideo-cuspidatis, foliolis parvis lanceolatis, 4-6-jugis, erecto-patentibus, racemis copiosis congestis sessilibus axillaribus, bracteis scariosis deltoideis persistentibus quam calyx duplo brevioribus, calycis pilosi dentibus linearibus, quam tubus triplo brevioribus, petalis rubro-purpureis breviter exsertis, legumine parvo oblongo uniloculari dispermo.

Suffrutex ramosissimus, pulvinatus, caulibus dense aggregatis 3-4 poll. longis deorsum rhachibus pungentibus foliorum vetustorum ascendentibus armatis. *Folia* novella 9-12 lin. longa, stipulis 3-4 lin. longis dimidio inferiore petiolo adnatis, rhachibus pungentibus, foliolis crebris erecto-patentibus firmulis, $1\frac{1}{2}$ -3 lin. longis, utrinque dense breviter pilosis. *Racemi* copiosi, congesti, sessiles, 4-8-flori, bracteis scariosis persistentibus $1\frac{1}{2}$ -2 lin. longis. *Calyx* floriferus 3-4 lin. longus, tubo magno oblique oblongo pallido breviter piloso post anthesin persistente valde accreto, dentibus parvis plumosis basi dilatatis. *Corolla* $4\frac{1}{2}$ -5 lin. longa, rubro-purpurea, petalis subæquilongis, vexillo glabro obovato-unguiculato 2 lin. lato. *Legumen* sessile, oblongum, 2 lin. longum, in calycis tubo accrescente scarioso 3 lin. diam. inclusum.

A near ally of *A. susianus*, Boiss., with which it quite agrees in general habit and inflorescence, differing in its laxer vestiture, lanceolate leaflets, shorter calyx-teeth, smaller bracts, &c.

It was distributed, 167 (1879), as *A. susianus*, Boiss., var.

76, 174 (1879). *A. decemjugus*, *Bunge*.

Near Kuram; it was collected for fodder.

61, 80, = 1215 (1879). *A.* (§*Acanthophace*) *Hemsleyi*, *Aitch. & Baker*, n. sp. Suffruticosus, foliorum rhachibus duris pungentibus albo-tomentosis vetustis persistentibus, stipulis minimis petiolo adnatis, foliolis 6-8-jugis minutis obovatis petiolulatis junioribus parce hispidulis adultis calvatis, racemis axillaribus subsessilibus 2-4-floris, bracteis minutis lanceolatis, calycis dentibus linearibus quam tubus oblongus tenuiter albo-hispidulus sesqui vel duplo brevioribus, petalis purpurascensibus quam calyx sesqui longioribus, legumine oblongo glabro uniloculari 3-4-spermo.

Suffrutex nanus, ramosissimus, caulibus lignosis rhachibus foliorum densissimorum pungentibus ascendentibus armatis. *Folia* novella 12-18 lin. longa, rhachi pungente albo-tomentoso; stipulæ 1 lin. longæ, apicibus perparvis patulis deltoideis; foliola crassa, pallide viridia, 1-2 lin. longa, pilis hispidulis albidis presertim ad marginem prædita. *Racemi*

axillares, pedunculis et pedicellis brevibus albo-pilosis. *Calyx* floriferus $2\frac{1}{2}$ -3 lin. longus, tubo oblongo parce albo-hispidulo. *Vexillum* glabrum, oblongo-unguiculatum, $4\frac{1}{2}$ -5 lin. longum; alæ vexillo paulo breviores; carina alis vix brevior. *Legumen* sessile, oblongum, subglabrum, 4 lin. longum.

A near ally of *A. horridus*, Boiss., from which it differs by its much smaller stipules, leaflets with much shorter and fewer hairs, calyx without any black hairs, shorter, less exerted corolla, &c.

In the Hariáb district, common at 7500 feet, occurring in large, flat, circular patches. Flowers greenish, tipped with rose-pink.

283. *Oxytropis glacialis*, Benth.

On meadows at the Nangrár pass, at an altitude of 11,000 feet.

68, 86, 186 (1879). *Onobrychis* (§ *Hymenobrychis*) *dasycephala*, Baker in Journ. Linn. Soc. xviii. p. 48. (Plate VI. figs. 1, 2.)

75, = 512, 484 (1879). *O.* (§ *Hymenobrychis*) *laxiflora*, Baker, n. sp. Herbacea, perennis, pilis brevissimis albidis adpressis ubique prædita, foliis 9-17 ellipticis crassiusculis pallide viridibus, racemis laxis elongatis, bracteis minutis scariosis lanceolatis, calycis dentibus tubo æquilongis, corollæ alis oblanceolatis lilacinis, petalis reliquis pallide luteis pulchre purpureo-venosis distincte brevioribus, legumine plano tenui semiorbiculari late cristato breviter piloso, areolis disci parce spinosis, margine dentibus pluribus parvis deltoideo-cuspidatis armato.

Herba perennis, caulescens, ad collum radice copiose ramosa, caulibus erectis pedibus et ultra firmis teretibus parce ramosis pilis adpressis albidis subtilibus inconspicuis vestitis. *Folia* imparipinnata, 2-4 poll. longa, stipulis parvis deltoideis acuminatis persistentibus, petiolo $\frac{1}{2}$ -1 $\frac{1}{2}$, pollicari, foliis oppositis vel suboppositis breviter petiolulatis planis 4-6 lin. longis. *Racemi* centrales demum semipedales et ultra, pedicellis brevissimis pilosis, bracteis minutis lanceolatis scariosis brunneis persistentibus. *Calyx* brunneus, obscure pilosus, 1 $\frac{1}{2}$ lin. longus, dentibus lanceolatis vel deltoideis, tubo campanulato subæquilongis. *Corolla* glabra, semipollicaris et ultra, vexillo obovato 4-5 lin. lato pallide luteo, venis flabellatis gracilibus purpureis decorato, alis saturate lilacinis concoloribus, petalis reliquis distincte brevioribus, carina truncata 3 lin. lata. *Legumen* circinatum, planum, semiorbiculare, monospermum, disci areolis subhexagonis muris elevatis parce spinosis, cristæ areolis duplo longioribus quam latis muris tenuibus integris, margine corneo brunneo dentibus parvis concoloribus crebris armato.

This is the plant which Dr. Aitchison gathered last year, and which closely resembles *O. heterophylla*, C. A. Meyer, in habit, leaves, and flower. This year he has obtained the pod, which is

that of a different section. Its position in Boissier's sequence of species will be next to *Onobrychis radiata*, Bieb.

Hariáb district, on the artificially raised hillocks around the margins of fields, at an altitude of 7500 feet; very common.

591 (1879). *Vicia hyrcanica*, Fisch. & Mey.

Near Karchátal in the Hariáb district; a weed on cultivated land.

It has large yellow solitary flowers, usually not sessile, and a flattish broad pod like that of *Pisum sativum*. Distributed along with and named *V. sativa*, Linn., under no. 591 (1879).

87. *Pisum sativum*, Linn.

Cultivated as a field-crop in the Kuram and Hariáb districts.

473. *Phaseolus Mungo*, Linn.

Extensively cultivated as a field-crop from Thal to Kuram, and generally so in the Kuram district.

538. *Rhynchosia aurea*, DC.

From Thal to Chaprí, in hot, dry, stony localities; September.

516. *R. minima*, DC.

From Thal to Mandúrí, under 3000 feet. It spreads densely over the surface of the bushes to which it clings, so much so as to completely hide its support.

517. *Dalbergia Sissoo*, Roxb.

From Thal to Badish-khól; occurs as an indigenous timber-tree along the banks of the Kuram river and its tributaries, up to nearly 3000 feet.

I have seen it cultivated, but more frequently as a protected self-sown tree at shrines &c.

ROSACEÆ.

Spiræa brahuica, Boiss.

50, 67. Large-flowered.

144, 248. Small-flowered.

Some of my specimens were taken from much more vigorous plants than those upon which the species was founded. Growing in a more humid climate and under shade, the plant is spineless, and the leaves and flowers are much larger than in the type, the latter being in some cases at least half an inch in diameter. My specimens from the open, dry, stony country possess the small flowers and leaves, with the extremely contorted, spinous branches of the type.

In my distribution of 1879 the two forms were mixed.

245, 295, =804, 422 (1879). *Rubus niveus*, Wall., var. *Aitchisonii*, Hook. fil.

Common in the Kuram district at an altitude of from 6000 to 9000 feet. Fruit orange-red, becoming purplish; good to eat.

200, =765 (1879). *R. purpureus*, Bunge.

Kuram and Hariáb districts, growing amongst large boulders and low shrubs, at the upper limit of trees.

Is a fine rasp-like scrub, having a large orange-red fruit the size of a good bramble, which is fleshy and good to eat.

The remarks under *R. niveus* and *R. purpureus* in my previous paper were transposed, and should stand as above.

41, 158, 178, 274=309 (1879). *Rosa Beggeriana*, Schrenk, var. *a. genuina*, Crépin*. (Plate VII. figs. 1-3.)

This was distributed under 309 (1879) as *R. anserinaefolia*, Crépin, non Boiss.

A common shrub at the western extremity of the Kuram district and throughout the Hariáb, in the vicinity of streams and watercourses; it is also very common near cultivation, where it forms natural hedges along the various channels of irrigation, at an altitude of from 4000 to 9000 feet.

It forms a bush of from 4 to 6 feet in height, the latter in more favoured localities. When in bloom, it is covered with a mass of pure white small flowers. The fruit is little larger than an ordinary pea, at first orange-red, when fully ripe of a deep purple-black. The calyx drops off as soon as the fruit reaches maturity; and the ripe achenes are seen dropping out of the aperture at the extremity of the fruit. The shrub is briar-scented.

This species is employed, as well as *R. Eglanteria* and *R. Ecæ*, the gooseberry, and *Hippophaë*, in forming hedges in the Hariáb district; and is much browsed by cattle, especially goats.

165 (1879). *Rosa Ecæ*, Aitch. (Plate VIII. figs. 1-3.)

Erratum.—At line 11, page 55, vol. xviii. Linn. Soc. Journal, for "achenia villosissima" read "styli villosissimi; achenia primum villosa, pilis demum deciduis."

178 A, 336. *R. Webbiana*, Wall., var. *a. genuina*, Crépin.

Common.

56. *R. Webbiana*, Wall., var. *γ. microphylla*, Crépin.

Common.

* M. Fr. Crépin, Director of the Brussels Botanic Garden, who has made a special study of Asiatic roses, has obligingly communicated his determinations of my Afghan species.

138. *Pyrus Aucuparia*, Gært., var.

On the north-west slopes of Mount Síka-rám, at an altitude of 11,500 feet.

Has much larger flowers than the type. No fruit collected.

277. *Cotoneaster tomentosa*, Lindl.

In the Kuram district, from 7000 to 8000 feet; in fruit, July.

Occurs as a small tree; and my specimens would unite the two species *C. tomentosa*, Lindl., and *C. bacillaris*, Wall.

SAXIFRAGEÆ.

133. *Saxifraga Stracheyi*, Hook. fl. & Thoms.

Mount Síka-rám, on overhanging rocks, at an altitude of 11,000 feet.

383 (1879). *S.* (§*Kabschia*) *afghanica*, Aitchison & Hemsley in Journ. Linn. Soc. xviii. p. 56. (Plate IX. figs. 6-12.)

CRASSULACEÆ.

538 (1879). *Cotyledon* (§*Umbilicus*) *tenuicaulis*, Aitchison & Hemsley in Journ. Linn. Soc. xviii. p. 57. (Plate X. figs. 1-5.)

456, 937 (1879). *Sedum adenotrichum*, Wall.

My specimens differ from the type in having glandular hairy leaves.

851 (1879). *S. heterodontum*, Hook. fl. & Thoms.

My plant is this, and not *S. asiaticum*, Decne., for which it was distributed last year.

469 (1879). *S. pachyclados*, Aitchison & Hemsley in Journ. Linn. Soc. xviii. p. 58. (Plate X. figs. 6-10.)

LYTHRARIÆ.

468. *Ammannia baccifera*, Linn.

Common between Badish-khél and Walli Mahomed-kalla, in rice-fields.

417. *A. pentandra*, Roxb.

Sháлизán, in rice-fields, profuse.

430. *Lythrum Salicaria*, Linn.

Kuram district, in wet localities, such as rice-fields, ditches, and watercourses, at an altitude of from 3000 to 5000 feet.

It extends westwards from Kulu (*Edgew.*), Kashmir (*T. Thoms.*), Hazara (*Falc.*), to Afghanistan (*Griffith*), North Africa, Europe, North America, and is also found in Siberia.

***Punica granatum*, Linn.**

Kuram district, from 3000 to 5000 feet. The pomegranate is indigenous, and it is also cultivated for its fruit.

ONAGRARIÆ.

***Epilobium minutiflorum*, Haussk. MSS. in herb. Kew.**

My plants nos. 348 and 651 (1879) (named *E. tetragonum*, Linn.), and my plant, without a number, collected at Shálizán, June 1879, all correspond exactly to the specimens of *E. palustre*, Linn., in Kew herbarium that have been named *E. minutiflorum* by Haussknecht.

The flowers in my specimens change in colour from white to rose.

939 (1879). ***E. roseum*, Schreb. ?**

Regarded as *E. roseum*, Schreb., var. *anagallidifolium* (Lamk. sp.) by C. B. Clarke, Fl. Brit. India; but in Kew herbarium it has been named *E. pseudo-obscurum*, Haussk., MSS.

651 A (1879). ***E. tetragonum*, Linn.**

Is not that plant, but corresponds to no. 29714 herb. C. B. Clarke, named *E. palustre*, Linn., which is designated a new species, Haussk. MSS. in Kew herbarium; and with it I identify my plant no. 300 of 1880.

CUCURBITACÆ.

498. ***Zehneria umbellata*, Thwaites.**

Thal to Badish-khél, from 2000 to nearly 4000 feet.

Characteristic of *Nannorrhops* scrub.

FICOIDEÆ.

528. ***Orygia decumbens*, Forsk.**

Near Thal, north-west base of Mount Tór-ghar, a little above 2000 feet, profuse.

UMBELLIFERÆ.

929 (1879). ***Bupleurum*, sp. Aff. *B. baldensis*, β . *olympici*, Boiss., dif-
fert caulibus numerosis recumbentibus, floribus luteis.**

This may prove the type of a distinct species.

152. ***Carum meifolium*, Bieb., var. *divergens*, Boiss. et Huet.**

Last year I named 478 (1879) *C. bulbocastanum*, Koch, var., which it is not, but is this plant.

313. ***Sium angustifolium*, Linn.**

Kuram district, in rice-fields and ditches, at 4000 feet, common.

846 (1879). *Pimpinella tripartita*, Aitchison & Hemsley, n. sp. (Plate XI. figs. 1-4.) Humilis, glaberrima, glauca, foliis parvis crassis, radicalibus longe petiolatis tripartitis (infimis fere vere trifoliolatis), segmentis sæpissime trifidis, umbellis sæpius triradiatis, fructu immaturo glabro.

Herba perennis, humilis (specimina nostra 6-9 poll. alta), prorsus glaberrima, glauca, radice crassiuscula valde elongata, caulibus gracilibus, divaricatis pauciumbellatis. *Folia* crassa, circumscriptione orbicularia, tripartita (infima subtrifoliolata, foliolis petiolulatis); segmenta sæpissime trifida, lobis rotundatis vel obtusis; caulina superiora pedata, lobis linearibus; inferiorum lamina ad 1 poll. diametro, petiolis usque ad tripollicaribus. *Umbellæ* compositæ, plerumque 3-radiatæ; radii 4-9 lineas longi, graciles; bracteæ nullæ; umbellulæ paucifloræ, ebracteolatæ, floribus minutis. *Fructus* immaturus glaber.

Dré-kalla, amongst the broken débris of stone, at 9000 feet, very rare; July.

294. *Chærophyllum villosum*, Wall.

No. 772 (1879) is not *C. reflexum*, Lindl., but is this species.

Kuram district, amongst grass, at from 9000 to 11,000 feet.

743, 744 (1879). *Pleurospermum* (§ *Hymenolæna*) *pulchrum*, Aitchison & Hemsley in *Journ. Linn. Soc.* xviii. p. 63. (Plate XII. figs. 1-7.)

398. *Pleurospermum*, n. sp.?

Material insufficient for description.

Mount Sika-rám, under the shelter of enormous rocks, at an altitude of from 10,000 to 11,000 feet, growing in rich loamy soil permeated by spring-water.

Occurs in extensive beds; and is much sought after and eaten by the natives in its fresh green state.

136, 394, = 821 (1879). *Angelica Strattoniana**, Aitchison & Hemsley, n. sp. (Plate XIII. figs. 1-7.) Glaberrima, radice maxima, caulibus pluribus ad bipedalibus, foliis crassis subcarnosis bi- v. triternatis, segmentis vel foliolis petiolulatis orbiculari-cordatis denticulatis.

Herba perennis, graveolens, omnino glaberrima, radice usque ad 3-4 ped. longa (interdum forsán ultra) et 2 poll. crassa. *Caules* plures, cavi, subaphylli, 1-2 ped. alti, sæpe 3-umbellati, umbellis lateralibus minoribus, sæpe sterilibus. *Folia* breviter petiolata, circumscriptione triangularia, bi- v. triternata, 6-12 poll. longa lataque, in vivis glauco-viridia; segmenta vel foliola petiolulata, crassa, subcarnosa (in siccis coriacea), orbiculari-cordata, nonnulla late oblonga, semi- ad sesquipoll. diametro, dentata vel denticulata, utrinque (in siccis) conspicue venosa. *Umbellæ* compositæ, maximæ usque ad 15-radiatæ et 5 poll. diametro; radii umbellarum terminalium sæpe 1½-2½ poll. longi; bracteæ breves, lineares,

* Named after Capt. E. Stratton, H.M. 22nd Foot, who was killed in action at Kandahar on Sept. 1, 1880.

cito deciduæ; umbellulæ multifloræ, pedicellis gracilibus, brevibus; bracteolæ parvæ, lineari-subulatæ. *Flores* parvi, luteo-virides; calycis dentes obsoleti; petala æqualia, ovato-acuminata, apice inflexa; discus majusculus, margine undulatus; styli per anthesin erecto-patentes, demum reflexi. *Fructus* (maturus non visus) oblongus, 4-5 lineas longus, dorso compressus, jugis primariis alatis, lateralibus late alatis; valleculæ univittatæ; commissura bivittata.

From Mount Sika-rám westwards to Mount Serátigab, growing out of the clefts of rocks, at from 9000 to 13,000 feet.

Used as a vegetable by the natives, in its raw state as well as cooked. Distributed as *Ligusticum* sp. in my former collection.

81. *Ferula communis*, Linn.

In the Hariáb district, under the shelter of trees or rocks, on the hills, at an altitude of 10,000 feet. Occurs as an occasional plant, and not, as is usual with the Umbelliferæ of these parts, in great patches.

234, 292, =738, 848, 930, 948 (1879). *Heracleum propinquum*, Aitchison & Hensley, n. sp. Aff. *H. Thomsoni*, sed differt foliis glabris, segmentis angustioribus, vittis omnibus usque ad basin attingentibus.

Herba perennis, fere glabra, caulibus gracilibus, pauciramosis, sæpius 1-1½ ped. altis, interdum humilioribus. *Folia* gracilia, petiolata, rigida, glabra, circumscriptione ovato-oblonga, usque ad 6 poll. longa, bipinnata, segmentis ultimis angustis 3-5-lobatis, nonnullis integris acutis.

Umbellæ compositæ (in speciminibus depauperatis interdum simplices) maximæ 12-15-radiatæ et 2 poll. diametro; radii puberuli, usque ad sesquipoll. longi, sed plerumque breviores; bractææ paucæ, lineares, basi dilatatæ, scariosæ; umbellulæ multifloræ, pedicellis brevibus fere filiformibus; bracteolæ lineares, puberulæ, pedicellos æquantes vel excedentes. *Flores* parvi, albi; calycis dentes obvii; petala inæqualia, exteriora alte obcordata; styli longiuseculi, per anthesin patentes, dein arcte recurvi. *Fructus* puberulus, oblongo-ellipticus, circiter 3 lineas longus, anguste alatus, marginatus; valleculæ univittatæ; commissura bivittata, vittis omnibus linearibus usque ad basin attingentibus.

Kuram and Hariáb districts, at an altitude of from 9000 to 12,000 feet. Akrobat pass, Griffith 1014 a, and 2622 Kew distribution. Distributed as *Pucedanum* sp. in my former collection.

760 (1879). *H. leucocarpum*, Aitchison & Hensley, n. sp. Sparse pilosulum, foliis ampliusculis (ternatis?) bipinnatifidis vel infra bipinnatifiditatis, segmentis ultimis oblongis subduplicato-dentatis, umbellis circiter 25-radiatis, fructu obovato-oblongo late circumalato, ala alba, vittis omnibus linearibus semen æquilongis.

Herba perennis, sparse pilosula, caule crassiusculo, sulcato, 3-4 ped. alto, apice pauciramoso. *Folia* tenuia, ampliuscula (basi ternata, segmentis

bipinnatifidis -partitisque ?), parte superiore bipinnatifida, infra medium bipinnatifida, segmentis ultimis oblongis, acutis, subduplicato-dentatis, 4-6 poll. longis. *Umbellæ* compositæ, maximæ ad 25-radiatæ et 8 poll. diametro; radii usque ad 4 poll. longi; bracteæ nullæ; umbellulæ multifloræ, floribus parvis, albis, graciliter pedicellatis; bracteolæ paucæ, lineares; calycis dentes obvii; petala inæqualia, exteriores late obovata; styli per anthesin suberecti, demum reflexi. *Fructus* obovato-oblongus, 5-6 lineas longus, dorso leviter puberulus, late circumalatus (pericarpio infra semina longe producto), ala tenui, alba, glabra; valliculæ univittatæ; commissura bivittata, vittis omnibus linearibus, fere æquilongis, semini æquilongis.

Kuram district, sides of fields, near water, at 7000 feet; July.

ARALIACEÆ.

267. *Aralia cachemirica*, Decne.

In the Malána valley, under birch forests, along with *Actæa* &c., at an altitude of from 9000 to 10,000 feet.

GAMOPETALÆ.

RUBIACEÆ.

Aitchisonia, Hemsley, *Pædericarum* genus novum. *Flores* dimorphi.

Calycis limbus fere obsoletus. *Corolla* elongato-infundibularis, tubo gracili intus glabro, fauce nuda; limbi lobi 5, valvati, patentes. *Stamina* 5, inæqualia, 2 fauci inserta, breviter exserta, 3 tubo inclusa, quorum 1 altius affixum est, filamentis brevibus; antheræ dorso affixæ, lineari-oblongæ, omnia (?) polliniferæ. *Ovarium* didymum, apice bilobum, papillosum, 2-loculare, strato exteriori utriculoso, interiore membranaceo, ovulum arcte amplectente; stylus filiformis, stigmatibus 2, nunc exsertis nunc inclusis; ovula in loculis solitaria, e basi erecta, anatropa. *Fructus* 2-coccus, papillosum; cocci breviter 2-3-cornuti, utriculosi, strato interiore demum soluto. *Semina* erecta, oblonga, testa membranacea; embryo in axi albuminis rectus, elongatus, cotyledonibus oblongis, radiculam æquantibus, radícula infera.—*Suffrutex* scabridus, contusus foetidus. *Folia* opposita, breviter petiolata, ovato-lanceolata. *Stipulæ* amplæ, integræ, scariosæ, persistentes. *Flores* raphidibus maximis notati, ad apices ramorum ramulorumque densissime cymoso-congesti, singulatim involuclati, sessiles, involuclis cupulatis, laceratis, invicem arcte imbricatis.

260, 272. *A. rosea*, Hemsley, n. sp. (Plate XIV. figs. 1-5.) *Suffrutex* densissime ramosus, usque ad bipedalis, ramis gracilibus teretibus. *Folia* 9-12 lineas longa. *Flores* rosei, 6-8 lineas longi; corolla fugax. *Fructus* vix 2 lineas longus.

This genus has the didymous fruit of the *Stellateæ* associated with opposite leaves and conspicuous interpetiolar persistent sti-

pules. In habit and many of its characters it is allied to *Leptodermis* and *Putoria*, near which genera it should be placed. It is also closely allied to some of the species referred to *Gaillonia*, e. g. *G. Bruquieri*, differing in the free stipules, involucrate flowers, dorsifixed anthers, and basifixed ovules.

In the Kuram district, at the base of the Saféd-koh range along the low hills, at an altitude of from 6000 to 7000 feet.

A shrub from 1 to 2 feet in height, very labiate in its general appearance, and growing in dense clumps that average 6 to 8 feet across, kept in a cushion-like form from the continuous browsing of sheep and goats. The flowers are produced in clusters of five or six, in terminal heads nearly simultaneously over the whole plant, of a rose-pink colour. When in full bloom, the plant is very lovely; but this does not last long, as the corollas are extremely fugacious. Yet, notwithstanding the short period of its beauty, I feel sure it would prove a good acquisition to the floriculturist.

501. *Gaillonia hymenostephana*, *Jaub. & Spach.*

From Thal to Alizai. Very profuse amongst the low hot hills below 3000 feet altitude.

Apt to be overlooked, owing to its scraggy leafless habit, until the development of its coloured calyces, which at once attract attention.

199,=797 (1879). *Galium Mollugo*, *Linn.*

G. asperifolium, *Wall.*, is reduced to this in the 'Flora of British India.'

37, 156 (1879). *G. tricornis*, *Linn.*, was distributed as *G. Aparine*, *Linn.*

631 (1879). *Asperula pycnantha*, *Boiss.*

VALERIANEÆ.

98, 192 (1879). *Valeriana sisymbriæfolia*, *Desf.*

Ali-khé1, under bushes, common; April.

59, 219 (1879). *Valerianella sclerocarpa*, *Fisch. & Mey.*

Kuram district, on dry stony soil, at 6000 feet, common.

DIPSACACEÆ.

641, 642 (1879). *Cephalaria Syriaca*, *Schrad.*

Shálizán; June.

707 (1879). *Scabiosa arvensis*, Linn., var.

Kaiwás; July.

883 (1879). *S.* (§ *Pteroccephalus*) *afghanica*, Aitchison & Hemsley in *Journ. Linn. Soc.* xviii. p. 67. (Plate XV. figs. 1-4.)

4, 34, 174, =82 (1879). *S. Candoliana*, Wall.

Not common at Thal, becoming more so on reaching Badish-khél, whence it is excessively common throughout the Kuram and Hariáb districts, and very characteristic of the shingle-plains of Kuram, at an altitude of from 3000 to 7500 feet.

It has a large woody rootstock, around which are clusters of short leaves, from amongst which spring up slender flowering stems averaging from 1 to 2 feet in height; they are almost leafless, and bear at their extremities usually only one large flower-head; the flowers are of a bright lavender-colour. These flower-heads, owing to their extremely slender stems, which are not easily detected at a short distance, seem to float gracefully in the air at every breath of wind, resembling butterflies rather than flowers.

COMPOSITÆ.

306, =901 (1879). *Aster lacunarum*, Aitchison & Hemsley, n. sp. (Plate XVI. figs. 1-5.) *Humilis*, ramosus, dense foliosus, foliis parvis linearibus, capitulis minimis, involucri bracteis 3-4-seriatis ligulas fere æquantibus, acheniis compressis pubescentibus, pappi setis 1-seriatis basi connatis deciduis.

Herba perennis vel biennis, habitu folisque *Alyssi maritimi*, ramosa, 2-4 poll. alta, glabra, ramis graciliusculis. *Folia* linearia, usque ad 1 poll. longa. *Capitula* ad apices ramulorum solitaria, circiter 3 lineas diametro, radiata; involucri bracteæ 3-4-seriatae, lanceolato-oblongæ, ligulis paullo breviores, acutæ, interiores scariosæ; receptaculum leviter foveolatum. *Flores* radii rubro-purpurei, circiter 15, 1-seriatae, ligulis angustis in siccis revolutis; disci numerosi, minimi, corollis quam pappus brevioribus. *Achenia* oblonga, compressa, ecostata, pubescentia; pappi setæ scabræ, 1-seriatae, basi leviter conuatae, deciduæ.—*A. roseus*, Stev. ? *Aitch. in Journ. Linn. Soc.* xviii. p. 68.

Kuram district, common on the shingle at the sides of streams, at an altitude of from 4000 to 6000 feet.

Distributed under 901 (1879) as *Aster roseus*, Stev. ?

323, =812 (1879). *A. pseud-Amellus*, Hook. *fl.*, was distributed as *A. Amellus*, Linn.

920 (1879). *Brachyactis umbrosa*, Benth., was distributed as *B. pubescens*, Aitch. & C. B. Clarke.

484. *Conyza ægyptiaca*, Aiton.

Between Shinak and Badish-khél, on the sides of watercourses.

530. *Pluchea lanceolata*, Wall.

Between Thal and Chapri, on peculiar clay soil, very local.

1224 (1879). *Filago germanica*, Linn., ex *Fl. Brit. India*, was distributed as *F. arvensis*, Linn.

914 (1879). *Anaphalis contorta*, Hook. fil. ex *Fl. Brit. India*, was distributed as *A. tenella*, DC.

801, 1223 (1879). *A. virgata*, Thoms., var.

With rose-coloured bracts.

9. *Lasiopogon lanatum*, Cass.

Kuram district, on the shingle-plains near Shálizán, in localities where there is clay-soil on which water collects, at an altitude of from 4000 to 5000 feet.

The plant looks like a collection of small balls of cotton, or some gigantic mildew.

404. *Phagnalon niveum*, Edgew.

The specimens nos. 298, 229 (1879), distributed as *P. denticulatum*, Decne., and no. 564 (1879), as *P. acuminatum*, Boiss., are all this species.

266 (1879). *Gnaphalium pulvinatum*, Delile, was distributed as *G. crispatum*, Delile.

976 (1879). *Inula rupestris*, Aitchison & Hemsley, n. sp. Aff. *I. multicaulis*, Fisch. & Mey., differt foliis scabridis, capitulis discoideis, acheniis omnino hirsutis quam pappus multo brevioribus.

Suffrutex ramosissimus, 12-18 poll. altus, ramis ramulisque gracilibus, scabridis. *Folia* sessilia, rigida, lineari-oblonga vel linguæformia, usque ad 2½ poll. longa, apice callosa, obtusiuscula, basi angusta, integra, utrinque scabrida. *Capitula* flava, discoidea, 3-4 lineas diametro, ad apices ramulorum solitaria; involucri bracteæ pallidæ, scarioso-herbaceæ, ovato-lanceolatæ, acutæ, ciliolatæ, exteriores gradatim breviores; receptaculum planum. *Flores* involucri paullo excedentes. *Achenia* brevia, omnino hirsuta; pappi setæ circiter 20, scabridæ, corolla paullo breviores.

Alikhél, profuse; August. Distributed as *I. caspia*, Blume.

431. *Pulicaria vulgaris*, Gart.

Near Kuram, on the sides of rivulets and in rice-fields, at an altitude of 4000 feet. Flowers yellow.

Helianthus annuus, Linn.

Cultivated in most gardens.

572 (1879). *Achillea micrantha*, Bieb., was distributed as *Tanacetum millefolium*, Fisch. & Mey.

60, 245 (1879). *A. Santolina*, Linn., was distributed as *A. leptophylla*, Bieb.

393. *Chrysanthemum Griffithii*, C. B. Clarke.

Base of Mount Síka-rám, in the deep gorges, growing from the clefts of rocks, at an altitude of 9000 to 10,000 feet.

A shrub, with a stem from 2 to 3 feet in height, throwing out a profusion of flowering shoots, each bearing one (or two) large handsome flower-heads, having a deep pure-white ray with a greenish-yellow disk. Flowers in July.

366, =820 (1879). *Tanacetum Fisheræ*, *Atchison & Hemsley*, n. sp.

Suffruticosum, foliis parvis rigidis pinnatis, segmentis angustissimis interdum pungentibus, capitulis discoideis solitariis, acheniis costatis, pappi palea unica magna.

Suffrutex glabrescens, ramosus, ramis graciliusculis, rigidis, usque ad 9 poll. longis. *Folia* rigida, petiolata, imparipinnata, usque ad 1 poll. longa sed sæpius breviora, segmentis utroque 2-5, teretibus, interdum pungentibus. *Capitula* solitaria, pedunculata, discoidea, multiflora, campanulata, 4-6 lineas diametro, flava; involucri bractæ 3-4-seriatæ, scarioso-herbaceæ, ovatæ, obtusissimæ, atro marginatæ; receptaculum subplanum, leviter alveolatum. *Flores* involucri vix excedentes, eglandulosi; corolla late cylindrica; antheræ basi brevissime caudatæ. *Achenia* (matura non visa) costata, glabra; pappi palea unica interior magna, subquadrata, apice lacrata.

In the Hariáb district, Mount Síka-rám, Serátigah, and Sergal, at an altitude of from 10,000 to 13,000 feet. Also collected by Griffith in the Bolan pass and elsewhere (941 and 3213).

A very tortuous shrub, much browsed upon by goats and sheep.

378. *Artemisia Falconeri*, C. B. Clarke.

Hariáb district, near the rock of Sergal, at an altitude of 8000 feet.

406. *A. Roxburghiana*, *Bessn.*, var. *purpurascens*, *Jacq.*

In the Hariáb district, at 8000 feet, August.

342, 392. *Senecio pedunculatus*, *Edgew.*

In the Kuram and Hariáb districts, in stream-beds, where there was a small amount of moisture throughout the summer, at an altitude of from 6500 to 9500 feet.

548. *Echinops echinatus*, *DC.*

Near Shinak, on hot stony ground, not common.

971 (1879). *Cousinia* (§ *Squarros*) *aptera*, *Atchison & Hemsley*, n. sp. Aff. *C. erinaceæ*, a qua differt segmentis foliorum angustioribus, foliis caulinis non decurrentibus, acheniis maculosis nec transverse rugulosis.

Herba biennis vel perennis, ramosa, 6-9 poll. alta, ramis divaricatis, gracilibus, apteris, plus minus floccosis, oligocephalis. *Folia* sessilia, an-

guste pinnatifida, longiora 3-4 poll. longa, præcipue subtus floccoso-araneosa; caulina non decurrentia, segmentis distantibus, angustis, apice aculeatis. *Capitula* subsessilia, ovata, absque spinis circiter 6 lineas diametro, pleiantha; involucri bractearum numerosissimæ, maximam partem squarrosæ, inferne araneosæ, anguste subulato-spinosæ, arcuato-recurvæ, spinis longioribus 6 lineas longis, intimæ erectæ, omnino scariosæ, lanceolatae, acute acuminatæ, margine ciliolatæ; receptaculum convexum, setis lævibus. *Flores* citrini, involucri breviores; filamenta glabra. *Achenia* obovato-oblonga, $1\frac{1}{2}$ -2 lineas longa, compressa, leviter costata, maculosa; pappi setæ breves.

Near Ali-khél, in fields, at 7000 feet; flowers yellow.

Equal to no. 775 Griffith's Journal, and 3268 Kew distribution, Afghanistan.

372, 383, = 921 (1879). *Cousinia auriculata*, Boiss.?

Hariáb district, on the spurs of Mount Síka-rám, at an altitude of from 10,000 to 14,000 feet.

My specimens are much more woolly, with larger and handsomer flower-heads than the type; but the achenes are identical.

10, 381, = 362, 504, 1233 (1879). *C. bupthalmoides*, Regel (descrip amplif.). *Herba* biennis?, radice tuberosa, caulibus 3-18 poll. altis, ramis divaricatis, sæpius 1-cephalis. *Folia* radicalia subsessilia, lyratopinnatifida, circiter semipedalia, subtus albo-araneoso-tomentosa, supra parce araneosa, marginibus aculeolata, lobis lateralibus utrinque 4-6, parvis, ovato-oblongis, terminali magno (usque ad 3 poll. longo et $2\frac{1}{2}$ poll. lato) ovato-deltoideo.—*Regel et Herder, Pl. Semenov. Contin.* iii. p. 53.—*C. auriculata*, Hook. *Fl. Brit. Ind.* iii. p. 360, non Boiss.

Kuram and Hariáb districts, from the shingle-plains of Kuram, through the pine-forests to the Hariáb, at an altitude of from 4000 to 9000 feet.

It has a curious radish-shaped root; and when the flower-heads have fully come to maturity, the plant is so altered in appearance that one can scarcely believe the two stages of growth belong to the same species.

Griffith's Journal nos. 793, 794, 795, 798, 991, 996, and Kew distribution nos. 3269, 3270, 3271, Afghanistan, belong to this species.

371. *C. pinarcephala*, Boiss. (*vide* Boiss.).

In the Hariáb district, at the base of Mount Síka-rám, from 9000 to 12,000 feet, profuse.

358, = 922 (1879). *C.* (§ *Alpinæ*) *carthamoides*, Aitchison & Hemsley, n. sp. (Plate XVII. figs. 1-7.) Fere omnino glabra, caulibus erectis gralinn. Journ.—BOTANY, VOL. XIX.

ciliuseculis 1-5-cephalis, foliis pinnatifidis, involuero araneoso, bracteis numerosis spinis erecto-patentibus armatis, acheniis ecostatis compressis, pappo brevi.

Herba perennis vel biennis, erecta, 1-2 ped. alta, fere omnino glabra, caulibus graciliusculis, apteris, striatis, interdum ad nodos leviter araneosis, 1-5-cephalis. *Folia* coriacea, rigida, luteo-viridia (saltem in siccis) glabra, nitida, pinnatifida, spinosa, usque ad 6 poll. longa et 1½ poll. lata, prominenter nervosa; radicalia petiolata; caulina sessilia, amplexicaulia. *Capitula* nunc solitaria, nunc 2-5 aggregata, subglobosa, absque spinis ad 1½ poll. diametro; involucri bractearum numerosarum, exteriores araneosae, basi latae, spinis rectis 6-9 lineas longis, erecto-patentibus; interiores scariosae, lineares, acuminatae, floribus breviores, dentis atrofuscae; receptaculum convexum, setis barbellatis. *Flores* numerosissimi, purpurei; filamenta glabra; antherarum appendices leviter laceratae. *Achenia* ecostata, obovato-oblonga, compressa, maculosa, laevia, glabra; pappi setae paucae, barbellatae, achenio multo breviores.

Hariáb district, base of Mount Síka-rám, at an altitude of from 9000 to 12,000 feet.

The leaves, on drying, become quite yellow.

359, = 923 (1879). *Cousinia* (§ *Alpinæ*) *elegans*, Aitchison & Hemsley, n. sp. (Plate XVIII. figs. 1-8.) Aff. *C. multiloba*, sed caulibus simplicibus saepissime monocephalis, capitulis majoribus, involucri bracteis non recurvis, etc.

Herba perennis, caulibus floccosis, simplicibus, erectis, 10-15 poll. altis, saepissime monocephalis (interdum capitula 2, quorum 1 multo minus), apteris. *Folia* subtus niveo-floccoso-araneosa, inferiora petiolata, usque ad 9 poll. longa et 2 poll. lata, omnia pinnatipartita, segmentis multijugis, 2-3-partitis, supra glabris, costis latis, prominentibus, pallidioribus (stramineis) in spinas rigidas abeuntibus. *Capitula* subglobosa, absque spinis usque ad 2 poll. diametro, polyantha; involucri bractearum exteriores 15-20, basi latae, araneosae, durae, acerosae, rectae, patentiores, flores multo excedentes, ad 1½ poll. longae; interiores numerosiores scariosae, lineares, rectae, acutae, ciliolatae, floribus breviores; receptaculum convexum, setis pilosis. *Flores* purpurei; filamenta glabra; antherarum caudae paucilaceratae. *Achenia* valde immatura tantum visa; pappi setae breves, scabridae.

In the Hariáb district, on the ridges of Mount Síka-rám, from 9000 to 12,000 feet, common.

353, 375, 376, = 1234, 1226 (1879). *C.* (§ *Alpinæ*) *scala*, Aitchison & Hemsley, n. sp. (Non eadem ac 3326, 3327, Griffith.) Facie foliis *C. multiloba* similis, sed distincta capitalis numerosis cymoso-paniculatis et involucri bracteis interioribus apice membranaceo-dilatatis.

Herba perennis vel biennis, erecta, usque ad 4 ped. alta, fere omnino

glabra, caulibus crassiusculis, subsimplicibus, apice laxè polycephalis. *Folia* omnia sessilia, usque ad 9-12 poll. longa et $2\frac{1}{2}$ -3 poll. lata, pin-natipartita, segmentis multijugis, sæpius 2-3-partitis, lobis acerosis. *Capitula* numerosa, pedunculata, laxè cymoso-paniculata, subglobosa, absque spinis circiter $1\frac{1}{2}$ poll. diametro; involucri bractæ numerosæ, exteriores parce araneosæ, e basi lata acerosæ, acubus rectis vel plus minus arcuatis, usque ad 1 poll. longis; interiores membranaceo-scariosæ, flores subæquantes, apice dilatatæ; receptaculum leviter convexum, setis parte superiore obscure barbellatis. *Flores* numerosissimi, pur-purei; filamenta glabra. *Achenia* (immatura tantum visa) glabra, compressa, ecostata, 2-alata.

In the Hariáb district, near cultivation, from 7000 to 9000 feet; very common.

No. 850 (1879) is too young for determination; but seems to be a state of this plant with sessile flower-heads. It is certainly not *C. racemosa*, Boiss.

435. *Cnicus lanceolatus*, Willd.

Kuram district, in fields, at 4000 feet altitude.

970 (1879). *C.* sp. This was distributed as *C. horridus*, Bieb. It is not that plant, but seems to be a very near ally of Griffith's Journal nos. 775 and 993, distribution number 3308, and of *C. echinatus*, Lois.

319, 888, 913 (1879). *Saussurea candicans*, C. B. Clarke, was distributed as *S. hypoleuca*, Spreng.

386. *Jurinea leptoloba*, DC.

Hariáb district, from 8000 to 9000 feet. Flowers from pink to a light purple; July.

721, 392 (1879). *Pertya Aitchisoni*, C. B. Clarke in Journ. Linn. Soc. xviii. p. 72. (Plate XIX. figs. 1-5.)

48. *Crepis*, sp.

In the Hariáb district, in pine-forests and under the shelter of large rocks, at an altitude of 8500 feet.

945 (1879). *C.* sp. was distributed as *C. Kotschyana*, Boiss.; but it is not that species.

312, 562, 839, 859 (1879). *Phæcasium lampsanoides*, Cass., distributed as *Crepis* sp.

717 (1879). *Lactuca Scariola*, Linn., was distributed as *L. auriculata*, DC.

329 (1879). *L. auriculata*, DC., was distributed as *L.* sp.

997 (1879). *L. macrorhiza*, Hook. f., was distributed as *Prenanthes* sp.

997,1 (1879). *Lactuca rapunculoides*, C. B. Clarke, var., was distributed as *L. sp.*

17,30. *Launæa nudicaulis*, Less.

From Thal to Shálizán, in dry stream-beds, under 5000 feet; very common.

589 (1879). *L. sp. nov.?*, was distributed as *Microrhynchus asplenifolius*, DC.

It occurs in the Hariáb district, growing from the crevices of huge rocks, associated with *Dionysia* and *Parietaria*, at an altitude of from 7000 to 8000 feet.

An elegant tender annual, scarcely over 4 inches in height. It grows in clusters, and, interlacing its branches with the others of its kind, produces the soft moss-like cushions so characteristic of the rocks of that part of the country, where there are few lichens or mosses, and still fewer ferns to vary the colouring.

I regret that there is no ripe fruit amongst my specimens to enable me to describe this interesting plant.

CAMPANULACEÆ.

279. *Campanula aristata*, Wall.

Collected a few specimens only on the Nangrár pass, at an elevation of 11,000 feet; July.

325, 410, = 941 (1879). *C. cashmiriana*, Royle.

In the Kuram and Hariáb districts; common on damp rocks, at an elevation of from 7000 to 9000 feet.

395. *C. cashmiriana*, Royle, var. *evolulacea*, C. B. Clarke in Hook. *Fl. Brit. Ind.* iii. p. 441.

From the same locality as the last.

382, = 941 A (1879). *C. ruderalis*, Aitchison & Hensley, n. sp. (§ Medium, triloculares-perennes-exappendiculata-saxicolæ, Boiss. *Fl. Or.* iii. p. 893.) *Herba* perennis, humilis, hispidula, dense ramosa, ramis gracilibus, adscendentibus, usque ad 6 poll. longis, 1-3-floris, sæpius 1-floris. *Folia* sæpius conferta, subsessilia, lanceolato-oblonga, obovata, vel interdum fere orbicularia, plerumque 4-8 lineas longa, integra vel obsolete denticulata. *Flores* rubro-cærulei, pedunculati, anguste campanulati, 5-6 lineas longi, patentes; calycis hispiduli lobi ovati, acuti, sinibus omnino nudis; corollæ lobi lati, obtusi vel rotundati; filamenta basi dilatata. *Capsula* semisupera, obconica; semina numerosissima, minuta, oblonga, nitidissima.

In the Hariáb district, on hot south and west exposures, growing in rubble, at an elevation of from 9000 to 12,000 feet.

ERICACEÆ.

344 (1879). *Rhododendron Collettianum*, Aitchison & Hemsley in *Journ. Linn. Soc.* xviii. p. 75. (Plate XX. figs. 1-8.)

457 (1879). *R. afghanicum*, Aitchison & Hemsley, loc. cit. (Plate XXI. figs. 1-7.)

PLUMBAGINÆÆ.

361. *Acantholimon* sp. (nov.?) near *A. roseum*, Boiss.

Hariáb district, from 10,000 to 12,000 feet. Flower-heads almost sessile.

A. (§ *Armeriopsis*) *calocephalum*, Aitchison & Hemsley in *Journ. Linn. Soc.* xviii. p. 77. (Plate XXII. figs. 1-4.)

439. *Statice Griffithii*, Aitchison & Hemsley, n. sp. (Plate XXIII. figs. 1-4.) Aff. *S. cabulica*, differt foliorum rosulis laxioribus, foliis longioribus angustioribus, scapis gracilioribus simplicibus vel 2-4-ramosis, bracteis bracteolisque minoribus.

Herba perennis, scaposa, pauciramosa, ramis brevissimis, crassis. *Folia* lepidota, rosulata, obovata vel linguæformia, usque ad $2\frac{1}{2}$ poll. longa, obsolete trinervia, apice aristulata, deorsum attenuata. *Scapi* graciles, simplices vel pauci et stricte ramosi, 8-20 poll. alti, spiculis sæpius 1-floris, sparsis; bractea exterior suborbicularis, mucronata, margine anguste scariosa, ceteræ præter costam scariosæ, interiores apice rotundata. *Flores* rosei; calyx appresse hirsutus, breviter 10-lobatus, 5-costatus, lobis obtusis, alternis brevioribus, ecostatis, omnino scariosis; petala integra, apice rotundata; stigmata capitulata.

On the low hills opposite Kuram, to the south of the river; also in the vicinity of Badish-khél and Shinak on similar low hills, at an elevation of from 3000 to 5000 feet; very common.

Griffith, Khyber pass, 4172 and 4173 Kew distribution; J. L. Stewart, Jhelum valley, 3000 feet.

PRIMULACEÆ.

355. *Primula denticulata*, Sm., var. *capitata*.

Hariáb district, common in boggy and spongy meadow-ground that is watered profusely by springs, at an elevation of 8000 feet.

462 (1879). *P. rosea*, Royle, var.

This variety has each flower supported on a long slender pedicel; and the tube of the corolla is longer and narrower than that of the type.

58, 71, 110, =323 (1879). *Androsace sempervivoides*, *Jacquem.*, var. *bracteata*, *Watt.*

Kuram and Hariáb districts, very profuse in the open glades of forests, at an altitude of from 7000 to 10,000 feet.

97, =925 (1879). *A. villosa*, *Linn.*

Exposed ridges of Mount Síka-rám, on fine gravel, at an altitude of from 13,000 to 14,000 feet; not very common.

321. *Samolus Valerandi*, *Linn.*

Kuram district, in watercourses near cultivation, at 6500 feet.

OLEACEÆ.

44. *Fraxinus xanthoxyloides*, *Wall.*

My specimens distributed last year under the name *F. Moorcroftiana*, *Wall.*, are this plant; I here alter the name, as my plant corresponds to Wallich's type specimen of *F. xanthoxyloides*; his type specimen of *F. Moorcroftiana* is *F. excelsior*, *Linn.*, as I am informed by Mr. C. B. Clarke.

SALVADORACEÆ.

524. *Salvadora oleoides*, *Decne.*

Thal, common in the low hills as far as Chaprí.

At a distance this looks like a large spreading bush; but on closer examination it is found to have a short stout trunk, much thicker in proportion to the size of the whole than one would expect.

ASCLEPIADEÆ.

550. *Periploca hydaspidis*, *Falc.*

At Jelamai, near Shinak, in the low hills, at an altitude not above 3800 feet.

Occurs as a large semiscandent shrub with bright-yellow flowers. Except when in flower or fruit, it is quite impossible to distinguish it as it grows from *Ephedra ciliata*, *Fisch. & Mey.*, a common plant of the same region.

485. *Calotropis procera*, *R. Br.*

From Thal to Badish-khél, below 3000 feet, not common.

399, =582 (1879). *Vincetoxicum parviflorum*, *Decne.*, var. *alpina*, *Schott.*

Kuram and Hariáb districts, on hot southern exposures, at an altitude of from 7500 to 8000 feet.

608. *Pentatropis spiralis*, Edgew.

Common between Thal and Badish-khél.

511. *Dæmia extensa*, R. Br.

From Thal to Alizai, common.

492. *Boucerosia Aucheri*, Decne.

Thal to Kuram, amongst large stones, in the clefts of rocks, and at the roots of large bushes, up to an altitude of 4000 feet.

Collected largely, and eaten raw as well as cooked, by the natives.

GENTIANÆ.

345, =881 (1879). *Gentiana aquatica*, Linn.

Hariáb district, in grassy loamy soil that is permeated by spring-water, at 8000 feet; common.

932, 1003 (1879). *G. aurea*, Linn.401. *G. Kurroo*, Royle.

Kuram district, on the low outer hills near Shálizán, at an elevation of 7000 feet. In some localities common.

360. *G. micrantha*, Aitchison & Hemsley, n. sp. (Plate IX. figs. 1-5.)

Annua, minima, calyce 4-partito corollam excedente, corolla cylindrico-campanulata intus omnino nuda.

Herba annua, gracillima, glaberrima, erecta, vix ramosa, 1-2½ poll. alta.

Folia opposita, sessilia, tenuia, obovato-oblonga, usque ad 9 lineas longa.

Flores cærulei, 3-4 lineas longi, breviter pedicellati, 2-8 aggregati; calycis lobi 4, parum inæquales, lineares, acuti, corollam excedentes; corolla cylindrico-campanulata, 4-lobata, intus omnino nuda glabraque, lobis semiorbicularibus, mucronatis, quam tubus paullo brevioribus; stamina 4, basi corollæ inserta; stigmata sessilia. *Capsula* matura non visa.

Saféd-koh range, under the shelter of Juniper bushes, at an altitude of nearly 12,000 feet.

A small slender annual, scarcely 4 inches in height. The flowers hidden within the opposite leaves.

Possibly a small-flowered state of a previously described species.

BORAGINÆ.

515, 529. *Ehretia obtusifolia*, Hochst.

Near Thal; a common shrub with large heads of lavender-coloured or white flowers.

486, =11 (1879). *Heliotropium cabulicum*, Bunge.

From Thal to Kuram, not above 5000 feet. Flowers large, few, and usually pure white.

427, = 662 (1879). *Heliotropium Eichwaldi*, Steud., was distributed as *H. europæum*, Linn.

From Thal to near Shálizán, up to 5000 feet, not common.

864 (1879). *Trichodesma strictum*, Aitchison & Hemsley, n. sp. Aff. *T. mollis*, differt caulibus erectis strictis bipedalibus et ultra, foliis omnibus (?) alternis multo minus hirsutis, hispidulis, floribus numerosis in paniculam terminalem dispositis.

Herba perennis, caulibus angulatis, subsimplicibus, erectis, strictis, 2-3 ped. altis, apice tantum floriferis. *Folia* omnia (?) alterna, sessilia (saltem caulina), ovato-oblonga, 2-3 poll. longa, acuta, basi rotundata nec amplexicaulia, utrinque hispidula, nec densissime molliterque hirsuta ut in *T. mollis*. *Flores* speciosi, 12-15 lineas diametro, cærulei, graciliter pedicellati, in paniculas amplas terminales dispositi; calyx basi nec alatus nec angulatus, lobis longe acuminatis; corollæ lobi rotundati, longe caudati; antheræ extus parte inferiore longe barbatae, supra medium inter se spiraliter tortæ. *Nuculae* depressæ, marginatæ, scrobiculatæ.

Ali-kbél, at 7500 feet.

A handsome herbaceous perennial, growing nearly 3 feet in height, and bearing masses of lovely large blue flowers.

106, 117, 197 (1879). *Omphalodes* (§ *Paracaryum*) *microcarpum*, Boiss.

900 (1879). *Cynoglossum micranthum*, Desf., var. *canescens*, Royle, distributed as *C. furcatum*, Wall.

46, 175, 243. *C. denticulatum*, DC.

From 6000 to 10,000 feet; common.

107. *Echinosperrum*, sp.

Mount Sika-rám, Hariáb district, at an altitude of 10,000 feet.

Eritrichium strictum, Decne.

The plant distributed without number in 1879 as *E. sericeum*, Royle.

140 (1879). *Rochelia stylaris*, Boiss.

The plant distributed as *R. stellulata*, Reichb.

507, 569, 858 (1879). *Lycopsis arvensis*, Linn., distributed as *Anchusa Milleri*, Willd.

192. *Mertensia echioides*, Hook. fl. & Thoms. ?

Up the Shend-toí valley, near water, at an elevation of 11,000 feet.

The material is scarcely sufficient for identification.

284, 286. *Myosotis sylvatica*, Hoff. ?

Near the Nangrár pass, at 11,000 feet.

45, 235 (1879). *Onosma stenosphon*, Boiss.

From Shinak to Kuram, under 5000 feet; April.

720 (1879). *Arnebia* (§ *Macrotomia*) *speciosa*, Aitchison & Hemsley in *Journ. Linn. Soc.* xviii. p. 81. (Plate XXIV. figs. 1-6.)

CONVOLVULACEÆ.

436. *Ipomœa eriocarpa*, R. Br.—I. sessiliflora, Roth.

From Thal to Kuram, under 5000 feet; a common weed near cultivation.

15 (1879). *Convolvulus Aitchisoni*, C. B. Clarke, n. sp. Suffrutescens, patule fulvo-hirsutus nec sericeus, dense cæspitosus, foliis fasciculatis linearibus; caulibus annuis floriferis $\frac{1}{2}$ -4-uncialibus, capitulis bracteatis, sepalis lanceolato-linearibus hirsutissimis.—C. lanuginosus, Aitch. *Cat. Punjab Pl.* 98, an Lamk.?

Species C. lanuginoso vel C. Calverti (Boiss. Fl. Orient. iv. 94) proxima, sed validior, fere hispida.

Herba perennis, basi ramosissima; e ramis plures abbreviati, dense foliati, cæspitem efformant. Corolla uncialis. Ovarium glabrum; stigmata filiformia, stylo longiora. Fructus non visus.—Bracteæ floresque fere similes iis C. capitati (Cav. Ic. ii. p. 72, t. 189), sed paullo majores, multo hirsutiores. Species forsan, cum aliis Boissierianis, sub C. lanuginosum revocanda.

From Alizai to Habîb-kalla, from 3000 to 6000 feet. Punjab: Jhelum and Salt range, Aitchison.

Very characteristic of the open gravel plains, forming almost hummocky woollen patches.

526. *Evolvulus alsinoides*, L.

Near Chaprî, common; August.

SOLANACEÆ.

500. *Solanum coagulans*, Forsk.

Thal to Badish-khél, up to 3000 feet, common.

Has a large globose fruit, very like that of some forms of *Solanum Melongena* Linn.

483. *S. xanthocarpum*, Schrad. & Wendl.

Between Thal and Badish-khél.

521. *S. gracilipes*, Decne.

From Thal to Alizai, under 3000 feet.

Always grows in the shelter of large bushes. Flowers from white to lavender. Fruit, when ripe, bright orange-red.

470. *Physalis minima*, Linn.

From Thal to Kuram, a profuse weed in moist cultivated land.

469. *Withania somnifera*, Dun.

From Thal to Kuram, not common.

SCROPHULARINEÆ.

318, 505. *Linaria ramosissima*, Wall.

From Thal to Kuram, on the face of conglomerate cliffs, below 4000 feet altitude; very common.

77, = 461 (1879) ex parte. *Scrophularia Scopoli*, Hoppe.

In the Kuram and Hariáb districts, at an altitude of from 7000 to 8000 feet, common.

461 (1879) ex parte. *Scrophularia* sp., the same as Griffith's Journal no. 816.919 (1879). *S.* (§ *Tomiophyllum-lucidæ*) *petræa*, Aitchison & Hemsley, n. sp. Humilis, multicaulis, præter calyces glanduloso-puberulos glabra, foliis crassis petiolatis oblongis grosse crenatis, thysis densis paucifloris, calycis segmentis angustissime scarioso-marginatis.

Herba perennis, multicaulis, 3-5 poll. alta, præter calyces glabra, caulibus gracillimis, teretibus. *Folia* opposita, longiuscule petiolata, crassa, oblonga vel ovato-oblonga, usque ad sesquipoll. longa, sæpissime obtusa vel rotundata, grosse crenata, venis primariis tantum conspicuis. *Flores* purpureo-virides, 4-5 lineas longi, breviter pedicellati, in thyrsos terminales parvos densiusculos dispositi, bracteis linearibus crassis; calycis segmenta glanduloso-puberula, crassa, oblongo-obovata, concava, vix vel angustissime scarioso-marginata; anthera sterilis reniformis, undulata; genitalia inclusa. *Capsula* sphæroidea, rostrata; semina scrobiculata.

Hariáb district, amongst rock débris, at an altitude of from 11,000 to 14,000 feet.

A dwarf species with extremely large flowers.

195, 664 (1879). *Veronica Anagallis*, Linn., was distributed as *Veronica Beccabunga*, Linn.609. *V. biloba*, L.

Kuram district, under the shade of large trees, at 5000 feet altitude.

38. *V. cardiocarpa*, Walp.—*V. Griffithii*, Benth.

Kuram district. Probably a form of *V. biloba*, Linn.

198, = 238, 331 (1879). *V.* (§ *Chamædryis*) *rupestris*, Aitchison & Hemsley, n. sp. (Plate XXV. figs 1-5.) Perennis, basi suffruticosa,

facie *V. Teucriti*, sed differt calyce 4-partito, segmentis subæqualibus, capsula ovato-oblonga apice obtusa; etiamque aff. *V. lanosæ*, a qua sat differt racemis lateralibus capsula quam calyx longiore.

Herba perennis, multicaulis, basi suffruticosa, caulibus gracilibus, teretibus, adscendentibus, junioribus sæpe albo-villosulis, 6-12 poll. longis. *Folia* opposita, subsessilia, tenuia, glabra vel glabrescentia, ovato-lanceolata vel oblonga, 9-18 lineas longa, utrinque (interdum argute) paucidentata. *Flores* cærulei, 6-8 lineas diametro, racemis sæpius 2 in axillis foliorum superiorum alternis vel oppositis (interdum pseudoterminales), pedunculatis, usque ad 3 poll. longis, bracteatis; bracteæ lineari-oblongæ, obtusiusculæ, pedicellos æquantes; pedicelli calyx subæquantes, fructiferi erecti; calyx 4-partitus, lobis fere æqualibus, linearibus, subobliquis; corollæ lobi leviter inæquales; stamina longa, filamentis filiformibus, antheris cordiformibus; stylus stamina æquans. *Capsula* (immatura tantum visa) anguste ovato-oblonga, calycem excedens, circiter 3 lineas longa, puberula, loculis pleiospermis; semina convexa.

Kuram district, on shaded moist localities, at from 8000 to 11,000 feet altitude. Saféd-koh, Collett no. 112. Lahul, Jaeschke. Herb. Falconer no. 784, Kew distribution in part. Unfortunately the portion of the plants drawn does not represent the characteristic lateral racemes. A showy species.

975 (1879). *Leptorhabdos virgata*, Benth.

My plant is not nearly so glandular as the type.

220, 285, =779 (1879). *Pedicularis bicornuta*, Klotzsch.

Kuram and Hariáb districts, on grassy slopes at from 10,000 to 12,000 feet in great profusion. Flowers large, yellow, very handsome.

108, =487 (1879). *P. pycnantha*, Boiss.

Kuram and Hariáb districts, in pine-forests and on dry hill-sides, at from 8000 to 12,000 feet altitude.

P. sp. (without number), was distributed as *P. tenuirostris*, Benth.; but it is not that species.

Shend-toi; August.

OROBANCHACEÆ.

214. *Orobanche Epithymum*, DC.

Kuram district, growing on a Labiate at 10,000 feet altitude.

85, 161, 350, =934, 934 a, 267, 893 (1879). *O.* sp.

Kuram and Hariáb districts; common everywhere, growing on two species of *Artemisia*, at an altitude of from 6000 to 10,000 feet.

The colour of the flower varies from a dirty white to a dark purple.

BIGNONIACEÆ.

489. *Tecoma undulata*, G. Don.

From Thal to Badish-khél, on the low hills and in ravines, not above 3500 feet altitude.

Occurs as a large bush or small tree. Flowers from a pale yellow to a deep orange, very large and attractive, the continuous resort of a small steel-blue honey-bird.

PEDALINEÆ.

519. *Sesamum indicum*, L.

From Thal to Kuram. The plants I collected originated, no doubt, from seeds left on the road-sides by travellers who used them for food, because I never saw the plant except in the vicinity of roads and villages. It is not cultivated at all in the Kuram valley.

ACANTHACEÆ.

471. *Justicia peploides*, T. Anders.

From Thal to Kuram, in rice-fields, common.

478. *Dicliptera Roxburghii*, Nees.

From Thal to Badish-khél.

VERBENACEÆ.

508, = 41 (1879). *Lantana alba*, Linn.

From Thal to Badish-khél, common. A very variable plant as to size and number of flowers in each flower-head, also as to the form, size, and consistency of its leaves; all the variations due to whether it has been growing in hot dry open places, or with moisture and in the shade of bushes.

309. *Lippia nodiflora*, Rich.

From Thal to Kuram, near water, very common.

446. *Vitex Negundo*, L.

From Thal to Kuram and Shálizán, near the river's bank or on its tributaries, forming a large bush; common.

LABIATE.

451. *Lycopus europæus*.

At Kuram, in the ditches round fields, common.

499. *Salvia pumila*, *Benth.*

From Thal to Badish-khél, on dry stony country. Greedily browsed by goats and sheep.

397. *Nepeta pubescens*, *Benth.*

Hariáb district, amongst wet gravel, at 9000 feet altitude.

242, 302, = 715, 768 (1879). *N. spicata*, *Benth.*

Kuram district, common at 9000 to 11,000 feet altitude.

447 (1879). *N.* (§ *Longifloræ*, *Boiss.*) *pinetorum*, *Aitchison & Hemsley*, n. sp. Glabrescens, gracilis, calyce subbilabiato, dentibus labii superioris latoribus, fauce parce pilosa, corolla quam calyx duplo longiore, tubo sursum inflato.

Herba perennis, fere glabra, 2-2½ ped. alta, caulibus numerosis, gracilibus, parce ramosis, viridibus, nitidis. *Folia* brevissime petiolata, crassiuscula, cordato-ovata vel cordato-orbicularia, usque ad 1 poll. longa, paucicrenata, obtusissima, venis conspicuis. *Flores* cærulei, cymosi, cymis subtrifloris, pedunculatis, vel superioribus subsessilibus; bracteæ minimæ, molliter subulatæ; calyx glanduloso-hirsutus, 15-nervius, leviter curvatus, sursum ampliatus, subbilabiatus, dentibus latis, patentibus, superioribus brevioribus, acutis, nec setosis nec cristatis, fauce parce pilosa; corolla calyce duplo longior, extus hirsuta, intus glabra, sursum inflata, labiis subæqualibus, postico bifido, antico corrugato; discus crasso-carnosus, antice 1-lobatus. *Nucula* oblongo-trigonæ, læves.

Near *N. lamifolia* and *N. teucriifolia*, differing from both in the teeth of the calyx, as well as in the tube being pilose within, and in other characters. Indeed the ring of hairs in the throat of the calyx would throw it out of the section; but it is otherwise so like these species that it must be associated with them.

Hariáb district from the Péwár-kotal to Káratígah, from 8000 to 11,000 feet. Profuse on the edge of pine-forests. A very showy plant, with large bright lavender-coloured flowers.

It has been raised at Kew, where it flowered in June 1881, from seed collected during 1879.

573 (1879). *Dracocephalum nodulosum*, *Rupr.*

Hariáb district, common from 9000 to 11,000 feet altitude. Flowers June to August.

A very handsome plant, having bright blue to purple flowers. I have not met with it yellow as in the type.

201 (1879). *Scutellaria glutinosa*, *Benth.*, var.?

Kuram and Hariáb districts, from 6000 to 7000 feet altitude. Saféd-koh, Collett no. 39.

It creeps very close to the ground, and has large yellow flowers, with the hood rose-coloured, or sometimes purplish.

537 (1879). *Scutellaria multicaulis*, Boiss.

Hariáb district, at 7500 to 8000 feet.

A low stiff shrub. Flowers with long elegant tubes of a light yellow, ending in a bright purple hood. The flowers grow erect, and thus give great character to the plant.

94, 190, 304, =777 (1879). *Phlomis lamiifolia*, Royle.—*P. bracteosa*, Royle.

Kuram and Hariáb districts, very profuse on the grassy slopes of streams, at an altitude of from 8000 to 12,000 feet.

This was the plant in which the natives packed the snow to enable them to carry it down the Kuram valley during the hot weather.

16 (1879). *Eremostachys acanthocalyx*, Boiss.

70, 82, =449, 486 (1879). *E. speciosa*, Rupr.

449. *Teucrium Scordium*, Linn.

Near Kuram, on the sides of ditches and moist fields; common.

444. *T. (§ Polium) incanum*, Aitchison & Hemsley, n. sp. Aff. *T. Stocksi*, a quo differt ramis folisque brevissime incano-tomentosis, floribus paucioribus majoribus.

Suffrutex densissime ramosus, usque ad 2 ped. altus, undique brevissime incano-tomentosus, ramis gracilibus, internodiis quam folia brevioribus, interdum brevissimis. *Folia* subsessilia, crassa, obovato-oblonga, 4-6 lineas longa, basi cuneata, apice rotundata, parte superiore crenata. *Flores* eburnei, circiter 8 lineas longi, pauci in apices ramulorum congesti; calyx intus extusque pilosulus, latus, subinflatus, leviter obliquus, dentibus fere æqualibus, quam tubum paullo brevioribus; corolla calyce subduplo longior; staminibus exsertis.

Between Thal and Badish-khél, growing gregariously on the low conglomerate hills, at an altitude not above 8500 feet. A small woody shrub about 2 feet in height; flowers a dull white.

MONOCHLAMYDEÆ.

NYCTAGINEÆ.

479. *Boerhaavia diffusa*, Linn.

From Thal to Kuram, on hot exposed stony localities; not common.

AMARANTACEÆ.

452. *Celosia argentea*, *Linn.*

From Thal to Kuram, a weed of cultivation.

523. *Ærua javanica*, *Juss.*

From Thal to Chapri.

CHENOPODIACEÆ.

491 (1879). *Blitum virgatum*, *Linn.*, distributed as *Chenopodium* sp.

Beta vulgaris, *Linn.*

Beetroot was cultivated in the Shálizán gardens; and I saw some splendid specimens of the root. The Afghans are very fond of this vegetable.

450. *Salsola Kali*, *Linn.*

From Thal to Kuram, but not common.

472. *Camphorosma* sp.?

Near Badish-khél, on hot dry clay-soil.

POLYGONACEÆ.

367. *Polygonum aviculare*, *Linn.*, var.

Hariáb, Mount Síka-rám, at 12,000 feet. Very like *P. recumbens*, *Royle*.

282. *P. Bistorta*, *Linn.*

On the Nangrár pass, in quantity, at 11,500 feet, varying very greatly as to size.

293. *P. cognatum*, *Meissn.*

Nangrár pass, at 11,000 feet.

433. *P. flaccidum*, *Roxb.*

Near Kuram, in moist localities.

437. *P.* sp.

Locality unknown.

EUPHORBIACEÆ.

820, 605 (1879). *Euphorbia cœladenia*, *Boiss.*

Ali-khél and Bíán-khél, very common on dry clay-fields.

461. *E. indica*, *Lam.*

Near Kuram, August.

64, 261, = 380 (1879). *Euphorbia Thomsoniana*, Boiss.

Kuram and Hariáb, very characteristic of the region at the limit of trees, 11,000 to 12,000 feet.

The crushed fruit and leaves employed to destroy vermin, and the root-stalk, after being boiled, used as a purgative.

549. *Buxus sempervirens*, Linn.

Between Thal and Badish-khél, on limestone formation, in the low hills, to nearly 4000 feet. Occurs as a large shrub, not a tree. The wood is put to various uses, and is known by the Afghans to be hard and close-grained.

425. *Crozophora tinctoria*, Linn.

From Thal to Kuram, as a weed in the vicinity of villages.

518. *Ricinus communis*, Linn.

Near Thal; appears as if indigenous amongst the low hills. A somewhat different variety occurs as a weed near cultivation. At Shálizán it is cultivated in gardens for domestic use, the leaves being employed as poultices.

CUPULIFERÆ.

146. *Quercus dilatata*, Lindl.

At Ali-khél, and on the Péwár-kotal, from 7000 to 8500 feet altitude. Specimens of the former collection were distributed under 770 (1879) as *Quercus Ilex*, var., collected Ali-khél 22nd July.

How far it is a prevalent tree in the forests, I do not know; for I certainly did not recognize it except on one occasion.

SALICINÆ.

341. *Salix* sp.

Shend-toi gorge, in the beds of streams at an altitude of from 9500 to 11,000 feet.

GNETACEÆ.

65, = 126 (1879). *Ephedra vulgaris*, Rich.

In the Hariáb district, on rocks at 11,000 feet common.

1209 (1879). *E.* sp.

Shálizán, June.

Only the male flowers of this species were collected; and they do not appear to differ materially from those of *E. vulgaris*, Rich.;

but the habit of the plant is so different, that I suspect it may be a distinct species.

496, 537, 537*b*. *Ephedra ciliata*, *Fisch. & Mey.*

This is reduced by Parlatore and others to *E. Alte*, C. A. Meyer. Judging from the type specimens in the Kew Herbarium, it seems to be a distinct species both in habit and inflorescence.

The male flowers of *C. Alte* are nearly four times as large as those of *E. ciliata*, bearing thicker non-ciliolate scales. My plant has ciliolate scales; the scales of the female flowers are at first green, becoming tinged with a russet brown; the inner scales, which at first only partially cover the seeds, become fleshy, gradually enlarge until they completely enclose the two seeds, and, by the close approximation of their free margin, give the fruit the appearance of being a drupe. The fruit, when ripe, is semitransparent, of a milky white (not red), clearly showing two black seeds occupying the interior.

From Thal to Maudúri, in the low hills, not above 3500 feet in altitude.

I have collected the same species at Rawul-pindee in the Punjab, no. 536, Salt range no. 6; Stocks, Scinde, nos. 7 and 449; Fleming, Salt range, no. 94; Vicary, Margalla pass near Rawul-pindee.

CONIFERÆ.

105, 226, = 1210 (1879). *Juniperus recurva*, *Ham.*

Pinus longifolia, *Lamb.*

Cultivated in the cantonments of Kohat. I did not meet with it anywhere in the Kuram or Hariáb districts.

P. halepensis, *Mill.*

Kuram district; occurs only as a cultivated tree near a shrine in the village of Zérán, at an altitude of 6500 feet.

MONOCOTYLEDONES.

PETALOIDEÆ*.

PALMACEÆ.

Nannorrhops Ritchieana, *Wendl. in Bot. Zeit.* 1879, p. 148. (Plate XXVI. figs. 1-12.)—*Chamærops Ritchieana*, *Griffith, Sec Journ. Linn. Soc.* xviii. p. 99.

* For the identification of the Petaloideæ I am indebted to Mr. J. G. Baker, F.R.S.

The accompanying woodcut (see p. 141) was drawn from a branched trunk in the museum at Kew, brought home from the Kuram alley, Afghanistan, by me in 1880. Plate XXVI. is a reduced copy of a drawing of a tree growing in the Saharanpur botanic garden, copied by permission of Mr. Duthie, Superintendent of the garden.

TYPHACEÆ.

600. *Typha angustifolia*, Linn.

On the banks of the Kuram river, at Shinak.

531. *T. latifolia*, Linn. ?

Between Chaprí and Mandúri, in shallows on the margin of the Kuram stream. A very large bullrush.

480. *T. Martini*, T. Thoms. in *Herb. Kew.*, non Jordan.

Between Shinak and Badish-khél, in rice-fields and pieces of still water; common.

AROIDEÆ.

327, 296, = 770 (1879). *Arisæma Jacquemontii*, Blume.

Kuram district, in moist shady woods, at an elevation of from 7000 to 8000 feet; not uncommon.

ORCHIDEÆ.

413. *Habenaria brachyphylla*, Lindl.

Darban valley, Kuram district, on rich loam in woods, at an altitude of 7500 feet. Flowers bright green.

Equal to 1036 Falconer, *Herb. Kew.*

34, = 1238 (1879). *Dienia muscifera*, Lindl.

Shend-toi valley, on rich loam in oak-forests, at 9500 feet altitude; rare.

LILLIACEÆ.

596 (1879). *Eremurus* (§ *Henningia*) *Aitchisoni*, Baker, *Journ. Linn. Soc. Bot.* vol. xviii. p. 102. (Plate XXVII. figs. 1-5.)

376. *Allium*, sp. (nov. ?) *A. lineare*, Linn., prox.

Hariáb district, at an altitude of 8000 feet.

The bulbs are like those of *A. strictum*, Schrad.

262. *Trillium Govanianum*, Wall.

Malána valley, in birch-forests, at an altitude of from 9000 to 10,000 feet.

227. *Polygonatum multiflorum*, *All.*, var.

Shend-toí, under bushes, at an elevation of from 8000 to 9000 feet.

JUNCAOCEÆ.

308. *Juncus lamprocarpus*, *Ehrh.*

In rice-fields and swamps at 4000 feet.

COMMELINEÆ.

490. *Commelina bengalensis*, *Linn.*

Near Alizai.

GLUMIFERÆ.

CYPERACEÆ.

494. *Cyperus puncticulatus*, *Vahl.*

Between Shinak and Alizai, in still water.

438. *C. niveus*, *Retz.*

From Thal to Kuram, in hot stony localities; common.

418. *C. Iria*, *Linn.*

Near Kuram, in rice-fields.

493. *C. infraapicalis*, *Nees.*

Alizai, in still water.

307. *Fimbristylis dichotoma*, *Vahl.*

Kuram, in rice-fields.

603. *Scirpus atropurpureus*, *Retz.*

Shálizán, growing with *S. juncooides*, in rice-fields.

420. *S. juncooides*, *Roxb.*

At Shálizán, in rice-fields, at an altitude of 6000 feet.

421, =868 (1879). *Scirpus maritimus*, *Linn.*, var. *macra*, *Boeck. MSS.*

From Thal to Kuram, profuse in rice-fields, up to nearly 7000 feet altitude.

Produces nodules or tubers on its roots.

312, 465. *S. subulatus*, *Vahl.*

From Thal to Kuram, in rice-fields and still water; common.

316. *Eriophorum comosum*, *Wall.*

From Thal to Kuram, growing in great luxuriance from the face of conglomerate cliffs, up to an altitude of 4000 feet.

Collected as fodder for cattle; not employed in the manufacture of twine or rope.

301. *Kobresia schcenoides*, Boeck.

Saféd-koh range. On the top and southern exposures of these hills with *K. scirpina*, Willd., forming dense turf above the limit of trees, at from 11,000 to 12,000 feet.

230. *K. scirpina*, Willd.

Saféd-koh range, on the tops of the hills, from 11,000 to 12,000 feet, forming turf.

670 (1879). *Carex muricata*, Linn.

Shálizán, June.

571 (1879). *C. vulgaris*, Linn.

Near Bíán-khél, Hariáb district, on moist meadow-land.

313, = 508 (1879). *C. fissirostris*, Ball in Journ. Bot. 1875, p. 206; Journ. Linn. Soc. xvi. p. 705, ex Boeckler in litt.—*C. Aitchisoni*, Boeckler in Flora, 1880, p. 456; Journ. Linn. Soc. xviii. p. 105 (nomen tantum). (Plate XXVIII. figs. 1-4.)1242 (1879). *C. Oliveri*, Boeck. in Flora, 1880, p. 455.

GRAMINEÆ.

544. *Panicum antidotale*, Retz.

Near Chaprí.

506. *P. maximum*, Jacq., var.? *Glumis parce puberulis*.

Exact locality not recorded.

531. *P.* (§ *Trichachne*) *pabulare*, Aitchison & Hemsley, n. sp. *P. leucophæi* affinis, differt imprimis panicularum ramis divaricatis.

Herba elata, culmis gracilibus, lævibus, glabris, supra vaginam nitidis. *Folia* caulina superiora 6-12 poll. longa, sursum longe attenuata, acutissima, leviter scabrida, basi prope ligulam parcissime barbata; ligula brevissima, lacerata. *Panicula* 10-20-ramosæ, pyramidales, ramis divaricatis, infimis fere horizontalibus, usque ad 6 poll. longis. *Spicula* geminæ, breviter pedicellatæ, flore mari nullo. *Gluma* exterior minutissima, secunda et tertia subæquales, longe sericeo-pilosæ, secunda 3-nervia, tertia 5-nervia. *Gluma* florifera omnino hyalino-scariosa, 3-nervia, paleam paullo superans. *Ovarium* glabrum.

Between Thal and Chaprí, also on Tór-gbar hill. In great luxuriance in September after heavy rain; considered the best fodder-grass for cattle in these parts.

509. *Panicum sanguinale*, Linn.—*Digitaria sanguinalis*, Scop.

From Thal to Badish-khél, very common, covering the low hills.

502. *Pennisetum orientale*, Pers.—*P. sinaicum*, Decne.

Thal to Badish-khél, very common.

540. *Lappago racemosa*, Willd.
Near Tór-ghar, not very common.
- 440, 467, =271 (1879). *Saccharum Griffithii*, Munro, MSS.
Kuram district, on the arid shingle-plains and borders of fields, up to 6000 feet; common.
546. *S. Sara*, Roxb.
From Thal to Kuram, always in the vicinity of water.
532. *Elionurus hirsutus*, Munro.
Between Thal and Mandúrí, not very common.
429. *Hemarthria fasciculata*, Kunth.
Near Kuram, in rice-fields.
533. *Heteropogon contortus*, Roem. & Schult.—*H. hirtus*, Pers.
Between Thal and Mandúrí and on Tór-ghar hill, very common.
6. *Andropogon commutatus*, Steud.
On the shingle-plains of Kuram, up to 6000 feet, profuse.
602. *A. laniger*, Desf.
On the shingle plains of Kuram, very common.
443. *A. Schoenanthus*, Linn., var.
In the vicinity of Kuram, on the low hills to the south of the river; common.
- 441, 503. *Chrysopogon ciliolatus*, Nees.
From Thal to Mandúrí, and the low hills on the south of the river near Kuram; very common.
19. *Anthistiria anathera*, Nees.
On the shingle-plains of Kuram, in profusion.
- 328, 444, 723, 896, 898 (1879). *Piptatherum*, sp. near *P. holciforme* and *P. molinoides*.
Kuram district and Pévár-kotal, from 6000 to 8000 feet, very common.
278. *Stipa* sp.?
Malána and Zérán valleys and eastwards, from 7000 to 8000 feet altitude.
Collected and employed as bedding at the shrines.
535. *Aristida cærulescens*, Desf.
On Tór-ghar hill, near Thal; a common grass.

442, 455. *Aristida cynantha*, Nees.

Between Thal and Kuram, and on the low hills to the south of Kuram; common.

1257 (1879). *Melica gracilis*, Aitchison & Hemsley, n. sp. Glabra, culmis gracillimis numerosis, foliis angustissimis, spiculis anguste racemoso-paniculatis 3-floris, glumis omnibus glabris.

Herba perennis (?) caespitosa, fere omnino glabra, culmis numerosis, gracillimis, $1\frac{1}{2}$ -2-pedalibus, foliosis. *Folia* caulina plana, angustissima (maxima vix ultra lineam lata), usque ad 6 poll. longa, acuta, vix scabrida; ligula antice longiuscule producta, acuta. *Spiculae* saepissime 3-florae, breviter pedicellatae, racemosae, pedicellis infra flores pilosulis; racemi saepius 4-6-spiculati, in paniculas simplices laxas elongatas dispositi, floribus longiuscule stipitatis, supremo neutro. *Glumae exteriores* fere omnino scariosae, obtusae, dorso obsolete ciliolatae, inferior 1-nervia, superior 3-nervia. *Gluma florifera* oblonga, obtusa, mutica, integra scariosa, glabra, indistincte 7-nervia. *Palea* lata, scariosa, minute bidentata, gluma paullo brevior, prominenter 2-nervia, nervis leviter scabridis. *Ovarium* glabrum, stylis plumosis.

Kuram district, in the Shend-toi gorge, at 9000 feet, common.

1252 (1879). *Agrostis* (§ *Lachnagrostis*) *Munroana*, Aitchison & Hemsley, n. sp. *A. ciliata*, Trin., affinis, differt spiculis minoribus, gluma florifera exaristata, etc.

Herba 12-15 poll. alta, fere glabra, culmis gracilibus, foliosis, nodis purpureis. *Folia* radicalia non visa, caulina tenuia, plana, glabra, usque ad 6 poll. longa et fere 2 lineas lata, acuta, utrinque leviter scabrida; ligula lata culmum involvens, circiter 2 lineas longa, truncata. *Spiculae* circiter lineam longae, numerosae, in paniculas angustas strictas dispositae, pedicellis laevibus, fere filiformibus. *Glumae exteriores* subaequales, acutae, inferior dorso minute ciliolata. *Gluma florifera* exaristata, extus intusque pilosa. *Palea* angusta, glabra, gluma paullo brevior.

Kuram district, Shend-toi gorge from 10,000 to 11,000 feet in altitude, common.

1253 (1879). *A. subaristata*, Aitchison & Hemsley, n. sp. (Plate XXIX. figs. 1-3.) Species habitu inflorescentia etc. *A. verticillata*, a qua differt glumis exterioribus subaristatis, gluma florifera aristata.

Herba 2-3-pedalis, culmis crassiusculis, glabris, laevibus, stoloniferis. *Folia* caulina plana, glabra, supra scabrida, usque ad $4\frac{1}{2}$ poll. longa et 3 lineas lata, acuta; ligula maxima, ochreoida. *Spiculae* 2-2 $\frac{1}{2}$ lineas longae, anguste denseque paniculatae, ramulis numerosis, subverticillatis; pedicelli puberuli, spiculis saepius breviores. *Glumae exteriores* subaequales, extus undique puberulae, simul ciliatae, plus minus aristatae, aristis terminalibus. *Gluma florifera* glabra, dorso supra medium aristata, arista longiuscule exserta, leviter geniculata. *Palea* glabra, late ovata.

Kuram district, on the margins of fields at 7000 feet; profuse.

648 (1879). *Agrostis verticillata*, Vill., distributed as *Polypogon littoralis*, Sm.

534. *Pappophorum Aucheri*, Jaub.

At Tór-ghar, a common grass.

525. *Dactyloctenium ægyptiacum*, Willd.

Chapri to Mandúri, common.

14, 504. *Chloris villosa*, Pers.

From Thal to the shingle-plains of Kuram, up to an altitude of 6000 feet. The commonest and most characteristic grass of the Kuram plains.

510. *Fingerhuthia africana*, Lehm.

From Thal to Shiinak, on the low hills up to 3000 feet altitude.

Extremely common, and one of the chief fodder-grasses of these parts; flowering in August and September, after the usual rains of this period of the year. Previously known only from South Africa.

543. *Phragmites communis*, Trin.

From Thal to Kuram, in the vicinity of water; common.

Poa annua, Linn.

From Thal throughout the Kuram district, to an altitude of 7000 feet; common.

177, =367 (1879). *Avena* (§ *Crithe*) *oligostachya*, Munro in Journ.

Linn. Soc. xviii. p. 108 (nomen tantum). (Plate XXX. figs. 1-7.)

Species nana, distinctissima, foliis (saltem in siccis) involutis, spiculis sæpissime 4 aggregatis racemosis erectis.

Herba annua, cæspitosa, 9-15 poll. alta, culmis gracilibus, simplicibus, glabris, lavibus, quam folia radicalia sæpius brevioribus. *Folia* radicalia numerosa, conferta, angustissima, in siccis arcte involuta, vix acuta, glabra, subtus lævia, supra scabrida; caulina similia sed multo breviora; ligula angusta circiter 2 lineas longa, apice lacerata. *Spicula* sæpius 3-floræ, racemosæ, sæpissime 4 aggregatæ, breviter pedicellatæ, erectæ, cum aristicis usque ad 2 poll. longæ, axi in aristam brevem producto. *Glumæ* exteriores leviter inæquales, glabræ, margine apiceque scarioso-membranaceæ, inferior 7-nervis, superior 11-nervis. *Gluma florifera* infra medium longe pilosa, bifida, dorso longe aristata, arista infra medium torta, medio geniculata. *Palea* glabra, bidentata, glumam subæquans. *Ovarium* longe pilosum, stylis elongatis, glumas excedentibus, exsertis.

Kuram district, in the deep gorges that give exit to the various tributaries of the Kuram river, hanging from the cliffs of limestone and slate rocks, at an altitude of from 7000 to 8000 feet; common.

384, = 814, 928, 1254, 1255 (1879). *Bromus erectus*, *Linn.*, var.

Hariáb district from Mount Sika-rám to Serátigah, at from 9000 to 13,000 feet altitude; profuse.

837 (1879). *Agropyrum repens*, *Roem. & Schult.*, distributed as *Lolium perenne*, *Linn.*

ACOTYLEDONES.

FILICES*.

329, 330. *Asplenium Filix-fœmina*, *Bernh.*

Shend-tói valley, in shady woods, at an elevation of from 9000 to 10,000 feet.

454. *Ophioglossum vulgatum*, *Linn.*

Kuram district, on the shingle-plains at an altitude of 5000 feet; August.

MARSILEACEÆ.

466. *Marsilea quadrifoliata*, *Linn.?*

From Thal to Shálizán, in rice-fields and still water; very common. Cannot be identified owing to absence of fruit.

CHARACEÆ.

463. *Chara vulgaris*, *Linn.*

Kuram district, at 5000 feet, common in still water and rice-fields.

FUNGI †.

Agaricus mitis, *Pers.*

Kuram district.

Polyporus pinicola, *Fries.*

Kuram district, on pine trees at an altitude of from 7000 to 8000 feet, very rare.

Geaster minimus, *Chev.*

Hariáb-district, in pine forests at 8000 feet.

G. hygrometricus, *Pers.*

Near Shálizán, in forests at 7500 feet.

* For the identification of the Filices I am indebted to Mr. J. G. Baker, F.R.S.

† For the identification of the Fungi I am indebted to M. C. Cooke, LL.D.

***Geaster rufescens*, Fries.**

Hariáb district, Pévár-kotal, in pine-forest at an altitude of from 8000 to 11,000 feet.

***Lycoperdon cælatum*, Bull.**

Kuram district, growing from the roots of an old dead tree, at an altitude of 8500 feet.

APPENDIX.

Since the publication of Part I. of this paper, I have discovered the following errors in the numbers attached to the plants, and take this opportunity to correct them.

Page 33, line 14 from top,	for 77 read 377.
" 34, " 8 " bottom,	" 621 " 694.
" 37, " 18 " top,	" 433 " 443.
" 39, " 10 " bottom,	" 868 " 878.
" 43, " 8 " top,	" "M." " Medicago .
" 51, " 13 " " "	" 387 " 103, 307.
" 54, " 9 " bottom,	" 04 " 304.
" 56, " 17 " " "	" 182 " 782.
" 57, " 19 " " "	" 413 " 414.
" 57, " 13 " " "	" 128 " 124.
" 60, " 17 " top,	" 3 " 983.
" 60, " 9 " bottom,	" 472a " 427a.
" 61, " 6 " " "	" 873 " 863.
" 72, " 3 " " "	" 616 " 619.
" 87, " 13 " top,	" 634 " 643.
" 92, " 2 " bottom,	" 71 " 671.
" 93, " 13 " top,	" 4898 " 4698.
" 105, " 14 " bottom,	" 870 " 670.
" 106, " 11 " top,	" 891 " 898.
" 109, " 6 " " "	" 1258 " 268.
" 110, " 7 " " "	" 705 " 709.
" 111, " 3 " " "	" 71 " 271.

DESCRIPTION OF PLATES.

The figures of the plants or portions of plants are all of the natural size; and the figures of the analyses are all more or less enlarged.

PLATE I.

Map to illustrate the Flora of the Kuram Valley, Afghanistan. The red lines indicate the routes of the two journeys made by Dr. J. E. T. Aitchison;

the blue marks the Kuram River and main tributaries. The diagrams I., II., and III. severally refer to ideal sections running north and south, and partially east and west, as shown by the direction of the arrows in the map.

PLATE II.

Clematis Robertsiana, Aitch. & Hemsl.

- Fig. 1. A flowering branch, nat. size. 2. A fertile stamen, enlarged. 3. A slightly metamorphosed stamen, enlarged. 4. A head of achenes, nat. size. 5. A single achene, enlarged.

PLATE III.

Oxygraphis Schaftoana, Aitch. & Hemsl.

- Fig. 1. A plant, nat. size. 2. A petal, enlarged. 3. Two stamens, showing back and front of anther, enlarged. 4. An achene, enlarged. 5. An achene with side removed, showing the seed, enlarged.

PLATE IV.

Corydalis pulchella, Aitch. & Hemsl.

- Fig. 1. Portion of a plant with most of the leaves removed, nat. size. 2. A sepal, enlarged. 3. A ripe fruit, enlarged.

PLATE V.

Astragalus kuramensis, Baker.

- Fig. 1. Portion of plant, nat. size. 2. The standard, enlarged. 3. A keel-petal, enlarged. 4. A wing-petal, enlarged. 5. A fruit, enlarged about one half.

PLATE VI.

Onobrychis dasycephala, Baker.

- Fig. 1. Portion of a plant, nat. size. 2. Interior view section of fruit, enlarged.

PLATE VII.

Rosa Beggeriana, Schrenck.

- Fig. 1. A branch bearing both flowers and fruit, nat. size. 2. A style, enlarged. 3. A ripe achene, enlarged.

PLATE VIII.

Rosa Ecæ, Aitch.

- Fig. 1. Portion of plant in flower, nat. size. 2. The same in fruit, nat. size. 3. An achene, enlarged.

PLATE IX.

Gentiana micrantha, Aitch. & Hemsl.

- Fig. 1. A plant, nat. size. 2. A corolla laid open, enlarged. 3. Front view of a stamen, enlarged. 4. Back view of a stamen, enlarged. 5. An ovary, enlarged.

Saxifraga afghanica, Aitch. & Hemsl.

- Fig. 6. A plant, nat. size. 7. A leaf, enlarged. 8. A calyx, enlarged. 9. Back view of stamen, enlarged. 10. Front view of stamen, enlarged. 11. Fruit, enlarged. 12. A seed, enlarged.

PLATE X.

Cotyledon tenuicaulis, Aitch. & Hemsl.

- Fig. 1. A plant, nat. size. 2. A flower, enlarged. 3. Back view of a stamen, enlarged. 4. Front view of a stamen, enlarged. 5. A pistil, enlarged.

Sedum pachyclados, Aitch. & Hemsl.

- Fig. 6. Portion of a plant, nat. size. 7. Back view of anther, enlarged. 8. Front view of anther, enlarged. 9. A petal with adherent stamen, enlarged. 10. A pistil, enlarged.

PLATE XI.

Pimpinella tripartita, Aitch. & Hemsl.

- Fig. 1. A plant, nat. size. 2. A petal, enlarged. 3. A pistil, enlarged. 4. A young fruit, enlarged.

PLATE XII.

Pleurospermum pulchrum, Aitch. & Hemsl.

- Fig. 1. A flowering branch, nat. size. 2. An umbel in fruit, nat. size. 3. A flower, enlarged. 4. A petal, enlarged. 5. A fruit dehiscing, enlarged. 6. A cross section of the same, enlarged. 7. A seed, enlarged.

PLATE XIII.

Angelica Strattoniana, Aitch. & Hemsl.

- Fig. 1. Portion of root, reduced about two thirds. 2. Portion of a radical leaf, nat. size. 3. A branch in young fruit, nat. size. 4. A petal, enlarged. 5. A carpel, enlarged. 6. A cross section of the same, enlarged. 7. A seed, enlarged.

PLATE XIV.

Aitchisonia rosea, Hemsl.

- Fig. 1. Portion of plant, nat. size. 2. Inflorescence, slightly enlarged. 3. A corolla laid open, enlarged. 4. An ovary, enlarged. 5. A fruit, the side of the carpels removed to show the insertion of the seed, enlarged.

PLATE XV.

Scabiosa (§ *Pterocephalus*) *afghanica*, Aitch. & Hemsl.

- Fig. 1. Portion of a plant, nat. size. 2. An involucrel, enlarged. 3. A flower, enlarged. 4. A ripe achene, enlarged.

PLATE XVI.

Aster lacunarum, Aitch. & Hemsl.

- Fig. 1. Plant, nat. size. 2. A ray-flower, enlarged. 3. Style of the same, enlarged. 4. A disk-flower, enlarged. 5. Style of the same, enlarged.

PLATE XVII.

Cousinia carthamoides, Aitch. & Hemsl.

- Fig. 1. Portion of a plant, nat. size. 2. Bristles of the receptacle, enlarged. 3. A flower, enlarged. 4. An anther, enlarged. 5. Upper portion of style, enlarged. 6. An unripe achene, enlarged. 7. A bristle of the pappus, enlarged.

PLATE XVIII.

Cousinia elegans, Aitch. & Hemsl.

- Fig. 1. Lower part of a plant without the radical leaves. 2. Upper part of the same, the intermediate part being removed, nat. size. 3. Bristles of the receptacle, enlarged. 4. A flower, enlarged. 5. An anther, enlarged. 6. Upper portion of style, enlarged. 7. A very young achene, enlarged. 8. A bristle of the pappus, enlarged.

PLATE XIX.

Pertya Aitchisoni, C. B. Clarke.

- Fig. 1. Part of a plant, nat. size. 2. A flower, enlarged. 3. An anther, enlarged. 4. Upper portion of style, enlarged. 5. A bristle of the pappus, enlarged.

PLATE XX.

Rhododendron Collettianum, Aitch. & Hemsl.

- Fig. 1. A flowering branch, nat. size. 2. Portion of a leaf showing the scurfy indumentum on the under surface, enlarged. 3. A single flower, nat. size. 4. A sepal, enlarged. 5. Upper portion of corolla laid open, showing the hairy throat (rather exaggerated), enlarged. 6. A stamen, enlarged. 7. A pistil with glandular disk, enlarged. 8. A cross section of the same, further enlarged.

PLATE XXI.

Rhododendron afghanicum, Aitch. & Hemsl.

- Fig. 1. A flowering branch, nat. size. 2. A portion of a leaf showing discoid scales on the under surface, enlarged. 3. A single scale, much enlarged. 4. A corolla, laid open, enlarged. 5. A stamen, enlarged. 6. A pistil with calyx, enlarged. 7. A cross section of pistil, further enlarged.

PLATE XXII.

Acantholimon calocephalum, Aitch. & Hemsl.

- Fig. 1. Portion of plant, nat. size. 2. A bract, enlarged. 3. Portion of the calyx, enlarged. 4. A petal with a stamen attached, enlarged.

PLATE XXIII.

Statice Griffithii, Aitch. & Hemsl.

- Fig. 1. Lower portion of a plant, nat. size. 2. Upper portion of the same, nat. size. 3. A one-flowered spikoleet, enlarged. 4. A pistil, enlarged.

PLATE XXIV.

Arnebia speciosa, Aitch. & Hemsl.

- Figs. 1 and 2. Portions of a plant, nat. size. 3. A calyx, enlarged. 4. A corolla, enlarged. 5. A fruit in which two of the nutlets are fertile, enlarged. 6. A fruit in which only one of the nutlets is fertile, enlarged.

PLATE XXV.

Veronica rupestris, Aitch. & Hemsl.

- Fig. 1. Portion of a plant, nat. size. 2. A corolla laid open, enlarged. 3. Two stamens, showing back and front views of anther. 4. A fruit, enlarged. 5. A seed, enlarged.

PLATE XXVI.

Nannorrhops Ritchieana, Wendl.

- Fig. 1. Reduced figure, copied by permission from a drawing of a tree growing in the Botanic Garden, Sabarunpore. 2. Portion of young inflorescence, nat. size. 3. A pair of flower-buds, enlarged. 4. Back view of anther, much enlarged. 5. Front view of same. 6. A pistil, enlarged. 7. A vertical section of the same. 8. A young fruit in which all three carpels are growing out, enlarged. 9, 10, 11. Fruits, nat. size. 12. Section of a seed, showing the embryo, nat. size.

PLATE XXVII.

Eremurus Aitchisoni, Baker.

- Fig. 1. Lower portion of a plant with most of the leaves removed, nat. size. 2. Upper portion of flower-scape, nat. size. 3. A segment of the outer series of the perianth, with adherent stamen, enlarged. 4. A segment of the inner series of the perianth, with adherent stamen, enlarged. 5. A ripe fruit dehiscing, enlarged.

PLATE XXVIII.

Carex flsistrostris, Ball.

- Fig. 1. A plant, nat. size. 2. A scale from a female spike, enlarged. 3. A fruit, enlarged. 4. A scale from a male spike, enlarged.

PLATE XXIX.

Agrostis subaristata, Aitch. & Hemsl.

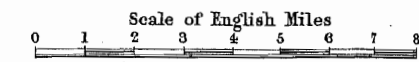
- Fig. 1. A plant, nat. size. 2. A spikelet, enlarged. 3. A flowering glume, enlarged.

PLATE XXX.

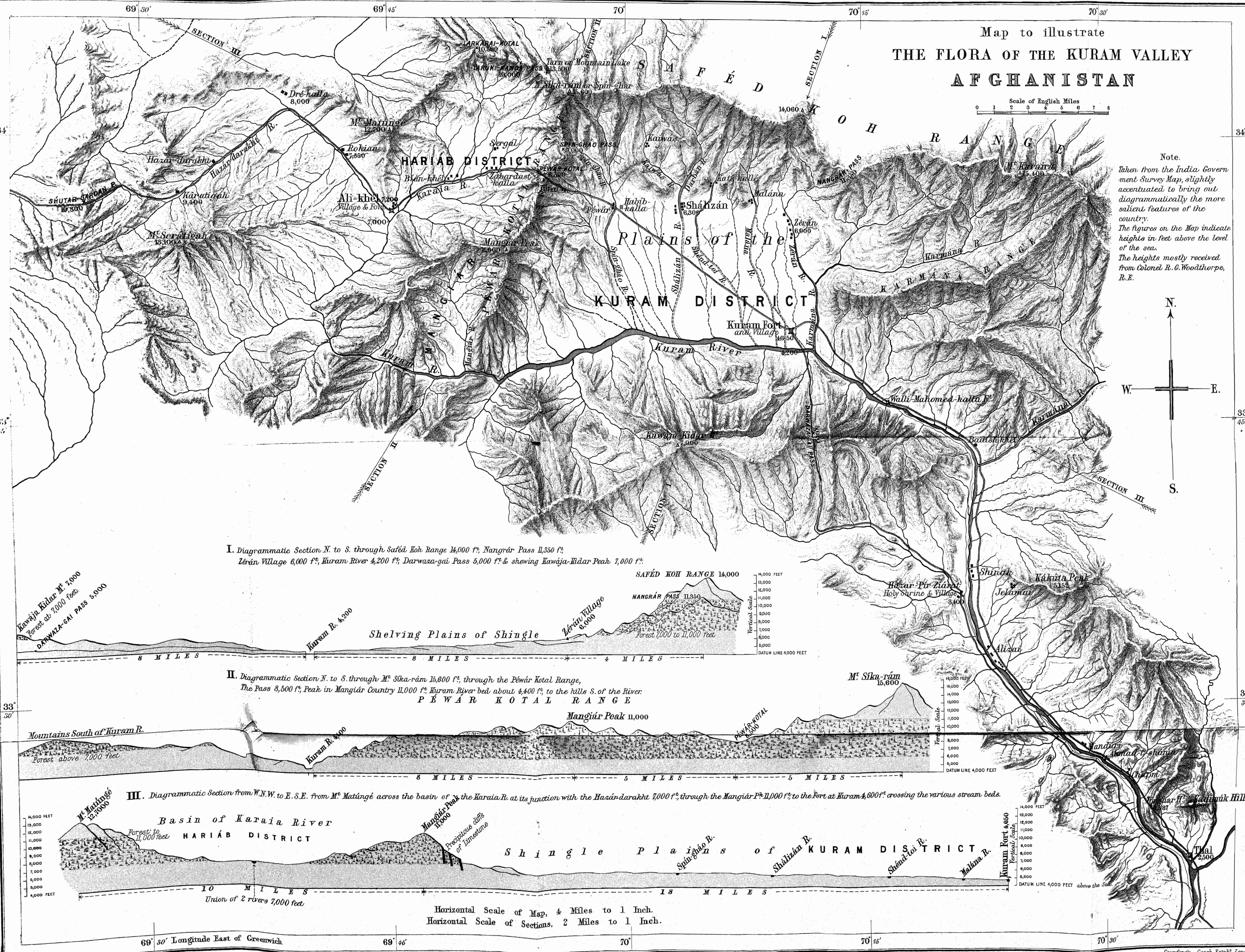
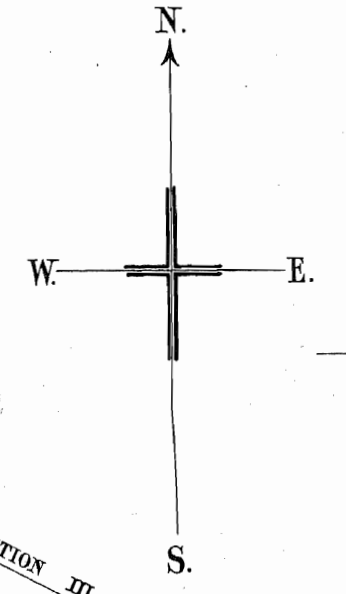
Avena oligostachya, Munro.

- Fig. 1. A plant, nat. size. 2. A spikelet, enlarged. 3. The lower glume of a spikelet, enlarged. 4. The upper glume of a spikelet, enlarged. 5. A flower-glume, enlarged. 6. A palea, enlarged. 7. An ovary enlarged.
-

Map to illustrate THE FLORA OF THE KURAM VALLEY AFGHANISTAN



Note.
Taken from the India Government Survey Map, slightly accentuated to bring out diagrammatically the more salient features of the country.
The figures on the Map indicate heights in feet above the level of the sea.
The heights mostly received from Colonel R. G. Woodthorpe, R.E.



I. Diagrammatic Section N. to S. through Saféd Koh Range 14,000 f^t; Nangrâr Pass 11,350 f^t; Lérân Village 6,000 f^t; Kuram River 4,200 f^t; Darwaza-gai Pass 5,000 f^t; & showing Kawâja-Eidar Peak 7,000 f^t.

II. Diagrammatic Section N. to S. through M^t Sika-râm 15,600 f^t; through the Péwar Kotal Range, The Pass 8,500 f^t; Peak in Mangiâr Country 11,000 f^t; Kuram River bed about 4,400 f^t; to the hills S. of the River.

III. Diagrammatic Section from W.N.W. to E.S.E. from M^t Matiné across the basin of the Karraia R. at its junction with the Hasân-darakh^t 7,000 f^t; through the Mangiâr P^h 11,000 f^t; to the Fort at Kuram 4,600 f^t; crossing the various stream beds.

Horizontal Scale of Map, 4 Miles to 1 Inch.
Horizontal Scale of Sections, 2 Miles to 1 Inch.

69° 30' Longitude East of Greenwich 69° 45' 70° 70° 15' 70° 30'











1-5 GENTIANA MICRANTHA, Aitch. & Hemsl.

6-12 SAXIFRAGA AFGHANICA, Aitch. & Hemsl.

J.N. Fitch imp.

M. Smith del et lith.



M. Smith del. et lith.

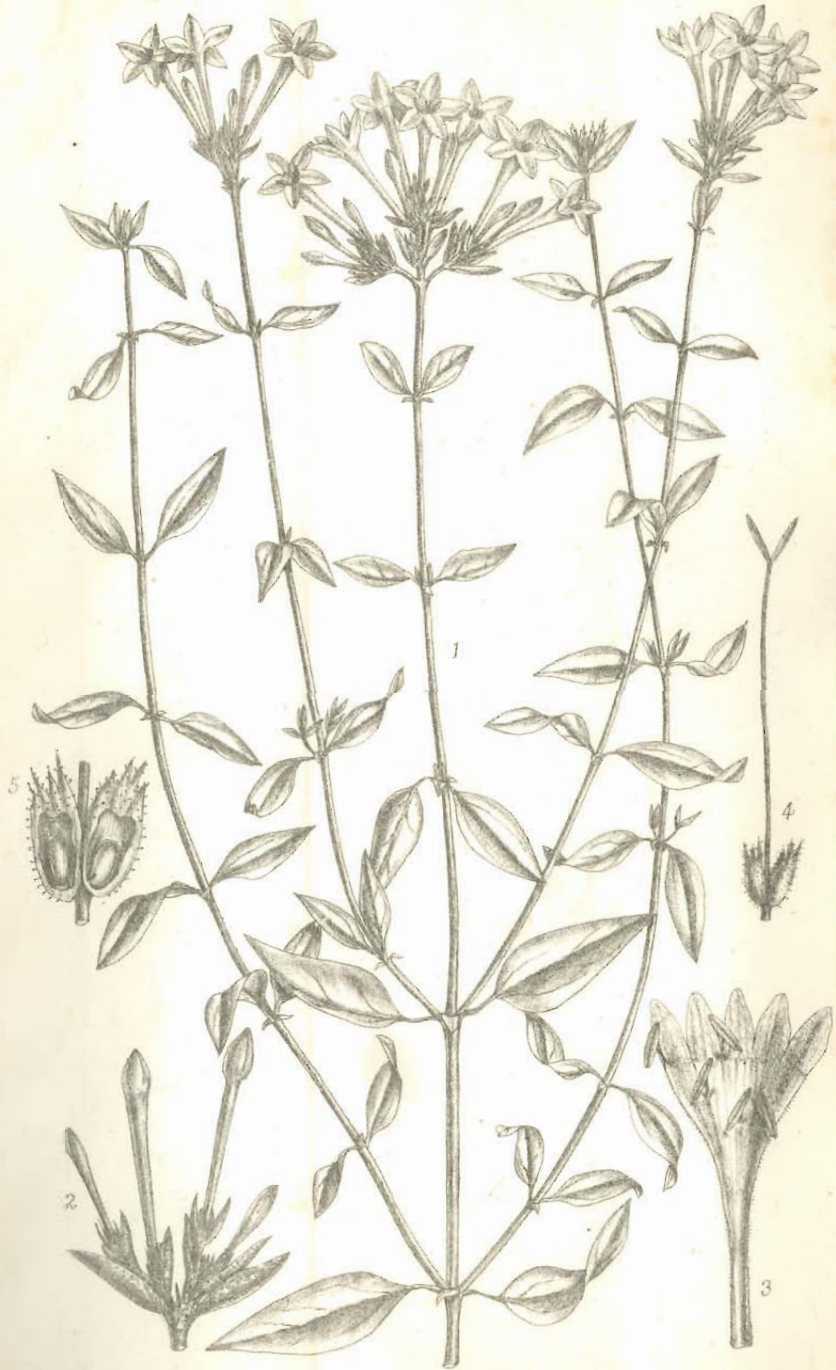
J.N. Fitch imp.

1-5. *COTYLEDON TENUICAULIS*, Aitch. & Hansl.
 6-10. *SEDUM PACHYCLADOS*, Aitch. & Hansl.











M. Smith del. et lith.

J.N. Yeech imp.

SCABIOSA (PTEROCEPHALUS) AFGHANICA, Aitch. & Hemsl.



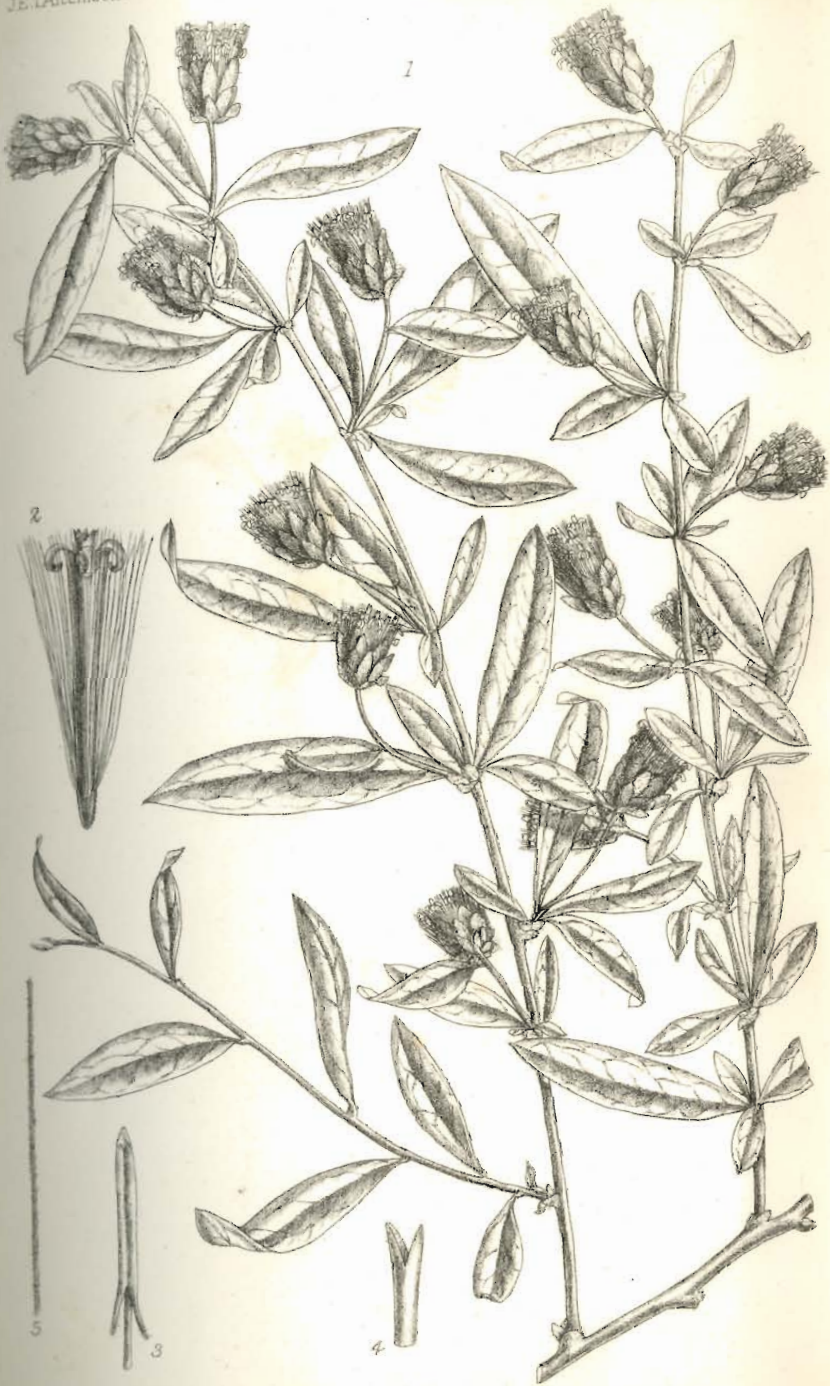




M. Smith del. lith.

COUSINIA ELEGANS, Aitch. & Hemsl.

J.N. Fitch imp.





HID del. & nat.

JN Fitch lith.

RHODODENDRON COLLETTIANUM, Aitch & Hemsl.



H. E. Aitchison del. & nat.

J. N. Fitch lith.

RHODODENDRON AFGHANICUM, Aitch. & Hemsl.



















