

Part I. Thalamifloræ.

Price 3/6

A MANUAL FLORA
OF
MADEIRA
AND
THE ADJACENT ISLANDS
OF
PORTO SANTO AND THE DEZERTAS.
BY
RICHARD THOMAS LOWE, M.A.

DOMINI est terra, et plenitudo ejus.—Psal. xxiv. 1.

LONDON:
JOHN VAN VOORST, 1 PATERNOSTER ROW.
MDCCCLVII.

Printed by Taylor and Francis, Red Lion Court, Fleet Street.

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RANUNCULACEÆ—PITTOSPORACEÆ.

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UNIVERSIDADE DE COIMBRA

JARDIM BOTANICO

NOTICE.

IMPEDED by graver avocations, and in prospect of being obliged shortly to suspend altogether further progress by the necessity of leaving England for the benefit of health, I have decided on publishing at once the following portion of the Flora of Madeira; which I offer rather for the local use of invalids, or other persons resorting to the island for a temporary residence, and who may find in these pursuits interest and recreation for themselves or kindly employment in behalf of friends at home, than with the hope of imparting to European botanists much new or valuable matter. Still the following pages will supply, it may be hoped, one desideratum: namely, a more complete and correct catalogue of the living plants, actually or heretofore existing in Madeira and the adjacent islands, than has yet been provided. For, although several more or less accurate or full lists have appeared in print, whilst lately one in manuscript, formed by my regretted friend, Dr. Charles Lemann, partly indeed from his own researches, but completed with reference to a great part of the Madeiran and the whole of the Porto-Santan and Dezertan species from my own catalogue lent him for his private use, has been communicated since his death to several botanists, still there is wanting, in a form accessible to every one, any such authentic and exact register of the plants really growing in Madeira as I may not unreasonably hope to furnish: my present list being the careful fruit of a twenty-six years' constant residence in the island, and of a subsequent six months' visit in 1855, improved by diligent attention to the previous or contemporary labours of others in the same field, and above all by the free use of the important authentic materials deposited in the Banksian and Hookerian Herbaria, accorded by the liberality and friendship of their respective guardians or owner. To Sir W. J. Hooker,

Mr. Robert Brown, and Mr. J. J. Bennett, are indeed owing my most cordial thanks.

On my return to England it is my purpose, if life be spared, not only to complete the present little publication, but to follow it up, as health and leisure may permit, with a series of similar Manuals on the Ferns and other Cryptogamic plants, the Birds and Fishes, Shells or Mollusks, marine and terrestrial, of the island: such as, in conjunction with the elaborate and admirable works of Mr. Wollaston on the Insects, may furnish together a tolerably complete Natural History of the Madeiran group.

In the mean time, no further inconvenience than delay will accrue to the purchasers of the present instalment, in itself complete, of the Phænogamic Flora, by its separate publication. When its sequel is carried through the press, care will be taken to make the paging continuous with that of the part now published, so that the whole may be ultimately bound up in one volume, for which a fresh title-page, with other introductory or prefatory matter, tables, indices, &c., will be supplied.

One word then only for the present to collectors in Madeira. It is a much better plan to take out a sufficient stock of drying-paper for the day's walk or excursion, strapped or tied up between two common boards of suitable size, placing the plants at once when gathered between the sheets, than to collect them in a herborizing-box, not laying them out till the conclusion of the expedition in the evening. A great amount of trouble is thus saved: and, indeed, the heat of the sun in Madeira renders the herborizing-box almost useless, its contents generally withering long before they can be carried home. The roughest wooden boards are better than the best paste-boards, pressing more equably, and affording more protection from a casual shower. At night, a stone of suitable weight placed on the bundle, forms the best possible plant-press.

LEA RECTORY, *July 27th*, 1857.

EXPLANATIONS AND ABBREVIATIONS.

REGIONS OR ZONES OF VEGETATION IN MADEIRA.

1. CACTUS and BANANA.—Tropical, cultivated, reaching from the sea to a height of 700 feet. Characterized by the following plants:—

Cultivated.—Banana, Palm, Sugar Cane, Arrowroot, Rose-apple, Custard-apple, Guava, Fig, Cypress, Bamboo, Oleander, Judas-tree, Carob-tree, Coral-trees (*Erythrina*), *Brugmansia*, *Bignonia*, *Hibiscus*, *Poinsettia*, *Euphorbia*, *Duranta*, *Cæsalpinia*, *Alpinia*, *Hedychium*, *Hoya*, *Stephanotis*, *Cereus* (*triangularis* L., *speciosissimus* Desf., *phyllanthoides* DC., &c.), *Passiflora* (*quadrangularis* L., *edulis* Ker, *Loweii* Heer, &c.).

Naturalized.—Prickly Pear (*Opuntia Tuna* Mill.), *Pelargonium inquinans* Ait., *Cassia bicapsularis* L., *Lantana Camara* L., *Ricinus communis* L., *Aloe arborescens* L., *Aloe vulgaris* Lam., *Ageratum conyzoides* L., *Maurandia semperflorens* Jacq., *Mesembrianthemum cordifolium* L., *Solanum sodomæum* L., *Sol. auriculatum* Ait., *Sida carpinifolia* L., *Commelina agraria* Kth., *Panicum repens* L., *Paspalum vaginatum* L., *Eleusine indica* Gaërtn., &c.

Indigenous.—Dragon-tree, *Teucrium heterophyllum* Herit., *Jasminum odoratissimum* L., *Chamæmeles coriacea* Lindl., *Sideroxylon Mermulana* Lowe, *Celastrus* (*Catha* Forsk.) *cassinoides* Herit., *Gomphocarpus fruticosus* R. Br., *Helichrysum obconicum* DC., *Euphorbia piscatoria* Ait., *Juniperus phœnicea* L., *Ephedra alata* Decaisne, *Pedrosia glauca* Ait., *Frankenia lævis* L., *Lavandula pinnata* L., *Matthiola maderensis* Lowe, *Sonchus ustulatus* Lowe, *Musschia aurea* L. fil., *Echium nervosum* Ait., *Hyoscyamus canariensis* Ker, *Sempervivum glutinosum* Ait., *Pennisetum cenchroides* Rich., *Andropogon hirtus* L., *Piptatherum multiflorum* Beauv., *Cheilanthes suaveolens* Sw., *Nothochlæna Marantæ* L., *N. vellea* Sw., *Nephrodium molle* R. Br., &c.

2. VINE and CHESTNUT*.—Temperate, cultivated, from 500 to 2500 feet. The chief characteristic plants are—

* The Chestnut forms from 1500 to 2500 feet a sort of upper belt or border to this zone, below whose upper limit snow never lies longer than a few hours.

Cultivated and naturalized.—The Vine, Cereals, Chestnut, Oak, Cork-tree, Orange, Lemon, Pomegranate, Fig, Mulberry, Peach, Almond, Apricot, Plum, Cherry, Apple, Pear, Quince, Japan Medlar, Walnut, American Aloe, Fuchsias, Heliotrope, Pelargoniums, Australian Acacias and Eucalypti, Stone Pine and Pinaster, Roses, Honeysuckle, *Mesembrianthemum edule* L., *Passiflora cærulea* L., *Oxalis purpurea* Jacq., *Solanum pseudocapsicum* L., *Hydrangea hortensis* Sm., *Rhus Coriaria* L., *Ornithogalum arabicum* L., *Lilium candidum* L., *Arum italicum* L. and *A. Dracunculus* L., *Richardia æthiopica* L., *Amaryllis Bella Donna* L., Common Furze, Broom and Bramble, &c.

Indig.—Dragon-tree, Myrtle, Dog-rose (*R. canina* L.), Madeira Holly (*Ilex Perado* Ait.), *Rhamnus glandulosa* Ait., *Myrica Faya* Ait., *Euphorbia mellifera* Ait., *Genista virgata* Ait., *Adenocarpus parvifolius* DC., *Hypericum grandifolium* Choisy., *H. glandulosum* Ait., *Teucrium betonicum* Herit., *Globularia salicina* Lam., *Phyllis Nobla* L., *Lavandula viridis* Ait., *Viola odorata* L., *Fragaria vesca* L., *Agrimonia Eupatorium* L., *Lobelia urens* L., *Cynoglossum pictum* Ait., *Salvia clandestina* L., *Aristolochia longa* L., *Brachypodium pinnatum* Huds., *Melica ciliata* L., *Danthonia decumbens* L., *Arrhenatherum avenaceum* Beauv., *Agrostis canina* L., *Ceterach officinarum* Willd., &c.

3. LAUREL and HEATH.—Mountains; uncultivated, from 2500 to 5500 feet. The principal plants are—

Naturalized.—Common Broom and Mountain Ash (*Pyrus Aucuparia* L.); the latter perhaps indig.

Indig.—Laurels (*L. indica* L., *foetens* Ait., *canariensis* Willd.), Heaths (*Erica arborea* L., *scoparia* L.), Whortleberry (*Vaccinium maderense* Link), *Clethra arborea* Ait., *Heberdenia excelsa* Ait., *Picconia excelsa* Ait., *Echium candicans* L. fil., *Sonchus squarrosus* DC., *S. pinnatus* Ait., *Chrysanthemum pinnatifidum* L. fil., *Cheiranthus mutabilis* Herit., *Senecio maderensis* DC., *Isoplexis sceptrum* L. fil., *Bystropogon punctatus* Herit., *piperitus* Lowe, *maderensis* Webb, *Teucrium abutiloides* Herit., *Mentha Pulegium* L., *Origanum virens* Hoffm., *Phyllis Nobla* L., *Fragaria vesca* L., *Viola sylvestris* Lam., *Saxifraga maderensis* Don, *Teesdalia nudicaulis* R. Br., *Sibthorpia peregrina* L., *Cedronella triphylla* Moench, &c.

4. HIGHEST PEAKS.—Rocky crags and summits of the higher mountains, uncultivated, from 5500 to about 6000 feet. The only peculiar plants are—

Indig.—*Arenaria serpyllifolia* L., *Cerastium tetrandrum* Curt., *Erica cinerea* L., *Viola paradoxa* Lowe, *Armeria maderensis* Lowe, *Avena marginata* Lowe.

REGIONS OR ZONES OF VEGETATION IN PORTO SANTO.

1. MARITIMA or Littoral.—From the sea to a height of 100 feet; cultivated. The characteristic plants are—
Cult. and naturalized.—Vine, Fig, Mulberry, Tamarisk, *Eleagnus angustifolia* L., *Lycium europæum* L., *Arundo Donax* L., *Mesembrianthemum edule* L., &c.
Indig.—*Convolvulus Soldanella* L., *Salsola Kali* L., *Cakile maritima* Scop., *Pedrosia Porto-sanctana* Lowe, *Atriplex parvifolia* Lowe, *Suaeda fruticosa* L., *Chenolea tomentosa* Lowe, *Glaucium corniculatum* L., *Polygonum maritimum* L., *Euphorbia piscatoria* Ait., *E. Peplis* L., *E. Paralias* L., *Spergularia rubra* L., &c.
2. COLLINA or Hill-side zone.—From 100 to 1200 feet; cultivated.
Cult.—Cereals (chiefly Barley and Rye), Pulse (*Ercum Lens* L., *Lathyrus Cicera* L., *L. articulatus* L.), White Poplar, Dragon-tree, Prickly Pear (*Opuntia Tuna* Mill.), Tamarisk, &c.
Indig. and naturalized.—*Ranunculus muricatus* L., *Erodium chium* L., *Frankenia pulverulenta* L., *F. levis* L., *Astragalus Solandri* Lowe, *Senecio incrassatus* Lowe, *Statice oralis* Poir., *Juncus acutus* L., *Pedrosia macrantha* Lowe, *Plantago Victorialis* Poir., *Cichorium Intybus* L. β . DC.; and amongst corn, *Chrysanthemum coronarium* L., *Silene inflata* Sm., *S. nocturna* L. β . DC., *S. ignobilis* Lowe, *Papaver Rhæas* L., *Centaurea melitensis* L., *Emex spinosus* L., *Melilotus parviflora* Desf., *M. sulcata* Desf., *Ononis mitissima* L., *Trifolium* sp., &c.
3. MONTANA or Mountain-pastures.—From 1000 or 1200 to 1500 feet; partially cultivated, but chiefly grassy.
Indig. or naturalized.—*Ononis micrantha* Lowe, *O. dentata* Lowe, *Medicago* sp., *Trifolium* sp., *Cynara horrida* Ait., *Verbascum virgatum* L., *Mentha Pulegium* L., *Origanum virens* Hoffm., *Prasium medium* β . Lowe, *Ajuga Ica* L., *Carex divulsa* Good., *Festuca bromoides* L., *Pteris aquilina* L., &c.
4. EXCELSA or Rocky mountain-peaks.—From 1200 or 1500 to nearly 1700 feet; bare uncultivated highest crags.
Indig.—*Cheiranthus arbuscula* Lowe, *Umbilicus pendulinus* DC., *Sempervivum stellatum* Sm., *Saxifraga maderensis* Don, *Galium geminiflorum* Lowe, *G. anglicum* Huds., *Helichrysum melanophthalmum* Lowe, *Senecio maderensis* DC., *Pedrosia macrantha* Lowe, *P. argentea* Lowe, *Andryala robusta* Lowe, *Tolpis fruticosa* Schr. γ , δ . Lowe, *Erica scoparia* L., *Wahlenbergia lobelioides* L. fil., *Sibthorpia peregrina* L., *Micromeria varia* Benth., *Sideritis Massoniana* Benth., *Plantago leiopetala* Lowe, *Rumex aculeatus* L., *Habenaria cordata* Link, *Dactylis glomerata* L., *Davallia canariensis* Sw., *Polypodium vulgare* L., *Lycopodium denticulatum* L., &c.

REGIONS OR ZONES OF VEGETATION IN THE DEZERTAS.

N.D.—North or Little Flat Dezerta.

MARITIME wholly.—Sea-cliffs, and top of the Island at or a little above 300 feet. The principal plants are—

Indig.—*Artemisia argentea* Herit., *Teucrium heterophyllum* Herit., *Olea europæa* L. a, subv. *buxifolia* Lowe, *Jasminum odoratissimum* L., *Silene inflata* Sm. γ, *maritima* With., *Matthiola maderensis* Lowe, *Crithmum maritimum* L., *Andryala robusta* Lowe, *Tolpis fruticosa* Schr. a, *Sonchus ustulatus* Lowe, *Calendula maderensis* Lowe, *Barkhausia divaricata* β. Lowe, *Helminthia echioides* Gaërtn., *Mesembrianthemum crystallinum* L., *M. nodiflorum* L., *Pedrosia glauca* Ait., *P. argentea* Lowe, *Vicia capreolata* Lowe, *Ononis dentata* Lowe, *Scrophularia arguta* Ait., *Plantago Coronopus* L., *Beta patula* Ait., *Suaeda fruticosa* L., *Urtica urens* L., *Asphodelus fistulosus* L., *Hordeum murinum* L., *Brachypodium distachyon* L., *Arthrochortus loliaceus* Lowe, &c.

M.D. or G.D.—Middle or Great Dezerta.

1. MARITIME.—Sea-cliffs, and up to a height of 800 or 1000 ft.

Indig.—*Monizia edulis* Lowe, *Crithmum maritimum* L., *Silene inflata* Sm. γ, *maritima* With., *Matthiola maderensis* Lowe, *Crambe fruticosa* Herit. β, *Phyllis Nobla* L., *Andryala robusta* Lowe, *Sonchus ustulatus* Lowe, *Tolpis fruticosa* Schr. a, *Calendula maderensis* Lowe, *Helichrysum melanophthalmum* Lowe, *Pedrosia glauca* Ait., *Plantago Coronopus* L., *P. arborescens* Poir., *Sideritis Massoniana* Benth. β, *Suaeda fruticosa* L., &c.

2. MOUNTAIN.—Central Valley and Mountains, from 800 or 1000 to 1600 ft.

Cult. or naturalized.—A little Wheat and Rye, a few Firs (*Pinus Pinaster* L.), a Fig-tree or two, a few Cabbages, a Tobacco plant or two, Common Broom, Furze (*Ulex europæus* L.), Milk or Holy Thistle (*Silybum Marianum* Gaërtn.), *Arundo Donax* L., *Reseda Luteola* L., *Papaver somniferum* L., &c.

Indig.—*Rapistrum rugosum* (L.) Bergm. a. and β, *Ruta bracteosa* DC., *Trifolium angustifolium* L., *T. lupulinum* L., *T. ligusticum* Balb., *Lotus hispidus* Desf., *Ononis mitissima* L., *Mesembrianthemum nodiflorum* L., *Asteriscus aquaticus* L., *Helminthia echioides* Gaërtn., *Galactites tomentosa* Moench., *Phagnalon saxatile* L., *Echium plantagineum* L., *Marrubium vulgare* L., *Micromeria varia* Benth., *Rumex pulcher* L., *R. aculeatus* L., *Urtica urens* L., *U. membranacea* Poir., *Carex divulsa* Good., *Holcus lanatus* L., *Lagurus ovatus* L., *Phalaris cærulescens* Desf., *P. paradoxa* L. fil., *Avena hirtula* Lag., *A. fatua* L., *Briza maxima* L., *Festuca bromoides* L., *Bromus madritensis* L., *Pteris aquilina* L., &c.

S.D.—South Dezerta or Bugio.

1. MARITIME.—Sea-banks and cliffs up to a height of 1000 or 1200 ft.

Indig.—*Papaver somniferum* L., *Silene inflata* Sm. γ , *maritima* With., *Crambe fruticosa* Her. β , *Pedrosia glauca* Ait., *Melilotus parviflora* Desf., *Crithmum maritimum* L., *Phyllis Nobla* L., *Mesembrianthemum nodiflorum* L., *M. crystallinum* L., *Senecio incrassatus* Lowe, *Calendula maderensis* Lowe, *Tolpis fruticosa* Schr. α , *Andryala robusta* Lowe, *Echium nervosum* Ait., *Hyoscyamus canariensis* Ker, *Micromeria varia* Benth., *Plantago leiopetala* Lowe, *Rumex aculeatus* L., *Dactylis glomerata* L., *Avena hirtula* Lag., *Polypogon monspeliensis* Desf., *Gastridium australe* Beauv., *Asplenium marinum* L., &c.

2. MOUNTAIN.—Top of the Island, at or above 1200 or 1300 ft.

Indig.—*Silene gallica* L., *Spergularia fallax* Lowe, *Arenaria serpyllifolia* L. β , *Cerastium glomeratum* Thuill., *Erodium chium* L., *Ononis dentata* Lowe β , *Pedrosia argentea* Lowe, *Aizoon canariense* L., *Galium murale* L., *Phagnalon saxatile* L., *Chrysanthemum hæmatomma* Lowe, *Carlovizia salicifolia* Less. β , *Centaurea melitensis* L., *Silybum Marianum* Gaërtn., *Helminthia echioides* Gaërtn., *Barkhausia divaricata* β . Lowe, *Heliotropium europæum* L., *Scrophularia arguta* Ait., *Sideritis Massoniæ* Benth. β , *Anagallis arvensis* L. β , *Urtica urens* L., *Hordeum murinum* L., *Festuca bromoides* L., *Lagurus ovatus* L., &c.

LOCALITIES OR HABITATS.

Mad.....	Madeira.
PS.	Porto Santo.
ND.	North or Flat Dezerta; " <i>Ilheo Chaô</i> ."
MD. or GD ..	Middle or Great Dezerta; " <i>a Dezerta</i> ."
SD.	South Dezerta; " <i>Bugio</i> ."
reg.	Region or Zone in each of these.

When any of these habitats are specified, the plant must be understood not to have been discovered in the rest.

When none are mentioned, the plant has been observed in all.

RARITY OR ABUNDANCE.

III.—*Extremely rare.* In one or two spots only. E.G. *Ranunculus acris* L., *Viola paradoxa* Lowe, *Visnea Mocanera* L. fil., *Pittosporum coriaceum* Ait., *Goodyera macrophylla* Lowe, *Luzula Seuberti* Lowe, *Festuca jubata* Lowe, *Lycopodium complanatum* L., &c.

- rr.—*Very rare*. In several spots, but only sparingly, a few detached plants here and there. E.G. Yew, Cedar of the island (*Juniperus Oxycedrus* L.) and *J. phænicea* L., Dragon-tree, *Picconia excelsa* Ait., *Rhamnus glandulosa* Ait., *Vicia capreolata* Lowe, *Convolvulus Massoni* Dietr., *Anthyllis Lemniana* Lowe, *Musschia Wollastoni* Lowe, *Melanoselinum decipiens* Hoffm., *Nycterium triphyllum* Lowe, *Balanium culcita* Sw., &c.
- r.—*Rare*. In a few spots only, and in those tolerably abundant; but quite local. E.G. Daisy, Dandelion, *Musschia aurea* Ait., *Erica cinerea* L., *Avena marginata* Lowe, *Polypodium drepanum* Sw., *Nothochlæna vellea* Ait., &c.
- $\frac{r}{2}$ —*Rather rare*. In several spots, or a whole district, and in such abundantly; but still local. E.G. *Laurus Barbusana* Lowe, *Ranunculus creticus* L. β , *Frankenia lævis* L., *Hypericum linarifolium* Vahl, *Sambucus maderensis* Lowe, *Sedum farinosum* Lowe, *Thymus angustifolius* Pers., *Salvia clandestina* L., *Nephrodium Oreopteris* Ehrh., &c.
- $\frac{c}{2}$ —*Rather common*. In many places, but confined to one Region only, and not very abundant. E.G. *Heberdenia excelsa* Ait. (Aderno), *Ranunculus creticus* L. α , *R. muricatus* L., *Cheiranthus mutabilis* Her., *Siderozylon Mermulana* Lowe, *Cheilanthes suaveolens* Sw., &c.
- c.—*Common*. General everywhere in two or more Regions, but nowhere very abundant. E.G. *Nigella damascena* L., *Delphinium Consolida* L., *Papaver somniferum* L., *Capsella Bursa Pastoris* L., *Trifolium repens* L., *Cichorium Intybus* L. β , *Gnaphalium luteo-album* L., *Scandix Pecten Veneris* L., &c.
- cc.—*Very common*. General and abundant, but mostly confined to one Region only. E.G. *Matthiola maderensis* Lowe, *Opuntia Tuna* Mill. (Prickly Pear), *Helichrysum obconicum* DC., *Andryala robusta* Lowe, *Tolpis macrorhiza* Lowe, *Vaccinium maderense* Link, *Erica arborea* L., *Festuca Donax* Lowe, *Deschampsia argentea* Lowe, *Woodwardia radicans* Sw., &c.
- ccc.—*Extremely common*. General and abundant everywhere, and in two or more Regions. E.G. *Ranunculus repens* L., *Fumaria muralis* Sond., *Isatis præcox* Kit., *Hypericum perforatum* L., Common Broom, Bramble, *Psoralea bituminosa* L., *Vicia conspicua* Lowe, *Ammi majus* L., *Calendula arvensis* L., *Echium plantagineum* L., *Solanum nigrum* L., *Antirrhinum Orontium* L., *Sibthorpia peregrina* L., *Origanum virens* Link, *Laurus canariensis* Willd., *L. fetens* Ait., *L. indica* L., *Rumex maderensis* Lowe, *Carex divulsa* Good., *Lolium perenne* L., *Festuca bromoides* L., *Briza maxima* L.,

Poa annua L., *Holcus lanatus* L., *Lycopodium denticulatum* L., *Polypodium vulgare* L., *Pteris aquilina* L., *Davallia canariensis* L., &c.

NATURE AND DURATION.

Herb.	Herbaceous.
Shr.	Shrub.
Suffr.	Do. under a foot high.
Tr.	Tree.
Ann.	Annual.
Bien.	Biennial.
Per.	Perennial.

SEASONS.

Spr.	Spring, <i>i. e.</i> Nov. Dec. Jan. Febr. Mar. Apr. May.
Sum. ..	Summer, <i>i. e.</i> June, July, Aug.
Aut. ..	Autumn, <i>i. e.</i> Sept. Oct. Nov. Dec.

TERMS OF DESCRIPTION.

ach.	achænia.	ov.	ovary.
anth.	anthers.	ovul.	ovules.
br.	bracts.	pan.	panicle.
caps.	capsule.	ped.	peduncle.
carp.	carpels.	pedic.	pedicel.
cor.	corolla.	pet.	petals.
fil.	filaments.	pl.	plant.
fl.	flower.	rac.	raceme.
fr.	fruit.	recept.	receptacle.
ft.	feet.	sds.	seeds.
in.	inches.	segm.	segments.
inv.	involucre.	sep.	sepals.
L. l.	leaves.	sp.	species.
lfts.	leaflets.	spec.	specimen.
l. c.	loco citato ; <i>i. e.</i> in the place last quoted.	st.	stem.
		stam.	stamens.
		stip.	stipules.
		var.	variety.

PUBESCENCE.

1. *Hairs soft.*

pubescent ..	downy with short fine hairs.
puberulous ..	downy in lowest degree.
pubescent ..	hairy, with long distinct hairs.
villous ..	hairy, with copious long close-set hairs.
lanuginous ..	woolly.
tomentose ..	cottony.

- floccose woolly or cottony, separating into loose locks.
 velutinous .. velvety.
 sericeous silky.
 furry clothed with short crisped or irregularly crumpled pubescence.

2. *Hairs hard or stiff.*

- hispid rough, with short coarse hairs.
 hispidulous .. rough in lowest degree.
 hirtose sprinkled with long distinct hairs.
 hirsute shaggy, with copious long close-set hairs.
 strigose harsh, with rather short distinct very hard stiff hairs, often springing from a bulb or tubercle. (Extreme of *hispid*.)
 setose bristly, with copious long close-set very stiff hairs. (Extreme of *hirsute*.)

DIRECTION OF STEMS.

- creeping lying flat along the ground, and rooting here and there.
 prostrate lying flat along the ground, but not rooting.
 procumbent.. lying partly flat, the ends ascending: less of *prostrate*.
 ascending . . . a little prostrate at the base; then, and for the greater part of their length, upright.
 decumbent . . rising obliquely from the base, but falling back upon the ground.
 diffuse spreading loosely irregularly from the base, but not falling back upon the ground: less of *decumbent*.
 climbing trailing or laying hold in various ways, but not themselves twining.
 twining twisting or winding spirally.

COLOUR OF FLOWERS.

w.	white.	or.	orange.
l.	lilac.	sc.	scarlet.
v.	violet.	cr.	crimson.
b.	blue.	r.	red.
gr.	green.	p.	pink.
y.	yellow.		

DEGREE OF NATURALIZATION.

- †.—Quite naturalized or self-propagating, but *probably* introduced originally: e. g. Prickly Pear (*Opuntia Tuna* Mill.), Broom, Bramble, Bella Donna Lily, Star of Bethlehem (*Ornithogalum arabicum* L.), *Oxalis corniculata* L., *Bidens*

leucantha Willd., *Gladiolus segetum* Ker, *Panicum repens* L., &c.

††.—More or less naturalized or self-propagating and growing without culture, but *certainly* introduced originally: *e.g.* Cape Gooseberry (*Physalis edulis* Sims), *Nicandra physalodes* Gaërtn., *Ageratum conyzoides* L., *Eclipta prostrata* L., *Eupatorium adenophorum* Spr., *Passiflora cærulea* L., *Cassia bicapsularis* L., *Pelargonium inquinans* L., *Lantana Camara* L., *Oxalis purpurea* Jacq., *Commelina communis* L., *Colocasia antiquorum* Sch. (Inhame), *Richardia athiopica* L., *Arundo Donax* L., *Maurandia*, *Aloe*, *Agave*, *Castor-Oil plant*, *Common Furze*, *Pomegranate*, &c.

†††.—Subnaturalized or perfectly acclimatized, but not self-propagating, and growing not without some slight culture, or chiefly as a crop or common ornamental plant: *e.g.* Chestnut, Oak, Plane, Acacia, Robinia, *Brugmansia*, *Fuchsia*, *Pelargonium*, *Heliotrope*, *Peach*, *Fig*, *Apricot*, *Quince*, *Mulberry*, *Flax*, *Wheat*, *Rye*, *Barley*, *Orange*, *Lemon*, *Plum*, *Cherry*, *Vine*, *Guava*, *Rosemary*, *Buddlæa*, *Rose-apple*, *Lupines*, *French Beans*, *Gourds*, *Pumpkins*, *Onions*, *Cabbage*, &c.

N.B. When no mark at all is prefixed, the plant is considered to be certainly or probably indigenous.

BOOKS OR AUTHORS, ETC. MOST FREQUENTLY QUOTED.

L.	Linnæus.
W.	Willdenow.
DC.	DeCandolle, <i>Prodromus</i> .
EB.	English Botany.
EBS.	English Botany Supplement.
RIB.	Reichenbach's <i>Icon. Botan. s. Plantæ Criticæ</i> .
RFG.	Reichenbach's <i>Icon. Floræ Germanicæ et Helvet. s. Fl. Germ. Excurs.</i>
BM.	Curtis's <i>Botanical Magazine</i> .
BH.	Banksian Herbarium at the British Museum.
HH.	Hookerian Herbarium at Kew.
Sm. E. Fl. . .	Smith's <i>English Flora</i> .
H. Fl. Sc. . .	Hooker's <i>Flora Scotica</i> .
Brot.	Brotero's <i>Flora Lusitanica</i> .
Desf.	Desfontaines' <i>Flora Atlantica</i> .
WB.	Webb and Berthelot's <i>Phytographia Canariensis</i> .
Presl.	Presl's <i>Flora Sicula</i> , Pragæ 1826.
Koch.	Koch's <i>Synopsis Fl. Germ.</i> Ed. 2. Lips. 1843-45.
Bab.	Babington's <i>Manual of British Botany</i> , Edit. 4. 1856.
Buch.	Von Buch's <i>List of Madeira Plants</i> in "Abhandlungen der Königl. Akademie der Wissen-

schaften zu Berlin, &c., für das Jahr 1816;" afterwards published in a Collection of Memoirs, 4to, Berlin, 1825.

- Holl A List of Plants observed in the Island of Madeira, with descriptions (by Reichenbach in the Phanerogamous Plants, and Kunze in the Cryptogamous) of some new species. By Fr. Holl, Dresden. Published in the Ratisbon Flora, Regensburg, 1830; and reprinted, with "Notes and Observations on the above list, &c., by R. T. Lowe," in Hook. Journ. of Bot. (Bot. Misc. 2nd Ser.) vol. i. Lond. 1834.
- Prim., Novit. Lowe's Primitiæ, Camb. 1830; Novitiæ, Camb. 1838; and Lond. 1851.

Altitudes of the principal mountains, stations or localities specified in the following pages (from Vidal's Survey chiefly).

MADEIRA.		PORTO SANTO.	
	Feet		Feet
Pico Ruivo	6056	Pico de Facho	1663
„ dos Arrieiros	5893	„ do Castello	1446
„ Grande	5391	„ Branco	1389
„ Ruivo on the Paul da Serra	5210	„ d'Anna Ferreira	911
Travellers' house on do.	4608	Ilheo de Baxo	570
Pico do Arrebentaõ	3844	„ de Cima	364
Mr. Veitch's house at the Jardim da Serra	2526	DEZERTAS.	
Mount Church	1965	Dez. Grande	1610
Cabo Giraõ	1934	Bugio	1349
Penha d'Aguia	1915	Ilheo Chaõ	336
Brazen Head	421	Sail-rock, off N. end of I. Chaõ	160
Encumeado de S. Vi- cente, about	4000	—————	
Levada in Rib. Frio and Rib. da Metade, about	3000	Lat. of FUNCHAL—	
Church at Camacha and at S. Antonio da Serra, about	2300	32° 38' 22" N.	
Church in the Curral das Freiras, about	2000	Long. 16° 54' 56" W.	
Palheiro, about	2000	Lat. of PORTO SANTO—	
Hotel at S ^{ta} Anna, about	1100	33° 3' 30" N.	
Levada de S ^{ta} Luzia, from 500 to 600		Long. 16° 20' 14" W.	
Quinta do Valle, about	350	—————	
Deanery, about	300	Mean annual temperature of Funchal, 65°-67° Fahr.	

A
MANUAL FLORA
OF
MADEIRA
AND THE ADJACENT ISLANDS.

I. VASCULAR PLANTS.

Leaf-bearing plants, composed of cellular tissue, woody fibre and spiral vessels. Epiderm with stomata. Seeds with a distinct germ (gemmule or plumule and radicle) and one or more seed-leaves (cotyledons).

Class I. EXOGENS OR DICOTYLEDONS.

Flowering plants, with stems composed of bark, wood and pith (*medulla*): the wood interrupted by medullary rays (*silver grain* of carpenters) and growing by accretion of fresh concentric rings or layers outside. Leaves with generally branched reticulating veins. Flowers distinct symmetrical antheriferous. Cotyledons two opposite, or rarely several whorled, very rarely (in a few exceptionally leafless plants, *e. g.* *Cuscuta* L.) none.

Subclass I. THALAMIFLORÆ.

Stam. free or distinct from the pet., and with the latter inserted separately from the sep. on the summit of the flower-stalk (*receptacle, thalamus* or *torus*) below the ovary (*i. e.* hypogynous).

Order I. RANUNCULACEÆ.

The Ranunculus Family.

Sep. 3-6, often 5, mostly deciduous. Pet. 5 or more, sometimes peculiarly shaped, sometimes with a gland or scale inside at the base, rarely 0. Stam. indefinite in number, free, hypogynous: anthers adnate, bursting longitudinally mostly outwards. Ov. 1-many, distinct, each with a style and 1-many ovules affixed to the inner suture. Fruit various, dry (achænidal or follicular), or (rarely) baccate. Carpels 1-many-seeded. Seeds erect or pendulous; embryo minute in a hollow of the horny albumen.—Herbaceous rarely shrubby with watery acrid often poisonous juices. Leaves mostly much divided, with dilated sheathing stalks, but no true stipules. Hairs when present simple.

Tribe I. RANUNCULÆ.

The Ranunculus Tribe.

Æstivation imbricate. Pet. with a nectariferous pore at the base. Anthers bursting outwards (*extrorsal*). Ov. many distinct, each with one ovule. Fr. a collection of many dry 1-seeded achænia. Seed erect except in *Myosurus*.

1. RANUNCULUS. Sep. 5, rarely 3, deciduous. Pet. 5, rarely many; nectariferous pore at the base of their claw either naked or covered by a scale. Ach. numerous, collected into a globular or oblong head.

Tribe II. HELLEBOREÆ.

The Hellebore Tribe.

Æstivation imbricate. Sep. 5, rarely more, petal-like. Pet. irregular or peculiar in form, or 0. Anthers extrorsal. Fr. consisting of one or several distinct or more or less combined many-seeded follicles, each bursting inwards.

2. NIGELLA. Sep. 5 petal-like deciduous. Pet. 5-10 smaller than the sepals, 2-lipped, their claw with a nectariferous pore covered with a scale. Follicles 5-10 more or less connate or combined into a capsule, each beaked with the long horn-like persistent style.

- †3. *AQUILEGIA*. Sep. 5 petal-like deciduous. Pet. 5, 2-lipped funnel-shaped produced downwards between the sepals into a long hollow horn-like spur. Follicles 5 distinct, each acuminate and tipped with the style.
4. *DELPHINIUM*. Sep. 5 petal-like deciduous irregular or unequal, the uppermost being produced downwards into a long spur. Pet. 4, the 2 upper each with spurs enclosed within the sepal-spur, or all combined into a monopetalous single-spurred cor. Follicles 1, 3 or 5, distinct.

Tribe I. *Ranunculeæ*.

1. RANUNCULUS L.

Crowfoot or Butter-cup.

- * Leaves divided. Fl. y. Nectary with a scale. Ach. compressed, lenticular, marginate, even, unarmed.

† *Root fascicled or grumose.*

1. *R. GRANDIFOLIUS* Lowe. *Douradinha* or *Oouradinha*.

Hairy pubescent sometimes villose, hairs soft and silky, *all quite simple at the base, those of the stem close-pressed*; st. stout erect branched corymbose; l. light gr. unspotted shining somewhat harsh or stiff, the lower stem and root-leaves roundish-reniform or cordate, undivided and obtusely pinnatifid, rarely pinnatifid or more deeply cut and gashed, *the edges always sharply and finely or copiously cut and toothed*; upper st.-leaves 3-5-pinnatifid, the uppermost sessile simple lanceolate entire; *fl. in a close crowded corymb, large*; sep. spreading horizontally; *heads of fr. short obtuse globosely oval*, sometimes inclining to oblong, rarely oblong; ach. quite smooth with a hooked beak.—Herb. per. Mad. reg. 3; $\frac{c}{2}$. Ravines and thickets on wet rocks and banks. Apr.—July.—Root large, often in a palmate with fleshy thick divisions, and in β . tomentose. Fl. bright y. large and handsome, 1-2 $\frac{1}{2}$ inches in diam. densely corymbose. Recept. slightly villose at the base.—Var. :

a. major; st. robust 2-4 ft. high; root-l. very large from 5-12 in. broad, scarcely divided with obtuse broad shallow lobes; corymb very large and ample many-flowered; fl. very large; fruit-spikes short and oval.—*R. grandifolius* Lowe Prim. (Ed. 1. 1830) 38! not Meyer; Walp. Repert. 1. 36; Hook. J. of Bot. 9. 70. *R. creticus* Prim. (Ed. 2. 1851) App. V. VI. ! not Linn. *R. arcticus* (misprint for *creticus*) Buch Verz. 195. *R. cortusæfolius* β . *sylvaticus* WB. i. 8, 9? *R. cortusæfolius* β . *sylvaticus* Seub. Fl. Az. 42. *R. cortusæfolius* Hook. in Bot. Mag. t. 4625! (hairs too

spreading; descr. in part only) not Willd. *R. megaphyllus* Steud.—Ledges and clefts of wet or shady rocks, especially near waterfalls, in ravines everywhere above 3000 ft., $\frac{5}{8}$. Rib. Frio, Rib. da Metade, de Seisal, de Janella, Serra d'Agoa, Boa Ventura, &c. A noble pl., gigantic in its genus, conspicuous on high rocks with its broad ample shining l. and vast corymbs of fine golden y. fl. often as large as a crownpiece or dollar.

β. minor; altogether smaller and usually more villose-hairy than *a*, with the lower or root-l. pinnatifid or more deeply cut and divided than in *a*, and only 2-4 in. broad; st. 1-2 ft. high; corymb of fewer generally smaller fl., and fruit-spikes sometimes distinctly oblong.—Hook. J. of Bot. 9. 72. *R. creticus* var. *macrophyllus* Lindl. Bot. Reg. t. 1432.—Moist open grassy banks, and thickets of *Vaccinium*, $\frac{5}{8}$. Paul da Serra, and close below the waterfall at the head of the Rib. de S^{ta} Luzia.—A starved or depauperated form of *a*, sometimes almost hoary-villose.

For a fuller account of *R. grandifolius* and its nearest allies *R. creticus* L. and *cortusæfolius* Willd., with one or both of which it has been usually united, see a Paper in Hook. Journ. of Bot. ix. 65. The Cretan pl. is on the whole rather more nearly related to the Canarian than to the Madeiran or Azorian sp., ranking intermediately according to affinity between the two, instead of coming in the order of its geographical position.

Nothing like the true Canarian *R. cortusæfolius* Willd. (Deless. Ic. 1. t. 36, opt.) has occurred in Madeira to myself or to any other botanist of my acquaintance. But in the BH. the hab. "Madeira, Fr. Masson" is affixed to an undoubted specimen of the pl. with its characteristic smaller thinner sparingly crenate black-specked l. sprinkled with bulbous hairs, its smaller scattered not corymbosely crowded fl. on slender elongated stalks, and altogether more delicate habit. Masson however having collected in Teneriffe immediately after Madeira, a mistake might easily arise from accidental transposition of his specimens or labels.

†† *Root fibrous.*

††2. *R. ACRI* L. Tall upright Crowfoot.

More or less hairy; st. erect branched many-flowered; l. palmately 3-5-partite, the segments trifid deeply and sharply cut and toothed; upper st.-l. tripartite with linear segments; pedic. round; sep. pubescent spreading; ach. oval smooth marginate with a very short slightly hooked beak; recept. smooth.—Brot.

ii. 367; EB. t. 652; DC. l. 36; Sm. E. Fl. iii. 51; Presl 16; Koch 18; Bab. 10.—Herb. per. Mad. reg. 2; rrr. Palheiro, chestnut woods by the road outside, and in fields inside, the Park, whence it has evidently straggled. Up the Caminho do Meio, S^r J. M. Moniz. Apr.—June.—St. stout hollow branched 2-3 ft. high. Fl. bright y. Sep. erecto-patent, not reflexed. Beak about $\frac{1}{4}$ the length of ach.

3. R. REPENS L.

Hairy pubescent; *st. suberect few-flowered with long creeping stolons*; root-l. ternate and biternate, leaflets trifid cut and toothed; *pedic. furrowed*; sep. pubescent *spreading*; ach. oval smooth marginate *finely punctate*, with a rather long slightly hooked beak; *recept. hairy*.—Brot. ii. 366; DC. i. 38; EB. t. 516; Sm. E. Fl. iii. 51, 52; Presl 17; Koch 19; Bab. 10.—Herb. per. Mad. reg. 1, 2, 3; ecc. All the year. Moist grassy places everywhere.—St. (primary) erect 6-12 in. high. Side-shoots widely spreading prostrate and rooting. L. dark gr. often spotted or blotched with darker. Fl. bright y.

** Leaves divided. Fl. y. Nectary with a scale. Ach. compressed lenticular marginate *rugose tubercular or muricate*. Root fibrous.

4. R. TRILOBUS Desf.

Smooth or nearly so; st. erect subrobust and firm much branched; root-l. roundish undivided crenate, the rest 3-partite with the segments wedgeshaped cut and toothed; *pedic. opposite the l. furrowed*; sep. reflexed: pet. subabortive 3-4, rarely 5, oblong scarcely or not longer than the sep.; disk of ach. *bluntly warted or tuberculated all over*.—Desf. l. 437. t. 113; DC. l. 42; Presl 19; WB. ! i. 10 (excl. var. β . *rhœadifolius*).—Herb. ann. Mad. reg. 1, 2; r. May, June.—St. 12-15 in. high branched from the base, stout and upright, more or less erect; herbage pale gr. Fl. small inconspicuous pale y. Ach. with a broad short curved beak, the smooth broadish rim or margin remaining gr. longer than the bluntly granulated disk, which soon turns tawny brown. The whole pl. is of very short duration.—Var.:

a. glabra; nearly or quite smooth.—Var. *a. Fontanesii* WB. ! l. c.—Ascent out of the Cayadas Ravine beyond Camacha, wet places by the roadside. Maxico, wet ditches and places on the beach.

β . *subpilosa*; st. l. and sep. more or less hairy; st. somewhat spreading or diffuse.—Borders of cornfields by the road between S. Vicente and the Encomiado, in drier situations than *a*.

Bourgeau's specimens from Grand Canary in the BH.

ticketed *R. trilobus* Desf., cannot be distinguished from his Teneriffe specimens of the true *R. parviflorus* L.—The HH. contains however true Canarian specimens from Webb of *R. trilobus* α , with Azorian also of both α . and β .

No such pl. has occurred in Madeira as *R. rhœadifolius* DC. Deless. Ic. l. t. 40, which also, by specimens in HH., appears distinct enough, with its much more hairy and divided Escholtzia-like l., from the present sp., to which it is referred by Webb and Walpers.

5. *R. PARVIFLORUS* L.

Hairy-pubescent; st. prostrate or procumbent weak and slender almost filiform branched here and there only; l. all trifid, their lobes or segments wedge-shaped, in the upper deeply cut or toothed; pedic. opposite the l. remote all along the st.; sep. reflexed pubescent; pet. subabortive 3-4 oblong not longer than the sep.; disk of ach. all over thickly echinulate with hooked or pointed tubercles.—Desf. l. 441; Brot. ii. 371; EB. t. 120; DC. l. 42; Sm. E. Fl. iii. 53; WB. ! i. 11; Bab. 11.

β . *acutilobus* DC. WB. l. c.; l. more deeply 3-cleft, the segments deeply cut with large acute teeth.—Herb. ann. Mad. reg. 1, 2; r. Gutters in Machico, and descent into Rib. Frio in the road. May-July.—St. 6-10 in. long, weak and trailing or diffusely spreading horizontally, their ends ascending. Fl. inconspicuous small pale y. Ach. few (8-10) in a head, rather large proportionately to the pl.; their margin very narrow; tubercles of the disk tipped each with a short hooked weak or bristly point. Beak short curved hooked at the tip. Recept. smooth.

6. *R. MURICATUS* L.

Smooth or with only a few scattered hairs, shining; st. robust and firm, at first erect, soon diffuse or spreading stiffly, much branched from the base; lower l. round or reniform 3-lobed coarsely inciso-crenate, upper trifid wedge-shaped at the base; pedic. opposite the l. slightly hirtose; sep. slightly hirtose spreading; pet. ovate-oblong small not longer than the sep.; disk of ach. all over prickly with long-beaked hooked or pointed tubercles, the margin unarmed even.—Desf. l. 440; Brot. ii. 373; DC. l. 42; Presl 19; WB. ! i. 9, 10; Koch 20.—Herb. ann. Mad. reg. 1, 2; c. PS. reg. 1; r. Gutters and wet places by roadsides about Funchal, and in PS. about the large tank halfway across the island. March, Apr. principally, but irregularly throughout the year.—Herbage pale gr. very shining. St. 4-8 or 10 in. high, short stiff thick and hollow. Fl. small bright y. Ach. broadly margined, their beak in the specimens short broad slightly curved and hooked at the tip.

Tribe II. *Helleborea*.

2. NIGELLA L.

1. N. DAMASCENA L.

Anthers awnless; carpels 5, even, 2-celled, connected quite to their tips into an ovate-globose capsule; floral inv. cleft like the l. into many capillary segments; sep. spreading; seeds triangular transversely rugose.—BM. t. 22; Desf. 1. 428; Brot. ii. 334; DC. 1. 49; Presl 25; WB. i. 3; Koch 22.—Herb. ann. Mad. reg. 1, 2; c. Cornfields and waste ground, general. Irregularly throughout the year.—Nearly or quite smooth. St. erect sparingly branched; branches 6–12 in. long spreading or diffuse. L. dark gr. finely divided like Fennel: their segments flat linear acuminate. Fl. bluish or grey.—The “Fitches” (Ketzach, Hebr.) Is. xxviii. 25, 27, was probably the seed of an allied sp., *N. sativa* L., used, like Aniseed, Caraway or Coriander-seed, to flavour cakes or bread.

3. AQUILEGIA L.

Columbine.

†1. A. VULGARIS L.

Spur of pet. incurved hooked at the tip, their limb very obtuse shorter than the stam.; sep. oblong-ovate; l. twice ternate, leaflets 3-lobed crenate.—Brot. ii. 333; EB. t. 297; DC. 1. 50; Sm. E. Fl. iii. 33; Presl 24; WB. i. 4; Koch 23; Bab. 12.—Herb. per. Mad. reg. 2; r. Rib. de S^{ta} Luzia, especially opposite the Chaõ dos Tornos. May, June.—St. 2–3 ft. high and with the petioles, pedic. and follicles or carpels subglandulose-pubescent; l. slightly pub. and whitish or glaucous beneath, quite smooth above. Fl. pendulous large, dark bluish-violet.

4. DELPHINIUM L.

Larkspur.

- * *Consolida* DC. Ov. 1. Pet. 4 united into a 1-petalous cor.; spur internal 1-petalous.

1. D. CONSOLIDA L. Branching Larkspur.

More or less pubescent sparingly branched, branches forked spreading lax and straggling, fl. few together in short lax terminal rac., pedic. as long as or longer than the br.; follicles rather short smooth or pubescent.—Linn. ! Herb.; Syst. (Ed. 12) ii. 370; Clus. Rar. Pl. Hist. p. ccvii; Fl. Dan. t. 683; Brot. 2. 302; DC. Syst. 1. 343; Prod. 1. 51; Koch 24; RFG. 3. t. 66. f. 4669.

β. pubescens; st. 1. and follicles pubescent.—WB. 1. 5. *D. Consolida* EB. t. 1839; Sm. E. Fl. iii. 30; Bab. 12.—Herb. ann. Mad. reg. 1, 2; c. Cornfields everywhere; PS. r. Apr.–Sept.

—St. 12–18 in. high stiff leafy finely and closely pubescent; branches more than once forked remote few slender lax and widely straggling ending in short lax few-flowered racemes 3 or 4 in. long. L. sessile deeply multifid with narrow linear acute segm. Fl. rather distant about 3–5 in each rac. large deep violet-blue; pedic. often scarcely longer than and never more than twice the length of the bracts. Follicles always (in Mad.) pubescent 4–6 or 8 lines long. DC. and Koch l. c. describe the caps. as smooth; and Brotero says the germen is so sometimes. I have never seen them, either in Herb. or in the living pl., otherwise than pubescent. They are unfortunately wanting in the Linn. type.

D. Ajacis L. ! with straight stiff erect virgate st. either simple or with few short simple stiff erect side-branches, with long closely and many-fl. rac. and always pubescent larger follicles, 8–10 or nearly 12 lines long, which is the origin of the common garden double-fl. Rocket Larkspur of so many varieties of colour, pink, lilac, purple, lavender, &c. and white, and of which *D. Consolida* Fl. Gr. t. 504, referred by DC. to his *D. pubescens*, seems to represent, as remarked already by Fischer and Meyer (Animadv. Bot.), a more than usually branched luxuriant state of the single-fl. wild pl., is not found in Mad. except in gardens.

** *Delphinellum* DC. Ov. 3; 2 lower pet. distinct or free and beardless; cor.-spur internal 1–2-petalous.

2. *D. PEREGRINUM* L.

Smooth or nearly so; st. erect branched leafy; branches rather numerous slender twiggy straight and stiff erect or erecto-patent; l. 3-partite many-cleft, segm. of the upper l. and br. long linear acute, of the lower broader and less divided; fl. in short somewhat crowded rac., the 2 lower pet. stalked, their limb orbicular or squarish, cordate at the base; cal.-spur pubescent slender ascending or erect; cor.-spur 2-petalous.—Linn. ! Herb. ; Syst. Nat. (Ed. 12) ii. 371. *D. peregrinum* L. *γ. elongatum* Boiss. ! in HH. ; Walp. Repert. 1. 51. *D. cardiopetalum* DC. Syst. 1. 347; Prodr. 1. 52.—Herb. ann. Mad. reg. 2; r. Cornfields a little below the Allegria Chapel above S. Roque near Funchal. June–Aug.—Size of the preceding but more slender branched and leafy with more numerous upright virgate branches and smaller more crowded paler b. fl., whitish and elegantly striped outside in the bud. Rachis of rac., pedic., br., sep., spur and ovary minutely downy; the rest smooth. Limb of the 2 lower pet. squarish-orbicular, as broad as long, notched at top, distinctly cordate at the base. Follicles 3, sometimes 5, subpubescent or sparingly downy, 4 or 5 lines long.

It is difficult to account for DC.'s very express reference (Syst. 1. 348) of *D. peregrinum* L. ("ex herb. suo") to his *D. junceum* rather than to his *D. cardiopetalum*; for certainly the specimen preserved in the Linn. Herb. has the limb of the 2 lower stalked or stipitate pet. plainly squarish—"orbicular and cordate at the base," instead of "elliptic or obovate" as it is in *D. junceum* DC. and in *D. peregrinum* RFG. iii. t. 68. f. 4672; which, with perhaps *D. peregrinum* Fl. Gr. t. 506 and Desf. 1. 426, differ notably in this respect from the Linnæan type.

Order II. BERBERIDACEÆ.

The Barberry Family.

Sep. 3, 4 or 6 in a double row, deciduous. Pet. the same (rarely double) in number, opposite the sep., with glands at their base. Stam. opposite the pet. Anth. adnate, bursting by valves from the bottom to the top. Ov. 1, 1-celled. Fr. baccate or capsular indehiscent. Seeds attached to the base of the unilateral placenta. Embryo straight axile.—Shr. or herbs with bristle-serrate or spinulose-serrate compound or by abortion or suppression simple alternate exstipulate l., and acid bitter juices.

1. BERBERIS. Sep. 6, with 3 coloured scale-like br. outside. Pet. 6, each with 2 glands inside at the base. Berry 2- (rarely 3-) seeded.—Shr. often thorny and with fasciculate simple l.; fl. y. generally in racemes; juices, especially of the berries, acid and astringent.

1. BERBERIS L.

1. B. MADERENSIS Lowe. *Ameixeira d'espinho*.

Spines 3-partite; l. simple subspathulate or bluntly oblong-lanceolate and attenuated downwards, somewhat stiff and coriaceous, very entire, reticulated with pale veins and slightly marginate; racemes erecto-patent rather short and few-(6-8) fld., fl. globose.—Shr. Mad. reg. 3; rr or rrr. High rocks in ravines. Brink of the upper part of the Rib. da Metade at a place called the "Agoa de Bica," on the way from the Fonte das Moças to Pico dos Arrieros. Canhas, J. M. Moniz. May, June.—A low shr. from 3 to 5 feet high, with several arching st. about the thickness of the wrist or arm downwards; the ultimate branches strongly striated or ribbed and of a bright rich or. or or-chestnut colour. L. few or remote and rather small in proportion, fasciculate, slightly pointed or blunt with a minute mucro; from 1-1½ in. long and from ¼-½ in. broad; their taste very bitter as well as astringently subacid. Racemes scarcely longer than the l. Fl. a little larger and more globose than in *B. cul-*

garis L., to which it is indeed less nearly allied than to *B. cretica* L.; having also some resemblance in its thin scant foliage and subspathulate entire l. to *Lycium europæum* L. as it grows wild in Madeira. Fr. partly y. and red, much shorter and thicker with a larger more tumid style than in *B. vulgaris* L.

The bright y. wood is employed in ornamental work by the Funchal cabinet-makers, and is called by them *Fustete*.

Order III. PAPAVERACEÆ.

The Poppy Family.

Sep. 2 deciduous. Pet. generally 4 cruciate regular. Stam. hypogynous free generally many. Ov. single; styles short or 0; stigmas 2, or many, radiating sessile. Ovules many. Fr. unilocular, either podshaped with 2 or capsular with several parietal placentas, many-seeded.—Pl. with exstipulate generally compoundly divided l., long 1-flowered ped., and narcotic milky or coloured juices. Pet. folded and crumpled in the bud, fugacious.

* *Seeds not crested.*

1. PAPAVER. Pet. 4. Stam. many. Style 0. Stigmas 4-20 radiating, sessile on or combined into a radiated peltate disk crowning the ov. Caps. obovate incompletely 4-20-celled, opening by slits or pores beneath the stigmas.—Fl.-buds cernuous. Juices white milky.
2. GLAUCIUM. Pet. 4. Stam. many. Stigmas 2 sessile. Caps. long narrow podshaped 2-valved bursting from the top downwards. Seeds imbedded in a spongy intervalvular dissepiment connecting the placentas.—Juices yellow or orange.

** *Seeds crested.*

- †3. CHELIDONIUM. Pet. 4. Stam. many. Stigmas 2. Caps. narrow podshaped 1-celled 2-valved bursting from the base upwards. Seeds crested attached to the 2 intervalvular distinct placentas. Juices orange.

1. PAPAVER L.

Poppy.

* *Filaments subulate, capsule smooth.*

1. P. RHŒAS L. Common Red or Corn Poppy. *Papoula* or *Papoila*.

Hispid-pilose; l. 1-2-pinnatifid, their segments oblong-lanceolate unequally inciso-serrate bristle-pointed; st. much branched many-flowered hairy substrigose; ped. clothed like

the st. with generally spreading soft hairs; sep. hairy with more upright hairs; caps. smooth shortly obovate or turbinate subglobular, lobes of the stigma-disk imbricated laterally.—Desf. l. 406; Brot. ii. 253; EB. t. 645; DC. l. 118; Sm. E. Fl. iii. 11; Presl 32; WB. ! i. 59; Koch 31; Bab. 15.—Herb. ann. Mad. reg. 1, 2; PS. reg. 2; ccc. Cornfields and waste ground. Apr.—June.—St. 6–18 in. high. Fl. large deep scarlet with usually a black patch at the base of each pet.—Var.:

a. hairs of ped. spreading.—Mad. and PS. ccc.

β. hairs of ped. adpressed.—*P. Rhæas β. strigosum* Bönningh. ex Koch l. c.—PS. $\frac{1}{2}$, Pico de Conselho, intermixed with *a*; Mad. r, along the Levada de S^{ta} Luzia, the pet. wanting the usual black spot.

2. P. DUBIUM L.

Hispid-pilose; l. 1–2-pinnatifid, their segments linear remotely inciso-serrate bristle-pointed; st. many-flowered hairy, the hairs spreading, those of the ped. adpressed; sep. hispid; caps. smooth narrow-oblong clavate; stigma-disk with few distinct and distant lobes or crenatures.—Brot. ii. 253; EB. t. 644; DC. l. 118; Sm. E. Fl. iii. 10; WB. ! i. 59; Koch 32; Bab. 15.—Herb. ann. Mad. reg. 2, $\frac{5}{8}$. Cornfields above the Mount, Cayadas Ravine, &c. Apr.—July.—St. 1–2 feet high. Fl. large paler scarlet than in *P. Rhæas*, their claw black. Herbage also paler. Caps. elongate, marked lengthways with pale lines.

** Filaments dilated upwards; caps. smooth.

3. P. SOMNIFERUM L. Common White or Garden Poppy. *Papoula.*

Smooth pale glaucous; st. very erect little branched many-flowered; l. broadly oblong waved or curled, irregularly and somewhat bluntly toothed, the lower unequally sinuated cut and lobed attenuated towards the base, the upper undivided cordate at the base amplexicaul; st. ped. and sep. smooth; caps. smooth short truly globular and very glaucous.—Desf. l. 407; Brot. ii. 254; EB. t. 2145; DC. l. 119; Sm. E. Fl. iii. 11; Koch 32; Bab. 12.—Herb. ann. Mad. and PS. reg. 1, 2, c; ND. r; MD. 2, c; SD. 1, 2, ccc. Waste ground amongst vineyards and cornfields about Funchal, &c. Apr.—June.—St. 2–4 ft. high. Whole pl. very smooth except now and then a bristly hair or two upon the ped. and sep. or tipping the teeth of the l. Fl. large, uniformly in Mad. bluish-white with the claw violet.

4. P. SETIGERUM DC.

Dark or dull lurid smoky green scarcely glaucous; st. very erect little-branched few-flowered; l. oblong regularly and

sharply doubly aristato-serrate, the teeth sphacelate and callous, tipped with a stiff bristly awn or mucro, the midrib and principal nerves beneath hirtose or copiously fringed or bearded with long bristles, the lower l. more sinuate or lobed, attenuated at the base, the upper undivided sessile subamplexicaul not cordate; st. smooth; ped. more or less hirtose with erect or adpressed bristles, rarely quite smooth; sep. copiously bristly upwards, the bristles erect or adpressed; caps. smooth top-shaped oval or ovate-oblong scarcely glaucous.—DC. 1. 119; Deless. Ic. ii. t. 7. *P. somniferum* a. *Setigerum* WB. ! i. 58, 59.—Herb. ann. PS. reg. 1; c. About the town and to the eastward in fields, waste ground and vineyards at the back of the beach, and in cornfields again 2 or 3 miles to the westward, growing often intermixed with *P. somniferum* L. Apr., May.—St. 2–3 feet high. Fl. large, like those of *P. somniferum* L., but the pet. uniformly dull purple with a broad darker atropurpureous spot at their base. Stigma-disk 9–10-rayed. Caps. more oblong than globular, and like the whole pl. scarcely (except in a dried state) glaucescent. This and the dark or lurid dull green of the foliage, the finely and regularly biserrate l. with aristate teeth, and colour of the fl. give a peculiar aspect to the pl., distinguishing it to the eye at once from the nearly allied *P. somniferum* L. The two pl. in PS. grow continually intermixed, preserving mutually their distinctive characters; but intermediate forms have not occurred, nor has *P. setigerum* been found in the Dezertas or Madeira.—A not uncommon var. of *P. somniferum* L. with bristly fl.-stalks, sometimes seen in English gardens, has perhaps been often taken for this pl.; which has also been supposed to be merely the wild state of *P. somniferum* L., an idea to which the facts above related are opposed.

2. GLAUCIUM Tourn.

Horned Poppy.

1. *G. corniculatum* (L.) Curt. Scarlet Horned Poppy.

Hispid-pubescent; st. pilose; l. all sinuate-pinnatifid oblong, the upper sessile and truncate at the base; pods hispid-pilose.—DC. 1. 122 (var. *a.*); WB. i. 56, 57 (the Fuerte-venturan pl.); Koch 32. *G. phæniceum* EB. t. 1433; Sm. E. Fl. iii. 7; Bab. 16. *Chelidonium corniculatum* L. Desf. i. 404.—Herb. ann. PS. reg. 1; rr. Waste ground amongst cornfields and vineyards towards the S.W. end of the island, P^{ta} de Malhado. Apr., May.—St. 1–2 ft. high with remarkably rigid stiffly divaricated branches. Whole pl. pubescent or pilose rather than hispid, scarcely or not at all glaucous. L. furry with short crumpled cottony hairs. Fl. rather small. Pet. scarlet with a black patch at the base. Pod 6–8 in. long narrow, finely and rather closely erecto-

pubescent. In the Canaries, except in Fuerte-ventura, the fl. according to WB. are always y.

3. CHELIDONIUM L.

Celandine.

†1. C. MAJUS Mill. a, L.—*Ceredonha*. Common Celandine.

L. deeply pinnatifid; fl. umbellate, fil. dilated upwards.—Brot. ii. 255; Sm. E. Fl. iii. 4; WB. i. 55; Bab. 16; Koch 32. a. *obtusilobum*; segm. of l. rounded and bluntly lobed or crenate.—*C. majus* a, Sm., Koch, Bab. l. c.; *C. majus* EB. t. 1581; DC. l. 123; Presl l. 34.—Herb. per. Mad. reg. 1, 2; c. Rocks, walls and waste places about towns or houses everywhere. Spr. and Sum.—Habit of a Siliquose Cruciferous pl., remarkable for the thick bright or. juice of its roots and y. juice of the l. and st. St. 1-2 feet high and with the sep. more or less hairy, sometimes almost woolly. L. deep full gr. above, pale glaucous and pubescent beneath. Fl. bright y. Caps. slender smooth.

Order IV. FUMARIACEÆ.

The Fumitory Family.

Sep. 2 deciduous. Cor. irregular; pet. 4 cruciate, one or both of the 2 outer gibbous or saccate at the base, the 2 inner cohering at the tip. Stam. 6 in 2 sets opposite the 2 outer pet.; another of middle stamen in each set 2-celled, of the side stamens 1-celled. Ov. free 1-celled; ovules 1 or more. Style filiform. Stigma with 1 or more points. Fr. an ach., caps., or silique. Seeds crested.—Herbs with alternate multifid l. and watery juices. Fl. mostly in racemes.

1. FUMARIA. Sep. 2. Pet. 4; the upper one spurred at the base. Stam. diadelphous. Fr. an ach. (indehiscent 1-seeded silicle).

1. FUMARIA L.

Molarinha. Fumitory.

* Ripe fruit even.

1. F. MURALIS Sond. in Koch. *Molarinha*.

Ach. nearly or quite even, perfectly globose or equably orbicular all round, either quite entire and merely dimpled on each side, or with a minute inconspicuous notch or crenule at the apex, not apiculate mucronate or retuse; sep. rather broadly ovate acute generally jagged or toothed, rarely quite entire, nearly as broad as but only $\frac{1}{3}$ the length of the cor.; br. linear or narrow-oblong half the length of the erecto-patent pedic. in fr.; rac. rather short

broad lax and few-fl. ; general and partial l.-stalks twining prehensile ; segm. of l. flat broadish ovate-wedge-shaped mostly trifid, their laciniae oblong obtuse mucronulate.—Koch 1017. *F. Petteri* Koch 435 (not Reichenb.).—Herb. ann. Mad. reg. 1, 2, 3, ccc. PS. reg. 2, c ; 4, rrr. ND. 1, r. Nov.—July—St. 1–3 ft. long rampant climbing usually by the prehensile l.-stalks. Very variable in size, luxuriance and glaucescence of herbage ; less so in size and colour of fl. which are mostly from 4–6 lin. long more or less deep rose with the tip dark atropurpureous or black, seldom pale. Ach. obtuse or equally rounded at top as elsewhere, and neither pointed (apiculate) or mucronate, nor truncate or retuse ; but either wholly uninterrupted at the apex, with the minute short not prominent white scar-like base of the style remaining and having a slight dimple or depression on each side of it, or else with a minute indistinct or inconspicuous notch or crenule : the surface in the living pl. mostly quite even or at least comparatively so with that of the following sp. ; yet sometimes and especially in the dried pl. very obsoletely verruculate or indistinctly rugulose with (as it were) close-shaven pimples when examined with a lens.—Var. :

a. vulgaris ; more or less glaucous ; fr. mostly even, quite entire at the apex ; sep. toothed.—*F. muralis* Sond. Alex. Jordan ! 1852 (fr. minutely verruculate) v. s. in HH. *F. officinalis* Buch ! 195, no. 303 ; WB. ! i. 53 ; Bourg. ! Pl. Can. no. 1173 in BH. and HH. ; Vogel. ! in HH. and Solander in BH. (as to Mad. spec.) ; not Linn. *F. media* Bourg. ! Pl. Can. (Teneriffa, San Diego del Monte in arvis, Jan. 1845) no. 293, in BH. and HH. (not Loisel.). *F. capreolata* var. *Bastardi* Bourg. ! Pl. Can. (ex itinere 2^{do}) Teneriffa, S. Diego del Monte in cultis, 10 Mart. 1855, no. 1232 in HH. (not Linn.). *F. Bastardi* (Boreau) Boissier et Reut. ! It. Alg. Hispan. 1849 (fr. quite even) in HH.—Mad. ccc, everywhere in waste and cultiv. ground ; the commonest of weeds in vineyards, gardens, cornfields, by roadsides, in beds of ravines, &c. about Funchal and elsewhere.—Varies according to soil or exposure : (1), larger more robust and often less glaucescent with broader larger lfts. and fl. twice as large 4–6 lin. long often paler ; and (2), smaller more bushy and slender, with smaller more finely divided lfts. and smaller darker-coloured fl. : the former state occurring in rich or moist soil and shady spots, the latter later in the season or in sunny drier places, as amongst corn.

β. pustulosa ; glaucous ; fr. rather larger and especially in the dried pl. more distinctly verruculate, with a minute notch or crenule at the apex ; sep. toothed.—*F. Bastardi* (Boreau) Krälik ! Pl. Tunet. no. 7 in HH. ; Balansa ! Pl. d'Alger. no. 627 in HH. *F. capreolata* var. *β. patula* (Coss. ex Germar) Bourg. ! Pl. de la Corse, no. 20 in BH. and HH. (not Linn.).

—Herb. ann. PS. reg. 2, c; ND. 1, r.—Sandy cornfields and waste ground towards the Fonte d'Aréa in PS., Apr., May; ND. near the ruined house, June, but nearly dried up with paler smaller fl. and very glaucous whitish foliage. The ach. in this ND. pl. appeared "perfectly smooth and even" (MSS. Notes) when fresh gathered. They are minutely but evidently verruculose and rugulose, or tuberculated with little flat pimples and slightly wrinkled in the dried state.—This is a very trivial var. and rather a mere accidental state of *a*. I found only a single spec. in the ND., and unfortunately preserved one only of the PS. pl. I cannot therefore vouch for the constancy of the foregoing characters, and should not have noticed here the form at all, but for its exact agreement on comparison with *F. Bastardi* Bor. of the botanists above quoted.

γ. læta; like *a*. (1), but of a light *γ*-gr., not in the least smoky or glaucescent; lfts. more regularly ternate ovate and leaflike; fl. not larger than in *a*. (1), but handsomer and more brightly or distinctly coloured; sep. quite entire or only sometimes here and there indistinctly toothed; fr. indistinctly and obsoletely verruculate.—PS. on the rocky summit of Pico de Facho, Apr. May.—Approaches *F. capreolata* (L.) Koch; but the sep. though mostly entire and rather large and broad are only $\frac{1}{3}$ instead of $\frac{1}{2}$ the length of the cor., the fr.-stalks are not "patent or recurved," the fl. are darker full rose-colour and smaller, and the ach. (entire at the apex as in *a*.) are exactly orbicular and hence only obtuse (as in *a*. and β .) not "subtruncate" or "very obtuse." Rac. 8-12- or 15-fl.; fl. tipped conspicuously with deep purple-black.—The true *F. capreolata* L. has never occurred in either PS. or Mad. It is constantly distinct from every state of *F. muralis* by its larger pale fl., large leafy sep. half the length of the cor., recurved fr.-stalks, and more obtuse ach.

** *Ripe fr. distinctly verruculate.*

2. F. PARVIFLORA Lam.

Ach. strongly verruculate globose or equally orbicular all round with a short minute mucro at the apex; sep. subovate *strongly toothed or jagged very minute and inconspicuous* not $\frac{1}{10}$ the length and not above $\frac{1}{2}$ or $\frac{1}{3}$ the breadth of the cor.; br. narrow-oblong usually as long as the short erecto-patent fr.-stalks; rac. nearly sessile short few-flowered; general and partial leafstalks simple not prehensile; segm. of l. ternate, their laciniae narrow linear-oblong or ligulate acute cuspidate, st. suberect or erecto-patent, branches diffusely spreading.—*F. parviflora* Lam. Dict. 2. 567; Brot. 1. 592; DC. Syst. 2. 136 and Prod. 1. 130 (excl. syn. Sm. EB. t. 590); Presl 38; RIB. 41. t. 50. f. 102; RFG. iii. t. 1. f. 4451; WB. ! 1. 53; Bourg. ! Pl. Can. no. 437 in BH.

and HH.; Koch 36, 1018. *F. fol. tenuissimis, fl. albis circa Monspelium nascens*, Vaill. Bot. Par. 56. t. 10. f. 5. *F. parviflora* β . *albiflora* Moris. Fl. Sard. 1. 91. *F. parviflora* β . Walp. Rep. 1. 122 (excl. syn. *F. Vaillantii* Lois. and RFG. iii. t. 1. no. 4452). "*F. leucantha* Viv. Fl. Cors." ex. Moris. l. c.; De Heldreich! in HH. *F. Vaillantii* EBS. t. 2877; Bab. 17, 18 (not Loisel.).—Herb. ann. PS. reg. 1; cc. Vineyards and cultivated ground about the town and all along behind the beach towards P^{ta} de Malhado, Apr., May.—Very glaucous leafy and bushy, with rather short branches 6–18 in. long. Fl. white or greenish-white, very distinctly tipped with black and gr., very small, $1\frac{1}{2}$ –2 lines long. Rac. dense in fl., lax in fr. Sep. like minute scales and scarcely visible without a lens, somewhat irregular in shape, narrower even than the pedicels. Ach. the size and shape of those of *F. muralis*, but with a minute abrupt projecting point or mucro at the apex, and strongly and distinctly granulate. Herbage strongly smoky-glaucous pale or whitish.—This is certainly the true *F. parviflora* Lam. of almost all continental botanists, as Cosson! Bové! Schimper! Kotschky! Hohenacker! Krälik! Boissier! Bourgeau! Webb! &c. in HH. And though not a question directly affecting the Mad. Fl., I am almost equally satisfied, by examination of numerous authentic specimens from different countries and authors in HH., together with a careful scrutiny of synonyms and figures, that not only *F. parviflora* EB. t. 590 (with larger fl. than usual), Sm. E. Fl. iii. 256 (which however comprehends the true white-flowered *F. parviflora* Lam.) and Bab. 17, but also that the true *F. Vaillantii* Loisel. (Not. 102, Fl. Gall. ii. 101; Vaill. Bot. Par. 56. t. 10. f. 6; RIB. p. 42. t. 50. f. 103; RFG. iii. t. 1. f. 4452; WB. 1. 53) are merely purple-flowered varieties, forms or modifications of the same sp. Little or no dependence can be placed on the laciniae of the l. being more or less narrow (*i. e.* filiform or linear) as in EBS. t. 2877. Compare *F. parviflora* α . and β . in Moris. Fl. Sard. 1. 91, with remark at the end.

Order V. CRUCIFERÆ.

The Cabbage, Mustard and Cress Family.

Sep. 4 deciduous, the 2 side ones gibbous at the base. Cor. regular cruciform; pet. 4 alternate with the sep. opposite each other. Stam. 6 (rarely 4) tetradynamous, the 2 shorter opposite the side pet., the 4 longer in pairs opposite the anterior and posterior sep. and stigmas. Torus with green glands between the pet. and stam. or stam. and ovary. Ov. free 1–2-celled with 1, 2 or more ovules in each; placentas parietal meeting in the middle and forming a false dissepiment. Stigmas 2. Fr. a silique (pod) or silicle (pouch) mostly 2-celled with a spurious

dissepiment and bursting by 2 valves, rarely 1-celled and indehiscent, 1-many-seeded.—Herb. rarely shrubby, sulphurously fetid in decay, antiscorbutic and stimulant, never poisonous. L. alternate. Fl. y. and white, more rarely purple or violet.

SUBORDER I. SILIQUOSÆ.

Pod long and narrow, with 2 valves opening longitudinally, and 2 cells separated by a long narrow linear spurious dissepiment.

Tribe I. ARABIDEEÆ.

Seeds flattened or compressed, often bordered, their cotyledons accumbent parallel to the dissepiment of the pod; radicle lateral applied to their edges.

1. MATTHIOLA. Pod linear round or compressed. Stigma 2-lobed, lobes erect or converging, gibbous or horned at the back.
2. CHEIRANTHUS. Pod linear quadrangular or compresso-quadrangular 2-edged, with a prominent longitudinal nerve or keel along the back of each valve. Stigma 2-lobed, lobes spreading or recurved. Seeds in a single row in each cell.
3. NASTURTIUM. Pod rather short thick and swollen roundish-tapering or elliptic; valves convex almost nerveless. Stigma capitate. Seeds irregularly in 2 rows in each cell.
- †4. BARBAREA. Pod linear round or subquadrangular; valves convex with a subprominent longitudinal nerve. Stigma capitate obtuse entire or notched. Seeds in a single row in each cell.
5. ARABIS. Pod linear compressed; valves flattish with a more or less prominent longitudinal nerve, or nerveless with several longitudinal veins. Stigma obtuse. Seeds in a single row in each cell.
6. CARDAMINE. Pod linear or lanceolate-linear compressed; valves flat nerveless. Stigma capitate. Seeds in a single row in each cell, their funicle simple filiform.

Tribe II. SISYMBREÆ.

Seeds ovate or oblong not bordered. Cotyledons incumbent contrary to the dissepiment, radicle dorsal applied to their back.

7. SISYMBRIUM. Pod linear round rarely quadrangular; valves convex with 3 longitudinal nerves. Stigma obtuse entire. Seeds in a single row in each cell, smooth; their

funicle filiform. (In *S. thalianum* the pod is quadrangular and the valves keeled with the side nerves fine and obsolete: thus approaching *Erysimum*.)

Tribe III. *BRASSICÆ*.

Seeds often globose. Cotyledons incumbent conduplicate folded together longitudinally in the middle, radicle dorsal embraced in their fold.

8. *BRASSICA*. Pod linear or oblong; valves convex with a single straight dorsal nerve; lateral nerves none or represented by a few anastomosing veins. Seeds globose in a single row in each cell.
9. *SINAPIS*. Pod linear or oblong; valves convex with 3 or 5 straight prominent strong nerves. Seeds globose in a single row in each cell.
10. *SINAPIDENDRON*. Pod linear slender curved or wavy, round or slightly quadrangular subtorulose; valves convex with a single strong straight dorsal nerve and a few lateral longitudinal anastomosing veins. Seeds subangular oval or oblong in a single row in each cell and partly imbedded in the somewhat spongy dissepiment.
11. *ERUCA*. Pod oblong short; valves convex with a single subprominent dorsal nerve. Seeds globose in a double row in each cell.

SUBORDER II. *SILICULOSÆ LATISEPTÆ*.

Pouch short oval orbicular or globose, compressed from back to front, opening with 2 broad valves, 2-celled; partition or dissepiment nearly or quite as broad as the pouch in its broadest diameter.

Tribe IV. *ALYSSINÆ*.

Seeds compressed. Cotyledons flat accumbent.

12. *KONIGA*. Pouch oval or roundish compressed, each cell 1-2-seeded. Filaments simple not winged or toothed. Hypogynous glands 8. Carpophore none.
13. *DRABA*. Pouch oblong or elliptic slightly convex or tumid. Seeds many in each cell, not margined, in 2 rows. Filaments simple.

SUBORDER III. *SILICULOSÆ ANGUSTISEPTÆ*.

Pouch short, compressed laterally, opening (except in *Senebiera*) with 2 narrow generally boat-shaped valves keeled or winged on their back; dissepiment narrow linear or lanceolate acute at each end.

Tribe V. *THLASPIDEÆ*.

Seeds compressed. Cotyledons flattened accumbent.

14. *THLASPI*. Pouch oval or obovate notched; valves boat-shaped winged at the back; ovules 4 or more in each cell, rarely 2. Pet. equal or nearly so. Filaments simple.
15. *TEESDALIA*. Pouch roundish or oval notched; valves boat-shaped keeled below, narrowly winged upwards at the back; ovules 2 in each cell. Pet. equal or the 2 outer larger. Longer filaments with a scale or petal-like appendage at the base.

Tribe VI. *LEPIDINEÆ*.

Seeds compressed. Cotyledons flattened incumbent.

16. *LEPIDIUM*. Pouch orbicular or oblong, roundish or ovate notched or (rarely) entire; valves compressed boat-shaped keeled or winged at the back; cells 1-seeded. Pet. equal. Filaments simple.
17. *CAPSELLA*. Pouch triangular-obcordate; valves compressed boat-shaped keeled but not winged; cells many-seeded. Filaments simple.

Tribe VII. *SENEBIEREÆ*.

Seeds turgid subglobose or ovate. Cotyledons long linear doubly incumbent twice bent or folded.

18. *SENEBIERA*. Pouch subreniform or 2-lobed not bursting or at least not scattering the seeds; cells 1-seeded.

SUBORDER IV. *SILICULOSÆ NUCUMENTACEÆ*.

Pouch short not bursting often 1-celled from abortion of the dissepiment.

Tribe VIII. *ISATIDEÆ*.

Seeds ovate-oblong. Cotyledons incumbent slightly channeled.

19. *ISATIS*. Pouch oblong-cuneate or oval longer than broad compressed laterally 1-celled 1-seeded; valves boat-shaped keeled or winged scarcely bursting.

SUBORDER V. *LOMENTACEÆ*.

Pod indehiscent divided transversely into 1-seeded cells or joints; the lowest cell or true pod often barren, the seeds being in the beak.

Tribe IX. *CAKILINEÆ*.

Seeds "elliptical" Sm. Cotyledons accumbent.

20. *CAKILE*. Pod short oblong quadrangular of two 1-seeded indehiscent joints, the upper deciduous ovate-ensiform with an erect seed, the lower persistent corky subturbinate barren or with a pendent seed.

Tribe X. *RAPHANÆ*.

Seeds globose. Cotyledons incumbent conduplicate.

21. *RAPISTRUM*. Pouch 2-jointed, joints each 1-seeded indehiscent, the upper globose or ovate and produced into the style with an erect seed, the lower round resembling a thickened pedicel with a pendent seed, rarely barren. Funicles short.
22. *CRAMBE*. Pouch 2-jointed, joints indehiscent, the upper deciduous globose or ovate with one seed pendent from a long curved funicle springing from the bottom of its cell, the lower joint barren resembling a pedicel. Longer filaments generally forked.
23. *RAPHANUS*. Pod of several 1-seeded cells, linear or sub-cylindric-oblong and subconic tapering upwards, either even and not separating, or moniliform and dividing transversely into 1-seeded indehiscent joints, the lowest joint barren imperfectly 2-valved, resembling a pedicel.

SUBORDER I. *SILIQUOSÆ*.Tribe I. *Arabideæ*.1. *MATTHIOLA* R. Br.

Stock.

- * *Pachynotum* DC. Pet. obovate. Stigmas gibbous not horned at the back.

1. *M. MADERENSIS* Lowe. *Goivos. Cravo de rocha. Bofe de Burro.*

St. herbaceous suffrutescent at the base erect, branches spreading; l. elongato-lanceolate acute softly tomentose hoary or greyish-white almost always very entire, the lowest forming a dense rose-like tuft; pedic. shorter than the cal.; pods spreading very long and slender compressed generally muricato-glandulose. —Novit. 551 or 29.—Herb. bien. Mad., PS., N. and MD. reg. 1, 2, cc; SD. rrr.—Sea-cliffs everywhere, Febr.—Aug.—A representative and close ally of the European *M. sinuata* and *incana*

L., but in Mad. constantly distinct. A large branching pl. 1-3 ft. high; flowering branches elongated; some of the l. occasionally here and there faintly repand-toothed; fl. rather pale violet or dingy violet-purple, very rarely pure white, fragrant (with a slight pungency) at night only; pods distinctly compressed not torulose 3-5 in. long, $1\frac{1}{2}$ -2 lines broad, generally waved and thickly muricate with large stipitate glands. The following may be distinguished, but are scarcely entitled to rank as var.

a. muricata; fl. lilac, pods and fl. branches thickly muricate with glands.—Sea-cliffs everywhere.

β. mitis; fl. lilac, pods and fl. branches nearly or quite without glands. Occasionally with *a.* in Mad., PS., and MD.; very rare.

γ. albiflora; fl. pure white. Occasionally with *a.* in Mad.; very rare.

2. CHEIRANTHUS L.

Wall-flower.

* *Cheiroides* DC. Style slender elongate. Seeds marginate. Pods quadrangular.

1. C. TENUIFOLIUS Her.

Shrubby, branches slender and fragile often tortuous; l. linear acute very narrow and entire grey or hoary densely silky somewhat stiff and strigose; fl. y., pods linear very slender stiffly erect or erecto-patent.—DC. Syst. ii. 183; Prod. i. 136.—Shr. per. Mad. reg. 1, rrr.—Cabo Giraõ, and Pico de Facho or P. de Rancho between the former and Camera de Lobos, along the edge of the cliff at a height of from 1500 to nearly 2000 ft., Mar.—June.—A small shr. 1-2 ft. high, with longish slender often tortuous or twisted and entangled very brittle pale greyish naked branches, bearing a tuft of fine narrow almost filiform grey l. about an inch long and only half a line broad, at their ends. Fl. lemon-y. rather large, like those of a *Sinapis*, not versicolorous or fragrant, at least by day. Style 2 lines long capitate. Pods stiff straight very slender and narrow, 1-2 in. long. Seeds numerous.—The pl. referred to by myself (Prim. p. 57) as *Ch. tenuifolius* Herit. and by Webb and Berth. 1. 67 as *Dichroanthus tenuifolius*, was the following sp., *Ch. arbuscula*, which I gathered abundantly halfway up Pico Branco in Porto Santo with my lamented friend Webb in May 1828. The true *Ch. tenuifolius* Herit. has never yet been found in Porto Santo.

2. C. ARBUSCULA Lowe.

Shrubby dwarfish thickly bushy and leafy; st. erect short, branches stout short stunted forming usually a dense capitate head; l. linear a little broader upwards acute very entire grey or

hoary harshly strigose spreading or recurved; fl. lilac, pods large stiffly and closely erect.—Hook. Journ. Bot. 8. 289.—Shr. per. PS. reg. 3, 4, r.—Rocks towards the summits of Pico Branco and P. de Conselho abundant, March-May.—A low tufted bushy shrub 4-8 or 9 in. high, with a stout very short stiff flexuose woody stem as thick often as the little-finger, dividing at a height of 2 or 3 inches into several short branches, each terminating in a thick rose-like tuft of spreading or recurved perfectly entire narrow linear leaves from $\frac{1}{2}$ to 1 in. long and about a line wide, densely clothed with adpressed bristles, scabrous and harsh to the feel. Fl. large and handsome in perfectly erect short numerous close terminal racemes 2-4 in. high, as large as in *C. mutabilis* Her. and of the same more or less deep lilac, but not in the wild pl. (so far as observed) either changeable or fragrant; their pedic. not shorter than the sep. Style 2 lines long; stigma capitate bilobed. Pods large 1-2 in. long and 1 line broad sub-quadrangular apparently smooth but really covered with short close-pressed bristles; each valve with a prominent dorsal rib.—Cultivated in England by the Rev. M. J. Berkeley, it preserves in great measure its peculiar habit, the branches only becoming more lax and slender and the foliage less hoary. In gardens near the sea especially it thrives vigorously in the open air, and is very ornamental on rock-work, flowering abundantly in the summer, but perishing with the first autumnal frosts. In pl. kept in a greenhouse the fl. were larger and always lilac. In others treated more hardily they were smaller, and at first white. M. J. B. in HH.

3. *C. MUTABILIS* Her. *Goivos. Quebra Panella.*

Shrubby loosely branched, branches simple straight and elongate, l. linear-lanceolate sharply serrate scarcely hoary and not closely silky-pubescent; fl. lilac fading into white, pods erecto-patent.—Curt. BM. t. 195; DC. Syst. ii. 183 (var. a.); Prod. i. 136. *Dichroanthus mutabilis* WB. ! i. 66. t. 8 A. f. 1-3 (pod).—Shr. per. Mad. reg. 3, g.—Rocks in ravines everywhere above 2500 ft.; Rib. Frio abundant, March-June.—Like *C. tenuifolius* in habit, but taller (2-4 ft.) and altogether larger and more robust, with long straight straggling branches generally pendent from the sides or face of perpendicular high rocks. L. dull green somewhat naked scarcely at all hoary or silky, 1-3 in. long and $\frac{1}{2}$ in. wide but extremely variable in both respects, sometimes at high elevations and on bare exposed mountain peaks very narrow as in *C. tenuifolius*, but always serrate; the teeth very fine and sharp almost pungent. Fl. in large and handsome terminal bunches, cream-colour in the bud, then more or less deep lilac, lastly white, fragrant like the white Jessamine at night. Pods about 2 in. long and 1 line wide stiff and straight.—Dwarf

starved or stunted pl. with the l. very narrow differ greatly in appearance from luxuriant pl. growing on more shaded rocks with larger broader greener and more naked l. But every intermediate form occurs between the two extremes: nor are the fl. less variable in intensity of colour in different situations, ranging from full bright lilac to almost white.

3. NASTURTIUM R. Br.

* *Cardaminum* DC. Pet. white entire, longer than the sep.

1. N. OFFICINALE R. Br. Water Cress. *Agrião*.

Pods spreading ascending scarcely longer than their often subdeclining stalks, wavy or subtorulose; l. lyrate-pinnate, leaflets subsinuate or repand, the lateral elliptic, the terminal one larger more rounded and subcordate.—DC. Syst. ii. 188; Prod. 1. 137; EB. 855; Sm. E. Fl. iii. 192; Presl 44; WB. i. 71; Koch 37; Bab. 22. *Sisymbrium Nasturtium* Desf. ii. 81; Brot. 1. 587.—Herb. per. Mad. reg. 1, 2, 3, ccc; PS. reg. 2, rrr. Watery places and streams in Mad. everywhere; in PS. only at the Fonte d'Aréa; not found in any of the Dezertas. Febr.—July, but almost throughout the year.—Whole pl. generally smooth, occasionally here and there a little hairy. St. creeping or procumbent rooting copiously, often floating. Cal. always closed with the sep. erect. Fl. white rather small. Very variable in size and luxuriance; when growing out of water, with small leaflets and short st., it is according to Koch and Babington *N. microphyllum* Reich.; when very large with stout thick st. and large leaflets like a *Sium*, it is *N. sifolium* Reich. (*N. officinale* β . Koch).

4. BARBAREA R. Br.

†1. B. PRÆCOX R. Br. Early Winter Cress.

Lower l. lyrate, the pairs of lobes gradually larger upwards, the upper pair nearly as large as the roundish subcordate ovate or oval terminal lobe; upper l. deeply pinnatifid with parallel distant very entire linear or linear-oblong blunt lobes; pods long erecto-patent.—DC. Syst. ii. 207; Prod. 1. 140; Sm. E. Fl. iii. 199; WB. ! i. 71, 2; Koch 40; Bab. 22. *Erysimum præcox* EB. t. 1129.—Herb. bien. Mad. reg. 2, r. Wet places by the upper road to the Jardim above the Estreito Church; and at a little hamlet called Ribeira de Machico at the head of the Machico Valley half a mile below the Portella. Apr.—July.—St. ribbed angular erect 1-2 ft. high. L. dark green, their terminal lobe not abruptly or greatly larger than the preceding. Fl. y. rather small and pale. Pods 2-3 in. long quadrangular. Whole pl. smooth. Flavour pungent not at all bitter: hence much used for early salads in Europe, though not in Mad.

5. ARABIS L.

- * *Alomatium* DC.; seeds without or with only an obscure slight narrow margin. Limb of pet. distinct from the claw, obovate spreading horizontally.

1. A. ALBIDA Stev.

L. somewhat sparingly but equably and strongly sinuate-toothed white or hoary tomentose (like the whole pl. except the pods) with branched starry pubescence, the lower l. crowded lanceolate-oblong or subspathulate, the upper lanceolate amplexicaul and slightly sagittate or cordate at the base; pedic. twice or thrice, pet. twice as long as the cal.; pods quite smooth very long and slender almost filiform loosely erecto-patent, ultimately vaguely spreading, curved or waved, valves faintly many-nerved; seeds oval or elliptic very narrowly and obscurely margined.—DC. Syst. ii. 217; Prod. l. 142; Presl 47; WB. ! i. 62, 63. *A. alpina* Buch! 196. no. 316 (not Linn.). *Turritis verna* Desf. ii. 92 (excl. syn.).—Herb. per. Mad. reg. 2, 3, c. Rocks in ravines, &c. everywhere above 1000 ft. flowering irregularly throughout the year but chiefly in Spr.—Rib. de S^{ta} Luzia, de João Gomez, Curral das Freiras, Rib. Frio, &c.—Habit of *A. alpina* L. but with larger more conspicuous fl. in larger fuller bunches. St. short procumbent sparingly branched thickly leafy subcaespitose; fl. st. ascending about 6 in. high. L. about 2 in. long and half an inch wide, the teeth equal prominent distinct and acute; st. l. varying with rounded angular or pointed basal lobes. Fl. conspicuous rather large and handsome pure white inodorous; limb of pet. horizontal as long as the claw. Pods 2–2½ in. long, ½ or ¾ of a line broad compressed subtorulose tipped with a very short beak much narrower than the pod; the valves with several fine and slender nerves but no one prominent. Seeds compressed lenticular broadly oval or elliptic, *i. e.* as broad at one end as at the other, not ovate as in *A. alpina* L. Webb *l. c.* remarks that the gland at the base of the longer fil. is mostly wanting, whereas in *A. alpina* L. it is conspicuous and somewhat elongate.

6. CARDAMINE L.

1. C. HIRSUTA L.

St. slender straight angular; l. all pinnate not auricled at the base, leaflets of the lower l. shortly stalked roundish repand-sinuate or toothed, the terminal one rather larger, of the upper l. narrower oblong or linear; pet. twice as long as the cal. oblong-obovate, pods and pedic. erect, beak or style shorter than the pod is wide.—Desf. ii. 80; Brot. l. 583; EB. t. 492; DC. Syst. ii. 259; Prod. l. 152; Sm. E. Fl. iii. 188; Presl 52; Koch 47; Bab. 24.—Herb. ann. Mad. reg. 3, c. Moist shady places in ravines; Rib. Frio, de S^{ta} Luzia at the foot of the Waterfall, &c. Nov.—

June.—Nearly smooth or but slightly pubescent. Root-1. numerous in a rose-like tuft. St. 4–12 in. high slender straight angular erect sparingly branched and leaved. Fl. small white. Sep. erect. Stam. in the same pl. varying in number, generally 5, rarely 6, more rarely 4; 1 or 2 of the shorter wanting. Stigma capitate pubescent subsessile, the style being very short. Pods linear slender scarcely an inch long, half a line wide, the upper considerably overtopping the fl.

Tribe II. *Sisymbrea*.

7. SISYMBRIUM L.

- * *Velarum* DC. Pods subulate attenuated upwards. Fl. yellow.

1. S. OFFICINALE (L.) Scop.

More or less pubescent; l. pinnatifid slightly runcinate, with 2 or 3 pairs of oblong coarsely and unequally toothed lobes and a large hastate terminal lobe; pods linear-subulate short and with their very short pedicels *close-pressed to the stem*.—DC. Syst. ii. 459, 460; Prod. i. 191; Sm. E. Fl. iii. 196; Presl 73; Koch 51; Bab. 25. *Erysimum officinale* L. Desf. ii. 85; Brot. i. 575; EB. t. 735. *Chamaepitium officinale* WB. i. 76.

β. leiocarpum DC. l. c.; smoothish, pods with their pedicels and rachis quite smooth.—Herb. ann. Mad. reg. 1, 2, c; PS. reg. 1, 2, r. By roadsides and in waste ground and vineyards about Funchal, &c., chiefly below 1000 ft. March–June.—St. nearly smooth 1–2 ft. high straight erect, branches very tough and hard stiffly spreading subdivaricate, in fr. declining or deflexed. Foliage neither hoary nor dull green somewhat hispid downwards, the upper l. nearly smooth. Fl. inconspicuous small y. Pods $\frac{1}{2}$ an inch long hexangular.—These characters are constant. The more hairy common European state or var. is not found in Mad. In Teneriffe Webb states that both the smooth and pubescent podded varieties occur promiscuously.

2. S. ERYSIMOIDES Desf.

Smooth, l. sinuate-pinnatifid or lyrate-runcinate with 1 or 2 pair of coarsely and unequally toothed lobes and a very large triangular or rhomboidal terminal one; pods linear-subulate very slender and rather long subsessile *spreading almost horizontally*.—Desf. ii. 84. t. 158; DC. Syst. ii. 482; Prod. i. 195. *Pachypodium erysimoides* WB. i. 75.—Herb. ann. Mad. reg. 1, 2, c; PS. reg. 2, r. On walls and buildings and in waste places by roadsides in or near deserted houses about towns or villages, Funchal, Machico, &c. March–June.—Pl. 1–2 ft. high nearly

or quite smooth rather dark full green leafy. St. stiffly erect not much branched often violet or purple towards the base. L. stalked 4 or 5 in. long. Fl. y. very small and inconspicuous, the pet. scarcely longer than the sep. Pods shortly stalked an inch or more long attenuated upwards neither compressed nor angular but round and striated, the valves being distinctly 3-nerved. Seeds minute cylindric-oblong finely reticulato-punctate.—In habit as in characters allied to *S. officinale*. The identity of Desfontaines' pl. cannot be questioned, although he describes (probably from dried specimens) the fl. as being white: whence also doubtless its wrong reference by De Candolle to the following section. *Sisymbrium nitidum* Zea and *S. rigidulum* Lag. are also, according to Webb, precisely the same pl.

** *Arabidopsis* DC. Pods linear, fl. white.

3. *S. THALIANUM* (L.) Gaud.

L. undivided oblong-lanceolate subobtusely sparingly and slightly toothed subhispid with forked or simple hairs nearly all radical and stalked; st. slender more or less branched; sep. erect, pods 4-angular linear very slender ascending longer than their spreading pedicels.—Koch 53 (var. a); Bab. 25. *Arabis Thaliana* L. Brot. i. 579; EB. t. 901; DC. Syst. ii. 226; Prod. i. 144 (var. a); Sm. E. Fl. iii. 209; Presl 48.—Herb. ann. Mad. reg. 2, 3; rr. Dry rocks and banks in ravines; Rib. de Santa Luzia, da Metade, das Cayadas, &c. March-August.—A small inconspicuous delicate pale green pl. 3–10 in. high, of short continuance and easily overlooked. St. erect single or several from a small flat rose-like tuft of a few l., loosely branched, often simple, almost filiform, slightly hairy below, smooth upwards. Root-leaves scarcely $\frac{1}{2}$ in. long attenuated downwards into a stalk pilose, their hairs forked and simple; st.-l. few linear-lanceolate smoother than the others. Rac. elongated lax filiform. Fl. small white. Pedic. longer than the cal. Pet. obtuse about twice as long as the erect sep. Stam. about as long as the pet. Pods scarcely an inch long and $\frac{1}{4}$ of a line wide, not much longer than their pedic. very fine and slender subquadrangular, the valves having a prominent dorsal nerve, but the lateral nerves faint and obscure. Seeds bright tawny y. oval striated.

Tribe III. *Brassicæ*.

8. *BRASSICA* L.

††† 1. *B. OLERACEA* L. *Cabbage*. *Couve*.

L. smooth glaucous, the lower lyrate stalked, upper oblong sessile, rac. before flowering elongated lax, sep. and all the stam.

erect.—Desf. ii. 93; Brot. i. 580; DC. i. 213; Koch 58. *B. oleracea* and *B. Botrytis* Presl 88, 89.—Var.:

B. acephala DC.; st. elongated branched, l. expanded.—*Sprouts* or *Winter Greens*. Subvarieties, *Couve de Rinchaõ*, *C. de Batatinha*, &c.

D. capitata DC.; st. short, l. concave imbricate forming a dense globose head.—*Common Cabbage*. Subvar. *Couve Murciana*, *C. de Repolho*, *C. roxa*, &c.

F. Botrytis DC. (*Brassica Botrytis* Presl 89); fl. abortive and with their thickened fleshy stalks forming a compact dense corymb.—Subvar. *Cauliflower*, *Brocoli*, &c. *Couve Flor*.

Herb. bien. Mad., PS., MD., reg. 1, 2, 3; B, D, ccc; F, $\frac{5}{2}$.—F, cult. in gardens only; B, D, in gardens and fields, cult. and partially naturalized, everywhere, throughout the year; forming a staple article of food amongst all classes, and a principal ingredient in Portuguese *Sopas*.—Although the exact original wild stock (*B. oleracea* A, DC.; EB. t. 637; Sm. E. Fl. iii. 219; Bab. 26) does not perhaps occur, the varieties B and D are too commonly found seminaturalized in some form or other to allow of their omission in a Flora of Madeira.—L. and whole pl. perfectly smooth more or less glaucous. Fl. rather large bright lemon-y., pale ochre, or more rarely white, not veined. Pods not beaked.

2. *B. NIGRA* (L.) Koch. **Black Mustard.** *Mostarda*.

L. all stalked, the lower hispid lyrate toothed with the terminal lobe very large and lobed, the upper smooth lanceolate very entire pendulous; sep. spreading; pods close-pressed to the st. quadrangular 2-edged shortly beaked.—Koch 59; Bab. ed. 1. 24. *Sinapis nigra* L. Brot. i. 585; EB. t. 969; DC. i. 218; Sm. E. Fl. iii. 222; Presl 95; Bab. ed. 4. 27. *S. incana* Herb. Linn. C. Lemann in litt. *S. incana* (Mass.) Buch 196. no. 320 (not of others).—Herb. ann. Mad. reg. 1, 2; ccc. Borders of cornfields and vineyards in waste ground about Funchal, &c., everywhere. Febr.—June.—St. 2–3 ft. high stiffly erect straight glaucous and purplish nearly smooth; branches remote straight slender with pendulous narrow l. and terminal rac. giving a peculiar light graceful habit to the pl. when flowering. Lower l. hispid or roughish, upper nearly quite smooth. Fl. bright lemon-y. Pet. roundish-obovate, entire. Pods half an inch long smooth torulose 1–4-seeded with a very short square slender seedless beak.—This is undoubtedly the pl. intended by Von Buch and others in their lists of Mad. pl. under the name of *S. incana* L. And in fact the late Dr. Charles Lemann found the original *S. incana* of the Linnæan Herbarium to be nothing but *S. nigra* L. The synonym has been however usually referred to a different pl., a specimen of which also exists in the Linn. Herb., though with-

out name or number, viz. *Erucastrum incanum* Koch, EBS. t. 2843 (*Hirschfeldia adpressa* Moench, WB. i. 85), which is found in Teneriffe but has not yet occurred in Madeira.

An old S. of Europe specimen (Herb. Dⁿⁱ Yalden 1778) of *Diplotaxis muralis* β . DC. in the BH. has been formerly marked *Brassica muralis*; and, though totally unlike any pl. with which I am acquainted in Madeira, is the only semblance of authority I can discover for *Brassica muralis* of Buch's List of Mad. pl. p. 196. no. 317. His no. 311, *Cheiranthus littoreus*, ought also to have been quoted above under *Matthiola maderensis*; and nos. 312 and 313 (*Cheiranthus argutus* and *dentatus*) both under *Cheiranthus mutabilis*, of which *Ch. dentatus* is merely the more hoary narrower-leaved form from more exposed or sunny rocks, such as are indicated by the locality, "Ribeira dos Soccoridos," of the original specimens in BH.

9. SINAPIS L.

1. S. ARVENSIS L. Wild Mustard or Charlock. *Mostarda*, Madeira; *Saramago*, Porto Santo.

L. ovate-oblong unequally toothed, the lower sublyrate or auriculate at the base, the upper sessile; sep. spreading; pods subcylindric torulose not shorter generally longer than the conical 2-edged seedless beak, valves subprominently 3-nerved.—Koch 60; Bab. 27.—Herb. ann. Mad. reg. 1, 2, ccc; PS. reg. 1, 2, c; GD. reg. 2, c. Cornfields and vineyards in waste ground everywhere. Nov.—June.—St. 1-2 ft. high diffusely branched bristly towards the base with short deflexed hairs. Whole pl. scabrous. Fl. y. rather large. Pods suberect about an inch long including the long distinct beak, when ripe many-ribbed or angular. Seeds brown.—Var.:

α . Pods smooth. *S. arvensis* (L.) Brot. i. 584; EB. t. 1748; DC. Syst. ii. 615; Prod. i. 219; Sm. E. Fl. iii. 221; Presl 96; WB. i. 78. *S. incana* Lowe in Hook. Bot. Misc. New Ser. i. 42 (not of others).

β . Pods retrorsally hispid. *S. arvensis* β . Koch l. c. *S. orientalis* Brot. i. 584.—A Madeiran specimen of this var. in BH., with the lower part of the pod and often of the beak retrorsally hispid, has been ticketed "*Sinapis alba* Linn." by Solander.

††2. S. ALBA L. White Mustard.

L. lyrato-pinnate, pinnæ unequally and coarsely toothed and lobed, the uppermost confluent; sep. spreading; pods hispid cylindric torulose not longer generally shorter than the sword-

shaped compressed 2-edged seedless beak, the valves subprominently 5-nerved.—Brot. i. 585; EB. t. 1677; DC. i. 220; Sm. E. Fl. iii. 222; WB. i. 77; Koch 60; Bab. 27.—*Bonannia officinalis* Presl 99.—Herb. ann. Mad. reg. 1, 2; rr. Occasionally in the neighbourhood of Funchal, but merely as an outcast or straggler from gardens. Apr., May.—St. 1-2 ft. high, and with the l. more or less hispid but always more so than the l. Fl. y. rather large. Pods spreading. Seeds pale.—This is the "Mustard" so commonly grown with "Cress" (*Lepidium sativum* L.) in Europe for winter or early spring salads. It has very slender claims however to a place in the Madeiran Flora.

10. SINAPIDENDRON Lowe.

1. S. FRUTESCENS (Ait.) Lowe.

Shrubby mostly smooth much branched, branches interlacing fragile, l. crowded towards their ends stiff more or less fleshy, the lower oblong-lanceolate or elliptic-ovate regularly and distinctly serrate or crenate, the uppermost linear-lanceolate or linear quite entire; sep. at first erect presently subpatent immaculate.—Var.:

a. diffusa; branches long slender tufted often pendulous, l. less fleshy more distinctly veined serrate and more or less sprinkled with short adpressed strigose hairs.—*S. frutescens* Prim. 37. *Sinapis frutescens* Sol. ! MSS. and BH. ; Ait. ! Hort. Kew. iv. 127; DC. Syst. ii. 623; Prod. i. 220; Hook. Bot. Misc. i. 119. t. 28. *Hesperis diffusa* Buch ! 196. no. 315; Spr. Syst. ii. 900.—Shr. per. Mad. reg. 3, 4; $\frac{5}{2}$. Rocks in ravines and highest peaks; Rib. de Santa Luzia on high rocks by the Waterfall, Caminho Central along the ridge dividing the Cúrral das Freiras from the Serra d'Agoa and under Pico Grande; Pico dos Arrieiros, &c. April-July.

β. succulenta; branches short stiff and thickish forming a low dwarf stunted shrub, l. in terminal rose-like tufts very thick and fleshy veinless obsoletely crenate perfectly smooth.—Shr. per. Mad. reg. 2; r. Sea-cliffs on the N. coast in several places between Santa Anna and S. Vicente; Vista da Rocha do Navio, Santa Anna; S. face of the Penha d'Aguia between Fayal and Porto da Cruz. May-July.

Branches often in *a* 3 or 4 ft. long interlaced and hanging in thick tangled tressy masses down perpendicular rocks: in *β* more erect. L. bright but rather pale gr. not glaucous. Fl. like those of *Brassica nigra* L. rather large bright lemon-y.; claw of pet. and fil., especially in *β*, purplish lilac. Sep. with a few short scattered hairs and even in *β* pale immaculate. Pods 1-2 in. long with a short cylindrical seedless beak erecto-patent flexuose;

in β distinctly quadrangular and striated when ripe though previously round; in all stages smooth.

2. *S. ANGUSTIFOLIUM* (DC.) Lowe.

Shrubby quite smooth, branches interlacing elongated fragile; l. crowded towards their ends all linear veinless stiff and fleshy generally quite entire sometimes sparingly toothed upwards; sep. erecto-patent spotted with purple.—*S. salicifolium* Prim. 37, Novit. 29 or 551. *Sinapis angustifolia* DC. Syst. ii. 624; Prod. i. 220. *Brassica frutescens* Sol. ! MSS. and BH.; Buch ! 196. no. 318.—Shr. per. Mad. reg. 1; rrr. Beyond Camera de Lobos all along the sea-face of the Pico de Rancho or P. de Facho and Cabo Giraõ at a height of 1500–2000 ft. April–June.—Habit with fl. and fr. entirely of *S. frutescens* Ait.: but the shape of the l. is constant, without intermediate forms, and they are only toothed occasionally towards their tips. L. 2–3 in. long, 2–3 lines wide, generally perfectly entire but now and then with a few remote teeth towards their tips. Sep. sprinkled with a few short hairs pale mottled or speckled with purple. Limb of pet. short and broad bright lemon-y.; claw and fil. often purple. Pods as in *S. frutescens* β .

3. *S. RUPESTRE* Lowe.

Herb. suffrutescent at the base strigose-hispid; st. branched erect; l. stiffly scabrous harsh and rough ovate-oblong and lanceolate sharply toothed and sinuate stalked, the lowest sublyrate or auriculate at the base, the uppermost elongated linear-oblong or linear very entire; sep. widely or horizontally spreading quickly falling; pods smooth.—Prim. 37.—Var.:

a. chatocalyx Prim. 38; rough and bristly, l. stiff but not fleshy or succulent; pedic. germens and sep. hispid, the latter spotted with dark purple.—Herb. ann. or bien. Mad. reg. 3; rr. Ravines of the interior, Rib. da Metade, R. de S. Jorge. May–August.

β . gymnocalyx Prim. 38; smoother, l. more succulent thick or fleshy and shining, the lower shorter more oval or rounded and obtuse; pedic. germen and sep. smooth, the latter subimaculate; pods short.—Herb. ann. or bien. Mad. reg. 1; rr. Sea-cliffs on the north coast at the Entroza and descending into Ponta Delgada. June–Oct.—A mere maritime state of *a*.

A tall upright large rankly growing sparingly and stragglingly branched pl. 3–4 ft. high, in general aspect or habit much resembling *S. arvensis* L. St. and branches woody downwards stout and stiff, divided in a straggling flexuose manner, angular or ribbed. Foliage dark gr. coarse and harsh; the l. large and rank. Fl. lemon-y. rather larger than in *S. frutescens*; claw of pet. and fil. almost always purple, Sep. conspicuously spotted

with dark violet-purple. Pods loosely erecto-patent slender about 2 in. long (in β . thicker and shorter) with a short seedless 2-edged beak $\frac{1}{2}$ in. long, subquadrangular subtorulose and striated. Seeds oblong subangular light brown finely reticulato-punctate, imbedded in the pithy or spongy dissepiment.

11. ERUCA DC.

1. E. SATIVA Lam. *Fedorénte*.

St. and branches hirsute; l. lyrate pinnatipartite, their lobes toothed and all acute; pedic. shorter than the deciduous sepals.—DC. i. 223; Presl 104; WB. i. 79; Koch 62. *Brassica Eruca* (L.) Desf. ii. 95; Brot. i. 581; Spr. Syst. ii. 912.

γ . DC., Presl l. c.; fl. pale ochre veined with black or dusky; pods smooth.—Herb. ann. PS. reg. 1, 2; ccc. Sandy beach, barren sunny slopes, borders of fields and roadsides, everywhere near the sea in Porto Santo and the Ilheo de Baxo.—A low spreading bushy pl. about a foot high with remarkably hard and tough stiffly divaricated straggling branches and dull greyish dark gr. more or less smooth foliage: when bruised or brushed emitting a strong rank foxy smell. Fl. like those of *Raphanus Raphanistrum* L., rather large ochroleucous with blackish purple or violaceous veins. Sep. erect rather long. Pedic. very short. Pods with their beak from $\frac{1}{2}$ to $\frac{3}{4}$ in. long, short and broad turgid, with a broad short 2-edged compressed ensiform pointed seedless beak $\frac{1}{2}$ in. long; valves with the dorsal nerve prominent. Seeds subovate subangular tumid numerous, regularly in 2 rows in each cell.

SUBORDER II. SILICULOSÆ LATISEPTÆ.

Tribe IV. *Alyssineæ*.

12. KONIGA R. Br.

†††1. K. MARITIMA R. Br. Sweet Alyssum.

St. suffrutescent downwards, procumbent; l. linear-lanceolate acute silky grey or hoary; pouches oval with an abrupt point smooth.—Bab. 28. *Lobularia maritima* (Desv.) Koch 65. *Chypeola maritima* L. Desf. ii. 72. *Alyssum maritimum* Brot. i. 558; EB. t. 1729; DC. Syst. ii. 318, 319; Prod. i. 164; Sm. E. Fl. iii. 162. *Alyssum halimifolium* Curt. BM. t. 101.

β . *canariense* DC. ll. cc.; branches elongated, cells of pouches often 2-seeded.—*Lobularia intermedia* WB. i. 92.—Herb. ann. Mad. reg. 1; r. Waste ground amongst vineyards about Funchal here and there: but a mere outcast of gardens. About

the Quinta do Val. Aug.-Dec.—St. numerous weak slender much branched from the base forming a low spreading tuft, presently in fr. elongated to the length of 1 or 2 ft. or more, the ends ascending. L. crowded small $\frac{1}{2}$ -1 in. long quite entire dull greyish-gr. clothed like the branches with copious close-pressed whitish silky forked hairs. Fl. very numerous pure brilliant white in terminal corymbose racemes which are much elongated in fr. Pouch oval or elliptic erecto-patent. Seeds 1 or 2 in each cell.—Seems scarcely worth distinguishing as a var. from the usual European garden pl. The st. and branches are indeed woody or suffrutescent downwards, but the pl. is notwithstanding truly annual or only accidentally of longer duration in Madeira.

13. DRABA L.

1. D. MURALIS L.

Root simple; st. leafy puberulous; l. hairy-pubescent ovate amplexicaul toothed, root-l. narrowed downwards forming a rose-like tuft; pedic. spreading as long or nearly twice as long as the 8-16-seeded smooth erecto-patent pouches.—Desf. ii. 65; Brot. i. 559; EB. t. 912; DC. i. 171; Sm. E. Fl. iii. 161; Koch 70; Bab. 29.—Herb. ann. Mad. reg. 3; rr. Rocky banks in ravines: Rib. de Santa Luzia close below the Waterfall; Rib. Frio by the Fountain. April, May.—Very variable in luxuriance with an erect slender st. 4-18 in. high often simple, but properly, as in more robust pl., branched sparingly from the base. Whole pl. more or less stellato-pubescent. Fl. small and inconspicuous white; pet. obovate entire but little longer than the erect always (in Madeira) hairy sep. Style very short scarcely any. Pedic. filiform subpuberulous. Pouch elliptic 1-2 lines long, the length or only half the length of its pedic., quite smooth.

SUBORDER III. SILICULOSÆ ANGUSTISEPTÆ.

Tribe V. *Thlaspideæ*.

14. THLASPI L.

†1. T. ARVENSE L. Penny Cress. Mithridate Mustard.

St. very erect branched at top, l. oblong toothed sagittate sessile; rac. in fr. elongated; pouches shorter than their stalk orbicular broadly winged, seeds arcuato-ribbed or striate several in each cell.—EB. t. 1659; DC. i. 175; Sm. E. Fl. iii. 171; Presl 61; Koch 73; Bab. 30.—Herb. ann. Mad. reg. 1, 2; $\frac{1}{2}$.—In Yam- (*Colocasia antiquorum* Sch.) beds, S. Vicente, Serra d'Agoa, &c. May-Aug.—Altogether smooth. St. 6-12 in. high stiffly erect and straight branched only at top or upwards, often simple.

Root-l. obovate. Fl. white very small and inconspicuous. Pouches very large and numerous erect deeply notched at top. Seeds brown shining beautifully ribbed and grooved spirally, biting in taste like Mustard with a strong flavour of Garlic.

15. TEESDALIA R. Br.

1. *T. nudicaulis* (L.) R. Br.

Pet. unequal.—Sm. E. Fl. iii. 170; Koch 75; Bab. 31. *T. Iberis* DC. i. 178. *Iberis nudicaulis* L., Brot. i. 570; EB. t. 327. *T. caulescens* Reichenb. in Holl's List, Hook. Bot. Misc. N. Ser. i. 21, 41.—Herb. ann. Mad. reg. 3, 4; ccc. Mountain pastures in moist or shady places everywhere above 2500 ft. up to the summits of the highest peaks. April–Aug.—A small insignificant stemless pl. consisting of a tuft of l. with many short mostly unbranched flowering st. or scapes from the crown of the root, and altogether smooth or only now and then with a few scattered hairs. L. numerous in a rose-like tuft mostly pinnatilobate or lyrate, sometimes undivided and spatulate. Scapes several soon becoming numerous 2–4 in. long; at first simple leafless, each with a terminal dense corymb of small white hexandrous fl., later in the season often sparingly 1- or 2-branched with a small leaf at each subdivision, constituting *T. caulescens* Reich., of which I have one of Herr Holl's original specimens gathered "at a little spring near the top of Pico Ruivo" in Aug. 1827. Pet. scarcely longer than the sep.; the 2 outer largest. Stam. 6 with large petal-like scales at their base. Pouches deeply notched spreading, about the length of their pedicels.

2. *T. lepidium* DC.

Pet. equal.—DC. i. 178. *T. regularis* Sm. *Lepidium nudicaule* L., Brot. i. 566. *Thlaspi nudicaule* Desf. ii. 67 (var. a).

β. integrifolia DC. l. c.; l. simple entire spatulate or lanceolate.—Herb. ann. PS. reg. 1; rrr. Sand-rocks very sparingly on the right hand at the mouth of the Serra de Fora (Porto dos Frades) close to the beach. March, April.—A small insignificant inconspicuous pl. 3 or 4 in. high with several slender erect or spreading sparingly branched and leafy altogether smooth stems. L. principally radical, all simple or undivided elongato-spathulate or lanceolate and more or less acute, attenuated downwards into long stalks. Pouches orbicular notched, about twice the width of the narrow lanceolate septum, shorter than their horizontally spreading pedic.; each cell 2- sometimes 3-seeded. Seeds very minute tawny oval compressed but not bordered. Cot. accumbent.—The few pl. observed were quite out of fl. and nearly burnt up when discovered early in May.

But the slender decidedly branched stems, and laxer not cespitose habit, not to speak of the peculiar locality, forbid their reference to any state of the common Madeiran *T. nudicaulis* L. which is never found below 2000 ft.

Tribe VI. *Lepidineæ*.

16. LEPIDIUM L.

1. L. VIRGINICUM L.

L. all undivided sharply inciso-serrate smooth, root-l. oblong-spathulate, st.-l. lanceolate, the uppermost linear-lanceolate; stamens 2-4, style very short; pouches orbicular notched keeled winged upwards spreading about the length of their pedicels.—DC. Syst. ii. 538; Prod. i. 205; Buch 196. no. 306. (*L. Iberis* Schk. not Linn.) DC. *Cynocardamum virginicum* WB. i. 97.—Herb. ann. (occasionally bien.) Mad. reg. 1, 2; ccc. Road-sides, sunny waste ground and dry beds of ravines, a universal weed; throughout the year. St. stiffly erect and straight about a ft. high often woody and suffrutescent at the base; branches slender stiff and rigid somewhat tough woody downwards minutely puberulous substrate. L. about an inch long narrow, the root-l. broader soon disappearing. Fl. very small and inconspicuous white; pet. often not unfolding spathulate obtuse. Seeds light tawny yellow compressed partly pellucid-bordered reticulato-punctate. Cotyledons accumbent.

No dependence can be placed upon the cot. in this pl. which vary from accumbent to incumbent. DC. in his *Systema* originally described them as incumbent. Webb finding them accumbent in his Canarian, Madeiran, N. American, and Porto Rican (Wydler's) specimens, was led to form his genus *Cynocardamum*: stating however the cot. to be "all incumbent in a most closely allied if not altogether identical" Mexican sp. from Berlandier.

†††2. L. SATIVUM L. Cress.

Lower l. stalked variously cut and lobed pinnate or bipinnate, upper l. sessile linear undivided; pouches orbicular or oval winged obtuse notched close-pressed to the st.—Brot. i. 567; DC. i. 204 (var. *a*); Koch 77 (var. *a*); Bab. 32. *Lepia sativa* (Desv.) Presl 83.—Herb. ann. Mad. reg. 1, 2; rr. Occasionally in the neighbourhood of Funchal in waste ground amongst vineyards &c.; a mere outcast from gardens. March, April.—Pl. 1-2 ft. high much branched and leafy smooth more or less glaucous. L. deeply and much divided with narrow linear

lobes; sometimes entire. Fl. small white very numerous in long erect racemes. Style scarcely any. Cot. often tripartite. Cultivated for early salads with *Sinapis alba* L. frequently in Europe.

17. CAPSELLA Med.

1. C. BURSA-PASTORIS (L.) Moench. Shepherd's Purse.

Pubescent; root-l. lanceolate runcinate-pinnatifid or undivided, those of the st. sessile sagittate and toothed, the uppermost undivided; pouch triangular-obcordate.—EB. t. 1485; DC. i. 177; Presl 86; WB. i. 98; Koch 79; Bab. 33. *Thlaspi Bursa-pastoris* Desf. ii. 68; Brot. i. 568; Sm. E. Fl. iii. 173.

γ. pinnatifida Koch l. c.; fl. regular, root-l. pinnatifid. Herb. ann. Mad. reg. 1, 2, c.; PS. reg. 2, r. Roadsides about Funchal, Dec.-Apr. and PS. at Camacha, Apr. Very variable in foliage; st. erect branched 6-12 in. high. Root-leaves in a flat rose-like tuft either undivided and lanceolate (var. *γ*. DC.; *α*. Koch), sinuate-toothed (var. *β*. Koch) or, as in Madeira and Porto Santo, pinnatifid (var. *γ*. Koch): but these three forms seem scarcely worth distinguishing. Pouches smooth on erectopotent or spreading stalks of about their own length in long branched racemes, each 3 lines long and 2 broad at top, their cells each with from 10 to 14 seeds.

Tribe VII. *Senebiera*.

18. SENEBIERA Pers.

1. S. CORONOPUS (L.) Poir. Swine's Cress.

Smooth; l. fleshy unequally and coarsely pinnatilobate, lobes entire or incised on their fore-edge; pedic. shorter than the fl.; pouch altogether closed not bursting, undivided reniform compressed crested and toothed at the back tipped with the pyramidal prominent style.—DC. i. 203; Sm. E. Fl. iii. 179; Presl 81; Koch 80; Bab. 33. *Coronopus Ruellii* Brot. i. 565; EB. t. 1660; WB. i. 96. *Cochlearia Coronopus* L.—Herb. ann. Mad. reg. 1; $\frac{c}{2}$. Streets and roads about Funchal, Jan.-Apr.—St. short branched prostrate and with the l. lying flat to the ground. L. light or dark full not at all glaucous gr. Fl. small white in short close lateral corymbs. Pouches in dense clusters large in proportion and of singular appearance, not bursting or splitting asunder, of a somewhat corky or leathery substance, not distinctly 2-lobed. Pl. when bruised fetid.

2. S. DIDYMA (L.) Pers.

St. hairy; l. regularly and elegantly pinnatilobate flattened, lobes oblong toothed or cut at their fore-edge; pedic. longer than

the fl.; pouch compressed deeply and distinctly 2-lobed granulate or reticulato-rugose widely notched at the top and bottom, the lobes turgid splitting asunder but not discharging the seeds, style very short.—Sm. E. Fl. iii. 180; Koch 80; Bab. 33. *Lepidium didymum* EB. t. 248. *S. pinnatifida* DC. i. 203; WB. i. 95. *Coronopus didymus* Spr. Syst. ii. 853.

β. pinnatifida DC. l. c.; lobes of l. 3-4-partite.—Herb. ann. Mad. reg. 1, 2, ccc.; PS. reg. 1, 2, c. Roadsides, streets, on walls, in waste ground in Madeira everywhere; less common in PS.; has not occurred in the Dezertas. Jan.—June.—St. at first prostrate then procumbent or diffuse a foot long or more and with the fl.-stalks more or less hairy, the rest of the pl. mostly smooth. L. dark green elegantly pinnate and flattened, the lobes usually deeply 3-toothed in front. Fl. white very small and numerous in dense rac. abundantly produced opposite the l. often apetalous and diandrous. Pouches pale green or yellowish erecto-patent deeply and widely notched, the lobes joining only in their middle and easily separating. Pl. fetid when bruised.—In a young state growing between the stones in a dry paved road it assumes sometimes a very peculiar and anomalous appearance, producing little sessile whitish or hoary and woolly globose rooting buds (gemmae or stolons) much resembling the flowering heads of *Trifolium tomentosum* L. or *T. resupinatum* L.

SUBORDER IV. SILICULOSÆ NUCUMENTACEÆ.

Tribe VIII. *Isatidea*.

19. ISATIS L.

†1. *I. PRÆCOX* Kit. *Pastel*.

More or less glaucous and hairy-pubescent; lower l. stalked oblong, upper l. sessile sagittate; pouches smooth oblong or slightly fiddle-shaped obtuse or rounded at each end, rarely or but slightly narrowed or attenuated at the base, twice as long as broad, tumid and corky towards the margins which are slightly winged.—DC. ! Syst. ii. 568; Prod. i. 210. *I. tinctoria γ. præcox* Koch 81. *I. bannatica* RFG. ii. t. 4. f. 4177 b. *I. tinctoria* Buch! 196. no. 322 (not Linn.).—Herb. ann. Mad. reg. 1, 2; ccc. Waste rocky ground in sunny places everywhere, especially near the sea. Spr.; but at almost all seasons.—St. 2-3 ft. high very erect virgate branching upwards into a large panicle. Lower l. large generally crenate and waved, upper more entire. Fl. small very numerous and with the smaller subdivisions and uppermost bracts of the large spreading panicle bright golden-y. Pouches pendulous, in all stages smooth, shining violet or steely blackish, rarely somewhat cuneate and

always nearly if not quite half as broad as long, *i. e.* not quite half an in. (10-11 millim.) long, $\frac{1}{4}$ in. (4 or 5 millim.) wide, tumid and corky towards the edges, scarcely or but very narrowly winged, imperfectly bursting and discovering in the middle the single pendulous large oblong seed, not separating.—Varies not only greatly in size, height and foliage, but in being (1) more hairy and less glaucous, (2) nearly or quite smooth and very glaucous, (3) pouches truncate or rounded at top, and sometimes a little narrowed or attenuated, though scarcely cuneate or wedge-shaped, at the base: but all these forms are too much blended together to be separable. And although the pouches vary thus in shape a little from their normally oblong character, the proportion of their greatest width to their length is quite constant, even in the most cuneate forms, in which the upper transverse diameter manifestly exceeds the lower or basal.—United by Koch to *I. tinctoria* L., but more nearly perhaps related to *I. alpina* All.; the pouches being of precisely the same shape, only considerably smaller. Still in *I. alpina* All. the pouches are not only 15-16 millim. long and 8 wide, but they are also altogether thicker, though neither tumid or corky towards the sides, nor more distinctly winged than in *I. præcox* Kit.—*I. præcox* RFG. ii. t. 4. f. 4178 does not seem to differ materially from f. 4177, which is the true *I. tinctoria* L. But the fig. 4177 b, "*I. bannatica* Link," exactly represents the fruit of the Madeiran plant. By Steudel both *I. bannatica* Link and *I. bannatica* Kit. are referred to *I. tinctoria* L., in which the pouches are not only finely attenuated downwards into the stalk, but are uniformly at least three times as long as broad.

Occasionally used for dyeing blue by the country people, but now almost superseded. Formerly it was much cultivated for commerce, but it is now quite neglected: and though extensively and perfectly naturalized in Madeira, its non-occurrence in Porto Santo and especially in the Dezertas is a fact (considering its favourite places of growth) opposed to its being truly indigenous.

SUBORDER V. LOMENTACEÆ.

Tribe IX. *Cakilineæ*.

20. CAKILE Tourn.

1. *C. MARITIMA* Scop. *a.* DC.

L. fleshy sinuato-pinnatifid, the lobes toothed; upper joint of the pod 2-edged ensiform acute.—DC. i. 185, var. *a*; Sm. E. Fl. iii. 183; Presl 69; Koch 83, var. *a*; Bab. 34. *Kakile maritima*

Desf. ii. 77. *Kakile Serapionis* Brot. i. 561. *Bunias Cakile* L. EB. t. 231.—Herb. ann. PS. reg. 1; cc. Sandy beach in front of the town abundantly. Apr.—June. Pl. altogether smooth and fleshy, 6–12 in. high or more, with numerous flexuose spreading hard stiff branches forming a close often pyramidal bush. Foliage light gr. not glaucous. Fl. handsome pale lilac rather large in rac. opposite the l. or terminal. Pods an in. long, hard and woody, sharply quadrangular, beak compressed.

Tribe X. *Raphanææ*.

21. RAPISTRUM Boerh.

1. *R. RUGOSUM* (L.) Berg. *Rinchaõ*.

Root annual; branches widely and stiffly patent or divaricate; l. toothed, the lower oblong obtuse lyrate or lyrate-pinnatifid, sometimes undivided and merely sinuate, the upper l. acute; pouches pubescent hispid or smooth many-ribbed, upper joint ovate then globose strongly granulato-costate or rugose, equal to or shorter than the elongated conico-subulate style, lower joint clavate.—WB. ! i. 86; Koch 83.—Var.

a. eriocarpum Webb l. c.; pouches hispid-pubescent, lower l. lyrate obtuse.—*R. rugosum* DC. ! Syst. ii. 432; Prod. i. 227; Presl 107; RFG. ii. t. 2. f. 4168. Varr. silic. hirsutis (*R. hirsutum* Host) and silic. scabris (*R. scabrum* Host) Koch l. c. *Myagrum rugosum* L. ! *M. perenne* Buch! 195. no. 304. Madeira, Fr. Masson, 1777, in BH. ! (not Linn.) *Cakile rugosa* Spr. Syst. ii. 852.—Herb. ann. Mad. reg. 1; cc. PS. reg. 2; $\frac{1}{2}$. GD., reg. 2; c. Waste sunny places and cornfields chiefly near the sea. Abundant to the westward of Funchal about the Gorgulho, Praya Formosa, &c. Ponta S. Lourenço about the fossil bed, &c. Less common in Porto Santo than var. β . March-May.—Root subfusiform strong tough and woody, perennial-looking, but always decidedly annual only. Pl. 1–2 ft. high with remote straggling divaricate very tough and stiff or rigid branches, and small scanty foliage. L. not above 2 or 3 in. long and 1 broad, principally radical in a flat rose, with the st. more or less hispid, the latter retrally strigose. Rac. in fruit much elongated and divaricated or declining. Fl. rather smaller than in *Sinapis arvensis* L., bright y. Sep. smooth. Pedic. very short erect closely adpressed in fr. Pouches when young densely hispid; in all stages and even when ripe more or less pubescent all over, corky, coarsely ribbed and rugose longitudinally, 3–5 lines long, the lower joint rarely seedless not longer than the pedic., as long as the upper globose joint which is strongly ribbed longitudinally and tipped by the slender conic-subulate style which is as long as or longer than the

joint; the ribs more or less broken into irregular coarse warts or granules.—The pubescence of the fruit affords a very obvious but the only well-marked or perhaps altogether permanent distinction between this and var. β . The two however grow continually intermixed; so that the differences between them cannot be ascribed to soil or situation.

β . *leiocarpum* Webb l. c.; pouches smooth, lower l. sinuate-toothed acute.—*R. rugosum* var. *silic. glabris* (*R. glabrum* Host) Koch l. c. *R. glabrum* (Host) RFG. ii. t. 2. f. 4171. *R. orientale* Presl 107 (not DC.). *Myagrum hispanicum* Brot. i. 563 (not Linn.). *M. clavatum* Poir. ex Webb l. c. *Rapistrum clavatum* DC. Syst. ii. 433; Prodr. i. 227.—Herb. ann. Mad. reg. 1, c; PS. reg. 2, cc; GD. reg. 2, c. Waste ground and corn-fields with α ; but the commoner of the 2 varr. in Porto Santo, though rather the rarer in Madeira. March-May.—Habit, size and general characters precisely as in α : but besides the smoothness of the fr. from its earliest stage, the lower l. are more acute and not lyrate but merely sinuate and toothed. In one Porto-Santan specimen the l. however are decidedly lyrate or pinnatifid, and the pl. is altogether smoother and the root more woody or perennial-looking than usual; the pouches being also merely ribbed and not verrucose or rugose, though with the ordinary slender elongated style.—*R. perenne* (L.) Berg. and *R. orientale* DC. with which α . and β . have often been respectively confounded, are both much taller larger more robustly growing and more upright pl., 2 or 3 ft. high or more, with long erect not straggling patent or deflexed branches, and much larger foliage: the l. in *R. perenne* L. being 6-8 in. long, lyrate-pinnate, with 3 or 4 pairs of pinnae and a large terminal lobe; and in *R. orientale* DC. a foot long, very obtuse, and merely sinuate with obtuse lobes and sinuses. In *R. perenne* also the root is decidedly perennial, sending up fresh stems annually from the old woody stock, which is never the case even by accident with the Madeiran pl.

22. CRAMBE L.

1. C. FRUTICOSA L. fil.

Shrubby hoary-pubescent and harshly strigose; l. scabrous harsh and stiff sinuate-pinnatifid or lyrate, coarsely unequally and sharply toothed grey or glaucous; panicle corymbose open spreading, its branches forked elongated slender smooth, the fl. numerous and crowded at their ends; pouch reticulato-rugose ovate-mucronate subcompressed more or less quadrangular.—

Var.:

a. pinnatifida; l. sinuato-pinnatifid, all the lobes acute and inciso-dentate; panicle large compound corymbose.—*Crambe*

fruticosa DC. i. 226. *Myagrum scabrosum* Buch! 195. no. 305. *M. scabridum* Sol.! in BH.—Shr. per. Mad. reg. 2; r. Dry sunny rocks and cliffs on the S. coast, as on the edge of the Cabo Giraõ or of Pico de Facho beyond Camera de Lobos; more rarely in ravines, as nearly at the bottom of the Curral das Freiras down the Voltas on the high rocks to the right of the road above the Church. March–July.—A low shrub 2 or 3 ft. high with stiff fragile straggling crooked branches. L. ovate-oblong 1–2 in. long and $\frac{1}{2}$ –1 in. wide. Panicle large corymbose; its branches thin stiff and naked; the fl. white middle-sized crowded in dense racemes towards their ends, smelling rather disagreeably. Longer fil. often forked or toothed. Fr. dark brown the upper seed-bearing joint ovate tipped with the style, about a line long, soon and easily falling or separating from the short minute stalk-like quadrangular strongly corrugated lower barren joint.

β . *brevifolia*; dwarfish stunted, sparingly or not branched; l. short roundish or oval obtuse thick and fleshy toothed but nearly simple with only a pair of very small inconspicuous auricles at the base; panicle scarcely or not at all corymbose, of few simple or sparingly divided branches.—Shr. per. Mad. reg. 1, r; PS. reg. 4, rr; ND. 1, rr; GD. 1, r; SD. 1, $\frac{5}{8}$. Sea cliffs; Mad. at Paul do Mar above the Waterfall, at Ponta de Pargo &c.: Porto Santo on the rocky summit of Pico d'Anna Ferreira. May–July.—Merely the maritime form of *a*, with all the usual variations characteristic of its locality. Fl. and fr. rather larger than in *a*.

The Canarian *C. strigosa* from authentic specimens in the BH. is very distinct in its greater size, large ovate finely toothed l. 4 or 5 in. long and 2 or 3 broad, large ample elongated not at all corymbose panicle with the fl. thinly scattered, few together, and not more than half the size of those of *C. fruticosa*. The whole pl. is devoid of hoary fine pubescence, but sprinkled with conspicuous long coarse bristles. The greater or less development of the tooth of the longer filaments is equally variable in both sp.

23. RAPHANUS L.

†††1. *R. SATIVUS* L. Radish. *Rabaõ*.

Pods oblong rounded tapering acuminate continuous or sometimes strangulated here and there scarcely longer than their stalks spongy and 2-celled within; seeds reticulato-rugulose.—Brot. i. 574; DC. i. 228; WB. i. 84; Koch 84.—*a. rotunda*; root fleshy globose red purple pink or white: *R. sativus* A.

a, DC. l. c.; *R. Radicula* Presl 108.—*β. oblonga*; root oblong or fusiform, at first fleshy purple red or white, then slender woody or fibrous: DC. l. c.; Presl l. c.; *R. sativus β. sylvestris* Koch 1019.—Herb. ann. Mad. reg. 1, 2; r. Cult. and in waste ground and vineyards about Funchal, &c. occasionally, escaped from gardens. Nov.—March.—St. branched erect 2–3 ft. high. Lower l. lyrate, upper lanceolate; all somewhat hispid. Fl. pale lilac with darker veins. Seeds large angular beautifully reticulato-punctate.

2. *R. RAPHANISTRUM* L. *Saramago*.

Pods linear slender tapering acuminate moniliform or stragulated between the seeds 1-celled and longitudinally ribbed or striated when ripe; seeds even.—Brot. i. 574; DC. i. 229; Sm. E. Fl. iii. 226; WB. i. 84, 5; Koch 84, 1019; Bab. 34.—Herb. ann. Mad. reg. 1, 2; ccc. PS. 1, 2; r. Cornfields waste ground and by roadsides in Madeira everywhere but especially from 1000 to 2000 ft. March–June chiefly but at almost all seasons.—Hispid dark green, st. glaucescent diffusely spreading or straggling 1–2 ft. long. Root slender fibrous. L. lyrate toothed, terminal lobe large. Fl. rather large. Sep. erect soon turning purplish. Pods smooth about an inch long, 2–4 times as long as their subulate acuminate smooth or adpresso-pubescent beak, when ripe breaking across between the seeds as if jointed, 2-celled whilst very young but the longitudinal dissepiment soon obliterated, the seeds becoming imbedded in a spongy mass.—Var.:

a. DC., Koch l. c.; fl. white with blackish violet veins giving them a bluish tint.—Not common. About S. Amaro and S. Martinho intermixed with *β.* and equally abundant.

γ. DC., Koch l. c.; fl. pale dull yellow (ochroleucous) or straw-colour with darker or dusky (not violet) veins.—EB. t. 856. Common everywhere. The fl. become deeper *γ.* ascending from the sea.

Order VI. RESEDACEÆ.

The Mignonette Family.

Fl. irregular. Cal. 4–6-partite persistent. Cor. irregular, pet. 4–6 unequal alternate with the sepals deciduous. Stam. indefinite numerous, fil. free or variously united, inserted on a glandular fleshy flat collar-like or ruff-like irregular unequally dilated disk broadest and scale-like on the upper side. Ovary 3–6-lobed, 1-celled, multiovular, with 3–6 parietal placentas and 3–6 stigmas. Fr. a 1-celled many-seeded caps. open from an early stage at the top and exposing the seeds; rarely of 3–6

few-seeded follicles. Seeds kidney-shaped; embryo curved mostly exalbuminous.

1. RESEDA. Pet. unequal entire or variously lacinate. Stam. 10-24. Styles 3-6. Caps. 3-6-angular.

1. RESEDA L.

†1. R. LUTEOLA L. Dyer's Weed or Weld. *Lirio.*

St. erect; l. undivided elongato-lanceolate entire with usually a single small toothlet on each side at their base; cal. 4-cleft.—Desf. i. 373; Brot. ii. 305; Buch 196. no. 323; EB. t. 320; Sm. E. Fl. ii. 347; Presl 112; Koch 97; Bab. 35.—Herb. ann. or bien. Mad. reg. 1, 2, cc; PS. reg. 1, 2, c; ND. r, or $\frac{c}{2}$; GD. c. Open waste ground everywhere. Spr., Sum.—Whole pl. smooth and shining. St. virgate branched 1-3 ft. high. L. undulate dark green. Fl. scentless pale greenish-ochroleucous, in long terminal erect tapering racemes densely crowded and spicate upwards. Pet. 3-5, the 3 upper lacinate. Caps. verrucose or granulate 6-valved 3-cuspidate, the points of the alternate valves inflexed.—Used by the country people to dye woollen yellow or green.—*Luteola tinctoria* var. *australis* WB.! i. 106 by Bourgeau's spec. in HH. and BH. seems to be merely a trifling accidental form or more branched state of the common pl. such as I have seen in Madeira produced by the cropping or browsing down of the main st. before flowering.

Order VII. CISTACEÆ.

The Cistus Family.

Fl. regular. Sep. 5 persistent unequal, the two outer larger or smaller sometimes wanting, 3 inner twisted in æstivation. Pet. 5 equal fugacious crumpled and twisted contrariwise to the sep. in æstivation. Stam. numerous free. Stigma capitate. Ovary free. Fr. a 3-, 5- or 10-valved 1-many-locular many-seeded capsule. Embryo spiral or curved within the farinaeous albumen.

1. CISTUS. Sep. 5, the 2 outer larger or smaller or 0. Pet. 5 fugacious. Caps. 5- or 10-valved.—L. opposite without stip.

1. CISTUS L.

†1. C. MONSPELIENSIS L. *Alecrim de Fora.*

L. sessile linear-lanceolate 3-nerved reticulato-rugose villous on both sides, presently smooth; fl. in villous viscous secund corymbose racemes, stigma nearly sessile.—Brot. ii. 260; Desf.

i. 409; Buch! 196. no. 344; DC. i. 265; Presl 117; Koch 85. *Stephanocarpus monspeliensis* (Spach) WB. i. 124.—Shr. per. Mad. reg. 2; rrr. In waste spots in a red clay-tufa soil by a roadside (Caminho de João Bouto) from $\frac{1}{4}$ to $\frac{1}{2}$ a mile above or beyond the church of S. Antonio near Funchal. Here it was gathered by Masson long ago according to specimens in the BH. marked "Madera prope Templum S^{ti} Antonii, Fr. Masson;" and to this spot it seems confined. March, April.—A low bushy shrub 2 or 3 ft. high with a profusion of snow-white fl., the size of those of *Ranunculus acris* or *bulbosus* L., contrasting with its dark green foliage which is scented like Peruvian Bark (*Cinchona*). L. 1 or 2 in. long with revolute margins, nearly sessile, at first hairy on both sides, ultimately smooth and shining on the upper. Fl. 5–10 slightly fragrant, in copious short racemes which are 1 or 2 in. long glutinous and densely villous; the 2 outer sep. more leafy narrow and acuminate than the 3 inner; pet. pure white, their claw yellow. Caps. small brittle smooth 5-valved bursting at the top, imperfectly 5-celled many-seeded.

Order VIII. VIOLACEÆ.

The Violet Family.

Fl. mostly irregular. Sep. 5 usually persistent. Cor. unequal or irregular. Pet. 5 marcescent rarely deciduous. Stam. 5, anthers introrse connivent or cohering round the ovary, sessile in the middle of the short dilated fil. which is produced above the anthers into a dry membranous point or crest. Ovary 1-celled with 3 parietal placentas. Style persistent thickened upwards with an oblique hooded stigma. Caps. 1-locular 3-valved loculicidal. Seeds often carunculate or sub-arillate. Embryo straight erect in the axis of the fleshy albumen.—Leaves with persistent stipules.

1. VIOLA. Sep. unequal produced downwards at the base. Pet. unequal, the hinder or lower one produced behind into a hollow spur. Stam. approximate into a cone or cylinder, but free; the two lower spurred at the base.

1. VIOLA L.

Sect. 1. *Nomimum* Ging. in DC.; the 4 upper pet. spreading irregularly sideways; the 2 side pet. generally bearded inside downwards: the 2 upper naked. Style slightly flexuose thickened or dilated upwards, constricted at the base.—Rhizome oblique or creeping; the later fl. apetalous.

- * Stigma hooked attenuated into a deflexed beak. Fruit-stalks prostrate. Summer-l. large and fl. apetalous.

1. *V. ODORATA* L.

Stemless or shortly caulescent; *summer shoots creeping stoloniferous*; l. all broadly ovate rounded deeply cordate, more or less pubescent on both sides, on long *deflexedly pubescent stalks*; stip. altogether smooth ovate- or oblong-lanceolate acuminate ciliato-serrulate or fringed with glands much shorter than the breadth of the stip.; *br. above the middle of the ped.*; sep. smooth or pubescent at the edges only, oblong mostly obtuse; spur straight obtuse; fruitstalks deflexed or prostrate deflexedly pubescent; caps. short globose pubescent.—Desf. ii. 313; Brot. i. 305; EB. t. 619; DC. i. 296; Sm. E. Fl. i. 301; Presl 132; Koch 90; Bab. 37.—

β. maderensis. Violêta.

Somewhat more decidedly caulescent or suffrutescent and pubescent than the common English pl.; ped. always deflexedly pubescent; sep. smooth subacute; fl. paler violet than in the E. pl., never white, highly fragrant, the 2 side pet. very slightly bearded; spur mostly very obtuse; anthesis subperennial, stolons flowering together with the mother-pl.—*V. odorata* Buch 196. no. 345; WB. i. 110. *V. odorata* L. var. Webb in Ann. des Sci. xiii. 138, 9. *V. maderensis* Prim. 36.—Herb. per. Mad. reg. 2, 3; ecc. In woods and shady places above 1000 ft. everywhere, e. g. the Mount, Camacha, S^{ta} Anna, S. Vicente, &c. Oct.—June.—Probably the origin of the "Perpetual Violet" of English gardens.

- ** Stigma hooked attenuated into a deflexed beak. Fruit-stalks erect, caps. drooping.—Summer-shoots annual not rooting or stoloniferous, with shorter-stalked l., smaller stip., and often apetalous fl.

2. *V. SYLVESTRIS* Lam. Round-leaved Dog Violet.

Nearly or quite smooth shortly caulescent, *summer-shoots ascending or procumbent*; l. *shortly and broadly cordate* simply acute or pointed, the lower orbicular or reniform and more obtuse, the upper more ovate or distinctly acute; stip. of ann. st. fimbriate-ciliate narrow attenuato-acuminate, the intermediate half as long as the slightly margined petiole, the upper as long as or longer than the same; sep. very narrow attenuato-acuminate; caps. *oblong or elliptic acute apiculate*.—Lam. Fl. Fr. ii. 680; RIB. Cent. I. t. 94. ff. 200, 201; Cent. 7. t. 601. f. 822; RFG. iii. t. 12. f. 4503; Koch 91. *V. sylvatica* (Fries) Bab. 37. *V. canina* EB. t. 620; DC. i. 298; WB. i. 110 (not Linn.).

β. Riviniana Koch l. c.; fl. larger and paler, spur mostly pale or whitish. *V. Riviniana* RIB. l. c. t. 95. f. 202, 203; t. 601.

f. 821; RFG. l. c. f. 4502.—Herb. per. Mad. reg. 3; cc. Dry rocks and sunny banks above 2000 ft. general; *e. g.* about the Torre de Luta and Arrebentaõ above the Mount, at the Portella of Porto da Cruz, the Encumeado de S. Vicente, &c. Nov.—July.—Pl. quite smooth, early in the season with short subcespitose suffrutescent st. and tufts of small cordate orbicular scarcely pointed l., producing numerous fl. in long succession, and throwing out, as the spring advances, several trailing but never-rooting shoots, 6–12 in. long, bearing more cordate-ovate larger l. and smaller sometimes apetalous or imperfect fl. Primordial fl. larger and much handsomer, but much paler and clearer blue than in *V. odorata* L. var. *β. mad.*, scentless, never white. Pet. varying in shape from very broad and oval or rounded to oblong or ligulate. Spur white or pale, obtuse, varying much in length.—L. crenate mostly as broad as long, varying much in size but not in shape except in being more or less ovate and pointed, yet never assuming the isosceles-triangular form of those of the true *V. canina* L. Early in the year or in dry exposed situations starved dwarf pl. with very small rounded l., $\frac{1}{4}$ – $\frac{1}{2}$ in. diam., and large fl. with often short broad almost orbicular pet., exactly represent *V. flavicornis* Forst. (not Smith) in EBS. t. 2736 (*V. canina* *γ. pusilla* Bab. ed. l. p. 34).—The modification *sylvatica* of the original name *sylvestris* would be very inappropriate to this *Viola* in Madeira, where it is generally found in open sunny places and not at all in woods.

Sect. 2. *Melanium* DC.; the 4 upper pet. ascending imbricated, the 2 uppermost more or less erect, the 2 side pet. and the lowest bearded inside at the base. Style ascending, expanding upwards into the large urceolate stigma labiate below with a tuft of hairs on each side.

3. *V. PARADOXA* Lowe.

St. suffrutescent branched cespitose procumbent or ascending, in flower elongated suberect diffuse; l. ternate crenate shining on long slender marginate petioles, the lower quite smooth rounded or ovate and cordate or truncate at the base, the upper subpuberulous spathulate or lanceolate; stip. simple entire spathulate ligulate or linear; sep. oblong-lanceolate entire thickly ciliato-pubescent; spur obtuse much shorter than the sep. or pet., longer than the basal calyx-lobes; anther-spurs not half the length of the stam.; caps. obsoletely 6-angular smooth.—Novit. 28 or 550.—Herb. per. Mad. reg. 4; rrr. Highest bare rocky mountain peaks: Pico dos Arrieiros and the neighbouring peaks. May–July.—An elegant little pl. smooth below, finely mealy-puberulous upwards; l. shining dark green, very small and elegant, from $\frac{1}{4}$ to $\frac{1}{2}$ an inch long or

broad, on slender petioles an inch long, before flowering crowded in tufts at the ends of the naked prostrate ascending branches, which are lengthened out when flowering often a foot or more, diffusely straggling, and producing from 2 to 6 or 8 fl. Fl. subcorymbose scentless large conspicuous bright full y., like those of the common garden Pansy, *V. tricolor* L., but less flat and regular, $\frac{3}{4}$ to 1 inch in diameter. Lower ped. elongated puberulous, upper shorter and with the br. and pedic. mealy-pubescent. Sep. acute puberulous, ciliato-pubescent at the edges. Claw of all the pet. pubescent; the 3 lower streaked and bearded inside at the base. Seeds from 15 to 20 ovate pale yellowish.

An exact representative and near ally of the European *V. calcarata* L.

†4. *V. TRICOLOR* L. Wild Heartsease or Pansy.

St. diffuse ascending branched; l. deeply crenate, the lower ovate-cordate, the upper ovate-oblong or lanceolate, stip. large lyrate-pinnatifid, their terminal lobe large ovate-oblong or lanceolate crenate.—DC. i. 303; EB. 1287; Sm. E. Fl. i. 305; Presl 134; Koch 94; Bab. 39.

β. arvensis Sm., Presl, Koch, Bab. ll. cc.; fl. small inconspicuous, pet. scarcely longer than the cal. very pale y. almost w., the lower odd one y. and streaked at the base; spur obtuse about the length of the basal lobes of cal.—*V. tricolor* var. *a.* L., *κ.* DC. l. c. *V. arvensis* Brot. i. 306; EBS. 2712. *Mnemion tricolor* (Spach) WB. ! i. 112.—Herb. ann. Mad. reg. 2; $\frac{5}{8}$. Cornfields, roadsides and waste ground here and there; about the Mount, Alegria, &c., near Funchal. March–Sept.—Shining and apparently smooth but more or less puberulous. St. 6–12 in. long angular often flexuose. Fl. varying in size, but never so large as in *a*, the larger blue-flowered var., which is not found except in gardens in Madeira.

Order IX. TAMARISCACEÆ.

The Tamarisk Family.

Fl. perfect regular. Cal. 5–4-partite persistent imbricate in the bud. Pet. 5 or 4 hypogynous regular imbricate in the bud, marcescent. Stam. 5–4 or 10–8, hypogynous free or monadelphous. Caps. 1-celled 3-valved many-seeded loculicidal, placentas often imperfect. Seeds ascending comose; embryo straight; albumen none.

Shrubby or small trees. L. cypress-like minute sessile scale-like alternate more or less imbricated entire, falling off together with the branchlets. Fl. small in dense terminal spikes or racemes, white or pink.

1. TAMARIX. Pet. 5 or 4. Stam. 5 or 4 inserted on a hypogynous ring. Styles 3 patent. Seeds affixed at the base of the caps. with a sessile coma or pappus-like pencil or tuft of simple hairs at the apex.

1. TAMARIX L.

†††1. T. GALLICA L. Tamarisk. Tamagueira.

Smooth not at all glaucous; l. keeled cordate-lanceolate or ovate-acuminate imbricate amplexicaul mostly narrowed and produced into a spur below the base; spikes lateral paniced, about four times as long as broad, cylindric-oblong, obtuse; fl. buds shortly globose-ovate or ovoid; hypogynous disk or ring fleshy irregularly 5-lobed, each lobe often indistinctly notched; fil. inserted in or behind the notch; anthers shortly apiculate; caps. pyramidate trigonal attenuated gradually upwards from the base.—Desf. i. 269; Brot. i. 475; EB. t. 1318; Sm. E. Fl. ii. 111; Fl. Gr. t. 291; DC. iii. 96; Koch 274. *T. anglica* Bab. 116. *T. gallica* and *T. anglica* Webb in Hook. Journ. of Bot. iii. 429, 430. t. 15. *T. canariensis* (Willd.) WB. ! i. 171. t. 25. *T. senegalensis* DC. iii. 96.—Shr. or subarborescent per. Mad. reg. 1, rr, only in a few gardens, e. g. Quinta do Val; whence introduced in 1834 by S^r João Antonio Pedroso into PS. it is now almost naturalized, spreading over the whole island in reg. 1, 2, ccc. April–June.—A smooth reddish-barked shrub or low tree from 10 to 20 ft. high with red-barked numerous elegant feathery slender upright or slightly drooping branches, and minute cypress-like l. which when dry are distinctly punctate. Fl. pale rose or pinkish-white small in densely crowded lateral spikes about an inch long and $\frac{1}{2}$ inch broad forming large elegant subterminal drooping panicles. Sep. pet. and stam. 5; the latter scarcely longer than the oblong obtuse concave spreading pet. Anth. apiculate. Hypog. disk normally 8–10-lobed, the lobes united in pairs, often indistinct or obsolete. Caps. trigonal bulbous with an abrupt neck.—A most valuable acquisition to Porto Santo for fences and firewood.

Order X. FRANKENIACEÆ.

The Sea-Heath Family.

Fl. perfect regular. Cal. persistent; sep. 5 or 4 united nearly to the top into a long ribbed or furrowed 5-toothed tube. Pet. 5 or 4 marcescent with a long claw and the limb with a scale or appendage at its base. Stam. mostly 6 rarely so few as the pet. and then alternate; anth. roundish. Ovary free; style slender 2–3-fid. Caps. within the calyx-tube 1-celled 2–4-valved septicidal with 3 parietal placentas. Seeds minute

numerous. Embryo straight in the axis of the albumen.—L. without stipules.

1. FRANKENIA. Style 3-fid, the lobes oblong bearing the stigma on their inner side. Caps. 3-4-valved many-seeded.

1. FRANKENIA L.

Sea-Heath.

1. F. PULVERULENTA L.

Herbaceous diffuse or prostrate; l. obovate retuse smooth above, furry-pubescent beneath, petioles ciliate at the base; cal. smooth.—Desf. i. 316; Brot. i. 556; EB. t. 2222; DC. i. 349; Sm. E. Fl. ii. 186; Presl 140; WB. ! i. 130; Bab. 41.—Herb. ann. Mad. reg. 1, rrr; PS. reg. 1, $\frac{5}{2}$. In Madeira only at Porto da Cruz on the N. coast near the sea, and "beach at S. Jorge," Sr Moniz; in PS. by roadsides, &c., not uncommon. April-June.—St. suffrutescent at the base, 6-12 in. long, much branched dichotomously, thickly leafy. L. small. Fl. small very pale pink or almost white, axillary.

2. F. LÆVIS L. *Resteira* or *Rasteyro*.

St. shrubby prostrate wiry thickly cespitose; l. linear stiff smooth on both sides sessile connate and subciliate at the base, their margins revolute; fl. solitary or collected in little terminal heads subcymose longer than the l.; cal. slightly hairy-pubescent at the base and between its ribs or angles.

a. *hebecaulon*; st. more or less velvety-pubescent. *F. laevis*, *hirsuta* and *Nothria* Linn. Herb. ! *F. intermedia* and ?*F. hispida* DC. i. 349. *F. intermedia* Presl 141? *F. Nothria* (Thunb.) DC. i. 34. *F. hirsuta* Desf. i. 317, 8. *F. laevis* Brot. i. 556; Sm. ! E. Fl. ii. 186; Bab. 41; Buch! 196. no. 351. *F. cespitosa* Lowe! Novit. 28. *F. capitata* WB. ! i. 131. t. 16.—Suffr. per. Mad. reg. 1, $\frac{1}{2}$; PS. reg. 1, ccc. Confined in Madeira to Ponta S. Lourenço; in Porto Santo general in barren exposed places near the sea. April-June.—Much branched and leafy, trailing, forming a thick spreading turf 2 or 3 in. high, with tough thick woody long wiry roots and st., and heath-like crowded often encrusted l. $\frac{1}{2}$ in. long and $\frac{1}{2}$ line broad, enlivened by the conspicuous rather large pink fl. which are either sessile and solitary or aggregate in leafy cymose heads of 2-4 towards the ends of the branches. Cal. and st. upwards reddish or purplish chestnut. In foliage the pl. resembles *Empetrum nigrum* L.; in fl., *Silene acaulis* L. It varies with fl. bright full pink or rose; and fl. pale flesh-colour or nearly w.; the latter occurring only, and that rarely, in Porto Santo.

The var. β . *leiocaulon* with smooth st. (*F. laevis* Desf. i. 317; EB. t. 205; DC. i. 34; Presl 141) has not occurred either in Mad. or PS.

Order XI. CARYOPHYLLACEÆ.

The Pink and Chickweed Family.

Fl. regular sometimes imperfect. Sep. 5 or 4 connected into a tube or free, persistent. Pet. 5 or 4 with a distinct claw and often notched or bifid limb, sometimes abortive. Stam. mostly 10 or 8, sometimes 5 or 4, connected at the base or free. Ovary 1 often stalked. Stigmas 2-5 sessile filiform. Caps. 1- or imperfectly 2-5-celled, 2-5-valved, but usually opening at the top with twice as many teeth as stigmas, many-seeded; placenta central. Embryo annular or curved round the farinaceous albumen.—L. opposite without or rarely with stipules.

SUBORDER I. SILENEÆ.

Sep. connected into a tube 5-4-toothed at top. Stam. connected below into a tube and with the pet. inserted on the distinct more or less elongated stalk (gynophore or carpophore) of the ovary. Caps. stalked. Pet. marcescent.

1. DIANTHUS. Cal. 5-toothed clothed at the base with 2 or more imbricated opposite scales or bracts (except in *D. prolifer* L.). Pet. 5 with long linear claws. Stam. 10. Styles 2. Caps. 1-celled opening at the top with 4 valves. Seeds peltate, convex above, concave beneath and keeled.
2. SILENE. Cal. 5-toothed naked. Pet. 5 with long linear claws. Stam. 10. Styles 3. Caps. more or less completely 3-celled opening at the top with 6 valves. Seeds reniform.
3. AGROSTEMMA. Cal. 5-toothed naked; the teeth produced elongated leafy. Pet. 5 with long linear claws. Stam. 10. Styles 5; stigmas hairy, papillary on their inner side. Caps. 1-celled opening at the top with 5 teeth.

SUBORDER II. ALSINEÆ.

Sep. distinct. Stam. free inserted on a more or less distinct hypogynous ring. Caps. sessile.—Pet. often deciduous.

* *Valves of caps. as many as the styles.*

4. SAGINA. Sep. 4 mostly spreading or 5 closed in fruit. Pet. 4, 5, or 0 entire. Stam. 4, 5, 10. Styles 4, 5. Caps. 4-5-valved many-seeded. Seeds reniform not winged.—L. without stip., connate at the base. (SAGINA L. and SPERGELLA Reichb.)
5. SPERGULA. Sep. 5. Pet. 5 entire. Stam. 5-10. Styles 5. Caps. 5-valved many-seeded. Seeds lenticular, their mar-

gin keeled or winged.—L. with scarious stip., free not connate at the base.

6. SPERGULARIA. Sep. 5. Pet. 5 entire. Stam. 10, the outer fil. with 2 short glands at their base. Styles 3. Caps. 3-valved many-seeded. Seeds either triangular or roundish-obovate compressed and apterous, or lenticular and keeled or winged.—L. with scarious stip., free not connate at the base. (LEPIGONUM Fr.)

** *Valves of caps. twice as many as the styles.*

7. ARENARIA. Sep. 5. Pet. 5 entire or retuse. Stam. 10. Styles 3. Caps. 6-valved many-seeded. Seeds reniform apterous.—L. without stip., connate at the base.
8. STELLARIA. Sep. 5. Pet. 5 bifid or bipartite. Stam. 10. Styles 3. Caps. 6-valved many-seeded.—L. without stip., connate at the base.
9. CERASTIUM. Sep. 5. Pet. 5 bifid or notched. Stam. 10, 5, 4. Styles 5, 4. Caps. cylindric tubular 10-8-valved or toothed at the apex many-seeded.—L. without stip., connate at the base.

SUBORDER I. SILENEÆ.

1. DIANTHUS L.

1. D. PROLIFER L.

Fl. in a dense close scaly head, involucreal scales 6 membranous pellucid scarious elliptic, the 2 outer short and mucronate, the inner very obtuse equal to or a little longer than the cal.; st. smooth; l. linear smooth; seeds boatshaped granulate.—Desf. i. 344; Brot. ii. 176; EB. t. 956; DC. i. 355; Buch 196. no. 352; Sm. E. Fl. ii. 286; Presl 145; WB. i. 135; Koch 102; Bab. 44.—Herb. ann. Mad. reg. 1, 2, c; PS. reg. 2, rrr. Dry sunny barren places in Madeira general, particularly beyond Camera de Lobos ascending Cabo Giraõ. At all seasons.—St. 6-12 in. high erect and solitary or several from the same root ascending geniculate. L. remote few finely serrulate. Fl. small pink or rose-colour scentless not more than 1 or 2 opening together in long succession from the hard compact ovate head which is coated with about 6 outer dry brown chaffy shining smooth scales.

2. SILENE L.

* Fl. in secund or distichous racemes or spikes. (*Stachymorpha* Otth. in DC., *Viscago* Koch.)

1. S. GALLICA (L.) Webb and Berth.

More or less hirsute; l. lanceolate or oblong, the lower

spathulate or obovate obtuse; st. single erect or branched and straggling, branches spreading divaricate; rac. terminal single or in pairs viscid-hairy; fl. secund alternate; cal. villous tubular, in fr. ovate ventricose, the teeth narrow-acuminate or subulate; pet. obovate mostly undivided and irregularly crenulate, rarely subbifid or entire; carpophore rather short; lower pedic. in fr. often spreading or reflexed.—WB. i. 138; Koch 109. *S. anglica* Bab. 45.—Herb. ann. Mad., PS., reg. 1, 2, 3, ccc; N, M, and S. D. c. Cornfields and waste ground everywhere, a universal weed. March–June, but at almost all seasons.—St. 4–12 in. high often simple erect. Rac. 2–4 in. long. Fl. rather pretty varying from deep pink or rose to white, their throat crowned with erect bifid scales. Var.:

a. vulgaris; rac. mostly many-flowered, fl. imbricate or crowded, pet. undivided finely crenulate immaculate, fr. mostly erect.—*S. gallica* (L.) DC. i. 371; Buch 196. no. 354. *S. cerastoides* DC. i. 372; Presl 149 (not Linn. ex Koch l. c.). *S. lusitanica* (L.) Desf. i. 347; Brot. ii. 184.—In sunny places everywhere.

β. quinquevulnera; pet. with a deep crimson or blood-red spot, mostly undivided but sometimes obcordate or subbifid; pedic. in fr. all erect.—*S. gallica* *β.* Koch l. c. *S. anglica* *β.* Bab. l. c. *S. quinquevulnera* (L.) EB. t. 86; Desf. i. 348; Sm. E. Fl. ii. 292; DC. i. 372.—In drier, poorer or scantier soil, as on walls, &c. More hirsute in Madeira than *a*, with shorter often simple st. and equally dense many-flowered rac.

γ. anglica; less hirsute; st. spreading branched diffuse, fl. axillary or remote in leafy elongated rac., pet. often slightly cloven or obcordate, pedic. of lower fl. spreading or reflexed.—*S. gallica* *γ.* Koch l. c. *S. anglica* *a.* Bab. l. c. *S. anglica* (L.) EB. t. 1178; Sm. E. Fl. ii. 291; DC. i. 371.—In moister richer soil or shady places, occasionally.

S. lusitanica L. (Desf., Brot.) and *S. gallica* *β.* Koch differ respectively from *a* and *β* in having the fr. spreading or reflexed; whilst *S. quinquevulnera* EB. t. 86 (*S. anglica* *β.* Bab.) differs from *β* in its diffusely branched st. and lax leafy few-flowered rac. much as *γ* (*S. anglica* L.) differs from *a* (*S. gallica* L.). But it would be endless to define the multifarious forms of this very variable pl. dependent upon soil and situation. I have therefore abstained from making the Mad. pl. *a* and *β* distinct varr.

2. S. NOCTURNA L.

Shortly and closely furry-pubescent; st. and branches quite erect rather tall; l. lanceolate, the upper linear, the lower spathulate and fringed or ciliate with long hairs at the base;

D 2



rac. terminal single elongate, fl. secund alternate adpressed, cal. tubular cylindric-oblong 10-striate pubescent, the teeth short ovate, pet. small inconspicuous narrow bifid involute; caps. cylindric-elongate contracted at top; carpophore short thick.—Brot. ii. 183; DC. i. 372; WB. i. 138. *S. nocturna* and *S. mutabilis* (L.) Spr. ii. 409. *S. vespertina* Bourg. ! Pl. Can. exsicc. in BH. no. 333, "Lancerottæ in cultis" (not Retz nor WB. i. 139).—Herb. ann. Mad. reg. 1, rr; PS. reg. 2, c. Cornfields near the Gorgulho and Ponta S. Lourenço; in Porto Santo general. April, May.—St. 1–2 ft. high very erect straight and stiff. Herbage dull gr. not glaucous or viscid. Pet. scarcely longer than the cal., dull smoky-greenish outside, white inside, tightly rolled up inwards in the daytime. Fl. inodorous at least by day, the throat crowned. Var.:

a. fl. crowded and more numerous. *S. nocturna* L.

β. pauciflora Otth. in DC. l. c.; fl. remote and fewer, "pet. smaller."—*S. mutabilis* L. ex DC. *Cucubalus reflexus* L. ex BH. —This is the common and apparently normal condition of the pl. in Porto Santo. But the two forms are scarcely worth distinguishing, and are often indeed united on the same pl.

** Fl. in loose forked corymbose cymes. (*Atocion* Koch; *Behenantha*, *Conoimorpha*, *Rupifraga* &c. Otth. in DC.)

3. *S. INFLATA* Sm. *Orelha Boi*.

Glaucous and usually quite smooth; st. decumbent at the base; l. oblong-lanceolate or elliptic acuminate; cyme terminal dichotomous subcorymbose, fl. drooping; cal. ovate or oblong inflated bladdery smooth many-nerved reticulate, with short broad ovate or triangular acute teeth; pet. deeply cloven, either naked and simply bituberculate at the base of the limb, or crowned; caps. short obovate; carpophore rather long or distinct.—DC. i. 368; Hook. Fl. Scot. i. 134.—Herb. per. Mad. PS. and Dez. nearly throughout the year. Var.:

a. *vulgaris*; quite smooth and glaucous; fl. st. tall erect, panicle large lax compound many-flowered, pet. w. or flesh-col. not crowned but bituberculate.—*S. inflata* α and γ Otth. in DC.; α , Hook. l. c.; Sm. E. Fl. ii. 292; Presl 148; WB. i. 136; Koch 112; Bab. 46. *Cucubalus Behen* (α , L.) EB. t. 164; Desf. i. 347; Brot. ii. 180; Buch 196. no. 353.—Mad. and PS. reg. 1, 2, c; GD. r. Borders of cornfields, &c. general. Feb.–June.—St. decumbent and leafy at the base, erect and 1–3 ft. high when flowering. Fl. generally w. sometimes pale dull pink or flesh-col.

β. intricata; smooth light gr. scarcely glaucous; root-stock often woody and st. suffrutescent or slightly woody at the base,

much branched and cespitose prostrate, often elongated pendulous; l. smaller fringed with minute cartilaginous points or teeth; cymes small 1-3-few-flowered, cal. smaller less inflated oblong, pet. w. not crowned but bituberculate.—Novit. 28 or 550.—Mad. reg. 3, c. Rib. de S^{ta} Luzia and other ravines, generally hanging in long dense entangled flowery masses down perpendicular rocks. June–Aug.

γ. maritima; altogether (except the fl.) smaller than *a*, very smooth glaucous; st. prostrate ascending often cespitose; l. smaller fringed or serrulate with minute cartilaginous teeth; cymes small 1-3-flowered, rarely more compound; fl. larger than in *a*, cal. generally less inflated or more oblong with a violet or purple tint, pet. w., generally but not always crowned with conspicuous bifid scales.—*S. inflata* *β.* Hook. l. c. *S. maritima* (With.) Sm. E. Fl. ii. 293; EB. t. 957; Bab. 46. *S. uniflora* Roth ex Sm., Koch, &c., ll. cc.—Mad. reg. 1, cc; PS. reg. 1, 2, 4, $\frac{1}{2}$; ND. ccc; GD. cc; SD. ccc. Sea-coast and cliffs, Machico, Ponta S. Lourenço, Paul do Mar, &c.; Porto Santo, hills on the coast to the eastward, Ponta de Guilherme on the N. coast, Zimbral d'Aréa, and top of Pico de Conselho.—Passes by a thousand intermediate gradations into *a*.

4. *S. IGNOBILIS* Lowe.

Nearly or quite smooth not viscous more or less glaucous; st. erect dichotomously branched; l. oblong-lanceolate, the lower spatulate, the margin cartilaginous often denticulate with minute points or teeth; fl. remote single solitary stalked erect; cal. at first oblong or subclavate, then ovate or elliptic membranous not inflated 10-striated reticulate upwards, the teeth rounded-ovate and obtuse; pet. inconspicuous small deeply cloven, their lobes equal ligulate or oblong rounded or obtuse crowned with 2 erect truncate scales at the base, scarcely longer than the cal.-teeth; fr. ovate ventricose urceolate or barrel-shaped, carpophore very short.—Novit. 27 or 549. *S. Pseudobehen* Boiss. Diagn. Pl. Orient. 36, 37; Walp. Rep. ii. 778.—Herb. ann. Mad. reg. 1, rr; PS. reg. 2, r. Cornfields, Ponta S. Lourenço; and in PS., between the town and Fonte d'Aréa. March–May.—St. 9–12 in. high branched leafy. L. rather large and broad sometimes subciliate towards the base. Fl. single in the forks of the stem and axils, stalked erect inodorous. Pet. dull lilac-pink or flesh-colour deeply and equally 2-lobed, the cor. thus appearing 10-petalous; sometimes abortive. Fr. rather large erect. Caps. finely and obsoletely granulated. Seeds rather large subechinulate most elegantly ribbed and cancellated.

The “more or less velvety-pubescent” variety (Novit. 549) is a mistake, caused by some intermixture or confusion with

this pl. of young or imperfect specimens of *S. nocturna* L. observed or collected by the late Dr. Charles Lemann. Except occasionally a few long hairs or cilia sprinkled on the edges of the l., *S. ignobilis* is always, so far as I have seen, quite smooth.

5. *S. INAPERTA* (L.) Ait.

Erect dichotomously branched minutely and closely puberulous or furry-pubescent; branches divaricate stiff and rigid slender or filiform corymbose; l. inconspicuous small lanceolate acute, the lower subobtuse, the upper remote linear acuminate; fl. inconspicuous loosely corymbose erect, their stalks filiform often elongated nearly or quite smooth; cal. slender narrow linear-clavate; pet. linear slightly cloven or obcordate not longer than the cal. teeth; caps. oblong or elliptic, carpophore not quite half its length.—Brot. ii. 188; Buch 196. no. 355; DC. i. 376; WB. i. 140. *S. filiformis* Novit. 27 or 549, not of Otth. in DC.—Herb. ann. Mad. reg. 2; r. Rocky barren waste ground amongst cornfields and dry beds of ravines; ascent of the Rancho and Cabo Giraõ beyond Camera de Lobos; bed of Rib. de Santa Luzia, &c. Sum., Aut.—Root fibrous decidedly annual. Whole pl. with a peculiar light slender appearance, finely hoary-pubescent below, smooth or nearly so upwards, 1-2 ft. high, with a thin very straight erect virgate st. and forked filiform branches forming a spreading loose corymbose cyme, with the internodes often viscid. L. few remote small and inconspicuous soon falling. Cor. small abortive inconspicuous, not exerted; pet. dull greenish-brown. Caps. oblong or cylindrical.

Viscago laevis, &c. Dillen. Hort. Eltham. 424. t. 315. f. 407, seems to be distinct by its "creeping filiform perennial root, ascending leafy few-flowered st., pet. cloven to the base, ovate caps.," &c. The Madeiran pl. is however *S. inaperta* of most authors, and certainly of the Hort. Kewensis and Banks. Herb.

3. *AGROSTEMMA* L.

††1. *A. GITHAGO* L. Corn Cockle.

Pet. obcordate or retuse, half the length of the long linear acuminate sepals.—Brot. ii. 220; Sm. E. Fl. ii. 325; EB. t. 741; Koch 117. *Lychnis Githago* (Lam.) a, DC. i. 387; Bab. 48. *Githago segetum* Desf. i. 363; WB. i. 144.—Mad. reg. 2; rrr. Once brought "from Rib. Frio" in October by a countryman; but a mere accidental straggler and scarcely entitled to admission, though so likely to occur with other corn flowers.—Pl. 2-3 ft. high dichotomously branched hairy; l. linear-lanceolate. Fl. conspicuous handsome solitary stalked. Cal. hard ribbed angular, its teeth narrow slender elongate erecto-patent.

Pet. large not crowned deep crimson or purple with bluish-black longitudinal lines or streaks. Carpophore none.

SUBORDER II. ALSINEÆ.

4. SAGINA L.

* Sep. 4 spreading in fr. Pet. 4 or 0. Stam. 4. Styles 4. Caps. 4-valved. (*Saginella* Koch.)

1. *S. PROCUMBENS* L.

Smooth cespitose or moss-like; main-st. very short, barren branches or stolons elongate slender filiform procumbent or prostrate often rooting at the joints their ends ascending; l. numerous crowded often fasciculate linear somewhat abruptly mucronate quite smooth; sep. obtuse much longer than the pet. rather shorter than the caps.; fr. at first drooping then erect.—Brot. i. 213; Sm. E. Fl. i. 238; EB. t. 880; Buch 196. no. 347; DC. i. 389; H. Fl. Sc. i. 59; Presl 158; WB. i. 147; Koch 118; Bab. 49.

β. spinosa (Gibs.) Bab. l. c.; l. very minutely ciliated-serrulate or spinulose at the edges; sep. distinctly shorter than the caps.—An *S. bryoides* Fröhl. in Koch l. c. ?—Herb. per. Mad. reg. 2, 3, ccc; GD. reg. 2, rr. Moist places on walls, banks, rocks &c., and in the turf on mountains, everywhere. At all seasons.—A small moss-like dark green pl. like a *Polytrichum* or *Dicranum*, forming tufts or patches 1 or 2 in. high; l. scarcely half an inch long and half a line wide, flat above, convex beneath, more or less fasciculate especially on the barren shoots, often forming terminal rose-like tufts. Pet. irregular small much shorter than the sep. white, sometimes 0. Sep. spreading cross-wise below the ripe caps.

2. *S. APETALA* L.

Barren shoots or stolons none, st. much and regularly branched dichotomously from the base, branches more or less erect slender filiform stiff and straight regularly forked; l. few remote very small and inconspicuous in pairs and not fasciculate linear very narrow gradually or acuminato-mucronate; sep. obtuse much longer than the pet. and shorter than the caps.; fr. always erect.—Sm. E. Fl. i. 240; EB. 881; DC. i. 389; H. Fl. Sc. i. 60; WB. i. 146, 7; Koch 118; Bab. 49.—Var.:

a. glandulosa; glandular-pubescent; l. ciliate at the base.

β. glabra, Bab. ed. 1. p. 45; nearly or quite smooth; l. not ciliate.

Herb. ann. Mad. reg. 1, 2, r; PS. 3 or 4, r. Dry sunny spots. *a.*, in garden walks at the Valle near Funchal, and on the walls

of the old Fort at the top of P. de Castello in Porto Santo; α and β intermixed on the terrace in front of the church-door of N. S. de Livramento in the Curral das Freiras, Mad. March–July. —A small inconspicuous pl. only 2 or 3 in. high, pale dull gr. and very distinct in its more delicate light bushy sparingly leafy habit, like *Radiola millegrana* L., and regularly forked branches, from *S. procumbens* L. Sep. obtuse, the 2 outer sub-mucronulate. L. not uniformly ciliate; in β not at all so. Pet. w. very minute, sometimes none. Sep. spreading cross-wise below the ripe caps.

5. SPERGULA L.

1. *S. ARVENSIS* L.

L. somewhat fleshy linear-filiform convex above channelled or grooved beneath blunt at the tip; fl. in forked glandular-pubescent cymes; sep. ovate and with the deflexed fruit-stalks glandular-pubescent; pet. slightly longer than the sep.; seeds dull coal-black spheroidal-lenticular or strongly doubly-convex and subglobose, simply carinate with a narrow raised keel or margin, not winged, finely and obsoletely granulated or papillose.—Desf. i. 368; Brot. ii. 214; EB. t. 1535; DC. i. 394; Presl 159; WB. ! i. 146†; Koch 120; Bab. (ed. 1) 46, (ed. 4) 124. *S. arvensis* α , Sm. E. Fl. ii. 336.

β . *vulgaris* Koch, Bab. ll. cc.; seeds frosted with white or pale brown clavate warts or papillæ.—Herb. ann. Mad. reg. 1, 2; $\frac{5}{8}$. Cornfields at Camaxa, S. Vicente, and between Feijã d'Ovelha and P^{ta} de Pargo; bed of the Rib. de Maxico, &c. Oct.–June. —St. loosely spreading 6–12 in. long; l. imperfectly whorled or fasciated at the joints, linear-subulate rather obtuse fleshy flaccid 1–1½ in. long. Branches of cyme pedic. and sep. always more or less glandular-pubescent. Pet. white a little longer than the sep. Stam. 4–10, often 5. Styles always 5. Caps. always distinctly 5-valved. Seeds dull coal-black not shining, frosted with pale yellowish deciduous bristly warts like grains of sand, lenticular-globose or tumid-lenticular subangular, with an equatorial distinct keel, which is sometimes broader and thinner than usual and with a pale edge, but never at all winged.

6. SPERGULARIA PERS.

1. *S. FALLAX* Lowe.

Altogether smooth; l. somewhat fleshy linear-filiform flattish and slightly grooved towards the base above, convex or flattened beneath, blunt at the tip; sep. lanceolate and with the deflexed fruitstalks wholly smooth; pet. lanceolate as long as

† Bourgeau's no. 334 in HH. is the present pl. His no. 334 in BH. is *Spergularia fallax*. (See Hook. Journ. Bot. viii. 290.)

the sep.; seeds shining coal-black flattened lenticular finely and sharply granulate bordered with a broad membranous radiatoplicate wing or frill.—Hook. Journ. Bot. viii. 289, 290; ix. 75. *Spergula pentandra* WB.! i. 145 (not Linn.!); Bourg.! Pl. Canar. no. 410 in BH., partly; Hook. fil. and Thoms.! Herb. Ind. Or. in HH.; Griff.! Affghan. Exs. no. 1629 in HH. *Spergularia*? (595) Stocks! Scinde, in HH. *Spergula pentandra* var. *intermedia* Boiss.! Pl. Or. nov. Ser. 2. 93, 94. *Spergula arvensis* Bourg.! Pl. Canar. exs. no. 334 in BH. (not Linn.). *Arenaria flaccida* Roxb. Fl. Ind. ii. 447.—Herb. ann. Mad. PS. and ND. reg. 1, SD. reg. 1, 2; r. or $\frac{1}{2}$, locally c. Sea-cliffs a little to the E. of Funchal and cornfields about the Brazen Head; roadsides and borders of cornfields towards Pico d'Anna Ferreira in PS.; at the top of N. and SD. March–July.—Habit and stature of *Spergula arvensis* L. but a more delicate pl. in all its parts, and always altogether smooth. L. slightly flattened above and beneath, obsoletely channelled above. Fl. similar but smaller, with the sep. more lanceolate than ovate and narrower, of a fresher more vivid green contrasting more with the narrow white membranous edges. Pet. lanceolate clawed not longer than the cal. white. Stam. 6 or 7. Styles and valves of the caps. always 3. Seeds intense coal-black shining as if polished.—At once distinguishable from *Spergula arvensis* L. by the constantly 3-valved instead of 5-valved caps., the perfectly smooth pedicels and sep., and broadly winged seeds.

The true *Spergula pentandra* L. by the original types from Löffling in the Linn. Herb. has also smooth-stalked cymes and sep., but is a much smaller pl. with larger fl. especially in bud, broader ovate sep. broadly edged with violet-purple, and pet. a little longer than the sep. The caps. are immature; but in the largest of the specimens on a separate sheet, 5 or 6 in. high, the caps. is truly 5-valvular, being partially split into 4 distinct valves, one of which is twice the breadth of the others and has manifest traces of a 5th medial suture. The smaller specimens on the other sheet, $\frac{3}{4}$ –1½ in. high, are marked "Hab. Madriti in collibus vulg."; and though ambiguous as to their capsular valvation, agree precisely otherwise with 6 specimens in BH. of "*S. pentandra* L." marked "1. Hispania C. G. Ortega M.D. 1777," and with another marked "H. L. Hab. prope Madritum, Löffling," which have a distinctly 5-valved caps. Thus *Spergularia fallax* seems to be no less distinct from the true Linnæan Spanish pl. (*S. pentandra* L.) of Löffling and Ortega, with which it agrees in its entire freedom from glandular pubescence, than from *Spergula arvensis* L.

2. *S. RUBRA* (L.) Pers.

Glandular-pubescent at least upwards; st. round; l. somewhat fleshy linear-subulate flattened above and beneath mucronate; fl. somewhat racemose and secund; fruitstalks deflexed viscid pubescent; sep. lanceolate obtuse nerveless with broadly scarious margins viscid-pubescent; caps. not longer than the sep. rather shorter than the slightly declining fr.-stalks; seeds pale brown compressed subtriangular pear-shaped or obovate, finely granulate or echinulate at the back, wingless.—Presl 160. *Arenaria rubra* (L.) EB. t. 852; Desf. i. 357; Brot. ii. 201; Sm. E. Fl. ii. 311; Hook. Fl. Sc. i. 138; Spr. ii. 400. *A. rubra* L. a, DC. l. 401. *Lepigonum rubrum* Koch 121; Bab. ed. 4. 124 (var. a). *Alsine rubra* (Wahlenb.) WB. i. 148; Bab. ed. 1. 50.—Herb. ann. Mad. reg. 1, $\frac{2}{3}$; reg. 2, rrr; PS. reg. 1, cc; GD. reg. 2, $\frac{1}{2}$. Gorgulho rocks; Praza in front of the Governor's palace in Funchal; at Machico, Porto da Cruz, and Porto Moniz, near the sea: Curral das Freiras in front of the church-door. March-July.—St. prostrate in a circle numerous subcespitose jointed dichotomous leafy 4–12 in. long the ends ascending. L. fascicled acute almost always except in PS. specimens bristle-pointed, in pl. growing near the sea almost or quite smooth. Fl. pale dull pink or rose-purple small and pretty racemose and secund on the terminal branches of the cymes. Pet. purple of varying intensity deeper towards the tip not longer than the sep. Styles 3. Caps. always 3-valved not longer than the calyx. Seeds very minute pale reddish-brown minutely scabrous most distinctly at the back or rounded thickened outer edge, not shining or polished and never winged.

7. *ARENARIA* L.1. *A. SERPYLLIFOLIA* L.

Finely and closely pubescent; st. erect or ascending dichotomously branched; l. ovate acute or acuminate subscabrous sessile, the lower contracted at the base into a short stalk; fl. in forked cymes; sep. lanceolate acuminate 3-nerved or ribbed longer than the pet.—Desf. i. 356; Brot. ii. 200; EB. t. 923; Sm. E. Fl. ii. 307; DC. i. 411; Presl 164; Koch 128; Bab. 52.

β. glutinosa Koch l. c.; smaller viscous clothed upwards with glandular hairs besides the short close pubescence. *A. serpyllifolia* WB. l. i. 150. *A. serpyllifolia β, viscida* DC. l. c. ?; *γ, depauperata* Novit. 27 or 549.—Herb. ann. Mad., PS., reg. 4, rrr; SD. reg. 2, cc. Summit of Pico Grande Mad. and P. de Castello PS. in the turf. April–Aug.—A small insignificant pl. 2 or 3 in. high with erect or spreading forked stiff slender branches. Fl. numerous from the forks of the st. or axils of upper l. Pet. w. small inconspicuous, narrow-ovate. Caps.

6-valved ovate-elongate or conic-acuminate shorter than the sep. Seeds minute tumid-reniform dark brown granulated.

8. STELLARIA L.

1. S. MEDIA (L.) With. Common Chickweed.

St. prostrate ascending flaccid cespitose dichotomous hairy on alternate sides between the joints; l. ovate acute or shortly acuminate stalked, the uppermost sessile; fl. axillary and terminal single on long stalks which are hairy on one side; pet. deeply cloven not longer than the lanceolate 1-nerved glandular-hairy sep.; fruitstalks deflexed; caps. oblong rounded at the base a little longer than the sep., 6-partite or with the valves cloven below the middle.—EB. t. 537; Sm. E. Fl. ii. 301; DC. i. 396; Presl 160; WB. i. 152; Koch 129; Bab. 53. *Alsine media* (L.) Desf. i. 271; Brot. i. 476.—Herb. ann. Mad. reg. 1, 2, 3, ccc; PS. reg. 2, 3, c. One of the commonest weeds in Mad., about Funchal, and in cultivated ground, everywhere; less common in PS., and not observed in the Dezertas. Nov.—June chiefly.—Herbage very variable in size and luxuriance light or y. gr. tender succulent or juicy. St. very numerous matted leafy often elongate 6–12 in. long. Petioles broad ciliate. L. smooth. Fl. small white. Stam. 3–10 generally 5; in richer or moister soil 10, the whole pl. being larger and more robust with the sep. smooth, constituting var. β *major* Koch, or γ *umbrosa* (Opitz) Bab. l. c.

2. S. ULIGINOSA Murr.

St. diffuse 4-angular smooth, l. sessile ovate or oblong-lanceolate with a callous tip smooth ciliated at the base; cymes dichotomous small few-flowered lateral and terminal, br. scarious smooth at the edges; pet. bipartite shorter than the lanceolate 3-nerved sep.; caps. ovate attenuated at the base about equal to the sep.—Brot. ii. 196; EB. t. 1074; Sm. E. Fl. ii. 303; Koch 131; Bab. 54. *S. aquatica* DC. i. 398. *Larbrea aquatica* (St. Hil.) DC. iii. 366, (not of Ser. in DC. i. 395). *Arenaria alsinoides* Raddi, Breve Osserv. sull' Isola Madera (Firenze 1821) p. 13 (with apetalous fl.). *A. Raddiana* (Ser.) DC. i. 412.—Herb. ann. Mad. reg. 2, 3; ccc. Wet sandy or muddy places chiefly in beds of ravines everywhere above 1500 ft. May–July chiefly.—Whole pl. nearly or quite smooth pale gr. often slightly glaucous. St. numerous branched and matted jointed trailing often rooting at the lower joints, 6–18 in. long. Ped. axillary mostly 1–3-flowered. Fl. small inconspicuous, often apetalous. Sep. very narrow acuminate spreading like a star in fl., afterwards erect. Pet. caducous very small white not half the length of the sep.—A bad but undoubted Mad. specimen of this pl. in the BH., marked "*S. graminea* L.?"

has doubtless occasioned the insertion of *S. graminea* as well as of *S. uliginosa* in Von Buch's list of Mad. pl. The true *S. graminea* L. is certainly not found in the Madeiran islands.

I am much indebted to M. Alph. DeCandolle for an extract from the rare little work of Raddi above quoted, which by its accuracy of application to the Madeiran apetalous state of *S. uliginosa* Murr. enables me to quote *Arenaria alsinoides* Raddi, and hence *A. Raddiana* Ser., with little short of the certainty accruing from actual comparison of types.

9. CERASTIUM L.

* Root scarcely more than annual or biennial. Pet. not longer than the calyx.

† Caps. curved. Pet. about as long as the sepals.

1. *C. GLOMERATUM* Thuill.

Hairy-pubescent *light gr. viscid*; *st. stiffly erect and straight or ascending*, several and tufted, or single; *l. short broadly ovate or oval and rounded*; *fl.* of cyme aggregate in close compact or crowded heads or fascicles; *br.* all herbaceous and like the narrowly scarious-edged *sep.* hairy quite to the points which are mostly bearded or tipped with a distinct pencil of several long hairs; *fruitstalks* and *pet.* shorter or not longer than the cal.—WB. i. 151; Koch 132 (var. *a*); Bab. 54. *C. viscosum* Linn. Syst. Nat. ed. 12. 320, and Sp. Pl.; Desf. i. 366; also Fries, Gaudin (ex Koch). *C. vulgatum* Linn. Herb. ! EB. t. 789; Sm. E. Fl. ii. 330; Hook. Fl. Sc. i. 142; DC. i. 415 (var. *a* and *β*). *C. vulgatum β* (*C. viscosum*) Brot. ii. 218.—Herb. ann. Mad. reg. 1, 2, 3, c; PS. reg. 4, r; SD. reg. 2, $\frac{r}{2}$. Rocky banks and hill-sides, beds of ravines, &c., above the Mount, in Rib. Frio, near the sea at Campanario, Machico, S. Vicente, &c., Mad.; summit of Pico de Facho and P. de Castello, PS., and of SD. Febr.—Oct.—St. 4–12 in. high very erect and simple. L. shortly ovate often rounded and obtuse. Pet. small and inconspicuous. Caps. cylindric ascending twice as long as the cal.—Distinguished at once from the more common *C. triviale* Link by its pale herbage turning y. after flowering, its short broad leaves, and smaller fl. collected into heads or bundles.

2. *C. TRIVIALE* Link.

Hairy-pubescent *dark gr.* scarcely viscid; *st. spreading diffuse and straggling* sometimes rooting, the ends ascending; *l. oblong-lanceolate*; *fl.* of cyme lax or distinct, only the uppermost aggregate; *br.* and *sep.* with a broadly scarious margin, smooth at the tips; *pet.* as long as, *fruitstalks* at least as long as, and

most distinctly longer than the cal.—Koch 133 (var. *a* and β); Bab. 55 (var. *a*). *C. vulgatum* Linn. Syst. Nat. ed. 12. 320, and Sp. Pl.; Desf. i. 365; also Wahlenb., Fr. (ex Koch). *C. vulgatum a.* Brot. i. 218. *C. viscosum* Linn. Herb. ! EB. t. 790; Sm. E. Fl. ii. 330, 331; Hook. Fl. Sc. i. 142, 143; DC. i. 416.—Herb. bien. or subper. Mad. reg. 2, 3, ccc. Mountain pastures, ravines, &c., everywhere above 1000 ft. May–Oct. chiefly.—St. 6–18 in. long widely branched and straggling, only erect or ascending when supported. L. ovate-oblong pointed. Hairs of pedic. and sep. more or less intermixed with viscid glands. Pet. as long as or rather longer than the sep. Caps. cylindric ascending twice as long and fruitstalks often more than twice as long as cal.—An altogether coarser and larger pl. in all its parts than *C. glomeratum*, with longer rampant st., narrower l. longer in proportion to their width, larger more branched and spreading cymes, longer pedicels, more scarious br. and sep. not tipped with hairs, and larger more conspicuous fl.

†† Caps. nearly straight. Pet. shorter than the sep.

3. *C. TETRANDRUM* Curt.

Hairy-pubescent, glandular and viscid upwards; *st. forked from the base with a fl. in each fork leafy*, branches erect short numerous often densely tufted and pulvinate, sometimes decumbent at the base; l. oblong or oval mostly recurved, the upper ovate or lanceolate sessile, the lower oblong attenuated into long petioles, all acute; br. wholly herbaceous broad and leafy altogether without scarious tips or margins oval or ovate acute or apiculate; sep. lanceolate acute herbaceous with their tip and margins narrowly scarious; fl. or rather fr. large, the former erect mostly tetramerous in forked leafy subcorymbose cymes, not aggregate or fascicled; pet. bifid and much shorter than the sep.; *fruitstalks straight* mostly erect 2–3 times as long as the sep.; caps. as long as or rather longer than the sep. with mostly 8 very short and obtuse or truncate shallow teeth.—Sm. E. Fl. ii. 332; Koch 133; Bab. (ed. 4) 55. *C. atrovirens* and *C. tetrandrum* Bab. (ed. 1) 52, 53. *Sagina cerastoides* EB. t. 166 (a drawn-up luxuriant garden state of the pl.).—Herb. ann. Mad. reg. 4, and upper part of 3; r. Highest summit of Pico Grande, top of the Paul; “peaks above the Icehouse,” Dr. C. Lemann. July, Aug.—Habit and pale colour of *C. glomeratum* Thuill. but of much smaller humbler growth and size, being not more than 2 or 3 in. high. Fruitstalks in both native and cultivated Madeiran plants almost always erect, rarely patent or a little deflexed or declining, but never so far as I have seen reflexed, and usually not more than twice the length of the sep., often in the upper fl. less. A few fl. (the primary or lower

in the forks) are pentamerous and larger, with more bulky 10-valved caps.; but the great majority are tetramerous though still often with 5 stam. Pet. small inconspicuous about $\frac{2}{3}$ the length of the sep. heart-shaped with blunt lobes cloven nearly halfway down. Seeds bright reddish-chestnut, compressed, granulate most strongly at the back.

** Root perennial. Pet. twice as long as the calyx.

4. *C. VAGANS* Lowe.

More or less pubescent, always glandular and viscid upwards; st. elongate diffuse and weakly straggling, suffrutescent downwards, ascending upwards, and with the whole cyme, br. pedic. and sep., densely clothed with tawny glandular viscid hairs; l. narrow linear-lanceolate acuminate or ensiform and sessile crowded downwards; fl. numerous; br. ovate or lanceolate herbaceous; sep. generally bluntish with broad scarious tips and margin, pet. bifid conspicuous scarcely twice as long as the sep.; caps. short ovate or oval before bursting, equal to or a little longer than the sep.—Novit. 26, 27, or 548, 549.—Per. Mad. reg. 3; rr. Dry rocks from 4500 to 5500 ft. Along the Caminho Central, between the Primeira Vista and the first view into the Serra d'Agoa; also under Pico Grande. July, Aug.—Habit and foliage of a *Stellaria*. St. 6 to 18 in. or 2 ft. long, slender, and with long internodes upwards, but decidedly shrubby below and thickly jointed, the joints swollen, with short internodes, never rooting, and although branched, and often crowded, not at all cespitose. L. more or less pubescent but never ciliate, stiffish and sharp-pointed, very like those of *Stellaria Holostea* L. but shorter, scarcely an inch long and 2 or 3 lines wide, usually tapering gradually from the base to the point, sometimes more or less lanceolate. Cymes erect forked subcorymbose 7-14- or more flowered. Even the minute uppermost bracts are very slightly if at all scarious at the tips or margins; but the sep. are broadly so. Pedic. before and after flowering always perfectly erect, not bent beneath the cal., but with buds, fl. and fr. alike erect. Styles 5. Caps. usually concealed by the cal., with 10 short blunt valves. Var.:

a. fulva; altogether densely clothed with tawny glandular hairs.

β. calva; altogether smoother, the lower l. nearly or quite smooth.

Approaches nearest to *C. arvensis* L. *γ. suffruticosum* Koch 136; but is sufficiently distinct from every state of the sp. by its altogether larger size and diffuse or rampant not at all cespitose habit, its long straggling divaricate branches with long internodes and fulvous pubescence, its longer not ciliate leaves

and larger more ovate or oval capsules. A further argument in proof of the two pl. being really distinct sp. is the occurrence of the true *C. arvensis* L. (WB. ! i. 152; Bourg. ! Pl. Can. exs. no. 719) in the Canaries, retaining all the char. and habit of the common English or European form.

Order XII. MALVACEÆ.

The Mallow Family.

Fl. perfect. Cal. 5- (rarely 3-4-) cleft valvate in the bud, often double with an outer involucre or bracteolæ. Cor. regular. Pet. as many as the inner sep. twisted in the bud, often connate with the stamen-tube. Stam. mostly numerous monadelphous united into a tube; anth. 1-celled reniform bursting transversely. Ovary composed of several or many carpels arranged round a common axis. Fruit capsular rarely baccate. Carpels verticillate 1-many-seeded. Embryo curved with twisted or doubled cotyledons and little or no albumen.—Leaves alternate stipulate. Pubescence generally stellate.

* Cal. double or involucre.

1. LAVATERA. Inner cal. 5-cleft, outer of 3 leaves or bracts partly connate or united at the base. Caps. orbicular many-celled, cells 1-valved 1-locular 1-seeded unarmed simple.
2. MALVA. Inner cal. 5-cleft, outer of 2-6 (mostly 3) quite distinct not united narrow oblong or setaceous bracts. The rest as in *Lavatera*.
3. MODIOLA. Inner cal. 5-cleft, outer of 3 distinct narrow or setaceous bracts. Caps. orbicular many-celled, cells 2-valved 2-locular 2-seeded armed bicuspidate or biaristate. (*Modiola* Lam., applied in zoology to a well-known Mytilaceous genus of Lamellibranchiate Mollusks, must yield to the long prior claim of the present well-marked botanical genus of Moench. For the Molluscan genus *Modiola* Lam., it would be best perhaps to modify the Lamarckian name into *Modiolus* or *Modiolaria*.)

** Cal. single, without bracts or involucre.

4. SIDA. Cal. 5-cleft 5-angular. Caps. orbicular many-celled, cells 1-valved 1-locular 1-seeded often armed beaked or aristate.
5. ABUTILON. Cal. 5-cleft 5-angular. Caps. orbicular or globose many-celled, cells inflated bladderly 1-valved 1-locular many-seeded unarmed.

1. LAVATERA L.

1. *L. SYLVESTRIS* Brot. *Malva*.

Greyish and clothed all over with starry pubescence; st. herbaceous diffusely spreading more or less erect; l. roundish-heartshaped with mostly 5 crenate lobes shallow and rounded in the lower, deeper and pointed in the upper l.; fl. axillary stalked aggregate often ternate, pedic. always erect shorter than the petioles; involucral br. or outer sep. broadly ovate united about one-third upwards; pet. narrow notched or bilobed thrice as long as the cal.; fr. quite smooth covered by the inflexed sep., valves rounded plain and even at the back, entire or with only a few faint obscure plaits or obtuse teeth at the edges; central disk small simple.—Brot. ii. 277, 278; Brot. Phyt. Lusit. ii. 225. t. 179. f. 2; DC. i. 440. *Malva Pseudo-Lavatera* WB.! i. 29, 30. Bourg.! Pl. Can. Exsicc. no. 667. in BH. and HH. *L. cretica* Cav. Diss. 2. 89. t. 32. f. 1 (not Linn.!)—Herb. ann. Mad., PS. reg. 1, 2; ccc. Roadsides and waste places everywhere. April–July.—St. 1–2 ft. long mostly branched and spreading, sometimes simple and erect, rarely prostrate. Stip. ovate or ovate-lanceolate. Fl. pale rose-purple middle-sized; claw of pet. slightly fringed or ciliate. Carpels sometimes very faintly reticulate at the back and obsolete toothed at the edges but mostly quite plain and even and always perfectly smooth as described by Cavanilles, who mistook it for *L. cretica* L. (Jacq. Vindob. i. p. 15. t. 41), which is an altogether larger stouter much more hirsute pl., with larger thickly shaggy fr. and sep., hispid-pubescent or densely strigose carp., and sharply lobed leaves. Jacquin's fig. above quoted well agrees with the original Linnæan type of *L. cretica* L. in Herb. Linn.: but neither one nor the other affords any information as to the carpels, which however by numerous specimens in HH. are closely and thickly hirsute.—*L. sylvestris* in general aspect much resembles the common English *Malva sylvestris* L.; but it is at once distinguished by the 3 bracts being united at the base into the monophyllous outer cal. of a *Lavatera*.

Lavatera arborea L. (the Tree Mallow) occurs in 2 or 3 places (Porto da Cruz in Madeira, and in Porto Santo) about cottages and in gardens near the sea; but it has no claim to a place in the Flora.

2. MALVA L.

1. *M. PARVIFLORA* L. *Malva*.

More or less starry-pubescent but often nearly smooth and shining; st. spreading prostrate or ascending rarely upright; l. subreniform or broadly roundish-heartshaped with 5–7 very shallow and obtuse or rounded crenate lobes; stip. ovate;

fl. small and inconspicuous in axillary clusters, 1-3 or 4 together, mostly 2 or 3, and nearly or quite sessile; pet. but little longer than the cal. retuse or widely notched, their claw very faintly and minutely ciliate; invol. br. or sep. 3 very narrow linear shorter than the broadly ovate sep. of the more or less smooth sometimes pubescent inner cal.; pedic. in fr. slightly elongated mostly erect; fr. somewhat pubescent, rarely quite smooth, with the cal. spreading or erect and open; valves strongly and elegantly cancellated or sharply reticulated at the back, with the margins usually sharply raised or prominent and irregularly but distinctly toothed; central disk small.—Linn. Herb. ! Cav. Diss. 2. 68. t. 26. f. 1; Desf. ii. 116; DC. i. 433; WB. ! i. 29; Presl 177 (except "cor. cærulea").—Herb. ann. Mad. reg. 1, 2, ccc; PS. reg. 1, 2, $\frac{r}{2}$; ND. r; GD. $\frac{c}{2}$; SD. r. Roadsides and waste ground. March-July.—St. branched 6-18 in. long. L. dark dull gr. on very long petioles which have frequently a thickly pubescent line on their upper side; upper l. always pubescent and more deeply and sharply lobed. Pet. pale pink or rose-colour, limb retuse with a wide irregular shallow sinus, the lobes unequal; claw very slightly and sparingly fringed or ciliate. Var.:

a. pubescent; st. prostrate; fl. and fr. nearly or quite sessile; pet. scarcely longer than the cal.—In dry poor soil or exposed places everywhere.

β. nearly smooth; st. more erect or ascending; fl. and fr. distinctly stalked, pedic. deflexed or declining; pet. sometimes rather longer than in *a.*, yet not exceeding twice the length of the cal.—In richer moister soil or amongst other herbage.—A rather larger stouter and more upright pl. than *a.*, with the fruit-stalks often an inch long and mostly 2 or 3 together. I can perceive no sure or constant marks of difference to distinguish from this state of the species *M. borealis* (Wallm.) Bab., Koch (*M. parviflora* Huds., *M. pusilla* Sm. EB. t. 241, *M. rotundifolia* *β.* DC., Sm. E. Fl., *M. rotundifolia* Fries): and indeed, not only Hudson, but Linnæus himself in his Herb. (see also EB. at t. 241) appears to have referred the plant in question to *M. parviflora* L.: a specimen marked by Linnæus himself "parviflora," with "(Huds. J. E. S.)" added in pencil by Sir J. E. Smith, being pinned in the Linn. Herb. to his original *M. parviflora*, from which it only differs in the carpels being quite smooth (which is however sometimes the case in the Mad. pl.) and in their being perhaps somewhat more finely or neatly cancellated, with their margins not raised or prominent. It is remarkable that Dillenius in Ray's Synopsis, p. 251, no. *3, calls the cor. "cærulea" in the "Hithe" pl. (*M. parviflora* Huds.), as Presl does in his Sicilian *M. parviflora* L.; whereas it is as truly pink or rose-colour in the EB. "Hythe" pl. as in

the Madeiran.—*M. Nicænsis* All. (Cav. Diss. 2. 79. t. 25. f. 1; RFG. 5. t. 168. f. 4838) is another closely allied pl., which may possibly have been overlooked in Madeira. It is mainly distinguished from *M. parviflora* L. by the broader leafy ovate or oblong-lanceolate (ovate-lanceolate Cav.) outer sep. or invol. br.; and the fr., which is either (as in *M. parviflora* L.) smooth, or more or less pubescent (subvillose Cav.), is also more neatly and finely cancellated, with the central disk often larger (as in *M. rotundifolia* L.), and with the edges of the carp. not raised or prominent. None of these char. however can be much depended upon to distinguish it from *M. parviflora* L. unless it be the first, in which it approaches *M. mauritiana* L.; forming as it were an intermediate link between the two; having the shorter pet. and more sharply or distinctly cancellated fr. of the former sp., and the leafy invol. br. and immarginate carpels of the latter.

2. *M. MAURITIANA* L. *Malva*.

More or less starry-pubescent but mostly somewhat smooth and shining; st. diffusely spreading or procumbent, often prostrate; l. on long smoothish or slightly pubescent footstalks with often a hairy line on the upper side, reniform or broadly roundish heartshaped, with 5 obtuse or rounded toothed or crenate lobes shallow in the lower l., deeper but scarcely ever acute in the upper; stip. ovate; pedic. axillary few *i. e.* 1-3 rarely 5 together erect usually much shorter than the petioles; fl. large conspicuous, pet. fully 4 times longer than the cal. deeply and widely notched or subbilobed, their claw thickly and copiously fringed or bearded on each side; invol. br. or sep. 3 unequal elliptic-ovate or lanceolate shorter than the inner sep. which are inflexed, closing over the fr.; fr. rather large thickly pubescent almost hirsute, the valves obscurely cancellated or reticulato-scribulate and beaded or granulated up the sutures at the back, not margined or toothed at the edges; central disk small.—Linn. Syst. (ed. 12) ii. 460; Cav. Diss. ii. 77. t. 25. f. 2; Brot. ii. 274; Brot. Phyt. Lusit. ii. 223. t. 179. f. 1; DC. i. 432; Koch 142 (under *M. sylvestris* L.).—*M. mauritiana* Linn. Herb. Buch! 196. no. 343. *M. rotundifolia* Buch! 196. no. 342 (not Linn.).—Herb. ann. Mad. reg. 1 and lower edge of 2; $\frac{g}{g}$. Roadsides, vineyards and waste ground chiefly at 1000 ft. above the sea. About S. Martinho and S. Antonio, Praya Formosa, and between Caniso and Porto Novo. May-July.—St. branched 1-3 ft. long very tough and almost woody at the base. Herbage very variable in degree of pubescence, but appearing mostly smooth and shining to the eye. L. dark dull green, nearly smooth above, more pubescent beneath. Petioles distinctly hairy at their junction with the l., smoother downwards. Pedic. not longer than the pet. nearly or quite smooth. Fl. handsome large and numerous or

produced copiously all over the pl. about an inch in length and more in breadth. Br. quite distinct or separate very variable in shape and breadth, all sometimes ovate or oval sometimes elliptical or lanceolate, often in the same fl. either ovate or narrow-lanceolate. Pet. bright purplish rose or deep full pink, wedgeshaped, their claw with a large tuft or thick fringe of hairs on each side.

Differs from *M. sylvestris* L. in its smaller size, more procumbent or diffuse or even prostrate habit, smooth petioles and pedicels, obtusely and fewer (only 5-) lobed l., larger brighter or richer and deeper coloured fl. which are also rarely more than 3 together, shorter pedic. (scarcely the length of the fl.), longer pet., narrow and more distant outer sep., larger fr. and thickly pubescent immarginate distinctly cancellated carpels. The fl. are of a fuller richer colour; not however brighter though perhaps deeper pink than as represented in *M. sylvestris* L. EB. t. 671, yet not deep red or "sanguineous" as in the original Linnæan spec. or as in the pl. described by Koch, p. 142: of which however the Madeiran pl. can be considered merely a less robust pale-flowered state or var.

In the Banks. Herb. there are only two Madeiran specimens of *Malva*; both collected in Madeira by Banks and Sol., one marked by Solander himself *M. mauritiana* L., the other *M. rotundifolia* L. The first of these is in its present state quite indeterminate, though there is nothing against its being correctly named: the 2nd, after long and careful examination I am quite satisfied is also exactly the same pl., possessing none of the really distinctive characters of *M. rotundifolia* L., though it is undoubtedly the original type of *M. rotundifolia* of Von Buch's list of Madeiran pl. It has indeed the pet. only 3 times the length of the cal. in the only remaining imperfectly expanded fl.; but on the other hand the sep. close in over the fr., as in *M. mauritiana* L., instead of standing erect or lying open as in *M. rotundifolia* L. The 3 involueral bracts are lanceolate and distant from each other. The fr. is densely strigose-pubescent or hirsute instead of softly and shortly velvety, with the surface of the carpels obviously rugose across or irregularly cancellated beneath the close-set short whitish stiff pubescence; but their edges are not toothed or raised. Lastly, the central disk is small, instead of large as in the true *M. rotundifolia* L. (EB. t. 1092): a pl. not existing so far as I have observed in Madeira, though included in Holl's List; which contains however neither *M. parviflora* nor *M. mauritiana* L.

3. MODIOLA Mœnch.

(Haynea Rehb. not Schum. or Willd.)

††1. M. CAROLINIANA L.

Hispid; st. stiff and woody, prostrate, creeping; l. palmate 5-7-lobed, lobes deeply toothed or cut, smooth above; pedic. axillary solitary erect longer than the petiole; pet. entire; fr. and cal. hirsute-strigose.—*Malva caroliniana* Linn. Herb. ! Cav. Diss. 2. 58. t. 15. f. 1; DC. i. 435; Spr. iii. 92.—Herb. ann. Mad. reg. 1; r. Waste ground immediately below the terrace-wall of the Quinta do Valle near Funchal; formerly abundant, but the locality by late alterations and enclosures seems now to be destroyed. March, April.—An inconspicuous pl. with st. 1-2 ft. long, creeping amongst grass and rooting for a part of their length, the ends only a little ascending, straight or regularly flexuose, thin and gr. but stiff and woody, the pl. however being not only decidedly annual but of very brief duration. Herbage bright gr. Lower l. less, upper more divided, lowermost undivided crenate. Stip. ovate. Pedic. hispid. Br. or invol. sep. linear-lanceolate. Sep. rugosely or granulate-strigose, in fr. erect not closed. Fl. small but pretty, $\frac{3}{8}$ in. in diam.; pet. pale dull scarlet with a dark lunate mark at the base, their claw greenish y. Fr. blackish of 20-22 partially 2-celled carpels, the upper cell bursting widely open, the lower indehiscent.

4. SIDA L.

††1. S. CARPINIFOLIA L. fil.

A low shrub clothed with forked or cruciform adpressed hairs; branches compressed or flattened upwards; l. ovate or ovate-oblong unevenly and coarsely or somewhat doubly serrate; stip. linear acuminate erect; pedunc. axillary 1-4-flowered mostly solitary very short much shorter than the petioles; fr. hirsute at top, of 8-11 carpels each with 2 short horns at the outer upper angle of the back and a single longer recurved awn at the inner angle.—*S. carpinifolia* L. fil. Cav. Diss. 1. 21; 5. 274. t. 134. f. 1; and *S. planicaulis* L. 24. t. 3. f. 11. *S. carpinifolia* and *S. carpinoides* DC. i. 461. *S. carpinifolia* WB. i. 37. *Malva subhastata* Holl's List (not Cavanilles).—Shr. per. Mad. reg. 1; r. Roadsides and waste ground amongst gardens and vineyards abundantly in the western suburbs of Funchal, beginning from the now desecrated and dismantled church and convent of S. Francisco; in the garden of which it was found by Masson in 1776, and sent to Dr. Solander with the remark, "called Tea by the inhabitants, and cultivated in their gardens" (Sol. MSS.): the former part of the observation applying however rather to the following sp. at the present day, and the latter

part to neither. The pl. appears to be confined to the above locality. In fl. throughout the year.—An insignificant little shr. not above 12–18 in. high with few straight straggling tough and stiffish branches sprinkled like the whole pl. with rather long shining whitish or tawny golden very close-pressed starry 4-rayed or forked hairs, one fork or pair of the rays directed upwards, the other downwards, like a St. Andrew's cross or hour-glass. L. bright full gr. broadish 1–1½ or 2 in. long and $\frac{3}{4}$ –1 or $\frac{1}{2}$ in. broad, the lower ovate broader and shorter, the upper oblong-lanceolate narrower and longer. Fl. small bright uniform golden y. the lower mostly solitary but the uppermost often 2–4 together in little heads or short upright rac. The fr. of this Madeiran pl., on which *S. carpinifolia* L. fil. was originally founded, agrees accurately with DeCandolle's description of that of his *S. carpinoides*.

A glance at Cavanilles' figure (t. 21. f. 3) of his *Malva subhastata* sufficiently explains Herr Holl's mistake and verifies his syn. The leaves indeed of *M. subhastata* in the above fig. much resemble in shape those of *S. carpinifolia* L.

Probably introduced into Madeira from Brazil, where it is one of the commonest weeds.

†2. *S. RHOMBIFOLIA* L. *Cha Ingleza*.

A low shr. free from hairs but clothed with very short and close mealy-looking starry pubescence; l. shortly petioled lanceolate or narrow-oblong serrate, thickly pubescent and pale or glaucous-hoary beneath, smoother above; stip. linear-setaceous erect; pedunc. 1-flowered axillary solitary, aggregate at the ends of the branches, elongated about as long as the leaves and distinctly jointed; fr. smooth, carpels 7–12, 1–2-rostrate. Var.:

a. maderensis; carpels 1-rostrate.—*S. maderensis* Prim. 35, 36. *S. rhombifolia* WB. i. 36. *Malvinda unicornis* &c. Dillen. Hort. Eltham. 216. t. 172. f. 212.—Mad. reg. 1, 2; ccc.

β. canariensis; carpels 2-rostrate.—*S. rhombifolia* (L.) Cav. Diss. 1. 23. t. 3. f. 12 and *S. alba* 22. t. 3. f. 8 (not Linn.). *S. canariensis* (W.) and *S. rhombifolia* (L.) *a* (not *β* ex icon. cit. Cav.) DC. i. 462; Spr. iii. 111.—Mad. reg. 1; r.

Shr. per. Mad. Roadsides and dry waste ground in hot sunny places everywhere along the S. coast chiefly. Throughout the year.—A small shr. with slender stiff straight often elongated simple rounded branches 1–2 ft. long very tough and strong or wiry, hence used occasionally for making small brooms or besoms. Whole plant appearing smooth or merely powdery, but really more or less densely starry-pubescent in all its parts. L. dull gr., more or less whitish or greyish beneath, 1–2 in.

long, $\frac{1}{4}$ – $\frac{1}{2}$ in. broad, wedgeshaped and entire towards the base. Fl. small buff or ochre-y. Ped. very variable in length but mostly rather shorter than the l. though sometimes longer especially in luxuriant pl. Fr. small hard and dry. Carpels mostly 10, and by far most commonly 1-rostrate; rarely and perhaps only in pl. growing in poor scanty soil and in the hot dry summer or aut. months birostrate. In the summer of 1845 the carpels of all the pl. in the paths or walks of my own vineyard, which had always borne before, as in subsequent years they again bore, 1-rostrate carpels, produced almost uniformly birostrate carpels. Thus α and β are rather two forms or states than properly varieties. In Madeira, however (as also in the Canaries apparently from Webb's account), α is assuredly the normal state: β occurring only here and there occasionally.

This is the pl. generally called "Cha Ingleza" or English Tea-pl. by the Portuguese at present. It is however rarely if ever used in any way.

5. ABUTILON Gaërtn.

††1. A. INDICUM (L.) Wight and Arn.

Inclining to shrubby, all over more or less hoary with very short and close velvety starry pubescence; l. soft finely velvety heartshaped ovate-lanceolate or subobtusate, somewhat lobed irregularly and unequally repand-crenate; stip. linear reflexed; ped. erect mostly longer than the petioles jointed near the fl.; sep. ovate acute; cor. spreading; fr. large of 12–15 scabrous stellately-hispid acute not awned carpels about the length of the sep. — *Abutilon indicum* Wight and Arn. Prodr. Fl. Ind. Or. i. 56. *Sida indica* (L.) and *S. populifolia* (Lam.) DC. i. 471 and 470; Spr. iii. 119.

β . *populifolia*; l. more or less acuminate; W. and A. l. c.; *S. populifolia* (Lam.) Cav. Diss. 1. 32. t. 7. f. 9; 5. 275. t. 128. f. 2; DC. l. c.; Spr. l. c. *S. Abutilon* Holl's List (not Linn.). — ^{Shr.} ann. rarely per. Mad. reg. 1; r. Waste ground amongst vineyards in the neighbourhood of Funchal occasionally, especially about the Quinta do Valle. July–Nov. — St. erect; branches 1–3 ft. long straight and stiff but weak and slender and decumbent or spreading horizontally and trailing, often dusky purplish or violet, hard and woody although the pl. is of scarcely ever more than ann. or bien. duration. L. poplar-like, 1–2 in. long, blunt at the tip, pale gr. inclining more or less to grey or hoary. Fl. rather large and handsome, the size of a shilling, buff or ochre-y. Fr. large and handsome from the neat regular arrangement of the dry papery or bladdery carpels. Pedunc. very variable in length, often not much longer but never shorter than the petioles.

Seeds black beautifully scabrous with pale raised points, rounded at the back.

†††Order XIII. AURANTIACEÆ.

The Orange Family.

Fl. regular. Cal. urceolate or campanulate 3-5-toothed marcescent persistent. Pet. 3-5 or 8 imbricate in the bud. Stam. as many as or multiples of the pet., their fil. more or less combined in sets or free, flattened downwards; anthers erect. Torus a fleshy hypogynous ring or disk to which the pet. and stam. are affixed. Ov. 5-many-celled free surrounded by the annular torus; style 1; stigma thick capitate. Fr. an orange, with a spongy often separable rind and 1-many-celled 1-many-seeded pulp composed of distinct separable juicy vesicles. Seeds affixed to the axis 1-many in each cell or carpel, without albumen; chalaza and raphe distinct. Embryo straight; cot. thick and fleshy 2-auricled at the base; plumule distinct.—Trees or shrubs abounding with aromatic fragrant volatile oil-glands. L. alternate pinnate, but often by abortion of the side-lfts. 1-leaved. Fl. generally white with thick fleshy pet. Fr. mostly edible.—The *Aurantiaceæ* form too marked a feature in the botanical aspect of Madeira to be here omitted. And having had constant and long-continued opportunities of observing them growing in all the luxuriance of native pl., I have been enabled to form conclusions with some confidence as to the true limits of the sp.

†††1. CITRUS. Cal. urceolate 3-5-toothed. Pet. 5-8. Stam. 20-60, fil. flattened dilated downwards and more or less united or 1-polyadelphous. Fr. 7-12-celled, cells many-seeded vesicular-pulpy. Integument of seeds coriaceous. Cot. with very short auricles.—Petioles winged with a single terminal lft.

†††1. CITRUS L. Orange and Lemon.

†††1. C. MEDICA L. Engl. *Citron*; Port. *Cidra* (the tree, *Cidreira*); Fr. *Cedrat*, *Cedrot*; Ital. *Cedro*; Sicil. *Citru*, *Cedru*. Germ. *Zitrone*, *Citrone*.

Subarborescent armed or thorny; branches stout firm rigid armed with long spines; petioles short thick simple or very narrowly marginate, l. broadly oblong obtuse serrate and when young with the young shoots and fl.-buds purplish or violet; fl. many in a cluster; fr. large more or less oblong with a very thick hard rind and pale pulp.—Lour. Fl. Coch. ii. 465, var. 1; Brot. ii. 281, 2, var. 4; DC. i. 539; Presl 183; Risso Hist.

Nat. de l'Eur. Mérid. i. 442.—Shr. per. Mad. reg. 1, cult. $\frac{1}{2}$. In a few gardens in and about Funchal. Fl. and fr. irregularly throughout the year.—The Madeiran form or var. is a low irregularly growing tree or shr. from 5 to 10 ft. high, with no very distinct st. or head, and straggling short thick straight, but somewhat stunted, branches. L. dark-gr. stiff and coriaceous, of the form and size of those of the common Guava (*Psidium pyriferum* L.) or Cherry Laurel (*Prunus Lauro-cerasus* L.); constantly very different from those of any other of its genus. Fl. like those of the Lemon, but many in a cluster. Fr. pale y. large neither umbonate nor mamillate but with the style usually persistent; its rind very thick and fragrant, sometimes rugged, generally smooth and even, with very little slightly acid pulp.—Madeira is justly famous for the excellence and cheapness of its candied citron.

††2. C. LIMONIUM L.

Arboreous armed or thorny; branches lax or diffuse elongate; petioles slightly winged or marginate; l. ovate-oblong acuminate or acute toothed; young shoots and fl.-buds purplish or violet; fl. solitary or only 2-3 together; fr. mostly oblong or oval rarely globose, always more or less umbonate or mamillate; rind hard and often thick; pulp pale.—*C. Limonium* and *C. Limetta* DC. i. 539. *C. Limonium* and *C. Limetta* Presl 184 and 187.—The principal Mad. var. are:

a. vulgaris; Engl. *Lemon*; Port. *Limaõ* (the tree, *Limoeira*); Fr. *Citron*; Ital. *Limone*; Sicil. *Lumiuni*; Germ. *Limonie*.

A tree 20-30 ft. high with long loosely spreading branches; foliage rather light gr.; l. acuminate; fr. rather large umbonate pale y. with a thickish often roughish rind and very acid pulp.—*C. Limonium* DC. l. c.; Risso i. 423. *C. Limonium* Presl l. c.—Tr. per. Mad. reg. 1, 2, cult. ccc. In gardens about Funchal, &c., everywhere below 2000 ft. Fl. and fr. Oct.-May.

β. dulcis; Engl. *Sweet Lemon*; Port. *Limaõ doce*, *Lima*, *Lima de chéiro*; Sicil. *Lumiuni duci*.

A small tree or shr.; fr. globose mamillated, pale y.; rind thin, pulp sweet insipid.—*C. medica* var. 2, Brot. ii. 281. *C. Limetta* DC. l. c. *C. Limetta a. dulcis* Presl 187. *C. lumia* Risso Hist. i. 414.—Small tr. or shr. per. Mad. reg. 1, cult. rr. In a few gardens about Funchal. Fl. and fr. Oct.-May.—Habit altogether of *a*, and with similar petioles and fl., but with l. acute, not acuminate. Fr. pale y. size of an ordinary orange, the knob or nipple at top surrounded by a flat or hollow space. Rind smelling more or less like Bergamot (*Monarda fistulosa* L.).

γ. acida; Engl. *the W. I. Lime*; Port. *Limaõ de Gallinha*.

Habit of *α* and *β*; fr. small globose even, mamillated, pale y.; rind thin, pulp very acid.—*C. acida* Roxb. *C. medica* var. 2, *C. Limon* Lour. ii. 465.—Small tree or shr. Mad. reg. 1, cult. rrr. In one or two gardens at Funchal.—Fr. 1-1½ in. diam.

C. Peretta Risso i. 418 seems to differ from this only in its pear-shaped fr.

††† 3. C. AURANTIUM L.

Arboreous armed or thorny; branches close crowded forming usually a compact round bushy head; petioles broadly winged; l. ovate-oblong or elliptic acute or acuminate; fl. numerous in thick clusters subracemose pure white; fr. globose more or less flattened at the poles; rind soft more or less acid or bitter adhering to the more or less high-coloured pulp.—Desf. ii. 215; Brot. ii. 282. *C. Aurantium* and *C. vulgaris* DC. i. 539; Presl 188. *C. Aurantium* and *C. Bigaradia* Risso Hist. i. 349 and 378.—Principal Madeiran varr.:

a. aurea; Engl. *Orange* or *common Orange*; Port. *Laranja* (the tr. *Laranjeira*); Fr. and Germ. *Orange*; Ital. *Arancia* or *Melarancia*; Sicil. *Aranciu*.

A tree 20-40 ft. high with thick very dark-gr. foliage; fr. flattened at the poles golden or reddish-y.; rind even, mostly thickish, rather bitter, pulp sweet.—*C. Aurantium* Lour. ii. 466; DC., Presl, Risso, ll. cc.—Tr. per. Mad. reg. 1, 2, cult. ccc; PS. reg. 1, 2, rr. In gardens in Madeira everywhere; in the north often attaining a height of 60 ft. Fl. Febr.—April. Fr. Aug.—April.—The oranges of the north of the island (Santa Anna, S. Jorge, S. Vicente, Porto da Cruz, &c.), and of these more particularly a sort called *Laranja de embigo*, are much better than those of the south, and are less infested with the maggots or larvæ of the destructive Orange-fly (*Ceratitis citri-perda* Macl. Zool. Journ. iv. 482. t. 15) and other Tephritidan or cognate Diptera.—Several subvarieties and monstrosities are cultivated occasionally, such as the Shaddock (*C. decumana* L.), the Maltese, St. Michael, the Double orange, the Forbidden fruit, &c.

β. Bigaradia; Engl. *Seville* or *Bitter Orange*; Port. *Laranja azeda*; Fr. *Bigarade*; Germ. *Pomeranze*.

A tr. 20-30 ft. high; fr. as in *a*, but with a very bitter rind and pulp.—*C. vulgaris* DC., Presl, ll. cc.; *C. Bigaradia* Risso l. c.—Tr. per. Mad. reg. 1, 2; cult. c. Gardens and vineyards here and there general, but much less abundant than *a*. Fl. April, May. Fr. Jan., Febr.—Fr. used for making marmalade and vinegar; sold very cheap, often at 20d. per hundred.

††4. *C. NOBILIS* Lour.

Unarmed; petioles simple or narrowly marginate not winged; l. lanceolate or elliptic acuminate mostly quite entire; fl. pure white; fr. much depressed and concave at the poles; rind soft not at all bitter or acrid, easily separating from the sweet high-coloured pulp.—Lour. Fl. Coch. 466; DC. i. 540. *C. Aurantium* var. *Mandarinum* Risso i. 378. Var.

β. *tangerina*; Engl. *Tangerine Orange*; Port. *Laranja Tangerina*.

A dwarfish shr. of delicate habit and foliage with slender crowded branches forming a loose light head; fr. small remarkably concave or umbilicate at the poles with the axis very short, more or less strongly torulose or ribbed at the base, rind very thin.—*C. nobilis* β *minor* Bot. Reg. t. 211. Shr. per. Mad. reg. I; cult. $\frac{c}{2}$. Gardens in and about Funchal chiefly; introd. from Lisbon. Fl. March–May. Fr. Dec.–Febr.—A small elegant dwarf shr. not above 4 or 5 ft. high of a delicate habit with small l. and fl. slender graceful tressy branches and light-gr. foliage. L. narrow, acuminate, the tip retuse. Fl. in all stages pure white small and delicate highly fragrant 2–3 in a cluster, subternate; pet. dotted with gr.; stam. 15, in 4 or 5 sets. Fr. rather small $1\frac{1}{2}$ –2 in. diam., axis not more than half the transverse diam., deeply hollow at the poles, usually ribbed like a melon at the base, the ribs disappearing upwards; deep red-lead colour with a somewhat rank strong fragrance like common Orange-flowers and Bergamot (*Monarda fistulosa* L.). Rind singularly thin and fragile, separating cleanly and very easily from the pulp, of a tender almost granular substance, and without the usual leathery or spongy inner lining, abounding with volatile oil and coarsely dotted with large conspicuous oil-glands. Pulp composed of rather large sacs or vesicles, deep full orange or red-lead colour, sweet but neither very juicy nor high-flavoured, though highly fragrant and much esteemed by many for its Bergamot-like aroma, and still more perhaps for its elegance, the cells or carpels, which are very small narrow and numerous, often 10–12, being separable as neatly and easily from each other as from the rind. In the middle of the fr. is a large vacant space left by the recession of the edges of the carp., and only partly filled with soft white cottony fibres. Seeds numerous and large; cot. greenish, not white as usual.—Raised from seeds it maintains constantly and steadily its peculiar characters. Grafted on a common Orange (*C. Aurantium a.*) stock, it becomes altogether larger (15 ft. high) and more robust, with rather darker foliage and larger fr., remaining otherwise unchanged. For use, this is the best mode of treatment; for seedling pl. are not only longer in coming into bearing, but their fr. is smaller, and the crop is more scanty and precarious.

It is however, speaking generally, an early, regular and abundant bearer: a tr. not above 4 or 5 ft. high yielding two or three score of fr.; and it is moreover particularly exempt from blight whether of Insects or Fungi.—The large-fruited var. *a. major* (Andr. Bot. Rep. t. 608), with fr. sometimes 5 in. in diam., is the famous Mandarin Orange of China. It does not occur in Madeira.

Order XIV. HYPERICACEÆ.

The St. John's Wort Family.

Sep. 4 or 5 distinct or partly connected mostly persistent often unequal glandular-dotted, imbricate in the bud. Pet. 4 or 5 often glandular-dotted, twisted in the bud. Stam. mostly indefinite numerous and polyadelphous or united in 3-5 sets or bundles; fil. filiform; anth. bilocular versatile. Styles 2-5. Carpels 2-5. Fr. capsular rarely fleshy 2-5-celled 2-5-valved. Seeds minute numerous; embryo straight mostly exalbuminous.—L. without stip. entire mostly opposite and sprinkled with pellucid dots. Fl. mostly y. and cymose.

1. HYPERICUM. Sep. 5 often unequal and more or less united at the base. Pet. 5. Stam. many polyadelphous at the base. Styles 3-5. Caps. more or less completely 3-5-celled. Fl. always y.

1. HYPERICUM L.

St. John's Wort.

* Shrubby. Sep. very unequal. Pet. deciduous. Styles 3-5.

1. *H. GRANDIFOLIUM* Chois. *Malforada*, i. e. *Milforada*.

Smooth; branches round *horizontal or declining*; l. *regularly 2-ranked in one plane ovate-oblong*, at first acute, then obtuse or even retuse, heart-shaped amplexicaul or sessile pellucid-reticulate *not dotted*; *cymes few-fl.*; ped. short 2-bracteate; sep. *very entire oblong-lanceolate* somewhat acute much shorter than the cor. presently *reflexed*; styles 3-4.—DC. i. 544. *H. erectum* Buch! 196. no. 324. *Androsæmum Webbianum* Spach in Ann. Sci. ser. 2. v. 362; WB. l. i. 50, 51. t. 4 E.—Shr. per. Mad. reg. 2, 3; ccc. Rocks everywhere chiefly above 1000 ft. Sum.—Aut., but at almost all seasons.—Shr. 2-4 ft. high, the branches reddish or cinnamon-brown sparingly divided elongated declining or loosely spreading horizontally with handsome regularly distichous foliage. L. large 1-2 in. long, 1-1½ in. broad very entire slightly glaucous beneath. Fl. rather large but in small bunches. Sep. very unequal and entire slightly punctate 3 or 4 times shorter than the deciduous pet.

Styles elongated filiform, as long as the stam., united only at the base.

It is remarkable that although *H. grandifolium* is common in the Canaries, yet neither the Canarian *H. canariense* L. nor the equally closely allied Azorian *H. foliosum* Ait. (distinguished by its crowded 4-ranked finely dotted rather smaller l., &c.) are found in Madeira.

** Shrubby. Sep. unequal. Pet. persistent. Styles 3.

2. *H. FLORIBUNDUM* Ait.

Smooth; branches round upright; l. in four rows crowded elliptic-lanceolate or pointed at both ends sessile thickly but faintly dotted; cymes rather numerous flowered; sep. irregularly or minutely serrulate or ciliate shortly ovate or lanceolate acute or acuminate very much shorter than the cor.; styles 3.—Ait. ! Hort. Kew. iii. 104; Buch! 196. no. 325; DC. i. 544? *Webbia floribunda* Spach in Ann. Sci. ser. 2. v. 356; WB. ! i. 47. t. 4 B.—Shr. per. Mad. reg. 2; cc. Dry sunny rocks above and near Funchal, Rib. de João Gomez, Palmeira, &c., at Ponta de Sol, and in the North at Santa Anna, Rib. de S. Jorge, &c., where it is sometimes called "Corno de Cabra." July–Oct.—A small bushy shrub 2–3 ft. high branched proliferously, with stiff erect straight virgate branches leafy only upwards. L. crowded somewhat narrow-lanceolate 1–1½ or 2 in. long, ¼–½ or ½ in. broad rather pale or y.-gr. Pedic. slightly compressed and dilated upwards. Sep. ovate acute or even sometimes acuminate, unequal, alternately longer or narrower and more lanceolate or acuminate, the shorter more especially very minutely ciliate or faintly serrulate, 4 or 5 times shorter than the cor. Fl. middle-sized bright golden-y. in thickly crowded bunches. Pet. persistent concave or cucullate. Styles as long as or longer than the stam. Seeds fungose reticulate.—DC.'s description seems at least partly ("calyce obtuso" and "fol. impunctatis") to belong to something else, possibly to *Webbia canariensis* WB., or to *W. platysepala* Spach. The present is however the true pl. of the Hort. Kew. by comparison with the original types in BH.

3. *H. GLANDULOSUM* Ait. *Malforada*, i. e. *Milfurada*.

Smooth; branches round upright; l. two-ranked crowded elliptic-lanceolate pointed at both ends sessile thickly and distinctly pellucid-dotted and serrulate with black glands; fl. crowded in short compact close cymes; br. and sep. lanceolate acute closely serrulate with large black glands; styles 3.—Ait. ! Hort. Kew. iii. 107; Buch! 196. no. 330; DC. i. 551; WB. ! i. 44. t. 3.—Shr. per. Mad. reg. 2, 3, but chiefly 2; cc. Rocks in ravines

almost everywhere; Rib. de Santa Luzia, dos Cayados, da Metade, Rib. Frio, Curral das Romeiras, das Freiras, Ponta de Pargo, &c., Santa Anna, &c. April-July.—Shr. 3-4 ft. high with stiff but somewhat weak and curved straggling or spreading naked pale yellowish or reddish branches proliferous and leafy only towards their ends; the quite young shoots clothed with a short white cottony or mealy down. L. thickly crowded upwards, somewhat broadly elliptic-lanceolate mostly sessile, the lower sometimes shortly stalked, bright y.-gr. shining as if varnished, 1-1½ in. long, ¼-½ in. broad. L. br. and sep. thickly fringed or serrulate with prominent black glands. Fl.-buds and pet. reddish outside varnished-shining. Sep. slightly unequal alternately narrower and more lanceolate. Fl. not large rather pale dull y. *Pet. persistent flat* scarcely twice the length of sep. sprinkled especially along their edges with a few black glands or dots. Styles as long as stam.—Bourgeau's specimen under this name in the BH. (Pl. Exs. Can. no. 246) is by some mischance or accident merely *H. perforatum* L.

*** Herbaceous. Sep. nearly equal. Pet. persistent. Styles 3.

4. *H. PERFOLIATUM* L.

Smooth; st. ascending erect compressed and faintly 2-edged; l. ovate or ovate-oblong obtuse subcordate half-amplexicaul thickly pellucid-dotted and more or less sprinkled with a few black glands either all over or towards or at the edge, quite smooth and slightly glaucous beneath; cyme close many-flowered; sep. and br. lanceolate or ovate-lanceolate acute or acuminate copiously dotted with sessile black glands and fringed or ciliate-serrulate with either short simple cilia or stalked black glands; pet. and anth. copiously dotted with black glands.—Linn. ! Herb.; Syst. Nat. (ed. 12) ii. 510; Willd. iii. 1462. *H. ciliatum* Lam. Enc. iv. 170, 171; DC. i. 552; Presl 193. *H. dentatum* Lois. Fl. Gall. 499, (ed. 2) ii. 169. t. 17; DC. l. c. *H. montanum* Buch! 196. no. 329 (not Linn.).—Herb. per. Mad. reg. 2; rrr. Curral das Romeiras, bank on the left side of the road descending from the Mount Church a little before coming to the first bridge at the bottom. In Chestnut woods at S. Vicente on the road to the Paul. May, June.—Very slightly and fugaciously glaucous. St. several stoutish often as thick as a small quill simple very stiff suffrutescent at the base 1-2 ft. high, compressed and with a prominent line or edge on each side alternately between the internodes which become gradually longer upwards. L. entire (not toothed as in Lois. t. 17) subcoriaceous, the lower smaller narrower and closer together, the upper larger broader and more remote, ½-1½ in. long, ⅓-½ in. broad, the uppermost shortest and broadest, beneath slightly glaucous and with the nerves or

veins quite smooth, not minutely furry or mealy-puberulous as in true *H. montanum* L.; the upper l. especially more or less black-dotted towards the edges, the dots rather large, sometimes confined to a single row at the edge, always sessile in Madeira, but in Sicilian spec. in HH. and in Cretan in BH. occasionally stalked and fringing the l. Fl. middle-sized subsessile in a close crowded not large forked cyme. Fringe of sep. much shorter than half their breadth. Styles not exceeding the stamens.

5. *H. LINARIFOLIUM* Vahl.

Smooth; st. ascending stiffly erect round below, compressed and faintly 2-edged upwards, simple straight slender wiry suffrutescent at the base; l. linear-oblong very obtuse or retuse with revolute margins erect half-amplexicaul without pellucid dots but with a marginal row of black glands and a few also sprinkled over the surface at the tip beneath; cyme terminal rather lax; fl. and fr. rather large; sep. lanceolate or ovate-lanceolate subequal subobtuse in the bud, subacute afterwards, thickly dotted and slightly fringed or serrulate with black glands; pet. edged and sprinkled with the same, anth. more sparingly so; styles longer than stam. twice as long as ovary.—*H. Linarifolium* Vahl Symb. Bot. i. 65; Lam. Enc. iv. 180; Brot. ii. 321. *H. linearifolium* Willd. iii. 1470; DC. i. 552; Loisel. Fl. Gall. (ed. 2) ii. 168. *H. linariifolium* EBS. t. 2851; Bab. 60. *H. angustifolium* Buch! 196. no. 328; Lowe! Primit. 35 (not Lam.). *H. nubigenum* Lowe! Hook. J. of Bot. i. 43; Novit. 548, App. xii.—Herb. per. Mad. reg. 3 (upper part); $\frac{3}{4}$. Whole surface of the Paul da Serra; summit of Pico Grande and about the Boca das Torrinas and adjacent peaks at the top of the Lombo Grande; very abundant, but scarcely found eastward of the Curral das Freiras or Pico Ruivo and the Torrinas. July, Aug.—St. 6–18 in. high several or numerous, at first ascending, then very erect and straight. L. small narrow $\frac{1}{2}$ –1 in. long, 1–2 $\frac{1}{2}$ lines broad stiff or thickish and coriaceous, the upper very rarely in luxuriant large pl. with here and there one or two pellucid dots. Fl. conspicuous $\frac{2}{3}$ or $\frac{3}{4}$ in. diam. rather pale bright y. a little inclining to buff, reddish outside especially in bud. Sep. nearly or quite equal. Styles 3 divergent much longer than the ov., shorter than the caps. Seeds oblong elegantly crenate-striate lengthways.—In Jersey specimens (St. Catherine's Bay, Aug. 1851, Stevens) in HH., the st. though round below are obscurely 2-edged upwards. In a large luxuriant Asturian spec. from Durieu also in HH., the st. is round nearly throughout, as I have also occasionally found it in robust luxuriant pl. up the Lombo Grande in Madeira. Hence all difficulty regarding the identity of Vahl's pl. on the ground of his describing the st. as "teres," may be considered at an end.

Lamarck l. c. says of the st. "caule ancipiti" in his specific char., and yet has "tiges cylindriques" in his descr. The sep. he calls "obtusos ou à peine pointues," which is sufficiently correct.

6. *H. PERFORATUM* L. *Erva de S. João.*

Smooth; st. ascending erect 2-edged much branched at the base; l. oblong or elliptic thickly pellucid-dotted and thinly sprinkled with a few black dots beneath, not reticulate; cyme large close many-fl.; sep. erect narrow-lanceolate very acuminate twice as long as ovary black-dotted; pet. obliquely oblong and with anth. copiously black-dotted; styles divergent longer than stam. or not shorter than ovary.—Brot. ii. 322; EB. t. 295; Buch! 196. no. 326; DC. i. 549; Sm. E. Fl. iii. 325; Presl 192; WB.! i. 43, 44; Koch 146; Bab. 60.

β. angustifolium Bab. l. c. (scarcely of Koch); l. narrow linear-oblong or elliptic copiously pellucid-dotted.—Herb. per. Mad. reg. 2, 3; ccc. Banks, mountain-pastures, ravines, &c., everywhere, chiefly from 1000 to 4000 ft. May-Sept.—St. 2-3 ft. long stiff but mostly spreading and declining or decumbent at the base, somewhat bushy downwards with numerous thickly leafy slender side-branches and longer prostrate weak and almost filiform finely leaved shoots at the base. Foliage dark or full gr. L. distinctly acute; only their principal nerves pellucid. Fl. rather large and handsome bright golden-y. in dense ample cymes. Sep. either quite entire or indistinctly subserrulate upwards. Black glands of pet. chiefly at the edge, but not so always on the l. Styles at least twice as long as the ovary.

7. *H. HUMIFUSUM* L.

Smooth; st. numerous prostrate or procumbent subcespitose slender filiform slightly 2-edged; l. oval-oblong minutely pellucid-dotted, the edges black-dotted beneath; fl. loosely cymose; sep. large leafy broadly oblong or oval obtuse quite entire unequal twice as long as ovary; styles very short.—Brot. ii. 323; Buch! 196. no. 327; EB. t. 1226; DC. i. 549; Sm. E. Fl. iii. 326; Koch 146; Bab. 60.—Herb. per. Mad. reg. 1, 2, 3; ccc. Banks, ravines and mountain-pastures everywhere from 500 to 6000 ft. May-Sept.—A small low much-branched and leafy pl. 3-6 in. high with very slender wiry st. often forming dense mats or tufts. L. small oval or elliptic more or less oblong more or less obtuse. Fl. rather small. Sep. with sometimes a few stalked black glands at the edge. Stam. 15-20. Styles shorter than the ovary.

8. *H. QUADRANGULUM* L.

Smooth; st. very erect and straight 4-angular, angles slightly

winged, sparingly and shortly branched upwards; l. decussate oblong or elliptic-oval thickly and minutely pellucid-dotted, the margins beneath black-dotted in a row near the edge; cyme large leafy open or spreading; sep. erect equal narrow-lanceolate very acuminate quite entire black-dotted; pet. lanceolate sparingly black-dotted, anth. copiously so; styles divergent shorter than the stam. not much longer than the ovary.—EB. t. 370; Sm. E. Fl. iii. 324; Bab. 60; DC. i. 548 (var. *a*). *H. quadrangulare* Brot. ii. 322. *H. tetrapterum* (Fr.) Koch 147.—Herb. per. Mad. reg. 2, 3; c. Mountain-dells and steep banks in moist or shady spots here and there; general but not abundant. Rib. Frio, R. da Metade, R. de Machico, &c. In the North in ravines above Santa Anna; cliffs above the Passa d'Arêa by the road, &c. July–Oct.—Rather light gr. St. 1–2 ft. high with short remote leafy opposite side-branches. L. 6–9 lines long, 3–4 lines broad, rather small but larger than in *H. perforatum* L. often thinly and obscurely sprinkled beneath with a few black dots besides the marginal row; the lower obtuse, upper acute. Fl. rather pale or lemon-y., reddish in the bud.—This sp. is not included in Von Buch's Madeiran List. Solander in his MS. List of Madeiran pl. has an "*H. ovatum* Masson: Hab. in declivibus rupium:" but no *H. quadrangulum*. And in the Banks. Herb. no Madeiran specimen exists of either pl. It can only therefore be surmised that possibly by *H. ovatum*, *H. quadrangulum* L. might be intended and the name afterwards suppressed by Solander on discovering its identity with the Linnæan sp.; for he has left no record of the char. of his *H. ovatum*.—The Azorian *H. decipiens* Wats. by a specimen in HH. from "S. Michael, 1846," appears not to differ essentially from the present sp.

Order XV. AMPELIDACEÆ.

The Vine Family.

Cal. small entire or minutely 4–5-toothed. Pet. 4–5 alternate with sep. inserted outside a disk or torus, valvate in the bud, in fl. often separating at their base and cohering at the tips like a *calyptra*. Stam. 4–5 opposite the pet., inserted outside the torus. Ovary free 2–6-celled; ovules erect; style 1 very short, stigma capitate. Fr. a grape *i. e.* pulpy and globose like a berry, but not adherent to or coated by the cal. Seeds bony with a horny albumen and erect embryo.—Climbing shrubs or trees with acid watery juices. Lower l. opposite, upper alternate. Fl. small greenish in racemes or thyrses, and like the tendrils often opposite the l.

1. *VITIS*. Cal. indistinctly 5-toothed. Pet. 5 often cohering at the tips and separating below, forming a *calyptra*.

Stam. 5. Ov. 2-celled, each cell with 2 ovules. Fr. juicy, properly 2-celled and 4-seeded, but cells and ovules mostly more or less obliterated or abortive.

1. VITIS.

†††1. V. VINIFERA L. The Vine. *Vinha* or *Videira*.

L. roundish heart-shaped 5-lobed and coarsely toothed.—Brot. i. 300; DC. i. 633; Presl 199; Koch 150.—Shr. or arb. Mad. reg. 1, 2; PS. reg. 1; ccc. Sunny slopes and hill-sides, from the sea up to a height of 2500 ft. everywhere cult., in the South on trellises, in the North on trees; here and there spontaneous. Fl. April–June; fr. Aug.–Oct.—Fl. very fragrant like Mignonette (*Reseda odorata* L.). Var. (principal only):

a. l. less deeply lobed and toothed.

A. fr. globose.

a. fr. black.—*Tinta*, *Negra molle*, *Negrinho*, *Bastardo*, *Marôto*, *Ferral*, *Castellaô*, &c.

b. fr. white, *i. e.* greenish-y.—*Sercial*, *Lestraô*, *Cara de Moça*, *Bastardo branco*, *Sabra*, &c.

B. fr. oval or oblong.

b. fr. white or greenish-y.—*Verdelho*, *Bual* or *Boal*, *Baboza*, &c.

β. l. deeply lobed and toothed, lobes subacuminate (*Malvazia* or *Malmsey Vines*).

A. fr. globose.

b. fr. white or greenish-y. or tawny.—*Malvazia*, *M. de cheira*, *M. baboza*, *M. roza*, *M. da ribeira*, &c.

B. fr. oval or oblong.

a. fr. black, fleshy.—*Alicante*, &c.

Though any attempt at a full or detailed account of Madeiran Wines would be beyond the scope or province of this work, some notice of the produce of a pl. so influential on the natural features and condition, physical and social, of the island may be perhaps expected.—The wine which is generally called Madeira, or commercially “London Particular,” is composed of an indiscriminate mixture of the above subvarieties of *a*; the *Verdelho* grape predominating. The wines called *Malvazia* or *Malmsey*, *Sercial*, *Tinta*, *Bual* and *Verdelho* are made each from the peculiar grape so called without admixture, and are about twice the price of the London Particular or ordinary Madeira. Malmsey

or Malvazia is noted for its sweetness and richness; Tinta (a red wine) for its Portwine-like astringency, Bual and Verdelho (both dry white wines) each for their peculiar high aromas. But Sercial when old and fully ripe—for before 10 or 15 years, even in Madeira, it is too austere and crude for drinking—is perhaps the very finest of dry cordial wines, combining great strength and aroma with the utmost creaminess or softness, without the least trace of either sweetness or acidity. The Sercial Vine is said to have been brought from Hockheim. The fr. though saccharine is so austere that it affects disagreeably the throat when eaten in any quantity.—Tinta owes its Portwine colour and astringency chiefly to the infusion of a certain portion of the grape-skins in the must during fermentation. In the course of 5 or 6 years in Madeira, 15 or 20 in England, it loses in great measure its peculiarities, becoming pale, like common Madeira.—Although these are the chief wines known in commerce, almost every separate vineyard produces a sort appreciably different from its next neighbour: a difference analogous to that of home-made bread or beer in different houses of the same town or village. The strongest wines are made on the S. coast; those of the N., with few exceptions, being much inferior, are generally distilled into Alcohol or Brandy. Malmsey is grown on the warmest sunniest slopes on or beneath the cliffs chiefly to the W. of Funchal close to the sea, as under the Cabo Giraõ (Fazenda dos Padres), Paul do Mar, Jardim do Mar, &c. But the principal district for the other wines of finest quality is the Estreita, a vast mountain amphitheatre, formed chiefly by the E. slope of the Cabo Giraõ, beginning about a league to the W. of Funchal, and reaching up to a height of from 1500 to 2000 ft. above the sea. The wines of Porto da Cruz, Ponta Delgada, and a few other places on the N. coast are also very excellent: some of the Tinta or red wines of the former district possessing much of the Hermitage character on the spot, although too delicate to bear transport without injury even across the island.—Madeiran grapes in general, though very sweet, have not much flavour comparatively with English hothouse grapes, and are too mucilaginous or fleshy and leathery or thick-skinned to be very good eating. Those of the N. are more juicy, but smaller and with still less flavour.—The Vine is said to have been first introduced

from Cyprus according to Cadamosto (Bowd. Exc. 103), and Candia, *i. e.* Crete, according to Cordeyro (Hist. Insul. 79) shortly before 1445; and it supplanted gradually the Sugar-cane, which had previously formed the staple produce of the island. It is trained in the S. of the island on trellises 3 or 4 ft. high of cane (*Arundo Donax* L.), and in the N. up chestnut or laurel trees called Balséiros. The ravages of the *Oidium* have however now completely changed again the face of the country. Its first appearance was in the summer of 1852. In 1855 I found the vines almost universally destroyed and rooted up; and supplanted in the S. chiefly by the Sugar-cane, and in the N. by crops of Maize or Indian Corn.

Order XVI. GERANIACEÆ.

The Geranium or Cranesbill Family.

Sep. 5 persistent more or less unequal, the upper one often spurred at the base; imbricated in the bud. Pet. 5 with claws alternate, twisted in the bud. Stam. monadelphous at the base 2 or 3 times as many as the pet., some often regularly abortive. Ov. 5-celled, ovules 2, pendulous. Styles 5 cohering round an elongated axis. Fr. of 5 one-seeded carpels cohering round the long beak-like produced axis or torus, each terminated by its hardened elongated style, which when dry curls elastically upwards separating from the axis and carrying up with it the carpel. Seeds solitary large filling the carp. without albumen; embryo curved folded; cot. leafy plaited convolute.—Herbs or succulent shrubs with acid juices often aromatic. L. stipulate either opposite or alternate with opposite fl.-stalks.

1. GERANIUM. Sep. 5, none spurred. Pet. 5. Stam. 10 monadelphous, alternately larger and with glands at their base. Carp. plain and rounded at top; the long finally recurved or revolute awn smooth inside.

2. ERODIUM. Sep. 5, none spurred. Pet. 5. Stam. monadelphous, 5 fertile with glands at the base, 5 sterile without glands, with broader fil. Carp. with 2 lateral scars or depressions at top; the long finally curled-up and spirally twisted awn bearded inside.

†3. PELARGONIUM. Sep. 5, the uppermost produced at the base into a nectariferous spur adnate to the fl.-stalk. Pet. 5. Stam. 10 monadelphous, 7 fertile, 3 generally sterile. Awns of carp. finally curled-up and twisted spirally, bearded inside.

1. GERANIUM L.

Cranesbill.

* *Batrachoides* Koch. Root strong fusiform simple or branched, forming at the crown a low scaly knob or caudex.

1. G. ANEMONEFOLIUM Herit. *Passas*.

Root more or less caudexcent at the crown; st. and leafstalks annual herbaceous more or less pubescent; l. smooth shining peltate palmately 5-partite, the 5 lobes or segments bipinnatifid; panicle corymbose broad ample repeatedly forked many-flowered compound, ped. 2-flowered forked and with the pedic. and sep. glandulose-hairy; pet. obovate very entire 3-4 times the length of the awned sep., their claw short smooth; carp. smooth varicosely veined; seeds quite even.—BM. t. 206; DC. i. 640; Spr. iii. 71; WB. ! i. 20. *G. palmatum*, Cav. Diss. 4. 216. t. 84. f. 2. *G. levigatum* Buch! 196. no. 335.—Herb. per. Mad. reg. 2, 3; ccc. Wooded ravines on shady or moist rocks and banks everywhere, R. de Santa Luzia, R. Frio, R. de S. Jorge, R. de Janella, &c. &c. March-Sept.—Fl.-st. ann. fork-branched upwards, 1-3 ft. high one or more from the more or less elevated short stem-like root-stock which is rugged and scaly with the remains of former st. and l. L. a peculiar bright shining gr., the root-l. with stalks often a foot long or more and large leafy stipules clothing the root-stock at their base; the limb 8-10 in. diam.; somewhat succulent, very smooth. Panicle level-topped, large and spreading, its divisions thickly clothed with purple glandular spreading hairs. Fl. crowded large and handsome 1-1½ in. diam. bright rose-purple the throat darker. Claw of pet. divergently 2-ribbed inside. Fil. equal very fine and long, dark purple persistent. Fr. small in proportion its beak short smooth, style pubescent. Whole pl. scentless. Varies much in smoothness.—One of the chief ornaments in woods and ravines of the rocks and banks, which it profusely clothes in many places, and enlivens with its bright gr. lucid foliage and fine rose-purple fl. varying in intensity of colour and often pale, but never white. The pl. continue flowering in long succession through the summer; and here and there indeed at almost all seasons.

** *Columbinum* Koch. Root ann. slender simple or branched; ped. 2-flowered.

† Carp. rugose or wrinkled but mostly smooth; seeds even.

2. G. ROBERTIANUM L. Herb Robert. *Passinhas*.

Villose-hairy; st. ascending spreading and diffuse; l. membranous thin and flaccid subpedate ternate or quinate, the 3-5 lobes or segm. unequal stalked bipinnatifid; pedic. forked

erecto-patent; pet. obovate or obcuneate entire 3-rayed twice the length of the closed awned villose or shaggy equally 10-angular cal.; claw linear quite smooth; carp. simply keeled varicosely wrinkled chiefly upwards.—Desf. ii. 104; Cav. Diss. 4. 215. t. 86. f. 1; EB. t. 1486; Sm. E. Fl. iii. 235, 6; WB. i. 21 (excl. var. β); Koch 155.

β . *maritimum* Bab. (ed. 4) 65; carp. quite smooth with 1-3 very strong transverse wrinkles or plaits at top.—*G. Robertianum* DC. i. 644 (excl. var. β).—Herb. ann. Mad. reg. 2, 3; ccc. Thickets and shady banks in ravines everywhere; R. de Santa Luzia, R. Frio, S. Vicente, &c. Spr., Sum.—A strong or rank foxy-smelling pl. sprinkled all over, especially the cal., with fine soft white hairs, and tinged more or less in all parts with bright red. St. often 1-2 ft. long and diffusely trailing hairy subvillose. L. membranous thin and flaccid hairy somewhat shining but of a dark lurid or dull hoary gr. turning bright red in decay; the middle lobe or segm. mostly a little produced. Cal. shaggy, thickly clothed with long white hairs. Fl. rather large and handsome though much smaller than in *G. anemonefolium*, bright purplish-rose; the pet. and claw together about half an in. long, their limb marked with 3 pale radiating lines. Carp. quite smooth, never "downy" as in the English pl. *a.* described by Sm. and Bab. and as sometimes in the Canarian pl. according to WB. i. 22, though I find them quite smooth in Bourgeau's Can. specimens, no. 663, both in BH. and HH. Beak stout rather long quite smooth, the style pubescent. Seeds quite even.

3. G. PURPUREUM Vill. *Passinhas*.

Smoothish or but slightly hairy not at all villose; st. erect or slightly spreading often nearly or quite smooth; l. somewhat stiff and succulent or fleshy subpedate ternate or quinate, the 3-5 lobes or segm. subequal stalked bipinnatifid, the subdivisions distinct and mostly narrowish; pedic. forked erecto-patent; pet. obovate or oblong-oval nearly or quite entire 2-rayed not much longer than the closed awned hairy or pubescent but not villose subpentangular cal., claw linear quite smooth; carp. smooth simply keeled strongly varicosely wrinkled especially upwards.—Herb. ann. Mad. reg. 1, 2, 3; ccc. Spr., Sum.—Var.:

a. lucens; more hairy, l. somewhat stiff or succulent and shining with smaller or narrowish subdivisions.—*G. purpureum* (Vill.) EBS. 2648. *G. Robertianum* β . *purpureum* DC. i. 644. *G. Robertianum* β . Sm. E. Fl. iii. 236. *G. Robertianum* β . *parviflorum* WB. i. 22. *G. Raii* Lindl. Syn. 57. *G. Robertianum* Brot. ii. 71, 72?—A common weed in vineyards, by roadsides, in sunny stony waste ground everywhere, below 2000 ft. chiefly and down to the sea-beach. March-June.

β. nemoralis; smoother, l. membranous with broader more leafy subdivisions.—Common on rocky shady banks in woods and ravines chiefly above 2000 ft., growing often intermixed with *G. Robertianum β*; Rib. de Santa Luzia near the Waterfall; bank above the Fountain in Rib. Frio along with *G. Robertianum β*. and *G. lucidum L.* May–July.

A smaller less straggling more upright bushy shorter-branched pl. less powerfully fetid than *G. Robertianum β*, but with the same kind of rank smell, and altogether less hairy, even in *a*. In drying it adheres much less to the paper, and is much less flaccid and membranous. In decay especially it is equally apt to acquire a bright red tinge. St. succulent shining only slightly hairy, often nearly or quite smooth. L. sprinkled with a few short hairs, much smaller and stiffer than in *G. Robertianum β*, with the middle lobe or segm. less produced, and usually with altogether more distinct and somewhat finer narrower divisions, smoother and normally more shining and succulent or firm; for *β*. is a state merely due to altitude or situation. Fl. small and inconspicuous, the size of those of *G. lucidum L.*, their pet. and claw together 3–4 lines long, not much exceeding the sep., pink or rose with 2 darker rays. Cal. pubescent rather than hairy, sometimes nearly or quite smooth, never shaggy or villose, with 10 unequal ribs or angles, but only pentagonal, 5 being alternately less prominent. Carp. smooth wrinkled and seeds quite even, exactly as in *G. Robertianum β*. Beak stout but rather shorter than in the pl. just named, quite smooth; style pubescent.—I have observed this pl. in Madeira many years without finding any variation in the above characters or intermediate states between it and *G. Robertianum β*, although the two are found continually growing intermixed. Few pl. in fact are either more constant in their differences or more easily discriminated. And in confirmation of this view it may be noted, that whilst in higher shady spots *G. Robertianum β*. retains all its hairiness, *G. purpureum Vill.* growing by its side becomes on the contrary smoother.

4. *G. LUCIDUM L.*

Nearly or quite smooth succulent shining; st. diffuse *subcespitose* ascending; l. roundish-reniform 5–7-fid, lobes obtusely inciso-crenate; pedic. forked erecto-patent; *pet. obovate or spatulate entire* 2-rayed not much longer than the large *pyramidal* strongly and *sharply winged 5-angular cal.* which is transversely *clathrate or wrinkled across* between the prominent winged angles; claw long linear pubescent inside; carp. shortly *glandular-pubescent upwards* or at top, 3–5-keeled and reticulately wrinkled across.—Desf. ii. 104, 5; Cav. Diss. 4. 214. t. 80. f. 2; Brot. ii. 72; EB. t. 75; DC. i. 644; Sm. E. Fl. iii. 236, 7; Presl

207; Koch 154; Bab. 64.—Herb. ann. Mad. reg. 3; r. Rocky shady banks in ravines; Rib. Frio above the fountain and the bridge; R. de Santa Luzia near the waterfall; Serra d'Agua along the Caminho Central between Pico Grande and the Encumeado. April–July.—Root long slender simple. Whole plant peculiarly shining and smooth sprinkled only here and there with a few short hairs, brittle and succulent, very apt to become bright red, much branched diffusely, knotty at the joints. Cal. large pale gr., with 5 winged angles, strongly clathrate across between the angles. Sep. rather cuspidate than either awned or mucronate. Fl. small but pretty; limb of pet. bright pink or rose with 2 deeper-col. radiating lines, claw white hairy inside but not ciliate at the edges. Carp. 3–5-ribbed lengthways, the ribs granulate or rugose; beak short smooth slender, style finely pubescent. Seeds even. Cal. after fl. tightly closed, in fr. loose, finally spreading.

5. *G. MOLLE* L.

Hairy-pubescent; st. diffusely spreading or decumbent; l. mostly alternate roundish-reniform deeply 7–9-fid, the segments wedge-shaped rather deeply trifid; pedunc. solitary short regularly opposite the l.; pedic. forked strongly declining in fr.; pet. deeply bifid longer than the cal., claw very short ciliate on each side; carp. smooth closely wrinkled across obliquely all over, simply keeled.—Cav. Diss. 4. 203. t. 83. f. 3; Desf. ii. 102; Brot. ii. 72; EB. t. 778; DC. i. 643; Sm. E. Fl. iii. 237; WB. i. 21; Koch 154; Bab. 64.—Herb. ann. Mad. reg. 1, 2, 3, c; PS. reg. 2; $\frac{2}{5}$. Roadsides and waste ground about Funchal, Camacha, &c.; Boca das Torrinas, up the Lombo Grande in the Curral das Freiras, about 5000 ft. above the sea. PS. roadside at Camacha. Febr.–July.—Slightly hoary-green softly pubescent. St. clothed with longer, l. with shorter hairs; the lower l. on long stalks and sometimes opposite in pairs; the upper always alternate. Ped. shorter than the l. Fl. small cup-shaped $\frac{3}{8}$ in. diam. Pet. with claw $\frac{1}{4}$ in. long, from $\frac{1}{3}$ longer to not quite twice the length of cal., bright deep reddish-purple. Sep. very shortly mucronulate not awned. Cal. not distinctly angular. Carp. quite smooth closely and finely wrinkled; beak very short and all over pubescent like the short style. Seeds smooth to the naked eye, but under a moderate lens very finely but *distinctly reticulate-rugulose*; forming in some sort a transition between the preceding and following sp.

†† Carp. even but mostly hairy; seeds distinctly reticulate or punctate.

6. *G. ROTUNDIFOLIUM* L.

Softly villose-pubescent grey or hoary; st. diffusely spreading

or procumbent; *l.* all opposite in pairs reniform 5-7-fid, the segm. shallow broadly and coarsely but not deeply cut and toothed; ped. solitary short; pedic. forked strongly deflexed or declining in fr.; pet. oblong-cuneate or spathulate obtuse entire or undivided, a little longer than the awned cal., claw not ciliate, slightly hairy inside and outside at the base; sep. shortly awned; carp. even pubescent clothed with short spreading hairs.—Cav. Diss. 4. 214, 215. t. 93. f. 2; Desf. ii. 101; Brot. ii. 72; EB. t. 157; Buch 396. no. 338 (var. fol. profundius incisus, laciniis angustioribus); DC. i. 643; Sm. E. Fl. iii. 240; WB. i. 21; Koch 154; Bab. 64.—Herb. ann. Mad. reg. 1, 2, 3, ccc; PS. reg. 2, $\frac{2}{3}$; SD. 2; rrr. Roadsides, waste ground, vineyards, and beds of ravines everywhere. In PS. at Camacha, top of Pico de Castello, &c. Febr.—July.—At once distinguishable from *G. molle* L. by its pale greyish foliage pale pink or flesh-col. fl. and opposite l. St. scarcely a foot long, often with the leaf-stalks reddish, diffuse or even prostrate, with longer hairs mixed with short close pubescence. L. softly pubescent flaccid and very quickly withering; the lower on long stalks; all in pairs, one l. smaller than the other. Ped. shorter than the l. Fl. small inconspicuous pale rose-pink or flesh-colour. Beak moderately long, and with the style downy. Carp. large somewhat bladdery. Seeds strongly and elegantly netted all over regularly like a honeycomb.

7. *G. DISSECTUM* L.

Adpresso-pubescent; st. diffuse straggling; *l.* opposite in pairs, deeply 5-7-partite, segm. of the lower many-, of the upper 3-fid, the laciniæ narrow linear; ped. short; pedic. forked, declining in fr.; pet. obcordate not longer than the awned sep., claw ciliate on each side; carp. even pubescent clothed with short erect hairs.—Cav. Diss. 4. 199. t. 78. f. 2; Desf. ii. 102, 103; Brot. ii. 73; EB. t. 753; Buch 196. no. 337; DC. i. 643; Sm. E. Fl. iii. 241; WB. i. 21; Koch 154; Bab. 64.—Herb. ann. Mad. reg. 1, 2, 3, c; PS. reg. 2, 3, 4; $\frac{2}{3}$. Borders of cornfields, grassy banks in ravines, mountain pastures, &c., everywhere. Above the Praya Formosa; Rib. d'Escalas, R. de Santa Luzia at the waterfall; Cerca at S. Antonio da Serra, &c. PS. at Camacha; summits of Pico Branco and P. Juliana, &c. Febr.—July.—St. 1-2 ft. long slender weak and straggling clothed like the petioles with short deflexed adpressed pubescence. L. deeply and rather finely cut almost to the base into many linear divisions, firm stiffish closely adpresso-pubescent but not hoary. Ped. shorter than the l. Fl. dark red or bluish-purple but small and inconspicuous, not exceeding the cal. Beak stout of moderate length thickly clothed with spreading glandular hairs; style short and finely pubescent. Carp. rather large and bladdery. Seeds strongly and distinctly netted like the last.

2. ERODIUM Herit.

Storksbill.

* *Cicutaria* Webb. L. divided pinnatipartite or pinnate. Cot-leaves crenate or lobate.

1. ERODIUM MOSCHATUM (L.) Herit. *Malvas*.

More or less pubescent; st. prostrate or procumbent; l. pinnate, lfts. distinct not quite sessile shortly stalked oval or ovate unequally cut and serrate scarcely lobate; stip. broad oval; ped. many-fl.; pet. nearly equal a little longer than the cal., claw very short smooth not ciliate; 5 fertile fil. dilated and 1-toothed on each side at the base; carp. obliquely 1-ribbed at top below the furrow, or with the lower as well as upper margin of the groove below the scar raised and prominent; beak moderate slender minutely adpresso-pubescent.—Cav. Diss. 4. 227. t. 94. f. 1; EB. t. 902; DC. i. 647; Sm. E. Fl. iii. 230; WB. i. 23; Koch 156; Bab. 65. *Geranium moschatum* (L.) Desf. ii. 106; Brot. ii. 74.—Herb. ann. Mad. reg. 1, 2, ccc; PS. reg. 2, 3, c. Roadsides and waste ground everywhere; Mad. about Funchal, Camacha, Ponta de Pargo, &c.; PS. at Camacha and up Pico de Castello. Nov.—June.—A rather coarse weedy pl. with a strong musky smell and light gr. soft flaccid foliage; st. in roads and paths quite prostrate, amongst other herbage more rank and procumbent or diffuse, 4–12 in. long, rather stout and succulent. Root strong fleshy whitish fusiform. L. 3–12 in. long pinnate with rather large and remote lfts. Ped. 4–10-fl. nearly smooth or slightly viscid-pubescent. Fl. small purplish-rose; sep. acute or acuminate scarcely awned; pet. about $\frac{1}{3}$ rd longer than the sep. very entire narrow-oblong or elliptic immaculate 3-nerved nearly or quite equal; claw a little darker-col. very short. Fertile fil. with a short membranous narrow wing or border downwards dilated at the base abruptly into a tooth on each side. Barren fil. petal-like lanceolate acuminate. Carp. with the lower margin of the smooth furrow or groove below the large oval hollow pit-like scar on each side the base of the beak at top sharply raised and prominent like the upper margin, forming a single oblique rib on each side under the groove. Beak $\frac{1}{4}$ in. long, 5 times as long as the sep.

2. E. CICUTARIUM (L.) Herit.

Hairy or hirsute; st. prostrate or procumbent; l. pinnate, lfts. sessile pinnatipartite or deeply pinnatifid and cut; stip. narrow lanceolate; ped. mostly many-fl.; pet. unequal longer than the cal., claw ciliate on each side; stam. smooth, fil. all simple dilated and rounded at the base not toothed smooth; carp. not distinctly ribbed at top, the lower edge or margin of the smooth

concentric furrows below the 2 hollow scars at the base of the beak being subobsolete instead of sharp and prominent; beak moderate slender minutely adpresso-pubescent.—DC. i. 646; EB. t. 1768; Sm. E. Fl. iii. 229; Presl 209; WB. i. 22; Koch 155; Bab. 65. *Geranium cicutarium* (L.) Brot. ii. 75, 6.

ζ. *bipinnatum* DC. i. 647; γ. WB. ! l. c. *Ger. bipinnatum* Cav. Diss. 5. t. 126. f. 3. *G. cicutarium* A. *bipinnatum* Desf. ii. 106; strigosely hirsute; l. bipinnatipartite, lfts. deeply and finely divided, with short narrow segm.; ped. 2-4-fl.; fl. slightly ringent, pet. $\frac{3}{4}$, twice the length of cal.

Subv. 1, *rosea*; fl. pink, 2 upper pet. with a pale spot at the base.—Herb. ann. Mad. reg. 3; $\frac{5}{8}$. Open grassy mountain pastures scarcely below 2500 ft.; between the bridge in Rib. d'Escalas and the Poço de Neve, and to the eastward between R. d'Escalas and Pico da Silva; ascent of the Pico das Aboaras beyond Camacha plentifully; Boca das Torrinhãs at the top of the Lombo Grande in the Curral das Freiras, &c. March-July.—Root strong fleshy fusiform whitish. Pl. for some time stemless though flowering; then throwing out several prostrate rarely branched st. 2-6 or even 12 in. long, tinged like the petioles and ped. with red and clothed with coarse shaggy white hairs. Whole pl. slightly fetid like *G. Robertianum*. Foliage dark gr. often reddish. L. opposite in pairs hispid finely divided, bipinnatifid or bipinnate with narrow deeply cut divisions; lower primary pinnæ or lfts. remote; rachis or midrib distinct or naked as in *E. moschatum* L. Pedic. in fr. declining or deflexed. Fl. elegant rather large conspicuous bright pink or rose. Sep. shortly awned or mucronate. Pet. obovate-oblong entire twice the length of the sep. the 2 upper smaller; each of the 3 lower with 3 dark lines or nerves at the base; claw in all copiously ciliate. Sterile fil. half the length of fertile, lanceolate membranous large, petal- or chaff-like. Glands at base of 5 fertile stam. notched, dark red. Anthers rose or purple darker than the pet. Stigmas purple rather long. Carp. narrow-oblong, attenuated downwards, clothed all over with short erecto-patent hairs below the obsolete lower edge or margin of the smooth furrows or grooves under the 2 deep pit-like scars at top. Beak $1\frac{1}{4}$ inch long 4 or 5 times the length of sep. and with the style clothed with short white strigose close-pressed pubescence; its valves lined with yellow or tawny silky hairs.—Pet. very caducous and fugacious, always falling before noon. Cotyledon-l. undivided 3-5-lobed.

Subv. 2, *albiflora*; fl. pure white. Herb. ann. PS. reg. 3; r. Roadside, Camacha, under Pico de Castello; north slope of Pico de Cabrito near the Ninho de Guincho. April, May.—Differs from the Madeiran pl. in no respect except the pure white fl.

On its first appearance in March this pl. is stemless with a central 2-flowered ped., flat-spreading leaves, and fl. larger than afterwards: excepting the more finely divided lfts. resembling (though not the same as) var. *a. præcox* DC. (*Ger. præcox* Cav. Diss. 5. 272. t. 126. f. 2). It soon sends out several branches, which are at first quite prostrate. Later in the season luxuriant robust pl. with diffuse ascending branches often a ft. long, almost assume the form of *Ger. Chærophyllum* Cav. Diss. 4. 226. t. 95. f. 1 (*Erodium cicutarium* γ . DC.), but with which they are certainly not identical. These 2 states or stages of the sp. (the stemless and luxuriant) are however doubtless the pl. intended by *Erodium cicutarium* α . and β . WB. l. c., excluding the references to Cavanilles.

3. E. BOTRYS (Cavan.) Bertol. *Agulheta*.

Hispid or strigose; st. ascending diffuse or spreading, and with the petioles thickly clothed with reflexed bristles; l. oblong obtuse subcordate, the lower undivided sinuate or sinuate-lobate crenate with shallow very obtuse lobes and teeth, the upper more deeply and finely divided or bipinnatifid, sharply cut and toothed with narrow linear segments; stip. ovate; ped. 2-4-fl. ; pedic. in fr. strongly reflexed; pet. unequal $\frac{3}{4}$, a little longer than the always close-pressed sep., claw slightly pubescent not ciliate; stam. smooth, fil. all simple dilated downwards not toothed at the base smooth; carp. obliquely 3-4-ribbed on each side at top below the furrow; beak very large about 8 times the length of sep. finely pubescent.—DC. i. 647; Spr. iii. 34; WB. ! i. 23. *Geranium Botrys* Cav. Diss. 4. 218. t. 90. f. 2; Brot. ii. 74. *Ger. strigosum* Buch! 196. no. 334. *Ger. ciconium* var. Desf. ii. 113.—Herb. ann. Mad. reg. 2, 3, ccc; PS. reg. 3, $\frac{1}{2}$. Sunny banks, mountain pastures and hills everywhere, but scarcely below 500 ft. PS. on N. side of Pico d'Anna Ferreira. Jan.—June.—Foliage rather dull greyish or bluish, dark gr. Root strong fusiform. St. several ascending more or less erect diffusely spreading stout 2-12 in. high mostly reddish on upper side clothed with copious short coarse harsh white cartilaginous deflexed bristles. Cot.- and root-l. lying flat to the ground undivided 3-4-crenate or lobate about 2 in. long and 1 in. broad, the upper more deeply cut or gashed nearly to the midrib: all somewhat rigid or stiffish and adpressedly hispid principally on the nerves, opposite, dark gr. and shining with a dull leaden lustre. Ped. mostly 2-fl. stout reddish and with pedic. and cal. often finely viscose-pubescent. Fl. rather large and conspicuous somewhat ringent; pet. not more than $\frac{1}{3}$ rd longer than the mucronate or shortly awned sep. pale rose-purple, with

5 dark veins or lines, 3 only reaching up the limb, immaculate obovate-oblong entire or merely a little erose at the edges, the 2 upper rather smaller. Barren fil. lanceolate acuminate membranous or petal-like; fertile not much longer. Anthers black. Stigmas short bright gr. Carp. narrow-oblong strigose below the 3 or 4 oblique ribs at top on each side beneath the smooth groove or furrow. Beak enormously and singularly large in proportion, 3-4 in. long slender and finely acuminate slightly angular minutely pubescent.—Pl. extremely variable in size and luxuriance rarely exceeding or even attaining a ft. in height; often dwarfed down to a single st. an in. or two high, when the enormous length of the beak becomes peculiarly striking. Seed-1. undivided indistinctly 5-lobed with very shallow notches. Cavanilles' figure is from a pl. with immature half-grown fr. having the beak only $1\frac{1}{2}$ in. long; but is otherwise highly characteristic of the Madeiran pl.

** *Malacoideæ* Webb. L. scarcely divided, 3-5-lobate; cot.-leaves entire.

4. E. MALACOIDES (L.) Willd.

Softly pubescent somewhat grey or hoary; st. prostrate or procumbent; l. cordate obtuse toothed or crenate slightly and very obtusely lobed *all undivided*, the uppermost oblong; stip. large ovate membranous; ped. 4-6-fl.; pedic. in fr. strongly reflexed; cal. in fr. *loosely erect not close-pressed*; pet. equal a little longer than the *shortly awned sep.*; claw ciliate; *fil. smooth lanceolate rounded and simple (not toothed) at the base; carp. obliquely 1-ribbed at top below the groove or with the lower edge as well as upper margin of the groove sharply raised and prominent; beak 3-4 times the length of cal. rather long and slender smooth.*—Buch 196. no. 333?; DC. i. 648; Presl 210; WB. i. 24; Koch 156. *Ger. malacoides* (L.) Cav. Diss. 4. 220. t. 91. f. 1; Desf. ii. 107, 8; Brot. ii. 74.—Mad. reg. 1, 2, ccc; PS. reg. 1, 2, rrr. Roadsides and waste ground in sunny places about Funchal, the Gorgulho Fort, Praya, the Piedade near Caniçal, &c. chiefly below 500 ft. and near the sea. PS. near the S.W. point (Ponta de Malhado) and in the Serra Dentro. Nov.-May.—Whole pl. more or less pubescent, pale dull greyish-gr., though sometimes in shady places scarcely perceptibly hoary, with soft flaccid foliage. St. diffusely prostrate long and trailing 1-2 ft. long, the ends ascending, sparingly branched, light shining gr. pubescent especially beneath in a thick downy line. L. little more than an inch long and $\frac{3}{4}$ in. broad, ovate or ovate-oblong, the lower as broad as long, the upper more oblong, all undivided slightly shallow-lobed and toothed. Stip. and br. large conspicuous dry pale brown. Fl. small inconspicuous. Sep. shortly awned hairy-pubescent with strong dark gr. ribs or

nerves on a light ground. Pet. dull purple with mostly 2 small oblong darker spots at the base of each, oblong-oval obtuse entire, $\frac{1}{2}$ in. long, $\frac{1}{3}$ in. broad; the claw very short and distinctly ciliate. Fertile fil. winged purple; 5 sterile more broadly lanceolate petal- or chaff-like pale or colourless: all simple at the base and quite smooth. Carp. thickly erecto-strigose with long white tawny hairs up to the raised rim-like lower margin of the smooth groove below the large hollow scar or pit at top: both scar and groove thickly sprinkled with shining sessile glands. Beak an inch long, nearly smooth minutely and slightly adpresso-subpuberulous chiefly upwards. Seeds smooth shining.—In drying the pet. turn bluish-purple. Whole pl. scentless, occasionally in luxuriant young states viscid. Pet. very fugacious mostly falling before noon. The carp., in the raised rim-like lower margin of the groove below the scar forming a single oblique rib on each side at top, exactly resemble those of *E. moschatum* (L.); and they are also equally attenuated downwards at the base into a kind of stalk.

Of 2 spec. in BH. on the same sheet, marked "*Erodium malacoides*—*Ger. malacoides* L. Madeira, Fr. Masson," the smaller may possibly be rightly so called, but the larger is certainly the next sp. *E. chium* L. Von Buch's synonym is therefore doubtful, since he only enumerates one of the 2 species.

5. *E. CHIUM* (L.) Willd.

Shining and moderately pubescent; st. diffuse or procumbent, *l. shining and often nearly smooth above*, cordate obtuse toothed deeply and very obtusely pinnatilobate *subtripartite*, the upper *tripartite*; stip. short broadly ovate membranous, ped. many-fl.; pedic. in fr. declining or deflexed; *cal. in fr. close-pressed*; pet. unequal longer than the *long awned sep.*; claw ciliate; *fil. hairy and ciliate downwards* simple at the base; *carp. simple not ribbed at top and without any groove at all* below the 2 small round pits or scars at the base of the beak which is 6 times the length of cal., long slender, *finely adpresso-pubescent*.—DC. i. 647; Spr. iii. 33. *Ger. chium* (L.) Cav. Diss. 4. 221. t. 92. f. 1.—Herb. ann. Mad. reg. 1, r; PS. reg. 1, 2, cc (called Alfinête); SD. reg. 2, r. Madeira, Brazen-head outside the hummock at top, and roadside at the top of the descent into the Porto Novo ravine on the road from Funchal to Santa Cruz. In PS. common in waste ground, especially under walls on the borders of cornfields, quite taking the place of the Madeiran *E. malacoides* (L.). In SD. near and at the top of the island.—Herbage of a bright light shining gr. smoother or at least appearing so than in *E. malacoides* (L.) with brighter-coloured more conspicuous pink fl. St. more erect, yet weak and diffuse or straggling, 1-3 ft.

long. L. larger 2 or 3 in. long and nearly as broad, deeply cut into 3 main lobes, each of the side ones 2-, the middle rather longer and less deeply 3-lobed; the uppermost distinctly tripartite. Ped. 4-fl. and upwards. Stip. pale brown dry and scarious. Sep. always close-pressed thickly hairy, with strong green nerves or ribs on a pale transparent filmy ground; awn half their length. Fl. small but conspicuous and pretty. Pet. pale but bright pure rose, immaculate, 3-nerved, just longer than the sep. with their awns, unequal, $\frac{2}{3}$, the 2 upper broader and oval, the 3 lower narrower and oblong or elliptic; claw very short abrupt pubescent inside and strongly ciliate with deflexed rather long hairs. Fertile fil. winged and dilated downwards; 5 sterile ovate or broadly lanceolate acute petal-like pink or rose-colour, all hairy or shortly ciliate downwards and simple or not toothed at the base. Glands at base of fertile stam. notched bright gr. Stigmas dull dark rose. Carp. thickly but finely pubescent with short close-pressed white silky hairs, without any grooves at all below the small round scars at the top and consequently without any rib. They are also shorter and plumper, broader above and less narrowed below, than in *E. malacoides* L. Beak 1-1 $\frac{1}{4}$ in. long, slightly pubescent.—Pet. very fugacious, falling mostly before noon. A very elegant and ornamental rock-work pl. in gardens near the sea in England, which it enlivens by its bright gr. foliage and pink abundant fl. opening in long succession.—It is curious that *E. chium* L. is as common and *E. malacoides* L. as rare in PS. as *E. malacoides* L. is common and *E. chium* L. rare in Madeira.

3. PELARGONIUM Herit.

Garden Geraniums. *Malvas*.

• Herbaceous.

††1. P. ALCHEMILLOIDES Willd.

“St. diffuse villose; l. cordate 5-lobed palmate; ped. few-fl., pet. nearly equal, stigmas sessile.”—DC. i. 660. *Geranium alchemilloides* (L.) Cav. Diss. 4. t. 98. f. 1.—Herb. per. Mad. reg. 1, 2; r. A mere outcast of gardens about Funchal here and there; as on the brink and down the rocky E. cliff of the Rib. de S. Joaõ a little way above the Peak Fort over against the Achada, &c. Spr.—Greyish or slightly hoary scentless. L. orbicular. Ped. long slender 4-6-fl. Fl. small pale y. or whitish. Pet. narrow.

** Shrubby.

††2. P. INQUINANS (L.) Ait. *Malvas*.

Velvety-pubescent; st. and branches erect stiff thickish succulent; l. orbicular-reniform very obtusely crenate-lobed light

uniform gr. slightly shining softly velvety, ped. many-fl.; pet. obovate-wedgedshaped unequal uniform red.—DC. i. 659; Spr. iii. 58. *Ger. inquinans* (L.) Cav. Diss. 4. 243. t. 106. f. 2. "Dill. Hort. Elth. t. 125. f. 151."—Shr. per. Mad. reg. 1; cc. Sea-cliffs for about a mile out of Funchal to the E. along the Caniso road, and elsewhere amongst thickets of Cactus everywhere on the S. coast and for some distance up the Ravines, completely naturalized. Throughout the whole year.—A low shr. 1-3 ft. high with thick short stiff fleshy or juicy gr. branches. L. 3 or 4 in. diam. thickish softly tomentose light grass-gr. but usually with a reddish tint, being powdered with the fine red tuffadust of the soil which clings tenaciously to their velvety surface, staining the fingers when rubbed or handled. Fl. bright scarlet, throat or claw of pet. white. Pet. $\frac{3}{4}$, the 2 upper rather smaller; 2 of the 7 fertile stam. very short.—L. with an acid not aromatic scent when rubbed or bruised, unpleasant to some people; not staining the fingers except by their dustiness; varying in summer more, in winter less, densely velvety or tomentose.—*P. Bentinckianum* DC. i. 664. of English gardens, and very frequent in those of Madeira, scarcely differs except in its somewhat thicker more tomentose or greyish l., and larger more brilliant intense-scarlet fl. In cold or wet winters I have seen it pass completely into the wild or naturalized pl. above described.

†††3. *P. GRAVEOLENS* Ait. *Malvas.*

"L. palmately 7-lobed, l. oblong obtuse toothed with the margins revolute, umbels many-fl. subcapitate, spur twice as short as the cal."—DC. i. 678; "Herit. Ger. t. 17." *G. terebinthinaceum* Cav. Diss. 4. 250. t. 114. f. 1.—Shr. per. Mad. reg. 1, 2; ccc. Used everywhere in ornamental clipped hedges about gardens and Quintas. The Mount, Camacha, Palheiro, S. Antonio, Machico, &c. &c. Throughout the year. St. 1-3 ft. high diffuse but stiff and bushy, scarcely succulent. L. softly and thickly pubescent pale gr. Fl. in thick crowded tufts uniform pale dull pink not handsome. Pl. with a strong disagreeable though subaromatic scent.

†††4. *P. GLUTINOSUM* Ait. *Malvas.*

"L. cordate hastate-5-angular toothed viscose smoothish, umbels 2-4-fl., spur a little longer than the cal."—DC. i. 679; BM. t. 143. *Ger. viscosum* Cav. Diss. 4. 246. t. 108. f. 1.—Shr. per. Mad. reg. 1, 2; ccc. A frequent outcast of gardens and used for hedges everywhere about country houses.—St. diffusely spreading 2-4 ft. long. L. large sinuate like oak-leaves highly glutinous or viscous, dark gr. with a darker blackish waved broad zone. Fl. large and handsome more or less pale pink or rose, the 2 upper pet. larger and broader, spotted, and streaked with dark purple. Pl. with a strong but to many

people not altogether disagreeable scent, something like that of a tan-yard, but combined with a pleasant aroma.

Several other sp. of shrubby garden *Pelargonio* are very common or occasionally almost semi-naturalized. But the two preceding are the most generally or abundantly diffused.

Order XVII. LINACEÆ.

The Flax Family.

Sep. 5 or 4 persistent imbricate. Cor. regular. Pet. 5 or 4 fugacious clawed twisted in the bud, sometimes cohering. Stam. 5 or 4 alternate with the pet., with intermediate teeth (abortive stam.), from a hypogynous ring or disk. Ov. 5-4-celled. Stigmas 5 or 4 capitate. Caps. tipped with the hardened remains of the styles, imperfectly 10- or 8-celled, *i. e.* each of the 5 or 4 complete cells more or less completely subdivided by a spurious partial dissepiment. Seeds 1 in each spurious cell compressed pendulous with little or no albumen. Embryo straight.—L. alternate without stipules veinless, entire.

1. LINUM. Sep. pet. and stam. 5. Styles 5, rarely 3. Caps. 10-celled 10-valved, rarely 6-celled 6-valved.
2. RADIOLA. Sep. 4 connected downwards, each deeply 2-3-fid. Pet. stam. and styles 4. Caps. 8-celled 8-valved.

1. LINUM L.

Flax.

* Edge of sep. glandular-ciliate. Fl. yellow.

1. L. GALLICUM L.

Herbaceous smooth; st. single mostly simple erect; l. linear-lanceolate minutely serrulate-scabrous at the edge; panicle loose corymbose, its branches angular quite smooth; sep. lanceolate glandular-ciliate downwards, attenuated upwards into a sharp roughish point, half as long again as the caps.; pedic. in fr. a little longer or a little shorter than the cal.—Brot. i. 483; Buch 196. no. 350; Presl 169; WB. i. 27; Koch 138. *L. gallicum* β . *medium* DC. i. 423. *L. aureum* Waldst. and Kit. ii. t. 177 (not DC.).—Herb. ann. Mad. reg. 1, 2, 3; ccc. Sunny hill-sides and mountain pastures everywhere; neighbourhood of Funchal at the top of rocks between the Valle Quinta and R. de Joaõ Gomez; Curral das Romeiras; at Camacha, Prazeres, &c. May-Sept.—A small delicate inconspicuous pl. from 2-10 in. high. St. sometimes but rarely branched from the base, otherwise simple erect straight slender

or filiform. Fl. very small golden-y. in a loose capillary corymbose panicle. Pet. about $\frac{1}{3}$ rd longer than the finely acuminate or subulate-pointed sep., very obtuse or truncate, erose or uneven at the edge, cohering laterally by the middle of their claw and thus all falling together. Styles 5. Branches of panicle not downy in the axils as in *L. corymbuliferum* Rehb. (*L. aureum* DC. not Waldst. and Kit.). Pedic. in fr. longer than the cal. only in the earlier or lower primary first-opening fl.; in the later or secondary upper fl. they are shorter.

2. *L. STRICTUM* L.

Herbaceous smooth; st. single or several from the base simple stiffly erect thickly corymbose at top and leafy; l. crowded stiff linear-lanceolate very scabrous and minutely ciliate-serrulate at the edges; panicle dense corymbose leafy; sep. lanceolate sharply acuminate or produced into a long rough glandular-ciliate or serrulate point, twice as long as the caps.; pedic. in fr. much shorter than the cal.—Desf. i. 278; Brot. i. 484; DC. i. 424; Spr. i. 964; Presl 169?; WB. i. 26; Koch 138.—Herb. ann. Mad. reg. 1, r; PS. reg. 1, 2, c. Cornfields and sunny waste ground near the sea in a calcareous sandy soil; in Madeira scarcely except about the Fossil-bed at the Piedade near Caniçal; in PS. general, Rib. de Cochino, towards the Fonte d'Arêa, &c. April–June.—A remarkably stiff rigid leafy pl. 2–10 in. high, the st. very erect and leafy. Panicle forked proliferously, thickly leafy and bushy or crowded, with densely aggregate very shortly stalked golden-y. very small fl. almost buried in the l.; sep. membranous below, their long produced rough stiff point herbaceous; in fr. pale whitish and stiffly membranous or horny downwards; pet. acute shorter or not longer than the long-pointed conspicuous sep. Caps. globose slightly pointed, smooth inside.

†††3. *L. TRIGYNUM* Roxb.

Shrubby smooth; root creeping; l. alternate elliptic pointed at each end, fl. bracteate trigynous.—BM. t. 1100; DC. i. 425.—Shr. per. Mad. reg. 1, cult. cc; subnat. r. On terrace-walls and waste ground here and there in or about Funchal, and a very common ornament of gardens. Oct.–June.—Roots sending up turions or suckers. St. 1–2 ft. high dark gr. like the l. which are 1–2 in. long and nearly sessile. Fl. very large and handsome 2 in. diam. bright golden-y. produced in vast profusion and in long succession throughout the winter or spring months.

** Edge of sep. not glandular. Fl. blue.

4. *L. ANGUSTIFOLIUM* Huds. *Linho bravo*.

Herbaceous smooth; st. numerous procumbent; l. linear-

lanceolate; panicle few-fl. corymbose; sep. ovate or ovate-lanceolate acuminate pointed nearly as long as the ripe caps., the inner slightly ciliate; pet. twice as long as cal.; caps. downy or mealy within.—EB. t. 381; DC. i. 426; Sm. E. Fl. ii. 119; WB. i. 27; Koch i. 139; Bab. 66. *L. agreste* Brot. i. 481. *L. angustifolium* β. DC. l. c. *L. perenne* Buch 196. no. 349 (not Linn.).—Herb. ann. Mad. reg. 1, 2, c; PS. reg. 1, 2, c. Roadsides, waste ground and borders of cornfields everywhere, chiefly above 500 ft. March–June.—Root tap-shaped simple white, decidedly and constantly only annual in Madeira though soon becoming thickened and woody at the crown and assuming quite a perennial appearance. Primary st. erect 2 or 3 in. high not flowering, of very short duration. From its base spring at first 1 or 2 then subsequently from 3 or 4 to 10 or 12 slender st. 5 or 6 in. to a ft. long, spreading on all sides close to the ground, their ends ascending or erect, woody and suffrutescent downwards, sparingly branched upwards and few-fl. L. small 3-nerved crowded and imbricated upwards, close-pressed, slightly glaucous. Ped. proliferous; pedic. erect in fr. Fl. rather large but a little smaller than in common Flax, pale lilac-blue; pet. twice as long as sep., $\frac{3}{8}$ in. long, half as broad, obtuse wedge-shaped, entire in Madeiran specimens; styles 5; fil. dilated downwards, without intermediate teeth or rudiments of abortive stam. Sep. 3–5- or even 7-nerved at the base, their edges membranous and slightly ciliate-serrulate. Caps. globose abruptly sharp-pointed, a little longer than the cal.; its larger dissepi-ments very slightly downy or rather mealy.

†††5. *L. USITATISSIMUM* L. Flax. *Linho*.

Herbaceous smooth; st. single erect; l. lanceolate; panicle lax corymbose; pet. 3 times as long as cal.; sep. ovate acuminate pointed ciliolate nearly as long as the caps. which is smooth within.—Desf. i. 277; Brot. i. 481; EB. t. 1357; DC. i. 426; Sm. E. Fl. ii. 118; Presl 170; Koch 140; Bab. 66.—Herb. ann. Mad. reg. 2, cult. cc; reg. 1, 2, subnat. c. Generally cultiv. as a crop, especially in the north at S. Anna, S. Vicente, &c.; and here and there springing spontaneously, as towards the Praya W. of Funchal, &c. Dec.–June.—St. solitary slender erect 1–1½ ft. high corymbosely branched upwards, of a peculiar light pleasant gr. Fl. large conspicuous, blue with darker veins. Pet. crenate.

A great proportion of the linen used in Madeira is spun and woven by the country-people with flax prepared from their own crops; and it is of excellent quality and very durable.

2. RADIOLA Gm.

Flax-seed.

1. R. MILLEGRANA Sm.

Hort. Kew. (ed. 2) i. 282; EB. t. 893; Sm. E. Fl. i. 243; Spr. i. 498. *R. linoides* (Gm.) DC. i. 428; Koch 141. *R. vulgaris serpyllifolia* Dill. in Ray's Syn. 345. t. 15. f. 3. *Linum Radiola* Linn., Brot. i. 485.—Mad. reg. 2; cc. Mountain pastures general; rocky ridge between the Quinta do Valle and Rib. de João Gomez; grassy hills up the Caminho do Meio and about Camacha, &c. April–June.—A minute inconspicuous delicate little pl. of short duration, 1 or 2 in. high, erect and smooth, bushy and regularly forked or branched dichotomously from the base, branches filiform or capillary stiff corymbose. L. opposite entire very small sessile ovate. Fl. white very minute and numerous stalked solitary from the forks of the st. and at the ends of the branches. Sep. sharply and deeply trifid.

Order XVIII. OXALIDACEÆ.

The Wood-sorrel Family.

Fl. regular. Sep. 5 equal persistent imbricate in bud. Pet. 5 equal clawed often cohering at the base twisted in bud. Stam. 10 monadelphous in 2 rows, the 5 inner opposite the pet. longer than the 5 outer. Ov. 5-celled; ovules 1 or more in each cell; styles 5, stigmas capitate. Caps. 5-lobed 5-celled 5–10-valved or fleshy. Seeds not numerous 1 or more in each cell often with an elastic fleshy epiderm (*arillus* Endl.). Embryo straight in a fleshy albumen.—Pl. with acid juices, often stemless. L. mostly trifoliate.

1. OXALIS. Fr. an oblong or cylindric 5-angular 5-celled 5-valved caps.

1. OXALIS L.

* Branched; ped. axillary; lfts. ternate.

1. O. CORNICULATA L. *Bolsa de Pastor*.

Pubescent; root fibrous without turions or tubers; st. diffuse with procumbent often rooting branches; lfts. obcordate; stip. oblong-lanceolate adnate to the petioles; ped. 2–5-fld. shorter than the leaves; pedic. in fr. reflexed; caps. narrow-oblong; seeds transversely ribbed.—Brot. ii. 223; EB. 1726; Buch 196. no. 339; DC. i. 692; Sm. E. Fl. ii. 324; Presl 212; Spr. ii. 429; WB. i. 25; Koch 157; Bab. 68. *O. pusilla* Salisb. in Linn. Trans. ii. 243. t. 23. f. 5.—Herb. ann. Mad. reg. 1, 2, 3; ccc. Roadsides, waste and cultiv. ground everywhere; one of the

commonest weeds in gardens and vineyards. Throughout the year.—Truly ann. propagating only by seeds. St. 4–12 in. long reddish or purplish. Fl. small mostly 2 or 3 in little umbels, y., the throat with a reddish spot on each pet. Stam. distinctly monadelphous downwards. Styles the length of the longer stam. Caps. large in proportion. The pl. is used for rubbing out stains of iron-rust &c. from linen.

** Stemless; ped. from the root many-fl. umbellate; lfts. ternate.

††2. *O. MARTIANA* Zucc.

Root solitary scaly producing turions; pl. shining somewhat hairy-pubescent; lfts. broad ample widely obcordate deeply notched almost 2-lobed plain-coloured ciliate somewhat hairy all over chiefly beneath; scapes pubescent umbellate slightly branched rather numerous fl. scarcely longer than the l.; umbel lax compound loosely branched; pedic. lax drooping slender flexuose or reflexed; sep. a little obtuse with 2 callous spots at the tip; pet. narrow ligulate-wedged-shaped distinct; styles halfway between the longer and shorter stam.—Zucc. Mon. p. 20; Nachtr. p. 27; BM. 3938. *O. urtica* Hil. Fl. Bras. Merid. i. 126; Spr. Cur. post. iv. 185. "*O. floribunda* Link and Ott. Abbild. Gew. t. 10" (ex Zucc.).

β. bipunctata; scapes and pedic. hairy, fl. pale v. or lilac.—*O. bipunctata* Graham in BM. 2781, opt.—Herb. per. Mad. reg. 1; r. A weed in vineyards and gardens about Funchal here and there, as about the Quinta do Valle, &c. Nov.—May chiefly. Remarkable for its very large lfts. about 1½ in. long and broad, of a lucid bright full gr. on both sides. Scape about 6 in. long. Umbel loose with long fl.-stalks often compound. Fl. not large, about the size of those of *O. Acetosella* L.—Root merely ann. but propagated perennially from year to year by successive turions or tubers.

††3. *O. CERNUA* Thunb.

Root simple fusiform scaly at the crown and turion-bearing; pl. sometimes slightly caulescent smoothish; lfts. deeply obcordate or bilobed slightly ciliate smooth above, dark-spotted or blotched; scapes umbellate many-fl. longer than the l.; umbel simple crowded close; pedic. drooping or reflexed very unequal, some elongated.—DC. i. 696; Spr. ii. 426. *O. caprina* Curt. (not Linn.) BM. t. 237 (with single fl.).

β. pleniflora; fl. double.—Herb. per. Mad. reg. 1; $\frac{c}{2}$. Road-sides, vineyards and gardens about Funchal in many places; Caminho dos Saltos a little above the "Deanery," &c. Nov.—May.—Root simple fusiform fleshy white reddish or purplish upwards annual propagating from year to year by numerous

scaly turions or tubers produced copiously at its crown. L. remarkably flaccid or fast-withering forming a thick tuft, lfts. bright gr. spotted like Dutch Clover (*Trifolium repens* L.) somewhat fleshy the 2 lobes very distinct or deeply divided, folded together. Fl. very numerous in dense umbels large and handsome bright sulphur or lemon y., always in Madeira double; pet. especially in the bud bright reddish outside.

*** Stemless; scapes from the root single-fl'd.; lfts. ternate.

††4. *O. PURPUREA* Jacq.

Root fibrous tuberiferous; pl. subpubescent; l. in a flat rose-like tuft prostrate; lfts. broad rounded ciliate thickish or fleshy and glaucous, the middle one wedgeshaped at the base; petioles short villose; scapes ascending pubescent rather longer than the l., with a pair of narrow br. below the middle; sep. acuminate pubescent; cor. broadly infundibuliform; pet. broadly rounded-obovate imbricated laterally; styles reaching halfway between the longer and shorter stam. and with the fil. of the latter glandulose.—Jacq. Oxal. t. 56 (not Linn.); Willd. (ex DC.) sp. 2. 778; DC. i. 699 (var. a); Spr. ii. 424.—Herb. per. Mad. reg. 1, 2; cc. In chestnut woods chiefly from 1000 to 2000 ft. everywhere most abundant covering the ground and in vineyards and gardens a frequent weed; at the Mount, Allegria, Camacha, &c. Dec.—April.—Forming in many places for 2 or 3 months quite a turf in the chestnut woods. L. close-pressed to the ground rather large with very short petioles 1–2 in. long; lfts. large stiffish of a leaden or dull glaucous dark gr. paler beneath, in withering often turning blackish-purple or livid-violet at the edges. Scapes 2–3 in. long slender flaccid pale or whitish. Fl. rather large conspicuous deep full rich rose-purple or crimson (not pink or rose colour and veined as in *O. variabilis* BM. 1712) with the throat y.—A very beautiful but often troublesome pl.; never varying at all in Madeira from the above characters. This constancy is unfavourable to the views propounded in the Bot. Reg. 18. t. 1505, after Sir J. E. Smith, and to the fusion of the present pl. along with *O. speciosa* Jacq. Ox. t. 60 (*O. purpurea* L.) into *O. variabilis* Jacq. Ox. t. 53 (Bot. Reg. t. 1505; BM. 1712).

O. versicolor L. (BM. 155) occurs with 2 or 3 other sp. occasionally in gardens, which may perhaps in the course of a few years become also naturalized.

Order XIX. TROPÆOLACEÆ.

The Nasturtium or Indian-Cress Family.

Fl. perfect irregular. Sep. 5 coloured persistent $\frac{2}{3}$, spurred, slightly imbricate in the bud. Pet. 5 alternate with the sep.



unequal $\frac{2}{3}$ often clawed sometimes abortive folded together and convolute in the bud. Stam. 8-10 free inserted on the recept. yet almost perigynous. Ov. mostly 3-celled 3-lobed rarely 2-5-celled 2-5-lobed; ovules 1 in each cell; style 1, stigmas 3 or 2. Fr. not bursting, spongy dry or baccate; carp. mostly 3 attached to the base of the style, 1-celled 1-seeded. Seeds large without albumen. Embr. large with thick finally conferruminate cot. eared at their base and a short radicle next the hilum.—Smooth trailing pl. with showy fl. and a pungent cress-like flavour, of a juicy tender substance and quickly withering. L. alternate without stipules. Fl.-st. axillary solitary.

††1. *TROPÆOLUM*. Cal. 5-partite, lobes equal, the upper spurred. Pet. 5 unequal, the 3 lower smaller or abortive. Stam. 8 wholly distinct or free. Fr. spongy or corky of 3 (by abortion 1 or 2) indehiscent 1-seeded kidney-shaped carp. ribbed and rounded at the back.

1. *TROPÆOLUM* L.

††1. *T. MAJUS* L. *Nasturtium*. *Chagas*.

L. peltate orbicular slightly 5-7-9-lobed or angular, the nerves not produced beyond the edge; pet. 5 obtuse.—BM. t. 23; Brot. ii. 15; DC. i. 683; Spr. ii. 226.—Herb. ann. or per. Mad. reg. 1, 2; $\frac{5}{6}$. PS. reg. 2; r. Waste ground and bramble hedges amongst gardens and vineyards about Funchal, and quite naturalized in the north along the sea-coast road between Ponta Delgada and S. Vicente, and at the latter place. PS. in a thicket by the half-built church of N. S. de Graça. April-Sept. but at almost all seasons.—Whole pl. smooth juicy and succulent with long trailing fleshy brittle st. L. glaucescent, throwing off water like drops of quicksilver. Fl. large orange more or less approaching to red, streaked with deep blood-red, and so together with their shape suggesting to Linnæus the name of Trophy-flower.

Order XX. RUTACEÆ.

The Rue Family.

Fl. perfect regular. Cal. 3-5-partite persistent imbricate in the bud. Pet. 4 or 5 alternate distinct with short claws inserted at the base of a short *gynophore* or glandular stalk or cup-shaped disk which is either free or united to the cal., twisted or twisted-imbricate in the bud. Stam. as many or 2 or 3 times as many as the pet., inserted with them, mostly hypogynous, sometimes perigynous. Ov. either stalked or sessile on the longer or shorter *gynophore*, deeply 2-5-lobed, 2-3-5-celled; ovules 2-4

rarely fewer in each cell; styles as many as the lobes or cells from their lower angles, separate downwards, united upwards; stigma simple 3-5-angular. Fr. a capsule with carp. more or less united bursting inwardly. Seeds few single or in pairs in each carp. with or without albumen; radicle superior.—Mostly strong-smelling pl. sprinkled with pellucid resinous dots or glands. L. without stipules often pellucid-dotted and compound. Fl. corymbose y. or w.

1. RUTA. Cal. 4-, rarely 3- or 5-partite. Pet. as many, clawed concave or spoon-shaped. Stam. twice as many. Nectariferous pores or glands on the gynophore as many as the stam. Ov. with as many lobes or grooves as the sep.—Strong-smelling glaucous pl. Fl. y. the central one generally pentamerous.

1. RUTA L.

Rue.

1. R. BRACTEOSA DC. Rue. *Arruda*.

St. flexuose leafy; l. nearly or quite sessile 2-3-pinnate 2-3 times as long as broad, in outline rather short broadly oblong or oval, the middle pinnæ being the longest; lfts. narrow oblong or elliptic obtuse, wedgeshaped downwards; branches of cyme and pedic. quite smooth; br. leafy rather large cordate or ovate; pet. fringed contracting abruptly into the claw; lobes of caps. remote acuminate.—DC. i. 710; Spr. ii. 320; Presl 215; RIB. 8. t. 780. f. 1063; RFG. 5. t. 157. f. 4815; Koch 159; WB. i. 13, 14; Seub. Fl. Az. 47. *R. graveolens* Buch! 196. no. 346; Holl's List (not Linn.). *R. angustifolia* Lowe in Hook. J. of Bot. i. 42 (not Pers.).—Suffr. per. Mad. reg. 1, cc; PS. reg. 3, $\frac{5}{2}$; GD. reg. 2, c. Sunny hill-sides and rocky places near the sea or with a maritime exposure general in Madeira, as at the Brazen Head, the Piedade and other parts of Ponta S. Lourenço. In PS. up Pico de Baxo and P. de Conselho sparingly. March-June.—A low shr. about 1 ft. high, glaucous or greyish very strongly fetid and intensely bitter. L. crowded upwards, with narrow spatulate or cuneate distinct lfts.; lowest pair of pinnæ stipulary or set close to the st. Fl. rather conspicuous greenish-y. Br. large compared with those of *R. angustifolia* Pers., to which I formerly referred this pl.

Order XXI. PITTOSPORACEÆ.

The Pitch-seed Family.

Fl. perfect regular. Sep. 5 or 4 deciduous imbricate in bud. Pet. 5 or 4 slightly clawed and cohering by the claws imbricate.

cate in the bud. Stam. 5 distinct alternate. Ov. free 2-5-celled, cells with many ovules; style 1; stigmas 2-5. Fr. a capsule or berry, with 2-5 many-seeded cells and more or less complete dissepiments; dehiscence loculicidal. Seeds numerous, bathed in a viscid resinous juice. Embryo minute in a fleshy albumen; radicle long slender; cot. short indistinct.— Small mostly resinous tr. or shr. L. simple alternate coriaceous without stip. Fl. white or yellowish, rarely blue.

1. PITTOSPORUM. Sep. 5. Pet. 5, the claws cohering. Caps. 2-3-valved, 1-celled. Seeds enveloped in resinous gum.

1. PITTOSPORUM Sol.

1. P. CORIACEUM Ait. *Moquem*, or *Moquino*.

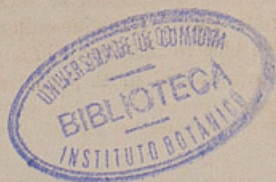
Arborescent; l. coriaceous obovate-oblong or spatulate mostly obtuse quite smooth and entire; fl. in terminal subumbellate racemes or racemose panicles; br. ped. pedic. and sep. rusty-pubescent.—Sol. ! in Hort. Kew. ed. 1. iii. 488; Vahl Symb. ii. 43; Andr. Bot. Rep. t. 151; Lodd. Bot. Cab. t. 569; DC. i. 346; Spr. i. 791; WB. ii. 139, 140.—Arb. per. Mad. reg. 2, 3; rrr. High rocks and remote inaccessible cliffs in ravines in the north; Seisal, 1855, Sr J. M. Moniz, growing in large quantity at a place called *As Fontes* and *Rib. das Fontes*, 1857, Mr. N. H. Mason, who has also observed a single tree in Rib. da Metade and two in Rib. Frio on almost inaccessible rocks. Young pl. in the grounds of Jas. Bean, Esq. at Camacha are said to have come from the Serra of Porto da Cruz: other full-grown trees are in the Quinta da Cova at the Mount. May, June.—A small tree from 15 to 25 ft. high with a straight trunk 4-6 in. diam. or as thick as the arm or thigh and a close or bushy somewhat pyramidal or oblong head of very dark gr. not shining foliage. Bark light ash-colour smooth and even. Wood white and close-grained but of no particular use. Branchlets proliferous in terminal bunches or umbels stiff and strong naked downwards. L. collected thickly towards the ends of the branches stiff and rigid, dark gr. above, pale beneath; when young light gr. and furry or velvety-pubescent on their upper surface only with the petioles, both becoming presently quite smooth and shining; the nerves indistinct or inconspicuous; the margins thin pellucid quite entire slightly revolute at least in the dried pl., the l. otherwise, especially while young, rather peculiarly flat, in shape oblong attenuated downwards into the short flattened petiole subacute whilst young, afterwards more or less obtuse and spatulate 2-4 in. long and 1-2 in. broad. L.-buds short ovate imbricated with dark brown scales which are persistent at the base of the shoots for a year or

two. Fl. in several aggregate somewhat branched or compound mostly drooping or nodding rac. or racemose panicles, from large terminal imbricated buds, bell-shaped elegant and highly fragrant like a mixture of Orange and Barberry fl., cream-coloured or yellowish-white, smaller but somewhat like a bunch of snowdrops. Racemes short sometimes simple but mostly branched at the base and with several terminal fl. or umbellate, often slightly drooping sometimes erect, 1-2 in. long. Pedic. $\frac{1}{4}$ in. long bracteate both at the base and often higher up. Br. oblong membranous; those of the lower fl. reflexed green and leafy deciduous; of the upper smaller narrower or linear-oblong and more permanent. Rachis of rac. pedic. br. and cal. all more or less clothed or fringed with close ferruginous velvety pubescence. Sep. ovate-oblong rather obtuse not quite half the length of the tube-like straight part of the campanulate cor. Pet. nearly $\frac{1}{2}$ in. long of a thickish leathery substance slightly pubescent outside, their claw or lower half straight, limb obtuse recurved or curling back. Stam. not reaching beyond the throat; fil. thick smooth white; anth. erect oblong. Ov. oblong pubescent, attenuated upwards into the thickish style which is scarcely longer than the stam. and crowned by the abrupt subcapitate gr. stigmas.—From Quinta da Cova trees transplanted from their native rocks.—Caps. (from Masson's orig. Mad. spec. in BH.) large, $\frac{1}{2}$ in. long and nearly as broad, roundish-ovate or oval, apiculate with the short hardened base of the style, rusty-brown, curiously vermiculato-verruculate or sinuato-rugulose, only 2-valved in the specimen; but this is frequently the case by abortion in other species.

The Portuguese name *Moquino* is doubtless a mistake or misnomer for *Mocaã* or *Mocano*, which at Seisal is properly the name of *Visnea Mocanera* L. fl.—a discovery due to the accurately discriminating eye of Sr J. M. Moniz, who in the summer of 1856 first found and distinguished the last-named pl. growing on its native rocks at Seisal, from *Catha* or *Celastrus casinoides* Herit., which it very much resembles: thus at once clearing away all confusion about two sorts of *Moquino* or *Mocano* in Madeira, of which I had some evidence, and making the interesting addition to the indigenous Madeiran Flora of another properly Canarian tree. On the other hand, it may be doubted whether *Pittosporum coriaceum* Ait. is really an indigenous Canarian pl., though described as such by Webb; M. Bourgeau, formerly Mr. Webb's Canarian collector, assuring me that he had not been able to discover it in any of the islands, though he had often searched in the exact spot in Teneriffe

indicated by Webb as that in which he had himself once only met with it. The description moreover in the *Phytographia Canariensis*, though in the main correct, is at variance in some few points with the true pl., and may have been therefore possibly drawn up from Madeiran specimens of the latter which were given to him by me in 1828, combined with something really different, though similar, gathered by himself afterwards in Teneriffe, perhaps in an imperfect state.

END OF PART I., THALAMIFLORÆ.



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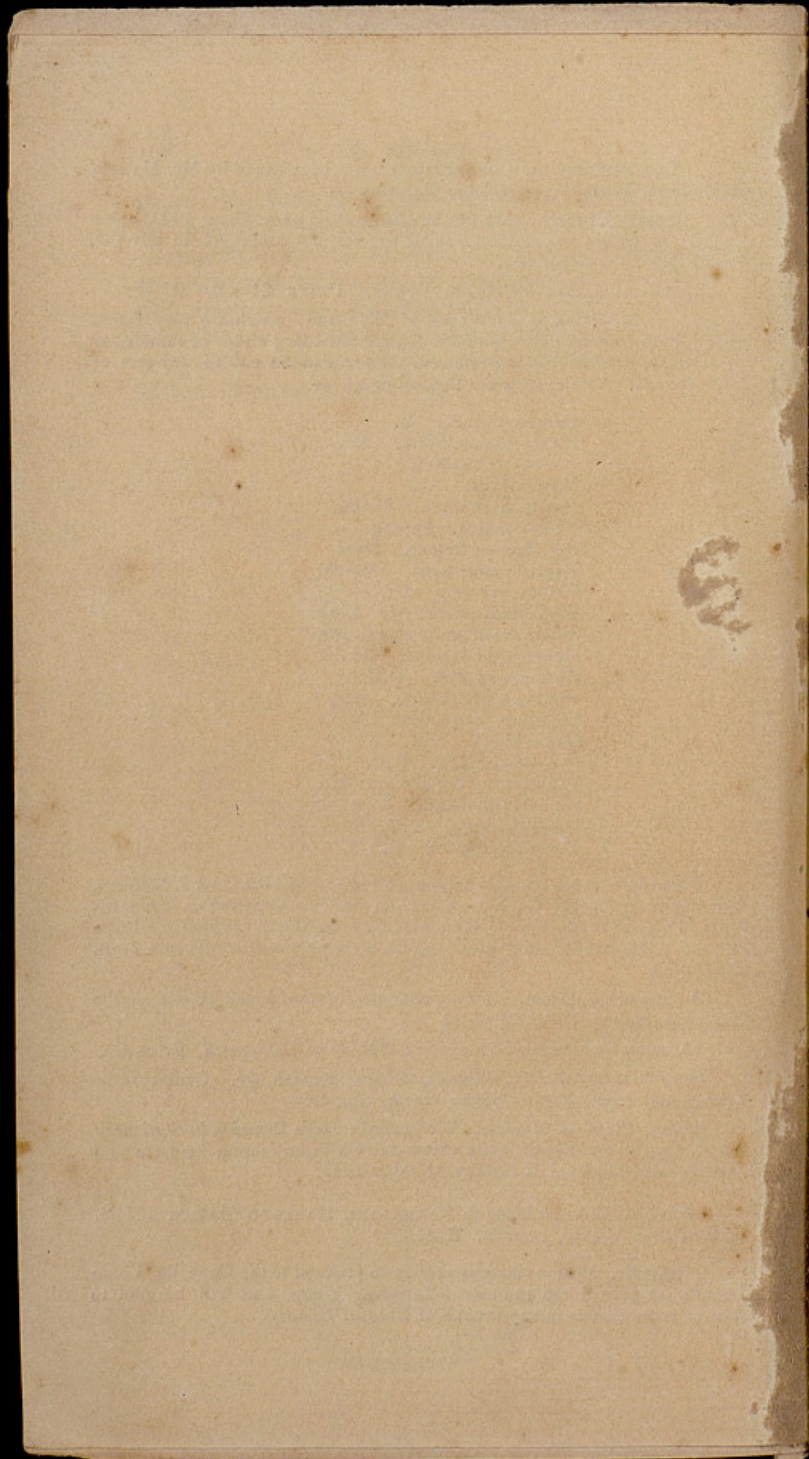
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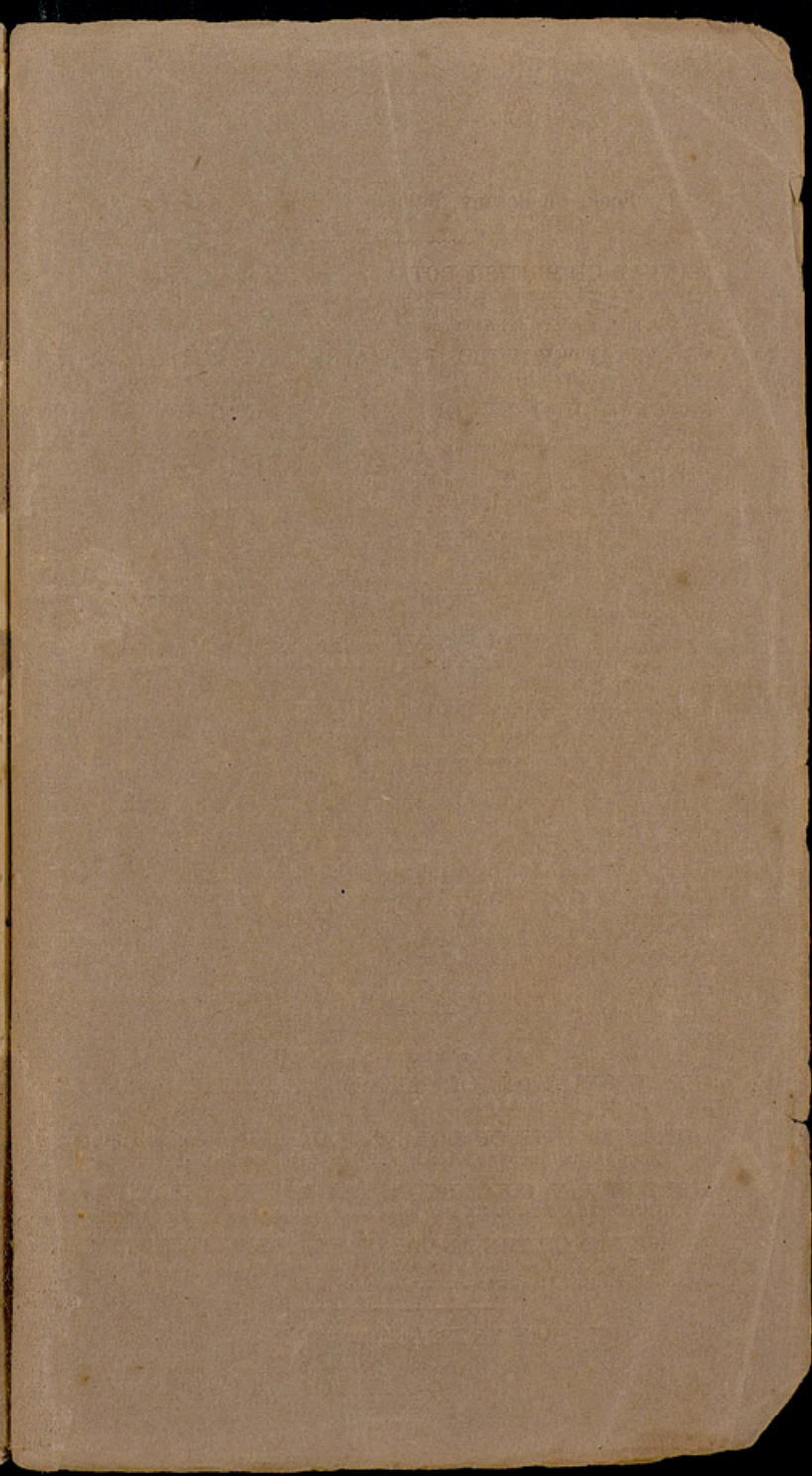
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