his inspection, who wrote me in reply that he could see the di-

vision into four pretty distinctly.

I have since observed the same peculiarity in the spores of Tyndaridea insignis, Hass., and Staurocarpus gracilis, Hass., and, as Mr. Berkeley remarks to me, it may prove more general than has hitherto been supposed. The separation of the contents of the sporangium into four portions does not take place in our three species until the fruit is nearly mature, and this soon afterwards becomes too opake for the character to be seen, so that it can be observed only in a particular state of the plant. The sporangium in all the species I have mentioned is more or less compressed

vertically.

Mesocarpus scalaris may occasionally be observed with some of its cells considerably inflated; and each of these enlarged cells is found to contain a globose echinulate body very much resembling the sporangium of some of the Desmidieae, and respecting the character of which it is difficult to determine: this body may first be seen as a very small spherical cell, apparently quite smooth, and containing an oily-looking fluid; it subsequently grows much larger and becomes furnished with several long curved spines: its texture seems to be corneous. It does not appear to be developed at the expense of the endochrome of the cell which contains it, but in some instances I have thought the quantity of endochrome rather larger than usual in the inflated cells. Can this curious body be an abnormal growth of the nucleus, or is it an internal parasite? Some of the cells of a Tyndaridea received from Mr. Ralfs, have within them a fusiform transversely ribbed body, which is probably of a similar character to the spherical ones found in the Mesocarpus.

> I am, Gentlemen, your very obedient servant, G. H. K. Thwaites.

XXXVI.—Botanical Notices from Spain. By Moritz Willkomm*.

[Continued from p. 196.]

No. XI. GRANADA, July 5, 1845.

Before my departure from Malaga I visited, in the beginning of last month, the southern portion of the Sierra de Mijas, lying near the village of Chuniana. Along the bank of the Guadalhorce occurred Scolymus maculatus, L., Achillea Ageratum, L., and various Carices in flower, and on boulders and sand above Chuniana and on the slopes of the mountain-chain blossomed Ruta montana, L., a small form of

^{*} Translated from the Botanische Zeitung, Nov. 21, 1845.

Jasione montana, L., various Rubiaceæ and several Centaureæ, especially C. Prolongi, Boiss., a pretty species with orange flowers tolerably frequent up to the summit. I also found on the acclivity and in the valleys of the mountain-chain Iberis umbellata, L., Helminthia echioides, L., Pulicaria odora, Rchb., Lagæcia cuminoides, L., Aphyllanthes monspeliensium, L., Coris monspeliensis, L., Genista hirsuta, Vahl., G. umbellata, L., G. ramosissima, L., Herniaria polygonoides, Cav., Xeranthemum erectum, Presl, plentiful; more rare occurred Chasmone argentea, E. Mey., Campanula Rapunculus, L., Erythræa major, L., Leuzea conifera, DC., and a Brassica. In fissures of the rock on the summit I gathered Anthyllis podocephala, Boiss., in plenty; and here grow also Umbilicus hispidus, DC., several species of Sedum, some grasses and Saxifraga globulifera, Desf., in large thick beds.

On the 7th of June I left Malaga to travel over the coast chain lying between this place and the boundaries of the province of Almeria, with a view to proceed thence toward the interior of Andalusia. The coast country appeared already very much parched, and in consequence nothing of any importance was collected as far as Velez-Malaga, excepting a rare plant, namely Withania frutescens, Boiss. (Atropa frut., L.), a rare shrub, often exceeding a man's height, of the growth of a Lycium, with white-gray virgate, hanging branches, obtuse-elliptic dark green leaves and pendent yellowgreen flowers. This shrub is found in the hedges around Velez-Malaga, as well as further towards the east around Motril, tolerably frequent. The town of Velez-Malaga lies two miles distant from the sea, near the left bank of the river of the same name, in the middle of a beautiful woody plain, in which sugar-canes are largely grown, and which is on three sides surrounded by a hilly table-land, rising higher and higher and wholly covered with vines. Behind this tableland rises the very steep and rocky Sierra Tejeda*, a dolomitic range more than 7000 feet in height, which divides the hilly land of the coast from the plain of Granada. The Sierra Tejeda is the highest portion of a long mountain-chain, which, under various names, stretches from W.N.W. toward the E.S.E., and fills up the space between the Guadalhorce and the Rio de Motril. The rocky mountain-range of Antequera, lying north of Malaga, forms one of the principal chains, but of no very important height, a branch of which stretches far to the north, which takes its name of Sierra de Loja from the town of Loja lying at its eastern foot, and is separated from the Sierra de Montefrio by the Jenil which here breaks through. The continuation of the chief mountain-chain, which connects the Sierra of Antequera with the Sierra Tejeda, is called Sierra de Alhama, and this is separated by a deep rocky cleft, the Puerto de Zafarráya, from the highest part of the Sierra Tejeda. The lower continuation of the Sierra Tejeda, running in a south-eastern direction, passes imperceptibly over into the many-branched Sierra of the Al-

^{*} The Sierra Tejeda has its name from Taxus baccata, in Spanish Tejo, which tree, according to tradition, once wholly covered it. It is still found in isolated specimens at the spring Fuente del Tejo, which is situated in the alpine region of this mountain-chain.

mijarras, which is separated by the deep valley of the Rio de Motril or Guadalfeo from the Sierra de Lugar lying opposite, to the east, and by the broad valley of the Rio Grande*, coming from the western and lowest portion of the Sierra Nevada, from the southern declivity of this mountain-range, with which the Sierra de las Almijarras is connected by a broad, barren and rocky table-land, which divides the

valley of the Rio Grande from the plain of Granada.

The best starting-point for a visit to the Sierra Tejeda is the village of Canillas de Aceytuno, on its southern acclivity, which is three leagues distant from Velez-Malaga. The path leads continually upwards through the numerous vine-hills, where I found in great plenty Tolpis barbata, L., a Jasione, Brassica batica, Boiss., Centaurea muricata, L., and Cleome violacea, L. In the highest part of the village, which is surrounded by many olives, lies a convent most romantically situated on a projecting rock of the Sierra, in whose clefts I found Galium pruinosum, Boiss., a beautiful species with coriaceous leaves, dark green on the upper side and covered with a white powder beneath, as well as Thymus longiflorus, Boiss., Th. hirtus, W. & erianthus, Boiss., Linaria origanifolia, DC., Sedum acre, L., S. amplexicaule, DC., and various grasses.

From hence I ascended to the Penon Grande, an immense wall of dolomitic rock, of great height, lying in the lower mountain region of the chain, and gathered on the boulders of rock Santolina squarrosa, W., which had just begun to flower, Passerina Tartonraira, L., a pretty Orchis, Anthyllis tejedensis, Boiss., Thymus longiflorus, Linaria satureioides, Boiss.; and near to the Penon Grande, in the clefts of which grow Barkhausia albida, Cass., a rock-plant common in all the mountains of Upper Andalusia, but never occurring in profusion,—a small yellow-flowered Linaria, which seems to me to be

L. Raveyi, Boiss., and is very rare.

The following day I ascended to the highest summit of the mountain-range, and was unfortunately compelled to turn back before I wished by the falling mists and rainy weather. At about a height of 5000 feet is an immense rocky projection, called the Cerro la Matanza, which parts two deep abysses. Here in fissures of the rock are found Arabis auriculata, Lam., Cerastium repens, L., Valeriana tuberosa, L., Melissa alpina, Bth., Taraxacum obovatum, T. lævigatum,

^{*} The Rio de Motril, or Guadalfeo, which is its true but less-known name (among the people it takes its name of Rio de Velezillo from the little town of Velez de Benandalla lying on it), is composed of the Rio Grande, issuing from the western part of the Sierra Nevada, but which is not considerable, and the full stream of the Rio de Orgiva, which forms the chief valley of the western Alpujarras, and brings down the whole water from the southern acclivity of the Sierra Nevada. The two rivers join below Lanjaron, whilst the Orgiva previously receives the river or streamlet of Lanjaron. The Rio de Orgiva is formed of the three chief portions of the western Alpujarras, the Barranco de Cadiar, Barranco de Trelevez and Barranco de Poqueira, and from that point where the Rio Poqueira joins it (a mile and a half above Orgiva), takes the name of Rio Grande. The Guadalfeo or Rio de Motril also often bears the same name.

Barkhausia albida, Xeranthemum erectum, Presl; and on loose strong soil on the steep acclivity, over which the road from Canillas to this rock ascends, Cistus monspeliensis, L., C. crispus, L., Helianthemum origanifolium, P., H. glaucum, P. var. suffruticosum, Boiss., H. hirtum, P., Passerina Tartonraira, Thymus longiflorus, Th. Mastichina, L., Anthyllis tejedensis, Chasmone argentea, Biscutella saxatilis, Boiss., and In the drift-sands of the lower alpine region, above the Cerro la Matanza, occurred rarely the Centaurea bombycina, Boiss., peculiar to this mountain-range, a small elegant species with procumbent stalks, pinnate, white downy leaves and violet flowers, which began to unfold its little heads of flowers; also a beautiful purple variety of Linaria tristis? in great abundance, and various grasses of the genera Festuca and Bromus, an erect form of Linaria origanifolia, DC., Galium verticillatum, Danth., Filago arvensis, L. B. Lagopus, DC., Bunium Macuca, Boiss., and along the rock thick beds of the shrubby Coronilla eriocarpa, Boiss., beginning to flower,—only a few plants had already developed their peculiar white woolly pods. From near the foot of the mountain-range up to the summit, the pretty Armeria filicaulis, Boiss., is tolerably plentiful, which in the upper alpine region forms small patches of turf with stems scarcely a finger high, whilst in the lower parts it reaches a height of from half a foot to a foot.

From the Fuente la Gitana, a spring lying about 500 feet above the Cerro la Matanza, the path winds zigzag upwards on the extraordinarily steep acclivity of the summit, covered almost wholly with loose masses of rock. Here blossom Alyssum alpestre, L., A. calycinum, L., A. montanum, L., a. atlanticum, Desf. and B. vulgare, Iberis nana, All., Draba hispanica, Boiss., Onosma echioides, L., Bunium Macuca, Boiss., Genista aspalathoides, DC., B. confertior, Boiss., Erodium trichomanæfolium, L'Hérit., Senecio minutus, DC., the rare Vella spinosa, Boiss., Erysimum canescens, Rth., and Ranunculus graminifolius β. luzulæfolius, Boiss., in great plenty, more rarely Callipeltis Cucullaria, DC., and Valerianella hamata, DC. On rocks on the summit I found Valeriana tuberosa, Saxifraga spathulata, Desf., and Draba hispanica, and moreover on the whole of the broad coomb Vella spinosa, Anthyllis erinacea, Ptilotrichum spinosum and Arenaria erinacea, Boiss., the last not yet in flower. The broad, gently rounded surface, of considerable extent, forming the summit, descends toward the north into a table-land filled with many hollows, in which there were still large fields of snow, and which bears the name of Los Ventisqueros. Here, at the edge of the melting snow, I again found Bulbocodium vernum, as well as on the whole of the northern acclivity of the summit the root leaves of the rare and remarkable Andryala Agardhii, Boiss., and under low shrubs of Berberis vulgaris β . australis, DC., Sisymbrium laxiflorum, Boiss., Fritillaria messanensis, Raf., Cerasus prostrata, DC., in flower, Centaurea montana, L., Pæonia coriacea, Boiss., with buds, and the remarkable white-blossomed Geum heterocarpum, Boiss. On sandy places flowered Androsace maxima, L., Veronica præcox, All., Myosotis stricta, Lk., Lithospermum incrassatum, Guss., Arabis auriculata, Lam., and other alpine plants, and in

clefts of sunny rocks a pretty Saxifraga in company with S. spathulata, Desf., and Brassica humilis, DC. On the way back, I moreover gathered on the southern edge of the summit Biscutella saxatilis, Boiss. var. lanata, a pretty little variety with narrow woolly silverywhite leaves, which is peculiar to these mountains, and at some hundred feet below the summit a small Cerastium, as well as the rare Arenaria modesta. Desf.

On the 11th of June I set out from Canillas for the little town of Nerja, lying on the coast, the road to which leads along the southwest foot of the Sierra Tejeda and in part through its lower portion, passing over a number of valleys and coombs. On moist, shady, rocky spots Anarrhinum bellidifolium, Desf., grows here luxuriantly in the valleys, constantly with blue flowers; on sunny rocks Leobordea lupinifolia, Boiss., and in the hedges Rubia peregrina, L., and other climbing plants. On shady rocks near the village of Salares I found Scrophularia peregrina, L., in small quantity, and on sunny hills between this place and Canillar de Albayda various Silenæ, Helianthemum lavandulæfolium? P., Ruta angustifolia, DC., and some specimens of a narrow-leaved Iris which is different from I. Xiphium. In the mountains between the villages of Competa and Frigiliana, Adenocarpus telonensis, Gay, and Sarothamnus affinis, Boiss., occur plentifully, as well as the splendid Orobanche fætida, Desf., on the roots of various species of Ononis. Lastly I gathered on stony and sunny spots at Frigiliana Cneorum tricoccum, L., and between here and Nerja a pretty white-flowered Teucrium with dense, ovate heads

of flowers and longish white woolly curved leaves.

The following day I travelled nine leagues further toward the east through the ramifications of the Sierra Tejeda and Sierra de las Almijarras, which here cover the whole coast, toward Motril, with the view of seeking Celastrus europæus, Boiss., which I soon found behind Nerja. It is a common shrub throughout the whole coast mountains between Nerja, Almunecar and Motril, but it had now neither flowers nor fruit. I have observed two varieties with respect to the form of the leaves and the colour of the branches, which occur promiscuously, namely one, foliis oblongo-lanceolatis subintegris, cortice ramulorum purpureo; and another, fol. subrhomboideis sinuato-dentatis, cortice griseo (the branch which is figured in the work of Boissier is of this latter variety). Besides the above, the following plants grow luxuriantly on these mountains: the Teucrium mentioned above, Artemisia Barrelieri, Boiss., Cneorum tricoccum, L., plentiful, on isolated spots Buxus balearica, L., which is in fruit, Beta maritima, L., and the splendid Nepeta tuberosa, Desf. Near Almunecar is a remarkable tract on the coast thickly covered with Aloë vulgaris, Lam., which was mostly out of flower. In the hedges of the Vega de Montril Elæagnus angustifolia is common, Withania frutescens is rare, and along the ditches everywhere flowers Senecio Doria, L. In the environs of Motril I now observed various sea plants in flower, especially Atriplex glauca, L., and the large bushes of Salsola oppositifolia, Desf.; and on the gypsum hills on the north of the town on the road toward Granada, a small Statice, together

with Frankenia corymbosa, Desf. In other respects the vegetation

had nothing peculiar.

From Motril I ascended on the 15th of June the Sierra de Lujar, lying some miles to the eastward, a dolomite range of mountains more than 6500 feet high according to the measurement of Clemente, which runs parallel with the Sierra Nevada, from which it is separated by the deep valley of the Rio de Orgiva. This range is joined on the east by the considerably lower and vine-clad Sierra de Contraviesa, which forms the southern boundary of the eastern Alpujarras, and is divided by the valley of the Rio de Adu from the Sierra de Gador situated in the province of Almeria. In the hilly country lying between Motril and the Sierra de Lujar, Thymus capitatus, Lk., Hoffm., occurred in flower, and around Motril it covers large tracts; I also gathered here in corn-fields Reseda lanceolata, Lag., and on shady walls near the little village of Lagua a species of Scrophularia resembling S. crithmifolia, Boiss., but differing from that, and probably a new species. The vegetation of the Sierra de Lujar is on the whole very similar to that of the Sierra Tejeda, but less rich in species. In the upper portion however occurred some interesting plants, which I had not before gathered, as Centaurea Boissieri, DC., Serratula pinnatifida, DC., Helianthemum canum, Dun., H. niloticum, P., Æthionema saxatile, R. Br., Thlaspi perfoliatum, L., and Arenaria grandiflora, L. Here grow, as in the Sierra Tejeda, Cerastium repens, Alyssum alpestre and montanum \(\beta \). vulgare, Saxifraga spathulata, Draba hispanica, Vella spinosa, Ptilotrichum spinosum, Anthyllis erinacea and others in great numbers. This mountain-range is in part wooded with Quercus Ilex, and from the foot to the summit occurs Aphyllanthes monspel., L., which is wanting on the Sierra Tejeda, as well as in some places Callipeltis Cucullaria, DC., in great abundance.

On the 16th of June I left Motril, and had the good fortune to find, upon limestone rocks in the neighbourhood of the little town of Velez de Benandalla, the hitherto little-known Lafuentea rotundifolia, Lag., a remarkable Personata, with very fragile thickly interlaced stalks, round fleshy curved leaves and dense naked heads of small vellowish white flowers resembling those of a Crucianella. In Velez I crossed the Guadalfeo, which was extremely swollen by the snowwater, in order to go a roundabout way through the Sierra de las Almijarras to Granada. This wild romantic limestone chain, which is partly wooded with Pinus Pinea, P. halepensis and P. Pinaster, as well as by Quercus Ilex and Qu. lusitanica a. faginea, rises scarcely to 5000 feet, and forms a half circle open toward the east, or more properly takes a horse-shoe shape. The centre of this extensive chain, west of the village of Guajar Alto, passes imperceptibly over to the Sierra Tejeda, and from hence a lofty southern mountain-chain stretches along the coast as far as the Guadalfeo, whilst a second lower chain goes parallel with the former and the western part of the Sierra Nevada, terminating in the country of Lanjaron, and forming the rocky wall on the right of the Rio Grande. The two chains are separated by a broad valley, which is watered by a rivulet and in part filled with hills: in this valley lie three villages, Guajar Fondo,

Guajar Faraguit, and Guajar Alto. From the valley of the Guadalfeo the road ascends to the Sierra de las Almijarras over the Cuesta de Lacebada, a steep rocky slope, on which I found among other plants Thymus longiflorus, Boiss., Allium Ampeloprasum, L., and Haplophyllum linifolium? Juss. In the valley dividing the two mountain-chains, which narrows into a deep rocky defile between the villages of Guajar Faraguit and Guajar Alto, occurred in tolerable plenty upon the drift-sand a pretty Helianthemum and a viscous Silene, and also among a variegated and thick shrubby vegetation Rhamnus velutinus, Boiss., and near the village of Guajar Alto the splendid Salvia Candelabrum, Boiss., in full flower, although very rare. It forms shrubs from four to six feet high. Above the village of Guajar Alto grew luxuriantly the beautiful Ononis speciosa, Lag., in the greatest plenty; and in the broad rocky mountain-chain through which my path from hence led me, occurred Brassica humilis, DC., Dianthus brachyanthus, Boiss., Anthyllis tejedensis, Boiss., the very rare Reseda Gayana, Boiss., Campanula mollis, L., C. Löfflingii, Bert., Helianthemum atriplicifolium, W., Cistus ladaniferus, L. &c. On the hilly, stony and barren high table-land between the Sierra de las Almijarras, the Sierra Nevada and the plain of Granada, Cleonia lusitanica, L., blossomed in immense quantities, covering large tracts of ground, and in the corn-fields Turgenia latifolia, DC., in company with Ræmeria hybrida, DC., Saponaria Vaccaria, L., Agrostemma Githago, L., and other plants.

The environs of Granada were still clothed in the most luxuriant green of spring and formed a magical contrast with the Sierra Nevada, which was still deeply covered with snow. Whilst on the coast the harvest had already begun, the young corn was here still green, and the hills, which in the summer are arid and brown, now appeared clothed with Thymus tenuiflorus, Boiss., Th. Mastichina, L., and other aromatic plants in bloom, diffusing a balsamic perfume far around. At present, although little more than a fortnight later, the Veya and the whole environs have already another appearance, and the beautiful green is limited to a few moist tracts. The Sierra Nevada on the other hand is still in its winter's garb, and it is as yet impossible to ascend to its higher part, for in the memory of man such a great fall of snow has never been known as in the past winter; Granada even and Veya were buried two feet deep in the snow!

The grassy declivities of the valley of the Darro are clothed at this season with a variegated carpet of flowers. Helianthemum marifolium, P., H. guttatum, P., and other species of this numerous genus; a pretty white Armeria, common throughout the hilly land and the lower part of the Sierra Nevada, as well as in the mountains east of the town; a Dianthus, various Linariæ, Antirrhinum molle, L., and others occur in the same localities in plenty, whilst on the banks of shady ditches, especially along the aqueduct of the Alhambra (rich in plants), flower Colutea media, L., Ononis speciosa, Lag., Tamus communis, L., Agrimonia Eupatorium, L., Lythrum Salicaria, L., Lapsana communis, L., Iris fætidissima, L., Medicago Helix, L., Med. lupulina var. Willdenovii, Mérat, Spartium junceum, and many other plants.

On the borders of the corn-fields upon the barren hills around Granada I observed the very rare Cirsium echinatum, DC., and also Alchemilla Aphanes, L., Minuartia montana, Löffl., and other plants. From the 24th to the 27th of June I stayed on the Sierra Nevada, and ascended on the 25th to a height of 8000 feet, but could not proceed further on account of the immense quantity of snow. Here, on the edge of the melting snow, above the limestone rocks of the Dornajo, I gathered Pyrethrum radicans, Lag., as well as Ranunculus acetosellæfolius, Boiss., in great plenty, which I had never before seen growing at so low an altitude. On the alpine meadows known by the name of Prado de las Yeguas, which are situated above the Cortijo de San Geronimo on the right acclivity of the valley of the Monachil, flowered Ranunculus charophyllus, L., Silene conica, L., Papaver Argemone, L., Cerastium ramosissimum, Boiss., Tetragonolobus siliquosus, DC., a Myosotis, various grasses, and in its highest part Doronicum scorpioides, W. On the western acclivity of the Dornajo, which I then ascended for the fourth time, I gathered, amongst other plants, the pretty Helianthemum piliferum, Boiss.; also on the south upon boulders Convolvulus nitidus, Boiss., which was just beginning to flower, and on shady rocks of the eastern acclivity Sisymbrium laxiflorum, Boiss., Linaria verticillata, Boiss., Bunium Macuca, Boiss., Butinia bunioides, Boiss., Saxifraga spathulata, Desf., Draba hispanica, Boiss. On the way down from the Dornajo into the valley of the Jenil over the woody Dehesa de la Vibora I found Passerina elliptica, Boiss., which occurs very sparingly on limestone rocks below the Dornajo, and in the copse-wood the pretty Anthericum bæticum, Boiss., also Ononis arragonensis, Asso., Sarothamnus scoparius, Wimm., and Pæonia lobata, Desf., Adenocarpus decorticans, Boiss., was still in flower; and lastly I found on my return to Granada between the villages of Guejar Sierra and Pinos del Jenil on sandy soil Linaria Salzmanni, Boiss., a pretty species with purple flowers.

[To be continued.]

PROCEEDINGS OF LEARNED SOCIETIES.

LINNÆAN SOCIETY.

June 17, 1845.—Edward Forster, Esq., V.P., in the Chair.

Read "Characters of undescribed species of British Chalcidites." By Francis Walker, Esq., F.L.S. &c.

The following are the characters of the species described:-

1. Pteromalus acrotatus Q, viridis, abdomine cupreo, antennis piceis, pedibus fulvis; coxis femoribusque basi viridibus, alis fuscis.—Long. corp. lin. 1; alar. lin. 1½.

Hab. in Scotiâ, prope Lanark, mense Julio.

2. Pteromalus sunides δ et ♀, viridis, abdomine æneo; maris fulvo-maculato, antennis nigris, pedibus maris flavis fæminæ fulvis; femoribus fusco-variis, alis limpidis.—Long. corp. lin. 1¾; alar. lin. 1¾—2.

Hab. in Scotiâ, prope Edinam, Dr. Greville.



Willkomm, Moritz. 1846. "XXXVI.—Botanical notices from Spain." *The Annals and magazine of natural history; zoology, botany, and geology* 17, 263–270. https://doi.org/10.1080/037454809495604.

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