Foss. du Bassin Tert. de Vienne.' Both are marginoporous, and both without pores on the surface (Carpenter, Quart. Geol. Journ. vi. p. 31); while the concentric circles represented in D'Orbigny's *Cyclolina cretacea* (*loc. cit.*) find their parallel also in Lamarck's *Orbitolites concava.* Carrying out this reasoning also, we find it stated by Dr. Carpenter (*loc. cit.*) respecting the Australian species of Quoy and Gaimard and *Orbitolites complanata,* that they "agree closely in every particular save the form of the superficial cells;" and as the former and *Orbitolites Malabarica* will be seen to be still more intimately allied, it also follows, that all these species should come under the genus *Orbitolites* of Lamarck. The chambers I apprehend are arranged spirally in all, though the superficial lines only appear to be so in *O. Malabarica.*

It therefore seems to me (though of course I make the remark with much deference) that D'Orbigny's genus *Cyclolina* should be a species in Lamarck's *Orbitolites;* then the latter genus would be characterized by a thin amorphous incrustation on the surface through which the chambers are more or less visible with a magnifying glass; and in D'Orbigny's *Orbitolina,* the incrustation would be characterized by its cellular structure, as in *Orbitoides,* rendering the species or varieties more or less convex on one or both sides. In this case the species in the "Descriptions, &c." to which I have alluded, called respectively *Cyclolina* and *Orbitolites,* should be called *Orbitolites* and *Orbitolina.*

Bombay, February 26, 1853.

EXPLANATION OF PLATE XVI. B.

Fig. 1. *Orbitolites Malabarica,* natural size.
Fig. 2. Portion of the centre magnified, showing the spiral arrangement of the chambers.
Fig. 3. Portion of the margin magnified, showing the marginal apertures.
Fig. 4. Portion of the internal, or opposite, side of the rows of chambers, showing similar apertures;—also the large oblong or ovoid chambers of the surface.

XXXIX.—*Remarks upon British Plants.*

By Charles C. Babington, M.A., F.R.S., F.L.S. &c.*

[Concluded from p. 368.]

6. Myosotis alpestris.

Having had occasion to refer to the *Myosotis alpestris,* it may be allowed, and indeed seems desirable, to take this opportunity of

* Read before the Botanical Society of Edinburgh, April 14, 1853.

correcting an error into which I have fallen concerning it. A careful examination of the materials in my possession, combined with a belief that good botanists who were acquainted with *M. suaveolens* and *M. sylvatica* could scarcely fail to see their distinctness, caused me to express an opinion that the *M. alpestris* of Schmidt, which so many authors of high repute have combined with *M. sylvatica*, was probably a mountain form of it, and to be specifically separated from *M. suaveolens* (Kit.). In that view I was confirmed by specimens of *M. montana* of Besser, which is usually placed under *M. alpestris*, being apparently a form of *M. sylvatica*, with which Besser himself (Prim. Fl. Gal. Aust. i. 142) identifies it; and also examples of *M. lithospermifolia* (which is usually considered as identical with *M. alpestris*), gathered in Lucania and sent to me under that name by Prof. Gasparrini, proving to be *M. sylvatica*. Having now acquired much fuller information upon the subject, I find that *M. alpestris* of Schmidt and *M. suaveolens* of Kitabel must be considered as identical; and the mistake of separating them may be perhaps excused by the difficulties caused by wrongly named specimens and the insufficient descriptions of the older botanists. Tausch has done his best to separate them (Bercht. Fl. Böhm. ii. pt. 2. 123 & 124), but, notwithstanding his long descriptions, has failed to point out any available differences; indeed he has quite overlooked the attenuated base of the calyx and the absence of a keel from the fruit; although these are apparently the points upon which the most confidence is to be placed as distinguishing *M. alpestris* from *M. sylvatica*. It should be added, that for the latter character we are indebted to Dr. Godron (Fl. Lorr. ii. 129; Fl. Fr. ii. 533).

7. Thymus Serpyllum.

Fries, in the year 1814, in the 1st edition of his 'Novitiæ' (p. 35) gave a short but very imperfect character of a new plant named *Thymus Chamædrys*, reserving, as he states, the description of it for a future opportunity. This opportunity does not seem to have occurred until 1828, when, in the second edition of the same work (p. 195), he treated at considerable length upon the *T. Serpyllum* of Linnæus and his own *T. Chamædrys*. Since the latter period these plants have been a subject concerning which botanists have greatly differed in opinion, most writers considering that they were only varieties of one species, but a few following the example of Fries and distinguishing them. This diversity of view has probably originated from that majority not being acquainted with the living plants: the attainment of such a knowledge has been the cause of my own change of view. These plants well illustrate the difficulty which those solely, or

chiefly, acquainted with allied species as preserved in an herbarium may have in appreciating their real distinctness. In this instance the technical characters to be found in books are scarcely sufficient for the separation of the plants, even when specimens of each are before the student; for it is found that the differences in the shape of the leaves, calyx, corolla, &c., and the distribution of the pubescence, are not so constant as to allow of certain dependence being placed upon them. It is to the habit of the plants that we must turn for a satisfactory distinction, and unfortunately that is seldom to be well seen in a dried specimen, although most marked in the growing plant. In *Thymus Serpyllum* there is a manifest difference between the flowering shoot and that which is intended to extend the plant. Quite prostrate and rooting shoots are produced each year, which grow from the end of the shoots of the preceding year, and do not flower: also there spring from the other axils of those old prostrate parts of the plant short erect or ascending shoots, which form a linear series, and of which each terminates in a capitate spike consisting of a very few whorls, and which die back to their base after the seed has fallen. The growing shoot is thus seen to be perennial and ultimately becomes woody, but the flowering shoot is annual. In very vigorous plants the growing shoot is sometimes seen to branch in a pinnate manner, and the flowering shoot similarly to produce short branches terminating in small capitate spikes, but their character as essentially growing and perennial, and flowering and annual shoots, is not altered by their luxuriance. This mode of growth causes the plant (especially if kept clear from weeds, as is the case in a garden) to present the appearance of a cushion of flowers surrounded by a prostrate fringe of leafy shoots.

In *T. Chamædrys* there is no such manifest separation into flowering and growing shoots, but they all are alike in their origin and appearance. The terminal bud often produces the strongest shoot, which itself ends in flowers, but has usually barren branches from some of its axils. It thus differs most materially from the *T. Serpyllum*, in which the terminal bud always produces a flowerless shoot to form the foundation for the flowering shoots of the succeeding year, and to terminate in a similar leaf-bud to that from which it sprung. A tuft of *T. Chamædrys* therefore has none of the beautiful regularity possessed by one of *T. Serpyllum*, but presents, from the centre to the circumference, a dense irregular mass of leafy shoots and flowers intermixed. In the autumn or winter these leafy shoots fall towards the ground, and such of them as become buried produce a few roots, increase in a cæspitose manner in the succeeding year and throw up intermixed leafy and flowering shoots. The

flowering shoots do not usually die back to their base, as in *T. Serpyllum*, but only as far as the first axil in which a leaf-branch or its rudiment has been formed.

If these differences in the mode of growth be attended to, there can be no difficulty in distinguishing the plants, and, as I think, in being convinced of their specific distinctness. Unfortunately, however, it often happens that the plants grow so closely packed with other plants, that they have not room in which to show their true habit, and it is then not unfrequently rather difficult for an inexperienced person to determine which of the species is before him. This cannot take from the value of the difference of growth, but only adds to the difficulty of the botanist.

It has been already stated that the whorls of the flowers of *T. Serpyllum* are often so closely packed as to look like a short glomerule or head, although generally the one or two lowest placed whorls are at rather a greater distance apart than the rest. In *T. Chamædrys* the head is oblong, being formed of very much more numerous whorls, its lower part is usually much more lax, and there are several, often many, distant whorls below it.

The plants may be characterized as follows:—

1. *T. Serpyllum* (Linn.); *stems prostrate creeping*, leaves oblong or lanceolate narrowed into the flat fringed stalk, floral leaves similar, *flowering shoots ascending*, *flowers capitate*, upper lip of the calyx with three short triangular teeth, lower lip of two subulate teeth, *upper lip of the corolla oblong*.

T. Serpyllum, *Linn. Fl. Suec.* ed. 2. 208, et *Sp. Pl.* ed. 1. 590; *Sven. Bot.* t. 320; *Wahl. Fl. Suec.* 377 (excl. var. β.); *Reich. Fl. excurs.* 312, et *Fl. exsic.* no. 187!; *Fries, Nov. Fl. Suec.* ed. 2. 195, et *Herb. Norm.* v. 7!, et *Summa*, 197; *Eng. Bot.* t. 1514; *Curt. Fl. Lond.* i. 120; *Gren. et Godr. Fl. Fr.* ii. 657; *Hook. and Arn. Br. Fl.* 311; *Guss. Syn. Fl. Sic.* ii. 95.

T. angustifolius, *Pers. Syn.* ii. 130; *Reich. Fl. excurs.* 312, et *Fl. exsic.* no. 186!; *Wimm. et Grab. Fl. Siles.* ii. 165; *Ledeb. Fl. Alt.* ii. 390; *Spr. Syst. Veg.* ii. 696.

T. Serpyllum γ. angustifolius, *Koch, Syn.* ed. 2. 641.

Stem woody, much branched, prostrate, rooting, producing in its second year the erect annual usually short flowering shoots from the lower joinings, and a prostrate flowerless woody and persistent shoot resembling itself from the terminal or a few other buds at its end. Leaves narrowed in their lower half which together with the petiole is often fringed, rather conspicuously nerved beneath, often narrow. Whorls of flowers collected into a small terminal head, the lower ones being usually only slightly separated from the others. Upper lip of the corolla

quadrangularly-oblong, conspicuously notched. Nuts globose, mealy, with a basal scar.

This plant varies considerably in appearance owing to the breadth of its leaves being inconstant, and individuals of it differing greatly in hairiness, but it is believed that the character derived from its habit may be depended upon. The nuts afford an apparently constant although minute distinction. The form of the upper lip of the corolla is stated by Bentham to vary, but it has proved constant as far as my observations have extended.

It appears to be quite certain that this is the true and exclusive *T. Serpyllum* of the 'Fl. Suec.' and the 1st edition of the 'Sp. Pl.' of Linnæus. His words in both of those works are—"T. floribus capitatis, caulibus repentibus, foliis planis obtusis basi ciliatis." In the 2nd edition of the 'Sp. Pl.' he altered the word "repentibus" into "decumbentibus," intending perhaps thereby to include the plant now called *T. Chamædrys*, in which the stems cannot well be said to creep, although they do ultimately become decumbent. In his herbarium there are several specimens upon papers pinned together; they consist of examples of the plants called *T. Serpyllum*, *T. angustifolius* and *T. Chamædrys*, but that which is marked with pencil and also with ink as intended to correspond with the 'Sp. Pl.' ed. 1. is the *T. angustifolius* of Persoon, and therefore the plant described above as the true *T. Serpyllum*. The above synonymy also shows that this is the plant called *T. Serpyllum* by the best writers. Bentham (Lab. 343, 344, and in DeCand. Prod. xii. 201) combines the *T. Serpyllum* and *T. Chamædrys* of Fries to form his *T. Serpyllum*, but doubtfully separates from it the *T. angustifolius* of Persoon. It will have been already seen that I believe him to be in error (resulting from a neglect by most authors of the habit of the plants); for although he has rightly separated the *T. angustifolius* from *T. Chamædrys*, he has erroneously distinguished it from *T. Serpyllum*, and also incorrectly joined the *T. Chamædrys* with the latter.

This plant inhabits heaths and dry barren ground, flowering throughout the summer. I have specimens from Thetford, Suffolk; Gogmagog Hills, Cambridgeshire; Isle of Wight; Bath; West Cornwall; Barmouth; Snowdon; Orkney Isles; S. Isles of Arran, Co. Galway; and the coast of the county of Antrim.

2. *T. Chamædrys* (Fries); *stems similar* diffuse ascending 2–4-fariously hairy, leaves broadly ovate with a flat winged stalk, floral leaves similar, flowers whorled and capitate, upper lip of the calyx with three triangular teeth, lower lip of two subulate teeth, *upper lip of the corolla semicircular.*

T. Chamædrys, *Fries, Nov.* ed. 1. 35, ed. 2. 197, et *Summa*, 197, et

Herb. Norm. v. 6 ! ; *Reich. Fl. excurs.* 312, et *Fl. exsic.* no. 188 et 189 ! ; *Gren. et Godr. Fl. Fr.* ii. 658.

T. Serpyllum, *Wimm. et Grab. Fl. Siles.* ii. 163 ; *Ledeb. Fl. Alt.* ii. 391 ; *Spreng. Syst. Veg.* ii. 696 ; *Bieberst. Fl. Tauro-Cauc.* iii. 402 (non *Linn.*).

Stems woody, slightly and irregularly branched, procumbent or ascending, not creeping but rather cæspitose, producing leafy stems and flowering shoots irregularly. Leaves ovate, usually broad (and some rounded) below, or very shortly narrowed into the petiole which is fringed, less prominently nerved than those of *T. Serpyllum*. The lower whorls of flowers distant, the uppermost usually forming a large oblong head. The upper lip of the corolla is semicircular and appearing to be quite entire, but has usually a deep notch in its centre, having the sides so placed as to touch each other and become unapparent except upon minute inspection. Nuts roundish, a little compressed, with a basal apiculus, reddish.

The plant now under consideration varies even more than *T. Serpyllum*, but the variations are unfrequent. In its usual state the stems ascend with a curve so as to present the top of the spike to the eye. This spike, of which the joints are shorter than the length of each of the cymes forming the false whorl, is generally about an inch in length (rather more than less), and has below it from one to four distant whorls of flowers. The extreme variation from this type is seen in a plant called *T. sylvestris* by Schreber as we learn from Reichenbach, which was gathered by Mr. Borrer and myself in a damp hollow on Box Hill. In this curious plant the stems are long filiform and nearly simple, with very many distant whorls of flowers and no trace of a terminal spike or head. Its leaves are all large and very broad (the length being to the breadth relatively as three to two in many instances), and their presence at the end of the stems where they quite hid the young flowers gave a very peculiar appearance to the plant. The shape of the leaves, the structure of the flowers, and the form of the seeds, show that this singular plant is a state of *T. Chamædrys*.

In this species also the form of the upper lip of the corolla and that of the nuts has proved constant in every specimen that I have examined, although the notch in the former is sometimes found to be open. The general shape also of the leaves is probably to be trusted, viz. that their broadest point is above the middle in *T. Chamædrys* and below that point in *T. Serpyllum*. It does not appear to me that the same confidence can be placed in the distribution of the hairs upon the stem ; for I find that although the stem of *T. Serpyllum* is often uniformly hairy, its hairs are also not unfrequently arranged in two or four rows, the

intermediate spaces being glabrous. It was this fact which led me erroneously to suppose that the common British plant ought to be considered as the *T. Chamædrys* of Fries, and caused me to so name it in the 3rd edition of my 'Manual.' In the 'Fl. Silesiæ' (p. 167) attention is justly directed to the fact that in *T. Serpyllum* the elongated forms have the more slender shoots, whilst in *T. Chamædrys* the more extended the shoots the thicker they become.

I possess *T. Chamædrys* from the Devil's Ditch in Cambridgeshire; Box Hill, Surrey (*T. sylvestris*); and How Capel, Herefordshire. It flowers throughout the summer, and, I think, likes rather a damper and more shaded situation than its ally.

In all probability these two species will be found throughout the kingdom, but it is to be desired that botanists should carefully note their presence in all parts of the country in order that their true distribution may be ascertained.

XL.—*Further Observations on the Animal of* Diplommatina (*including a Note by* Capt. T. Hutton). By W. H. Benson, Esq.

Dr. J. E. Gray, and after his example Dr. L. Pfeiffer, being at issue with Capt. Hutton and myself on the subject of referring the genus *Diplommatina* to the operculated or inoperculated pulmoniferous Testacea, the holders of the latter opinion being moreover those who have studied the animal in a living state on its native mountains, and who ground their persuasion on the view of many hundred specimens, while the maintainers of the contrary part can only refer to two or three Museum* specimens which must have passed through several hands before submission to scientific examination, anything which can tend to throw light on the question will be acceptable to conchologists.

The occurrence of a single operculum in a living specimen, or in one conveyed from the Himalaya to England, secured from all risk of being tampered with, either ignorantly or designedly, would be sufficient to settle the matter in the affirmative, even although thousands should be found destitute of this accessory piece; but I cannot allow that such a certainty has yet been arrived at as to induce us to reject the accumulated evidence of opposing observations. No apology will be necessary for the publication

* Dr. Pfeiffer's note, 'Monograph,' p. 121, "Cl. Benson operculum non observavit, tamen in copiosis Musæi Britannici speciminibus adest, et ideo genus familiæ Carychiadarum adnumerat," leads to an erroneous conclusion. Dr. Gray has assured me that there are only two or three opercula in the British Museum.