

given. But even more perplexing is the problem presented by the survival of maritime plants upon some of the highest and bleakest mountain-tops. In such portions the *Cochlearia* or scurvy grass, the *Armeria* or sea pink, with *Silene maritima* and *Plantago maritima*, are found abundantly. They are poor dwarfed forms, it is true, when compared with their contemporaries on the coast, so that the latter habitat is evidently more congenial to them than the bleak uplands. Descendants of the old arctic flora once indigenous in this country down to the sea-level, as it is in northern Scandinavia at the present day, how have they come to be left on our mountain tops? Were they maritime plants originally, and have they been carried up by the gradual elevation of the land? This would involve a former submergence of the country to a depth of at least 4,000 ft.—a limit much beyond that suggested by other geological evidence. Or did they form part of the generally distributed flora whereof some species keeping to the shores have been able amid bare rocks and salt spray to maintain themselves there ever since, while farther inland they have succumbed to the march of the invading Germanic flora, and have been allowed to struggle on in dwarfed and stunted forms only on the bare chill mountain tops, whither the invaders did not care to pursue them?

Some light might possibly be cast on these questions by an examination of the contents of our older peat-mosses. There is reason to suppose that some of these mosses may date back into Glacial times. It would be interesting to discover whether among the plants whose remains went to form the peat any northern species could be detected no longer living in this country, even in our Alpine zone. This line of inquiry is now being prosecuted in Scandinavia, and it is suggested to the botanists of Scotland as a fit subject for their attention.

The more purely geological work by the brethren of the hammer during this excursion, whether when with the botanists among the Grampians or afterwards by themselves along the shore between Dunnottar and Aberdeen, is hardly appropriate in a communication to the Botanical Society.

ON THE FERTILISATION OF CERTAIN LABIATÆ

IN the early part of April of the present year I had an opportunity of watching somewhat closely the mode of fertilisation of some species of Labiatae, on which some notes may be interesting. The species observed were the three most abundant of the early flowering representatives of the order, *Lamium album*, *L. purpureum*, and *Nepeta glechoma*; the post of observation a bank covered by the three species growing completely intermixed, just outside a cottage-garden where were several hives of bees; the time occupied, several hours on three sunny mornings. The point which interested me most was the constancy with which the same species of insect confined its visits to the same species of flower, notwithstanding the close proximity in which the three were growing, this being perfectly in harmony with Mr. Traherne Moggridge's observations of a similar character respecting the visits of insects to fumitories and other flowers.

My conclusion is not based merely on actually noticing the visits of insects, but on the microscopic examination of the pollen collected on the captured insects. For this purpose the pollen-grains of the three species named offer unusual facilities, those of *Lamium album* being yellow, of *L. purpureum* red, and of *Nepeta glechoma* white.

In *Lamium album* the length of the style is such as to bring the stigmatic surface exactly on a level with the anthers of the shorter pair of stamens, as represented in Fig. 1; one branch of the style is nearly straight and is

hidden among the anthers, the other projects at right angles into the opening to the tube of the corolla, so that it must necessarily be struck by any insect entering the flower. The only visitors to the flower seen were two species of humble-bee, *Bombus pratorum** (female) and *Anthophora retusa* (female), the former in large numbers, the latter much more rarely. From the position of the stigmatic surface, both it and the stamens must be struck by about the centre of the head of the bee; and it was on this part that the greater number of pollen-grains were found, and proved to belong exclusively to this species. In no single instance was a hive-bee seen to visit the flowers; Müller states that they obtain the honey from this species entirely by sucking it through holes bitten in the corolla by *Bombus terrestris*.

In *Lamium purpureum* the difference in length between the two pairs of stamens is less considerable and the anthers are consequently closer together, both branches of the style being bent forwards into the mouth of the corolla, as shown in Fig. 2. Although hive-bees were constantly hovering over the flowers, in no single instance did I see either them or the humble-bees visit this species; the only insect observed to settle on it being a butterfly (*Vanessa urticae*) twice.

The position of the parts in *Nepeta glechoma* is very different. The two pairs of anthers are at a considerable distance from one another (Fig. 3), and the length of



FIG. 1. —*Lamium album*; stamens, style, and stigma. FIG. 2.—*Lamium purpureum*; stamens, style, and stigma. FIG. 3.—*Nepeta glechoma*; stamens, style, and stigma.

the style is such as to bring the stigmatic surface considerably beyond the longest pair, and projecting beyond the mouth of the much smaller corolla. The flowers were profusely visited by the hive-bees from the other side of the hedge. On no single occasion did I see the *Bombus pratorum*, of which such numbers were flying about, even attempt to enter the flower, and the smaller species, *Anthophora retusa*, only twice; and on each of these occasions she immediately came out again and began industriously to wipe the pollen off her head with her fore-legs, as if she disliked it. Owing to the much smaller size of the flower, and the greater length of the style, the part of the body of the bee touched by the stigma is very different to that in the *Lamium album*, namely, the back of the neck or even of the thorax. Hence even if the insect should visit the two species on the same journey—which, I should infer, is not usual—the pollen of one species would not easily be wiped off on to the stigma of the other. I did not observe any plants of the ground-ivy with the "female" flowers described by

* In this and all other instances I am indebted for the determination of the insects to the kindness of my friend Mr. Edward Newman.

Müller, with which one is familiar in the case of the wild thyme and other Labiatae; but a large number of flowers in this particular locality had all the anthers bitten off, a depredation which I attributed to the hive-bees, inasmuch as the same was the case in other habitats near hives, but not in those at a greater distance from cottage-gardens. The only other flowers growing on or near the same bank which I observed the bees to visit were the dandelion several times, and *Veronica buxbaumii* once.

At this early period of the year the following species of insects were captured on the dandelion; those marked with an * are not in Müller's list of ninety-three kinds which visit this plant, unless under synonyms which I fail to recognise.—Hymenoptera, *Apis mellifica*, **Halictus lugubris*, **Andrena nana*, *A. varians*, and *A. nitida*; Diptera, **Syrphus clypeata* and *Eristalis arbustorum*; Coleoptera, **Apion apicans*.

The sloe was abundantly visited by **Andrena fulvicrus* (Hymenoptera), both male and female, and by *Eristalis tenax* (Diptera). On opening the abdomen of the latter, it was found to contain abundance of pollen-grains, belonging to the species on which it was then feeding, and to the dandelion, mixed with a few larger triangular pollen-grains, belonging apparently to a *Fuchsia*; thus confirming the opinion at which I had previously arrived, that the Syrphidae are large consumers of pollen. The abdomen of the Hymenoptera, on the other hand, contained but a very few pollen-grains, which might easily have been sucked up accidentally along with the nectar; and this was also the case with the hive-bee, the grains in this latter case belonging to the dandelion.

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NOTES

THE Cambridge Museums and Lecture Rooms Syndicate, in their eighth annual report state that the Regius Professor of Physic has again called their attention to the urgent need of better accommodation for the medical examinations. Among the additions which have been made to the collections in the several museums, the bequest of the late Mr. M'Andrew, F.R.S., of the whole of his collection of shells and other specimens, deserves the first mention. It is of the highest scientific value. A most interesting collection of human crania, made by the late Dr. Thurnam, of Devizes, has been presented to the Museum of Human Anatomy, through the liberality of Prof. Humphry. A series of Devonian fossils, of great beauty, presented by Lady Burdett Courtts, deserves special mention, as also does the contribution of several hundred specimens of Palaeozoic and other fossils by Prof. Hughes, and the gift of 500 sterna of birds by Prof. Newton and Mr. E. Newton, and of a skeleton of the extinct bird "the Great Auk" by Prof. Newton. The building of the Cavendish Laboratory is now finished, and the Laboratory is open for practical instruction in physics. As the several collections and the number of students in the several departments increase, the current expenditure necessarily increases. The Syndicate are therefore of opinion that the time has arrived when they are obliged to call the attention of the Senate to the necessity of increasing the amount of the annual grant to the museums and lecture-rooms maintenance fund. They suggest, however, that for the current year a special grant of 300*l.* be made to the fund. Appended are the reports of Professors Humphry and Newton, and of the Superintendent, Mr. J. W. Clark, which give details of the past year's work and the additions made to the various collections.

IN a Convocation at Oxford, on May 28, the name of H. S. Smith, F.R.S., Savilian Professor of Geometry, Fellow of Corpus, who had been nominated to the office of Keeper of the Museum, by the delegates, in succession to the late Prof. Phillips, was approved.

THE list of those on whom the honorary degree of LL.D. is to be conferred at the approaching Cambridge commencement is very numerous. We have already mentioned some names; the following is a list of the men connected with Science who are to receive the honour:—Sir Charles Lyell, F.R.S.; Sir James Paget, F.R.S.; M. Leverrier, of the Paris Observatory; Joachim Barrande, of the Royal Society of Sciences of Prague; George Bentham, F.R.S.; and William Lassell, F.R.S.

WE have received the prospectus of a new "College of Science and Literature," which it is proposed to establish at Bristol for the South and West of England and South Wales. Such an institution, if properly organised, would no doubt be of great service, as these extensive and important districts are far distant from any college in which the sciences applied to their various industries can be studied. Judging from the prospectus, the organisers of the scheme have sound notions of what such an institution ought to be, keeping in view as models Owens College and the Newcastle College of Science. Balliol College and New College, Oxford, have come very liberally forward in aid of the scheme, having offered to contribute towards it 300*l.* a year for five years. It is estimated that a capital sum of 25,000*l.* will be required, and an annual subscription of 3,000*l.* for the first five years secured. It is, however, proposed to commence operations when such proportion of these amounts has been guaranteed as may justify the expectation of success. A public meeting is to be held at Bristol on the 11th inst. to inaugurate the undertaking, which we sincerely hope will be taken up heartily by those interested in it.

MR. W. SAVILLE KENT, F.L.S., the late Superintending Naturalist of the Brighton Aquarium, and formerly Assistant in the British Museum, has been appointed to the control of the Manchester Aquarium. This aquarium being constructed on the "circulating" principle, advocated by Mr. Kent, and it being, moreover, intended to make the building subservient more to the instruction and education of the masses rather than for the realisation of extraordinary dividends, we may anticipate from it scientific results of the most gratifying sort. The tank frontage of the Manchester Aquarium presents a length of no less than 750 ft., an amount exceeding that of any aquarium yet constructed. An ample guarantee of the encouraging support this undertaking is likely to receive at the hands of the public is shown by the returns for the first week of its opening, the visitors who passed through the gates during that period numbering over 19,000.

THE Birmingham Natural History and Microscopical Society, whose enterprise we have had frequent occasion to speak of, is contemplating the foundation of an aquarium in Birmingham, and has been seeking information from the managers of various aquaria at home and abroad. The result is not altogether encouraging to those who desire to see an aquarium standing on its own legs as a scientific institution, apart from adventitious attractions. It seems that scarcely any existing aquarium pays that is not attached to or does not form part of some place of amusement; and Mr. Lloyd of the Crystal Palace Aquarium gives it as the result of his large experience that no aquarium can be made to pay its way, unassisted by other attractions, even in the largest centre of population, unless its cost be limited to 3,000*l.* and its annual expenses to 500*l.* Still we hope that, whether as an independent or as a parasitical institution, the Birmingham Society will be brave enough to take steps to establish an aquarium in that busy centre.

FROM the Twelfth Annual Report of the Birmingham Free Libraries Committee, we are glad to see that this system of libraries continues to enjoy increasing prosperity. These annual reports furnish a number of very interesting statistics as to the number and class of books in the libraries, number and occupa-