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strict. This bed, which varies from 10 to 50 feet in thickness, covers indiscriminately and without interruption the plains, valleys, hills, and even the gentle slopes of the mountains. It consists principally of clay containing subordinate strata of gravel and quartz pebbles, and is frequently ferruginous to such a degree, that the particles of iron are converted into pistholitic iron ore resembling that which fills the fissures of the Jura.

The soil which fills the caverns has undergone some modifications, arising from its introduction and sojourn in them; 1st, it contains angulose or rounded fragments of limestone; 2nd, it is hardened by the particles of lime deposited in its interior by the waters charged with this substance filtrating through the fissures of the rock; 3rd, it is impregnated with saltpetre, and is on this account explored by the inhabitants of the country.

It is in this soil that the fossil bones are found; they are deposited pell-mell, are fragile, very white in their fracture, and adhere strongly to the tongue. Frequently they are petrified, more often converted into calcareous spar. In general they are broken or mutilated, and, lastly, they frequently bear the impressions of teeth, leaving no doubt that the animals to which they belonged had been dragged into these caverns by ferocious animals then inhabiting them. The larger ones have been introduced by various carnivorous Mammifera and the smaller ones by a diurnal bird.

At the present day not a single ferocious animal of the Mammifera sojourns in these caverns, and none accumulate masses of bones comparable to those we find in the diluvial deposits. At the utmost, we find in the modern excavations bones of small animals scattered at the surface, which had served as prey to a nocturnal bird, the Terror (Effraie) of Brazil, *Strix perlata*, Licht.

[We shall give the list of the fossils in one of our next numbers. —EDIT.]

XXVIII.—*Notices of a Botanical Excursion to the Mountains of Ternova in Carniola.* By EDWARD FORBES, M.W.S.; For. Sec. B.S., &c.

IN the chain of the Julian Alps, nearly opposite Goritzia, is a district called the Forest of Ternova, reserved by the Austrian government for the use of its navy, on account of the fine timber therein found. It consists of a group of well-wooded mountains, of from 4000 to 5000 feet above the level of the sea. The highest summits are bare and rocky, but the general form of the hills is round-backed. They rise from an elevated plain,

which itself is the summit of an extended elevation raised as it were on the high plain of the Karst.

My distinguished friend Mr. Tommasini, of Trieste, has for some time past been occupied with a Flora of Illyria, and these mountains have furnished him with some of its richest ornaments, they having been scarcely examined since the days of Scopoli. There still remained several elevations of the group to be explored, and as the promise of a good harvest was great, I gladly accepted the invitation of M. Tommasini to join him in an excursion to the unexplored part. Accordingly I met him at Goritzia on Tuesday, the 26th of June, and on the same day, with a proper stock of materials, botanical and gastronomical, vascula and bottles, boards, plates, bread and paper, we set off in a wicker cart for the mountains, our first object being to reach the village of Chapovano, in the heart of the forest (a distance of about 30 miles), by night. After following the course of the river Isonzo, remarkable for the white colour of its waters, we commenced ascending the mountains at about 6 miles from Goritzia. The point of ascent is the locality given by Reichenbach for the true *Athamanta Matthioli* of Wulfen, the only known locality, and there we found it. But assuredly it does not specifically differ from the *Athamanta rupestris* of Scopoli, which I had gathered the week before at its recorded habitat near Trieste. The differences arise from situation, and are in themselves scarcely sufficient to constitute a variety, much less a species. Had Reichenbach seen the two plants in their native stations he would doubtless have recognized their identity; but he has probably in this case, as in many others, been deceived by the fallacious experiment of cultivation; assuredly no test of specific character, as the fleeting difference of the field not unfrequently becomes (abnormally) permanent in the garden. Along with the *Athamanta* grew the *Phyteuma Scheuchzeri* and the *Dianthus monspeliacus*.

After rattling up and down several steep hills in our basket-like vehicle we changed it for ponies at a village a few miles beyond the church of Monte Santo, and commenced ascending again. On the way the Flora gradually changed from that of the Karst to a more alpine character, and the vegetation assumed a more northern aspect. *Phyteuma nigra*, certainly only a variety of *Phyteuma spicata*, which grew along with it,

ornamented the road side in company with *Cirsium serratoloides*. My companion was delighted to find *Scrophularia verna*, a plant much prized in his country. At Chapovano, our destination for the night, we found a tolerable village inn, and after a hearty supper of omelettes we slept soundly until 4 o'clock on Wednesday morning, when we proceeded to ascend the neighbouring mountain of the Stoddar. Our way lay up a steep slope, so covered with rare and beautiful plants that it resembled a garden run wild. All the colours of the rainbow were represented amid the grass, for the richest plants were in full flower. There were *Lilium carniolicum* and *bulbiferum*, with their gorgeous flame-coloured petals; the modest pink of *Hieracium incarnatum*; the bright yellow *Biscutella* and *Cineraria*; the blue of *Campanula carnica*; *Veronica prostrata* and the *Gladiole*, with its brilliant purple blossoms. Here and there *Cytisus angustifolius* waved its golden flowers above our heads, whilst *Aquilegia Sternbergii* flourished in its shade. Most of the plants I saw around me were new to me; for though the vegetation resembled *generically* that of the Valerian Alps of Switzerland, *specifically* it almost entirely differed. Every now and then however some well-known acquaintance, such as *Rhododendron ferrugineum* or *Tofieldia palustris*, reminded me of my alpine rambles. One of the rarest flowers which there grew was *Primula carniolica*, but its time of flowering was nearly over, and most of the specimens were in fruit. After recovering from the first shock of the novel and beautiful flora before me, my *Polygala*-hunting propensities came into full action. I sought and I found: for among quantities of *Polygala vulgaris* I discovered a few stalks of *Polygala austriaca*, and higher up the pretty plant grew in great plenty. It delighted my friend as much as myself, being an addition to the Flora of Carniola. Near the summit we found a new locality for one of the rarest plants in Europe, the *Pleurospermum Gollaka*, a native of these mountains only; its time of flowering had not yet come. The summit itself was covered with bushes of *Rosa alpina* and *Spartium radiatum*, which only flourishes on mountain tops where the winds prevail. The view from the Stoddar is truly magnificent: in front the valley of Idria; behind the gigantic mountains of the Terlon, capped with perennial snows; far beneath and around, the thick forests of

Ternova and the fearful precipice of the Budanowitz, a mountain of great height, cleft as it were from its summit to its base, adds not a little to the grandeur of the scene. From the Stodard we traversed the forest at a considerable elevation (about 3500 feet) to the Budanowitz, but had no small trouble with our guides and porters on the way. The peasantry of these mountains are Slavonian and speak a dialect of that language; a very few know some words of Italian.

Much is said about travellers corrupting the virtue of the Swiss mountaineers, but certainly in knavery the Carniolian peasants excel them; they must be born knaves, as no travellers visit these mountains, and certainly no Englishmen. Yet although M. Tommasini spoke their language and knew their habits, they contrived to cheat, lie, beg, and annoy us throughout our excursion. They are as ugly as they are roguish.

In the forest we found *Cardamine bifolia* and *sylvatica*, three species of *Dentaria*, *Aremonia Agrimonioides*, *Omphalodes verna*, *Astragale alpina*, *Paederota Ageria*, *Carex firma*, *pedata*, *tenuis* and *mucronata*. The rare *Euphorbia carniolica* was also extremely abundant. On the Budanowitz we gathered *Gentiana Frolichii*, assuredly distinct from *Gentiana acaulis*, and not to be confounded with the variety of the latter called *angustifolia*, in Switzerland. Here also we obtained *Achillea Clavennæ*, *Saxifraga crustata*, *Orobanchia flaccidus*, *Kerneria saxatilis*, *Astragalus carniolica*, *Salix Wulfenii*, *Apargia incana*, *Betonica Alopecurus* and *Polygala alpestris*. It is of importance to observe that in these mountains *Polygala alpestris*, *P. austriaca* and *P. vulgaris* all grow at the same elevation and never pass into each other. I regard them as truly distinct species.

We descended to a hamlet called Laguna, where we dined. On our way down we found *Sambucus racemosa*, *Primula elatior* (the true plant) in fruit, *Spiræa ulmifolia*, and *Arnica austriaca*; also a *Myrrhis* regarded by M. Tommasini as undescribed. From Laguna we journeyed on ponies through the forest to Doll, a small village distant 12 miles. Except *Pyrola uniflora*, here very rare, nothing of interest occurred on the way. Both Laguna and Doll are situated on the elevated table land of the forest. This table land is about 3000 feet and upwards above the level of the sea. At Doll we stopped and slept.

The object of our Thursday's excursion was to ascend the

highest mountains of the forest, namely the Golaks (385 toises high). Our guide was an old forester, but missing his way he misled us sadly, and I have seldom been obliged to scramble so much or so inconveniently as during the ascent of the Maligolak. Our scratched faces and torn clothes (travellers carry few coats) bore evidence of our toil for some time afterwards. The general aspect of the vegetation was similar to what we had seen the two preceding days, but several plants of great interest and novelty diversified it. In the wood we found *Lonicera cærulea* and *nigra*, *Hacquetia Epi-pactis* and *Salix Kitaibeliana*. Towards the summit of the Golaks *Pinus Muglus* grew in great plenty; also *Silene quadridentata*, *Carex capillaris*, *Apargia fœtida*, and that variety of *Gnaphalium dioicum* which Don named *Gnaphalium hyperboreum*. Though the weather was warm and the month June, in consequence of the lateness of the season, much snow lay around us, which we turned to good account by manufacturing ice-punch, being well provided with materials, wherewith to drink the health and happiness of Queen Victoria with all the honours, this being the coronation day. The snow was useful in another respect also, for in its neighbourhood we found *Gentiana angulosa* in beautiful flower, a great gratification to myself, as I had despaired of seeing its blossoms; hitherto all the specimens I had found were in fruit. We found no other plants of interest before descending to the Karst, when we gathered the beautiful *Campanula spicata* in fine condition, also *Geranium macrorrhizon* and *Anthriscus fumarioides*. The botanical part of our excursion was now at an end; and once more reclining in a wicker car, we jogged on to Goritzia, well loaded with treasures, and arrived there at midnight.

During this excursion I found but few land shells. *Helix verticellus* and *H. planospira* were common in the woods. Several good species of *Clausilia*, *Vitрина elongata*, and *Cyclostoma elegans* also occurred. The greatest rarities were a few specimens gathered on the summit of the Maligolak of two of the scarcest and most interesting European *Pupæ*, viz. *Pupa pagodula* and *Pupa Kokeilii*. The latter is a trochiform *Pupa* with a ringent mouth, and forms a natural link between *Pupa* and *Helix*; it was first described by Rossmassler, who received it from Carinthia about a year and a half ago.