

UP IN THE ALPS.

BY CAPTAIN WRAXALL.

CHAPTER I.

Alpine climbers—Switzerland in winter—The return of spring—Mountain torrents—Ruin and desolation—Mountain slips—Destruction of villages—A narrow escape—Intermittent springs—Caves—Wind-holes—The Shaf-lech.

NO literature of the day is more popular, and deservedly so, than that which records the exploits of the bold mountaineers who, under the name of the Alpine Club, have taken peaceful possession of the ice-clad peaks of Switzerland. It is, after all, something for Englishmen to be proud of, that their pluck and endurance have been so magnificently displayed to Continental nations when a belief was current that England had lost her prestige, and was rapidly going down the hill. The suppression of the Indian mutiny, however, sufficiently proved that our army, though small in number, is worthy of the traditions of the Peninsula and Waterloo; while the achievements of the "scalars of the Alps," as the French call them, are evidence that we, as a nation, have not degenerated.

We have only one fault to find with this Alpine literature; but it is a grave one. Too much stress has been laid upon difficulties overcome, and dangers faced; and Switzerland, though a land teeming with natural wealth, and offering a charming field for the investigations of the geologist and the naturalist, is, for the present, neglected on behalf of her comparatively sterile peaks. This is, however, an evil which will cure itself. We believe that there is at present but one mountain untrodden by the foot of the Englishman, and that will be overcome ere long. When this has been achieved, the members of the Alpine Club will, probably, seek fresh fields and pastures new in Iceland, and amid the jökuls and fiords of the Old Norsemen, whilst the mountains of Switzerland will be left to recover from the excitement under which they now labour.

It is our purpose, in the present and ensuing chapters, to draw our readers' attention to the peculiar features of mountain life and scenery to be found in Switzerland. They

have already had a fascinating description of the pleasures of mountain climbing in the diary of the late Albert Smith, and we can refer them, if they desire further information, to the recently-published work of Berlepsch. Incidentally, it is true, we may allude to the more memorable achievements of the climbers; but, as we said, our main purpose is to bring together all the facts we have been able to collect as to the natural phenomena of Switzerland.

Any one whom his misfortune has compelled to visit a German watering-place after the birds of passage have fled, will remember the melancholy appearance it offered. The hotels are shuttered up and deserted; the landlords have retired to the capital to enjoy themselves on their summer spoils; and everything looks shabby and run to seed. Switzerland offers precisely the same appearance, and Nature seems to have departed for the winter, and locked away her scenery behind shutters of snow and bolts of icicles; and yet Switzerland is very beautiful at this period. The snow becomes massed into a hard, glittering surface, which reflects the sun's rays in a thousand crystals, while the hoar-frost begems every object in the landscape. The course of the torrents is arrested, the Alpine lakes are covered with a green, shining mirror, and winter reigns triumphant. But man is not to be checked by these obstacles, and in the very heart of winter the dwellers in the mountain valleys visit the neighbouring woods with axe and sleigh, for the snow facilitates the bringing home of the logs. The firs and beeches fall with a hollow moan; the trunks, denuded of their branches, shoot with the speed of an arrow down the precipices, and are dragged home by the sturdy, sure-footed horses over hill and through ravine. At night a fox barks in the bushes; by day the hounds rove through the forests, and the shots of the sportsmen echo far and wide through the desolate landscape. The startled hare dashes madly across the snow-fields, or the heavy flutter of the heath-cock is heard. The blackbird, snow-finch, and sparrow twitter

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their merry song along the banks of the stream, or in the scanty foliage; and the more silent the general face of nature is, the more cheerful grow these isolated signs of life.

Warm, pleasant breezes announce the return of spring, and busily help the tardy sun in tearing through the old snow coating. Fresh falls of snow may occur before the tedious task is ended; but they do not endure long, once the old, tough crust has been eaten through. The woods and streams shake off the unpleasant burden; the verdure forces its way through, and is quickly decked with white, and blue, and yellow blossoms wherever it has gained the mastery. The dashing and trickling of water begins once again; at first for an hour or two at mid-day; then in the afternoon; then by night; until at last the plashing, rustling, seething streams are alive all through the day and night. The rocks drip, the rivulets have eaten their way through the snow-hedges and masses of ice, while fresh tributaries arrive from every terrace and from every snow-field. The ice-columns of the waterfalls crack on the precipitous walls, and fall with a voice of thunder into the deeply-hollowed bed. To this must be added the mountains, with their dully-rolling avalanches and cracking glaciers; the hurtling stones dislodged by the thaw, and the caving in of snow-banks, which produce a universal turmoil. Nor is the voice of animal nature silent. Woodpecker and cuckoo, the jackdaw and the magpie, the tomtit and the snipe, the thrush and the goldfinch, the eagle and owl, finch and sparrow, make the woods harmonious with their varied carols. To these are soon joined the rustling bat, the martin, the squirrel, the badger, crickets, grasshoppers, chafers, bees, wasps, and flies—each with its own voice, which is at length partially stifled by the noises of the domestic animals—the goats, horses, oxen, dogs, and cocks; by the hundred-voiced bells, the merry children, and the singing neat-herds.

During summer, and even far into autumn, the mountain torrents are a very terrible natural phenomenon. They are more formidable than the storms and avalanches, which generally work their way harmlessly in deep channels and basins. If any excessive amount of rain fall, or the warm west wind melt the

snow too rapidly, the torrents swell into wild streams within a few hours. They leap over the rocks with the noise of thunder, and fill their broad, stony beds. In dry seasons, this bed is found quite dry, or only watered by a clear, narrow brook. The stranger is amazed at the breadth of the stony bed, at the immense *débris* with which it is filled, and the Cyclopean masses of rock which lie scattered about. Nothing more frightful can be conceived than the sight of these water-demons when at full work. The thick flood is seen collecting high up in the mountains; suddenly it leaps forward, and, dragging down huge blocks of stone, fir-trees, gravel, sand, and earth in its mad course, spreads far and wide over the cultivated meadows, till it has filled up the valley, and chills the inhabitants with horror. They rush with poles, spades, and mattocks to remove any obstacles that collect; and the cries, shouts, and lamentations of the villagers are mingled with the crash of the rock-masses. Any one who has witnessed this awful scene at the dark hour of midnight will never forget it. The most splendid meadows are covered, in a few hours, with a depth of ten or fifteen feet of rubble, and are suddenly converted into dead wastes, from which the crowns of the fruit-trees peer out mournfully. The torrent frequently alters its course, tears away houses and stables with lightning speed, and ruins hundreds of families. Many a beautiful valley of Switzerland has been laid waste, and the bad management of the woods seems to render such accidents more frequent, in spite of the works raised to check the torrents.

These periodical deluges are only surpassed in horror by one natural phenomenon—the mountain slips. That of Conto in 1618, which overwhelmed the town of Pleurs, and the village of Scilano, with 2,340 inhabitants, sparing only three people and one house; the two falls of the Diablerets in 1714 and 1749; that of the Rossberg in 1806, which buried five villages, with 475 men; and the threatening slip of the Felsberg, whose peaks are constantly in movement, and may fall into the valley at any moment—have attained a European celebrity. A circumstance connected with the first fall of the Diablerets is worthy of notice. A cowherd of the Valais was buried in a most remark-

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able manner. A large mass of rock rested on the roof of his chalet, so as to protect it from being crushed by the *débris* that subsequently fell, and which covered it to a height of several hundred feet. For weeks and months the buried man lived, in momentary fear of death, in his gruesome dungeon, supporting himself on his stock of cheese, all but deprived of light and air. Day by day he groped about desperately in the enormous mass of rubbish which surrounded his prison. At length he followed the course of some running water, and, after weeks of toil, found his way through the loosened earth. Worn out by hunger, toil, and fear of death, half-naked and bleeding, he knocked at the door of his house in the valley. Wife and children were horrified by the supposed ghost, and the village pastor was the first who could explain the mystery. Fortunately, these mighty mountain revolutions are a rarity; but smaller landslips take place repeatedly, and evidence the gradual, but uninterrupted, disintegration of the European mountain-rampart, which is slowly approaching a chaotic state.

Here and there, Nature, inexhaustible in her creative experiments, has placed in the mountain region isolated curiosities, which impart to it a peculiar and mysterious charm. The entire base of the High Alps contains not only numerous sweet springs, which often gush out from the rock in vigorous jets, and a great number of hot and cold mineral sources, but also those interesting intermittent springs usually called "Mai brunnen," or May wells. There can be no doubt that they originate in the period of the snow melting, through the over-filling of the regular internal water-courses of the mountains, which, unable to discharge their waters through the natural resources, are forced to seek fresh outlets, situated above their natural level. In the same way the higher Alpine lakes discharge their superfluous waters into the valley in the form of "Mai brunnen," the waters being sucked up by holes above the usual level of the lakes, and then sent down through internal conduits. Interesting specimens are the Hundsbad, in the hinder valley of Wiggis; the "Wunderbrunnen," on the Engstlen Alp, which, in the summer, plays regularly from 8 A.M. till 4 P.M.; the Dürrenbach, on the

Engelberg, which, from May till September, gushes out from the centre of a green meadow with the force of a mill-stream, bubbling up from several fissures; and, above all, the remarkable spring in the Assa valley, in the Lower Engadine, which pours out of a limestone cavern, about three hundred paces in depth, into a large basin, whence it flows into the valley with the volume of a stream. It begins playing at 9 A.M., and suspends its action thrice in the day, each time for a period of three hours.

Cave formations are also numerous throughout the Alps, and are frequently of a most interesting nature. They appear in every variety of shape and form—sometimes as a slight nook in a wall of rock, with an overhanging roof; while others, again, run in the form of vaults for miles through the hills. Very often tradition connects with these caves pious reminiscences of saints and missionaries, and here and there a chapel or hermitage stands in their vicinity. The interior of these rocky abodes is often strangely formed, and contains narrow passages, galleries, subterranean pools of water and streams, and unexplored ways running deep into the mountain. As a sign that they were, in olden times, the refuge of persecuted persons, or the lurking-place of malefactors, Roman and old German coins have been found; in others, petrified bones or shells; in others, again, rounded pieces of grauwacke and serpentine, which the mountains themselves do not contain; or else the remains of predaceous animals, which have disappeared for centuries in the vicinity; in others, lastly, especially in the Jura, never-melting masses of ice and snow. The majority of the caves are covered with an incrustation of stalactites. A very beautiful specimen is the Cuol Sanct (Holy Cavern), near Fettau, in whose magnificent stalactite architecture the peasants fancy they can trace a natural altar, with candlesticks and vases.

Almost more remarkable are the "wind" or "storm holes," deep fissures in the snow. In summer, during fine weather, a sharp and very cold wind blows out of them; in winter, however, the air rushes into them from outside, and their temperature is heightened. Such wind-holes are very frequent in the Alps, and closer observation has proved that they generally exist in

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split rocks, resting on larger masses. Very probably the whole blowing apparatus consists of a perpendicular passage and a sloping one combined. The cowherds usually employ these wind-holes as milk-dairies, and in the canton of Tessin they are converted into excellent wine-cellar. Nor are they without a certain influence upon animal and vegetable life. When they are not claimed by man, a fox or a marmot will employ them as one of the numerous entrances to its retreat. Plants, however, will not grow in the vicinity of their opening, the only exception being a few dark mosses and lichens.

On the same laws of nature depends the appearance of the vast and marvellous ice-grottoes, which are found in the mountains far below the snow-line, and contain large masses of ice all the year round. Such is the ice-cave of St. George, over the Lake of Geneva, which contains a hundred tons of ice, formed, even during the summer, from the water dripping from the walls. The most celebrated of all, however, is the Shaf-loch, on the Lake of Thun. In spite of its inhospitable and dreary appearance, in stormy weather or oppressive heat the shepherds and their flocks seek shelter in it, and at times as many as a thousand head of sheep will nestle in its recesses.

CHAPTER II.

Alpine forests—The Dubenwald—Tropical vegetation—The fir-tree—The larch—Oak forests—The sycamore—The walnut-tree of Stanz—The flora of the Alps—Curiosities of vegetation.

FORESTS impart a very peculiar feature to the character of Alpine scenery, and are comparatively far more abundant than in the lowlands, where the land is employed for agricultural purposes, and has gradually been cleared. Still, these forests vary considerably in character and appearance on different slopes of the mountain. The mighty Dubenwald, in the Valais, might fairly be called a virgin forest, if any of the Swiss forests could lay claim to such a title. It is so large that it takes a day to ride round it; and the valley road runs for nearly eight miles between its clustered columns. Thousands of noble firs and larches stand there, dead and withered, and woodpeckers have bitten through their bark; and, just as in the tropical forests, leaves twine round the

stems, and orchideans let down their flower-laden tendrils to the damp ground. Here, tangled masses of blackberry, dog-rose, and bindweed grow luxuriantly. Strawberry plants shoot up a foot and a-half high from the soft wood earth, thousands of young offshoots spring out of the decaying stems, and the gum-bearded lichen trails from the branches on which the cock of the woods calls, and the lynx and wild cat watch for prey. Avalanches and conflagrations have terribly injured the upper portions of the forest, and trunks charred by fire or broken by the storm evidence that the fury of the elements is as busily engaged as man's ignorance in the destruction of the forests.

Throughout the Swiss mountains, conifers are the basis of vegetable life, and among these the fir, especially the dark red species, is the most common, and is above all the other trees in girth and height. Only in a few districts does the larch seem to rival it, as is the case in the higher mountain regions of the Grisons; but in the lower districts of that canton the fir reigns supreme, and imparts its own dark and gloomy character to the landscape. The lighter silver fir and the Scotch fir, with its lofty, spreading branches, the tapering juniper, and tufted yew are found at intervals, while, in some districts, the savin fills the lower forests with its unpleasant odour. Among the white firs, however, are a few giants, which stand worthily by the side of the loftiest red pines. On the Schwändi Alp, in Unter-Walden (4,500 feet above the sea), a perfectly sound white fir was felled in the spring of 1852 which measured twenty-one feet in girth at the root, and even at a height of 100 feet was $8\frac{1}{2}$ feet in circumference.

As regards the oak forests of Switzerland, it may be said of them, as of the stag and beaver, that they are extirpated. They formerly grew magnificently on the lower mountains and hills, and even now a solitary specimen may be seen in all its grandeur, but they are growing more and more rare. On the other hand, the monotony of the dark pine woods is, in many parts, relieved by extensive tracts of beech-trees. As the oak and the lime are the noblest trees of the lowlands, the beech and sycamore are the grandest representatives of the central region. The beech-tree, with its smooth white



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bark, and rich though transparent crown of foliage, forms an excellent barometer of the seasons. The swelling and expanding of its buds, its full burst of leaf, and the gradual appearance of the autumnal tints, succeeded by the bareness of winter, accompany the year in its progress step by step, and attract our sympathy and attention in a manner not known to the monotonous and gloomy fir.

The sycamore stands next in estimation to the beech, but the valuable nature of its timber causes it to be felled in large quantities, and the loss thus entailed is not sufficiently compensated by fresh plantations. The common mountain sycamore, with its widely-extending branches and large serrated leaves, is often found in clumps; and there are also enormous isolated specimens, as in the Melch Valley, where one stands with a girth of 28½ feet. We may say too of the sycamore, that it is the most celebrated tree in Switzerland—a real historic tree. Close to the chapel of Truns still stands the veteran sycamore, denuded of branches on one side, but still covered with vigorous foliage on the other, under which the Grey Confederation was formed in 1424. Its trunk is hollow and broken through at many places, and the grateful piety of the people has surrounded it with a fence for protection. The sycamore is a true child of the mountains, and does not flourish in the plains. In consequence of its manly beauty, the mountaineers are fond of planting it round their cabins; but owing to the size it attains, it is unfit for localities exposed to the fall of avalanches. Its brother, the maple, and the whitten tree, are generally rare, and more at home in the lowlands. The noble, fragrant lime-tree, in which strength and grace are combined—the slender, tough ash—the sturdy alder—the birch, with its waving network of leaves—the quivering aspen—the sombre, bushy elm—and the wide-spread black poplar do not flourish to any great extent in Switzerland. A single lime-tree, walnut, or sycamore is often found in the centre of some open space in which the public meetings of the inhabitants are held. The immense lime-tree, 400 years old, which stood in the square where the cantonal meeting is held at Appenzell, was recently broken in a storm. The walnut-tree, which adorned for so many centuries the parade-

ground at Stanz, yielded, in boughs alone, without counting stem or branch wood, upwards of thirty cords of wood. The parishioners of Scharanz, we may also mention, have assembled since 1403 beneath the shadow of their old lime-tree.

The forests contain many flowering plants of the lower orders, and a variety of obscure lichens, mosses, and light-shunning fungi; but no bushy plants flourish in them, with the exception of a few rosaceæ, woodbines, and laburnums. The last-mentioned plant grows in great abundance in some districts, especially on the southern side of the Col de Trent, where it fills the woods with masses of its bright yellow blossoms. Bushy plants, many of them yielding wholesome berries, are found clothing the sandy or stony banks of the mountain streams and steep, rocky projections where no trees grow; and in their vicinity blooms a profusion of labiate and cruciferous flowers, roses, hawkweed, and scrophulariæ. In the pine-woods ranunculi and orchids abound, while a few saxifragis, thymes, campanulas, hawkweeds, and silenes are met with here and there upon the rocks, wherever a slight stratum of earth allows vegetation.

The character of the flowering plants of a particular locality is determined not only by its elevation above the level of the sea, or its exposure to the sun, but also by its geological formation, some plants preferring the primary rocks, others the limestone, slate, or pudding-stone; and this preference frequently degenerates into an idiosyncrasy. It is not only the specific nature of the soil, formed by the disintegration of the rock and decomposition of the first cryptogamic covering, which regulates the vegetation. Some idea may be formed of the richness of the carpeting that covers marsh, moor, pasture, meadow, field, and coppice, rock and gravel on the central portion of the Alps, when we state that it contains nearly one thousand genera of flowering plants, many of which are divided into from sixty to a hundred sub-genera.

Very curious are the conditions of growth in different parts of the mountain region. Thus, on the south side of Monte Rosa vines grow at an altitude of 2,750 feet, while in the north of Switzerland they cease at about 1,700 feet. The potato is successfully culti-

IN PRAISE OF THE HORN BOOK.

vated on the summit of the Righi, 5,500 feet above the sea; but this is an exceptional instance. Cultivated plants are frequently capricious, and may be raised at great heights by proper care, and on spots entirely sheltered from rough weather. Thus, in the backward valley of the Grindelwald, where the cherry does not ripen before August, and neither the oak nor the walnut tree can flourish, art has succeeded in rearing cabbages, and even asparagus, earlier than they can be procured at Berne. The peasantry are everywhere most fertile in expedients. Thus, on the south side of the Col de Balm, in order to expedite the melting of the snow, they scatter over the fields bits of slate, which, throughout the summer, have been carefully collected on the banks of the Arve. At Winkelmatt, 4,300 feet up the side of the Matterthal, the inhabitants carry up earth to cover the immense blocks of rock, and thus produce flourishing gardens, in which corn and potatoes ripen far earlier than in the valleys.

There are many other characteristic features of the mountain region of Switzerland to which we would refer, if space permitted. What we have said will, we trust, be a sufficient preparation for our readers, whom we shall invite in another paper to follow us to the land of the glaciers and avalanches; which will, probably, prove more interesting to them, as less known. There we shall find ourselves in wondrous company, and pay a flying visit to the home of the eagle and the vulture, the ibex and the chamois. We shall follow the hunter in his desperate pursuit of his nimble-footed prey, and show to what dangers he is, almost hourly, exposed. At the same time we shall not neglect the Alpine flora, which, although scanty, is not the less wonderful, as showing how wisely Nature adapts her means to the end.

IN PRAISE OF THE HORN BOOK.

But how shall I thy endless virtues tell,
 In which thou dost all other books excel?
 No greasy thumbs thy spotless leaf can soil,
 Nor crooked dogs'-ears thy smooth corners spoil;
 In idle pages no errata stand,
 To tell the blunders of the printer's hand:
 No fulsome dedication here is writ,
 Nor flattering verse, to praise the author's wit:
 The margin with no tedious notes is vex'd,
 Nor various reading to confound the text:
 All parties in thy literal sense agree,
 Thou perfect centre of concordancy!
 Search we the records of an ancient date,
 Or read what modern histories relate,
 They all proclaim what wonders have been done
 By the plain letters taken as they run.

Thy heavenly notes, like angels' music, cheer
 Departing souls, and soothe the dying ear.
 An aged peasant, on his latest bed,
 Wish'd for a friend some godly book to read:
 The pious grandson thy known handle takes,
 And (eyes lift up) this savoury lecture makes:
 Great A, he gravely read; the important sound
 The empty walls and hollow roof rebound:
 The expiring ancient rear'd his drooping head,
 And thank'd his stars that Hodge had learn'd to read.
 Great B, the younker bawls! O heavenly breath!
 What ghostly comforts in the hour of death!
 What hopes I feel! Great C, pronounced the boy;
 The grandsire dies with ecstasy of joy.

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CHAPTER III.

THE ALPINE REGION.

Formation of the Alps—The passes—Strategic occupation of the Alps—Savarov—Bonaparte—The Great St. Bernard—The highways of Europe—The galleries—The hospices—St. Bernard dogs—Barry—Treatment of saved men.

WE will now leave the forest-clad mountain region of Switzerland, and ascend to the desolate rocks of the realm of snow, which comprises all the elevations between 4,000 and 8,000 feet above the sea-level. Here fresh marvels await us; and here, too, man can contemplate the wondrous manifestations of Nature's powers of production, preservation, and dissolution. To quote an eloquent passage from Berlepsch—"He will stand in astonishment before that giant edifice of the Alps built up by powers whose origin and action can indeed be described, and whose relation to other powers can be set forth according to the laws which natural sciences have won from phenomena, but whose whole extension and boundaries in the universe human knowledge can only dimly suspect."

According to the generally accepted theory the Alps are a link of that colossal backbone of the world which, under the name of the Pyrenees, Apennines, Tschar Dagh, and Hæmus, gives internal support to the Spanish, Italian, and Grecian peninsulas, as they stretch out into the Mediterranean. They are the results of the crystallisation and deposits of many hundreds of thousands of years in primeval oceans. The highest peaks can only be regarded as the isolated ruins of the original mountain fabric, and it must have required a period almost beyond human calculation for the intervening masses to have been torn away and sunk into the depths from which they in all probability rose. The Alpine fabric, as Berlepsch reminds us, includes an inexhaustible wealth of natural wonders. No other mountain chain of Europe displays, like the Alps, the flora of three zones. The arctic and the temperate join hands with the tropical, and we find representatives of the vegetation of

more than thirty degrees of latitude in a short space. In no other mountains of our quarter of the earth does the power of the atmosphere act with such fearful force and such tremendous manifestations of strength, and in none are the contrasts in the life of the inhabitants so striking as in the Alps.

That portion of the Alps which we have now under consideration contains nearly all the more considerable *cols* and passes, as well as the highest cultivated valleys in Europe. Its organic life is naturally much scantier than that of the lower mountain region, and still more so than that of the plains and lowlands; while, on the other hand, it is more productive than the snow region which lies above it. Civilisation has been introduced to a certain extent, but the ruggedness of nature in many parts defies man's utmost efforts. Very admirable is the manner in which man has here contended successfully with nature, and the great European pass-roads impart a most peculiar character to the valleys through which they are carried. The traveller contemplates in amazement the bridges boldly thrown over yawning chasms, and the succession of galleries cut through the solid rock. After following for awhile the zigzag course of the wide highway, he reaches the summit, and finds, nestling in the snow, and surrounded by inhospitable rocks, the protecting hospice, the last place of human refuge which the Alpine region affords.

We find that the Alps were traversed from a very early period of history; our readers will all remember what, we fear, must be considered the fable of Hannibal dissolving the rocks with vinegar; but it is certain that Julius Cæsar crossed by the Mons Penninus, or Great St. Bernard, and, after the foundation of the colony of Pretoria Augusta, this became a much-frequented road. Through these passes the oppressed Pagans proceeded to take their revenge on Imperial Rome. When the German kings introduced the fashion of proceeding to Rome to be invested by the pope with the Holy Roman Empire, the passes of the

Brenner, Bernardino, and Julier came into use; the latter was the chief commercial road between Venice, and France, and Germany, in the fifteenth century. The Alpine passes rose in value with each succeeding century; the greatest commanders have striven for their possession; and the remains of old field-works and intrenchments may still be seen on the most isolated heights and amid the eternal snows. Suvarov fought some brilliant actions on the St. Gothard, and it was by the Great St. Bernard that Napoleon passed to win the battle of Marengo. It is rather humiliating to humanity to find that the first artificial road over the Simplon was made to convey guns into Italy.

There are four great roads, or world-highways, connecting the North and South of Europe. Bonaparte, when consul, as we have just seen, made the first road across the Simplon between the years 1801 and 1806, the highest point being 6,218 feet. The next, over the Bernardino, was made by the canton of the Grisons, at its own expense, between 1819 and 1823. Austria, for self-defence, was obliged to open a communication with Lombardy by the Splügen; and the Helvetic Confederation, finding that trade was diverted by these roads, opened the St. Gothard pass for travellers in 1830. In the wildest parts of the roads, where the snow-storms rage most furiously in winter, stone houses of refuge are built at regular intervals, in some of which the road-menders reside in a species of Siberian exile. In them the benighted traveller will generally find wood to light a fire, a loaf, and a bundle of hay, to support himself and horse, should he be temporarily blocked in. The galleries are of great importance for the safety of the roads in winter and spring, and are intended to protect travellers against the constantly-falling avalanches. Other galleries, however, serve as a defence against mountain torrents, which would otherwise render the road impassable. As the traveller moves through the gallery, he sees the cascade dashing down in front of him, which has a most charming and peculiar effect. The largest of these galleries is the All' Acque Rose in the Splügen, 1,530 feet in length. Crosses, erected at various spots, mark where travellers have perished

in avalanches and snow-storms. Von Tschudi gives so animated a description of these mountain passes, that we cannot refrain from a quotation:—

“Strange and wild is the aspect of the mountain world brought so immediately before the traveller's eye as he visits these passes. Around, in savage majesty, stand thousands of ice pinnacles and rocky peaks which were never reached by human foot—scarcely by the chamois. No naturalist has, as yet, examined into the laws of their confused, irregular piling up, or the poor fragments of their vegetable and animal world; but at their base winds the noisy caravan of commerce. The braying post-horn echoes among their heights, mingled with the bells of the mules and man's polyglot language. The giants care nought for this. With the diamond crown on their undesecrated heads, they continue their slumbers of thousands of years, dreaming, perchance, of the ocean waves which once dashed against them; the colossal fire which upheaved them from the maternal lap of earth; or of the gaily painted molluscs and fish which sported on their peaks and in their crevices. Then, how the waters slowly ebbed away; how the luxuriant shrubs and palms of the South waved freshly over their summits; how, next, chestnuts and limes merrily clothed their slopes; and how, finally, all life sank into the depths; the storms swept away the crust of soil; the winters grew longer and the summers shorter; how the snow, once unknown to them, constantly clung more closely, and grew even higher, till ice and snow and frost and storm held their melancholy sway over the once sunlit crests! Perhaps, too, they may be reflecting on the ruins of a more beautiful primeval state, which were turned into stone lest they should be lost; and among them glitter veins of gold running deep within their bosom, and beds of crystal, and the nests of flashing precious stones. But to the outward eye they are dead, and every century buries them deeper in snow and under masses of ice, and crumbles away their naked ribs.”

The fifteen hospices on the Alps are all pious foundations of greater or less extent, intended to shelter every traveller according to its means, free of expense; to give a meal

gratis to the poor; and to guide people who have lost their way by ringing bells or sending out dogs. The description which Berlepsch gives of the St. Gothard hospice is not of such a nature as to make us desirous of spending a winter there. The snow generally begins to fall in October, and lasts almost uninterrupted up to the end of May. It is often so intensely cold there in July and August that flowers in the windows are frost-bitten. The Lago Grande near the hospice is generally frozen at the beginning of July, and in winter there are many nights as cold as those of Spitzbergen or Nova Zembla. Thick clouds brood over the hospice for more than half the year, while the lower valleys and mountain-peaks are bathed in sunshine. On the St. Bernard, winter lasts for nine months of the year, and fuel has to be fetched from a distance of several miles. During the summer large snow-flakes fall; and in winter, dry frozen ice needles, which are so fine that the wind can drive them through every crack in doors and windows. The storm frequently piles these up, in the neighbourhood of the hospice, to a height of thirty feet, so that they cover all the paths and passes, and at the slightest impulse dash down into the depths in the form of avalanches.

The St. Bernard pass is only absolutely safe in bright summer weather; but in stormy, wintry weather, when the snow whirls round the traveller, it becomes very dangerous. Annually the mountain claims a small number of victims, who are kept in a Morgue or dead-house built for the purpose. Sometimes the wayfarer falls into a crevasse, or is buried beneath an avalanche; at others a fog surrounds him and makes him lose the path: he then wanders about till he perishes of hunger and fatigue, or else that sleep surprises him from which he is destined to know no waking. The power of this desire for sleep, which only a most energetic will can resist, is so great, that it attacks the wayfarer when in the strangest position. Thus the monks of the hospice found, in 1829, a man in the middle of the road, in an upright posture, with his stick in his hand, and one leg raised. He was stiff and dead. A little farther on this man's uncle was also discovered in the same iron sleep.

Were it not for the truly Christian and

self-devoting activity of the monks, the St. Bernard pass would only be available for a few weeks in the year. They have been engaged in saving and nursing travellers since the eighth century. The archives of the hospice have been lost in two fires, which have destroyed the building. The present spacious building, dating from the sixteenth century, is inhabited by twelve Augustine monks and a number of serving brothers. It is calculated that 2,000*l.* a-year is expended at the St. Bernard in affording hospitality to some 20,000 travellers. The strong stone buildings, in which the fire is never allowed to expire, can, in case of need, afford shelter to two hundred people, and the storehouses are equally large. The most peculiar thing connected with the hospice, however, is the service of safety, in which the world-renowned dogs play an important part. Every day two lay brothers cross the dangerous portions of the pass, one coming up from the lowest chalet, the other going down. In storms, and when avalanches are falling, many of the monks join the seekers, provided with spades, poles, litters, and refreshments. Every suspicious trail is carefully followed up, signals are constantly interchanged, and the dogs are closely watched. The latter are excellently trained to follow human sign, and will often, of their own accord, roam about the ravines for days. If they find a frozen man, they gallop by the shortest road to the monastery, bark violently, and lead the monks, who are always in readiness, to the unfortunate man. If they come to an avalanche, they examine it with the greatest attention for signs of human presence, and if they find them, they at once begin scratching the victim out, in which their strong paws and powerful build are of great use to them. If they do not succeed, they hurry to the hospice for help. They generally carry round their neck a basket containing restoratives, and woollen blankets on their backs. The number of persons saved by these intelligent animals is very large, and conscientiously entered in the annals of the hospice. The most celebrated of the dogs was Barry, an indefatigable and faithful animal, that saved more than forty persons during its life. This dog's zeal was extraordinary; and if it saw signs of a snow-storm or a fog in the distance, no power on

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earth could retain it at home. Incessantly seeking and barking, Barry searched and searched again through the most dangerous regions. His most noble exploit during his twelve years' service at the hospice is recorded as follows:—He found in an icy grotto a half-frozen boy, who had already yielded to the death-bringing sleep. The dog at once licked him till it awoke him, and then contrived, by its cooing, to induce the lad to mount on its back and cling to its neck. Barry reached the monastery triumphantly with his burden. His stuffed body is to be seen at the present day in the museum at Berne. We regret to add that the race of St. Bernard dogs is dying out, and the efforts made to cross the breed have hitherto failed.

The way in which help is afforded to the half-frozen travellers at the hospices is very practical. They are first walked up and down a cold room, and have a glass of mulled wine or weak spirits and water given them to drink. Those parts of their body which have been most exposed to the cold are then dipped in snow-water, or rubbed with snow, and when the circulation is properly restored the patients are put to bed, to wake up next morning quite recovered. Although food and lodging are provided gratis at the hospices, travellers who can afford it generally place some compensation in the box kept for the purpose, and such charity is surely well bestowed.

The other passes of Switzerland, unfortunately, are not so well provided for; at some, speculators have built inns, but others are quite untenanted; and any poor fellow who is surprised by the storm in them is left to starve and freeze to death.

CHAPTER IV.

NATURAL PHENOMENA OF THE ALPS.

Temperature of the Alpine region—Arrival of spring—Glacier disruptions—Terrible accidents—Dust avalanches—A beauroll of disasters—Ground avalanches—Periodical return—Pegging down an avalanche—Protecting walls—Obstinacy of the Swiss—Smaller snow-falls.

EVERYWHERE within the Alpine region winter is long, summer short, and frost keen and constant. The snow often comes down suddenly and covers the half-ripened potato crop, and does not loose its hold for six or seven months. There are hardly

three whole months in the year during which the upper portion of this zone is entirely denuded of snow, and even then it is frequently visited by drifts; the lower part may have four months, and a few sheltered valleys of the Grisons five months, of summer, if the temporary melting of the snow-crust may be said to constitute that season. The alternations of heat and cold are also very sudden throughout the Alpine region; after a summer's day, when the sun's rays have been powerful enough to scorch the tender grass, hoar frost glistens at night on the banks of the streams.

In our first chapter we described the rapid transition of the seasons in the lower mountain region, but this is even more striking in the Alpine zone. The winter is silent and inanimate; for, though the great passes are still daily traversed by sleighs and baggage-waggons, life in the uninhabited Alps is reduced to a minimum. The snow masses press heavily on the meadows, forests, and hills, cover the ravines, rocks, and milking-huts, and merge the individuality of the landscape in one general white, glistening uniformity. The lower types of animal life have disappeared in the ground, to dream of spring; mice and marmots, bears and badgers, retire to their rocky holes. The other predaceous animals and migratory birds descend to the mountain region, or prowl about the plain. Ibexes and chamois hide themselves in the highest forests; the white hare alone continues to support life beyond the forest margin, in the company of Alpine cocks, ravens, crows, eagles, vultures, woodpeckers, and some smaller birds; but these are merely fragments of the animal life, and not numerous enough to change the solitude of the interminable snow-fields.

In April, spring begins to struggle against winter with the combined forces of sun, rain, and wind; but a single night-storm will often tear from it what it has gained by a week's toil. In May, however, it grows stronger, and then its progress is wondrous. By the aid of the westerly wind and warm rain, it invokes in a few days, in the sub-Alpine region, a fresh, smiling vegetation; shakes off the snow from the firs and pines; develops blossoms, catkins, and leaves; and gradually advances upon forest vegetation. Beyond that, however, winter lasts longer,

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and grants the year but few months of summer. The fogs also help powerfully in restoring summer to the Alps; they prevent the nocturnal freezing of the day's thaw, and are hence characteristically called, in some parts, "snow-eaters." Spring is the noisiest season in this zone, with the rending of glaciers, the fall of avalanches, the dripping of water, bird songs, the hum of insects, and the cheering voices of men. Curious effects are produced by the thawing of the extremity of the glaciers. Spikes and columns of ice, attached to edges of steep rocks, drop off piecemeal, and fall with uproar into the valleys and passes. Their force is so great that ice spikes will often drive through boards, and ricochet like cannon-balls. In order to protect the roads, these ice formations are often shot away with rifle-balls from otherwise inaccessible rocks. Where streams of running water percolate the clefts, these destructive missiles often fall from concealed mountain terraces into the woods, and, in course of time, produce a regular clearing. In some parts these ice pinnacles fall during the whole of spring, and form a confused mass, which the waters trickling down by day undermine; then a warm breeze or rain sets the whole mass in motion, and these streams of ice fall like avalanches into the woods or mountain pastures, where they lie a long time unmelted.

These must not be confounded, however, with the great glacier disruptions produced by the falling in of an entire glacier, an event, fortunately, of rare occurrence. The village of Randab, in the Valais, has experienced frequent calamities of this nature. In 1636, the greater portion of the Bis glacier fell in and thundered down into the valley, where it destroyed nearly the whole village. In the last century two similar falls occurred, and another in 1819, when a mass of ice, containing 360 millions of cubic feet, fell, and the agitation of the air caused by it twisted houses round and flung the rafters into a wood some distance above the village. Similar ruin was produced in 1818 by the advance of the Gietroz glacier in the upper Bagne valley, for it filled up the narrow gorge with ice to a height of one hundred feet, dammed the river, and converted the entire valley into a lake. After awhile the

dam burst, and the flood inflicted frightful injury on the lower valley. Small glacier avalanches, produced by the melting of the ice, are very frequent on the Jungfrau and the lower Grindelwald glacier, where they may be seen in summer nearly every quarter of an hour.

Among the most picturesque phenomena of the Alps are the avalanches, those mighty, thundering streams of snow, whose majesty is as great as their power is terrific. They occur periodically, and have their regular stations and gathering places, and so certain are their movements that they may be predicted to a day, sometimes to an hour. The most dangerous of all are the dust avalanches, which are only seen in winter or early spring, and are produced by heavy masses of fresh, granulated, and loose snow falling on a firm, hard bed of old snow. If the slope be steep, the new deposit has no holdfast. The fall of a small ledge of snow above, the step of a chamois or a hare, even a snow-ball falling off a bush, or the slightest disturbance in the air, suffices to set the mass in motion. It glides slowly forward at first in a solid mass, then falls over and disperses, to rise again in small dust-like particles. The main stream hurries into the abyss with ever-increasing weight and a deafening sound, till it reaches the wooded country in the form of a broad, deep flood, tears up rocks and bushes, and bursts into the forest with a crash; then one more thunder-clap, one crushing hollow sound, and all is still.

The inhabitant of the plains rarely forms a correct idea of the phenomena which accompany one of these dust avalanches. A tremendous blast of wind rushes along with it, driving in doors and windows, and lifting chimneys from their roofs for an area of half a league. This wind frequently uproots thousands of the loftiest and strongest trees on either side of the snow-stream, snatches up men and beasts, and dashes them over precipices, breaks down fruit-trees in the valley, tears down stables and farm-buildings, and overthrows heavy waggons. Strange to say, though, its limits are sharply defined, and beyond its immediate path not a leaf is stirring. Berlepsch gives a full account of the misfortunes produced by avalanches of this nature:—



HOSPICE OF ST. BERNARD.

"On January 14, 1719, the whole village of Leukerbad, with the exception of a few huts, was destroyed by an avalanche which overwhelmed the houses with such an incredible burden of snow that only a few of those buried alive in their dwellings could work their way up to daylight above. Stephen Roll was shut up a whole week in the corner of a cellar, and could not break his icy prison with his feeble strength. He sang loud psalms and hymns in praise of God, and was consequently heard by some energetic diggers, found, and drawn up from the darkness. Notwithstanding every care, he died the following week. Fifty-five human lives were destroyed by this avalanche. In 1749, nearly the whole village of Ruäras, in the Grisons, was overwhelmed by an avalanche which buried more than a hundred beings. As it fell in the night, when all were sleeping, many, whose houses were not ruined or only gently thrust on one side, knew nothing of the awful accident, and only wondered on waking that the night lasted so long, till they convinced themselves that they were immured in a Bastille of snow. Some sixty of these were saved by their own exertions and the help of others. The most remarkable accident in modern times is that which, in 1827, befell the village of Biel, and killed forty persons. On the other hand, many extraordinary escapes are recorded. Thus, in December, 1836, a house in the Avensthal, in which twelve children were playing, was seized by an avalanche, pushed forward horizontally, and so covered with snow that not even the roof-ridge was visible. The parents of the children, though almost paralysed with fear, hastened with shovels and spades to the spot where they supposed the house to be; but, before they had begun to dig, the children came creeping out in safety. During the Suanian war of 1498, four hundred Imperialist soldiers were carried off by an avalanche and thrown over a cliff; but, strange to say, the whole heap of snow became as full of life as an ant-hill, and, amidst roars of laughter from the soldiers who had not been touched, all the others, without exception, crept out, some certainly hurt, but none fatally injured."

To furnish an idea of the power of the wind accompanying the avalanche, we may

state that a man saw a fall high up on a mountain wall, perhaps five miles from him, and hastened to reach a stable which was in a tolerably safe position. Though it was *only fourteen yards off*, he could not reach it, but was seized by the forerunning gale of wind, hurled over the cliff, and buried there by the avalanche which followed with the speed of lightning. In the year 1754, a dust avalanche fell over the St. Placis valley, and the side wind blew off the cupola from the eastern tower of the monastery at Dissentis, although it was nearly two miles distant from the avalanche's track.

The ground avalanches which usually fall in summer are of a different character; they are regular in their movements, and are caused by the loosening of snow-fields some thousand feet in extent by the action of the sun and wind, until the slightest impulse suffices to set them in motion. Avalanches of this description do not scatter clouds of snow-dust, and hence injure nothing but what comes immediately in their path. The snow lies piled up to a height of thirty or forty feet in the basin where its career ends, and is often not melted away till July. The mass of snow is so firmly cemented together that it becomes as hard as iron. A mountaineer who was hurled into a valley in the Splügen by a ground avalanche without sustaining any injury could not with all his strength release his cloak, half of which was buried in the snow. Another curious circumstance connected with these avalanches is, that persons buried in them are able to hear distinctly every word uttered by those who are searching for them, while their own loudest shouts will not penetrate through even a few feet of the dense covering.

In addition to these large avalanches, smaller ones constantly fall during spring and summer on peaks which rise abruptly from deep hollows, such as the Jungfrau, Weggis, and Glärnisch. Von Tschudi has counted as many as six such thundering cascades on one mountain at the same time, and, under favourable circumstances, the visitor to Switzerland may see from twelve to sixteen falls on a warm spring day within a few hours, each possessing its peculiar form and beauty. Were it not for this sudden removal of huge masses of snow, spring

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vegetation would be impossible. If it were all left to gradually melt away it would last till late in the summer, and in many shady places, permanent heaps would stand on spots where the haymaker now collects his aromatic load. When a ground avalanche has transported one vast snow-field from the heights to the valley beneath, the sun and rain operate with redoubled force on the vacant spot, the soil becomes warm, and the neighbouring snow-fields are fretted away till they slide down after their predecessors, or disappear. These cleared spaces are the earliest foraging-ground for crows, ravens, ptarmigan, blackcock, and all those birds that feed on insects; for, within a few days, the dark-brown oasis is animated by swarms of gnats, chafers, flies, and spiders. Avalanches, on the whole, then, may be regarded as very useful phenomena in the Alpine world, notwithstanding the devastation they sometimes cause.

In some high valleys of the Valais the inhabitants have an ingenious method of nailing down the avalanches. In early spring they repair to the sources of the snow-streams and drive pegs into the earth along the entire inclined plain, so that the fall of the molten snow may not bring down with it the entire bed. Sometimes periodical avalanches have been put a stop to merely by the fact of some grass having been left uncut on ledges by the wild-haymakers of the previous summer; the long dry stubble, frozen hard in the snow, restrains it from falling down and setting an avalanche in motion. In some exposed valleys of the Rhaetian Alps the inhabitants defend their houses by

two walls of stone and snow reaching to the gables, which, formed in an acute angle on the side exposed to the avalanche, divide the snow-stream, so that it passes without injury on either side of the dwelling. This is no protection, however, against the dust avalanches, which leap over both walls and houses. The church of Our Lady, at Davos, is protected in this manner, as are many houses in the valleys of Mayen, and Bedretto, and elsewhere. Detached barns are merely protected by a wall of snow, iced by pouring water over it, and which holds out till the danger has passed.

Among the best known localities at present exposed to danger from avalanches are the Schöllenen, the Val Tremolo, the Zuga, near Davos, the Platifer Pass, near Dazio Grande, and some others. Man opposes a stubborn and energetic resistance to the might of nature. He builds his chalet dauntlessly in the very path of the avalanche, and though it may be swept away like an ant-hill, with a strange pertinacity he will erect a new one on the same spot. In the Valais, avalanches carry off the chapels of Lugein and Koppigstein almost every spring; but the inhabitants invariably rebuild them where they stood.

Avalanches are only phenomena of the lower region, especially of that on the borders of woody vegetation; they rarely occur above a height of 10,000 feet. Still, snow-slips occur at very great heights; but such trifling and partial fractures have too little the character of avalanches to be included in our description.



The Chamois.

UP IN THE ALPS.

BY CAPTAIN WRAXALL.

CHAPTER V.

ALPINE SCENERY.

Watercourses—River heads in the Alps—Cascades—Mountain tarns—The Great St. Bernard lake—Mud avalanches—Stalactite caves—Mineral springs—Mephitic vapours—"Karren" fields—Legends—The Alpine martin.

AMONG the characteristic features of the Alpine region water assumes a marked place, and animates it after its way quite as much as do the vegetable and animal types. Without water the most luxuriant valley or the most fertile plain is, to a certain degree, lifeless and unattractive; and a broad rivulet or a small lake always forms a pleasing relief in the monotony of the landscape, however grand it may be by nature. The Alps are specially rich in watercourses; the valleys, it is true, are too short to contain rivers, and too narrow for large lakes; but, at the same time, they are the birth-place of such world-renowned rivers as the Rhine, the Rhone, the Ticino, and the Adige. Some of them take their rise in marshy ground, while others issue from small mountain tarns or mighty glaciers; at times, however, they originate solely in the drops trickling from rocks, or burst from the ground in the form of springs, and at once form brooks of some size. Their affluents are almost countless; thus it is calculated that, in the Rhetian district alone, three hundred and seventy glaciers add their melting waters to the Rhine, sixty-six to the Inn, and twenty-five to the Adige and the Po. Any one who visits the Alps in the spring, and sees the streams pouring down from every rock, snow-field, and crevice in the mountain side, will be able to form an idea of the infinite mass of water which descends from the Alps to the plains to spread fertility around. The discharge is greatest when warm winds and showers prevail: fresh veins of water then appear on every side; small, pebbly brooks become muddy, turbulent streams; and the glaciers sparkle with a hundred bubbling channels. The warm south wind, which enlivens men and brutes, arouses a wild

life in the world of plants and waters. It is difficult to decide the source of many rivers; thus, for instance, the Vorderrhein takes its rise from several brooks, each locally called the "Rhine." All the sources of this marvellous river, which, in its course of nearly 900 miles, receives 12,283 streams and rivulets, lie in the Alpine region. As a rule, sources from real springs have a preference over those which rise from glacier outpourings. The three springs of the Rhone receive two ice streams from the Rhone glacier, which contribute twenty-fold the amount of water offered by the little spring-head in the meadow near the Gletsch hostelry, and yet the latter is alone honoured with the name of "the source of the Rhone." Similar is the contempt frequently expressed by the mountaineers for the "wild" glacier waters, and their liking for the "living" sources; as the former are cold, muddy, and harsh, and are considered unhealthy and debilitating, while the latter are pure, limpid, and often so warm that a green vegetation is visible around them in winter; and yet many streams can only boast of such despised glacier sources. Thus the Aar is formed of the waters pouring from the Ober, Finster, and Lauter Aar glaciers, which meet at an elevation of 6,270 feet. The only stream which runs for a long distance through the Alpine valleys, and becomes a river amid them, is the Inn. The Aar, however, also attains a considerable size by the confluence of the tributary streams from all the dark ice valleys through which it races in its long career. After quitting these it flows through the dreary deserts of Aar-boden Thal, under the Grimsel hospice, into a narrow gorge, where it bounds from ledge to ledge, eventually forming the renowned Handeck waterfall, the largest in the Alps, which in winter, however, degenerates to a mere thread of water. The remaining falls of this region—with the exception of that of the Drance into the valley of the Bagne, fifty feet deep, and that of the Toccia in the highest part of the Piedmontese valley of Formazza

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which rushes with a breadth of eighty feet in three branches over a shelving rock to a depth of nearly 500 feet—are formed by small bodies of water, but are often very bold and striking in appearance.

The high lakes, or deep green, blue, or greyish tarns, which the hand of the Creator has scattered so abundantly over the Alps, are equally numerous and attractive. They are generally small basins of an oval shape, with jagged rock bottoms. Within the forest limit, their banks are still fringed with dark red firs and Siberian stone pines. Other lakes are bordered by rocky banks, from which the bold mountain cones rise abruptly, or by damp, sour pasture lands. The eternal Alps—with their grim battlements, dark ravines, dazzling snow-fields, and widely-extending terraces—are clearly reflected in their smooth mirror-surfaces. The more elevated water collectors—which are mainly fed by glaciers, and allow no tree to grow on their banks, or at most a few stunted shrubs, such as willows, Alpine roses, dwarf cherries, and alders—have a gloomy and melancholy aspect. Their dark green hue and usually unruffled waters harmonise with the desolation of the landscape. No boat or raft has ever disturbed them; no lily has expanded its flower on their surface; no fish sports in their depths; no bird nor frog is visible on their banks. For the greater part of the year they are covered by snow and ice; and several of the shallow lakes are frozen to the bottom. Spring and summer thaw them slowly and laboriously, and small blocks of ice float on their surface at the season when the Alpine roses on the surrounding cliffs are waving their blossoms in the wind. Now and then a late avalanche will hurl its lofty masses of snow into their basins, or a frost cover the scarcely melted water with a crystal mantle.

One of the highest of these lakes is that of the Great St. Bernard, just under the hospice of the same name. It is a quarter of a league in circumference, and is only melted for a few months in the year. And yet, during the short summer, double violets shoot up on its banks, the second flower emerging from the calyx of the first; but animal life exists neither in nor around it. In the vicinity are the small tarns of the

Col de la Fenêtre (8,250 feet above the level of the sea), perhaps the highest basins in Europe, and frequently frozen for years together. Among the more remarkable tarns are the little Schwartz lake on the Matterhorn, having on its banks a chapel dedicated to "Our Lady of the Snow," annually visited by a procession of pilgrims from Zermatt; and the Aletsch lake, on the glacier of that name, whose walls of ice rise about fifty feet above the highest water level, and which has islands of ice almost constantly floating in it. Many of these tarns have no visible outlets; their waters are discharged through some cavity, the position of which is marked by an eddy, and then work their way through subterranean channels, to reappear at some great distance. Other tarns, again, have no visible inlet, and are fed by springs. These phenomena heighten the mystery hanging over the silent waters of the High Alps, and favour the wild legends current about them among the mountaineers. Several of them were held in great veneration by the ancient Celts, and hence, probably, originated the modern fables about them. The high lakes of the Alpine and snow regions are almost destitute of animal life, and attempts made to people them with spawn have failed, owing to the length and severity of the winter. Some of them, however, are celebrated for their trout, as, for instance, the Silsersee (5,600 feet above the sea), in which fish of considerable weight are caught.

Torrents of a very remarkable nature are seen, though rarely, in the Alpine region; these are what are called the "mud" streams or avalanches. In the year 1673, a torrent of this sort, composed of a bluish clay, poured from the Septimer mountain over the little village of Casaccia, and partly destroyed it. In the autumn of 1835, another—900 feet broad—fell into the valley of the Rhone from the Dent du Midi. The conical earth hills near Chur, called by the Romanic population "Horses' tombs," may be regarded as the relics of mighty pre-historic mud torrents. Streams of rocky deposits also break out from glaciers and ravines, and, in 1793, buried Surllegg, on the lake of Silvaplan. Among other mountain curiosities are stalactite caves, intermittent springs, shell-beds, veins of variegated marble, masses of soft alabaster, rocks of wonderful colouring,

mineral springs, &c. The Baretto Balma, a small dry cave, is famous for the peculiarity that it is always kept perfectly clean and empty by the wind, and no leaves or moss are allowed to lie in it. The crystal grottoes of Zinkenberghave acquired great celebrity: from these wonderful vaults, through which a small rivulet runs, four tons' weight of valuable crystal has been removed, the finest specimens being kept at Berne and Paris. The mineral springs are very abundant, and equal in curative properties to any in Europe; but only two—that of St. Maurice, which Paracelsus declared to be the finest chalybeate in the world, and that of the Bernardin—offer accommodation for visitors. The town of Engadine is specially rich in mineral treasures and their accompanying phenomena. At Tarasp pure copperas is found; at Schuols, sulphur and quantities of gypsum, marble, porphyry, carbonate of lime, and serpentine. In the numerous stalactite caves in the neighbourhood the richest mineral efflorescences are visible, but even more interesting is the phenomenon of mephitic vapours, which are usually only observed in connexion with volcanoes. From openings in the earth near Schuols rise copious streams of carbonic acid gas mixed with nitrogen. Heaps of dead insects, mice, and even birds, lie at the mouth of these apertures, poisoned by the deadly vapour. The exhalations ascend scarce a foot above the ground, emitting a sharp odour which causes violent coughing. Glaciers, also, form a marked item in the Alpine scenery, but, as they belong more especially to the snow region, we shall defer any account of them for the present. A peculiar element of the Alpine region, however, must not be passed over, and that is the "Schratten" or "Karren" fields, which Von Berlepsch thus describes:—

"High up in the mountains, by the side of the frequented passes and the lovely Alpine pasturages, at a height of four to six thousand feet on the limestone Alps, lie bare, naked plains of stone, often extending at a dead level for miles, which are so furrowed and crossed by deeply-cut channels, that they look as if a swelling sea had suddenly been turned to stone, and left behind an inextricable net of crested waves. Below, they are so terribly split and gnawed by gutters, that it is impossible, by jumping,

clambering, or careful balancing, to make way across them; for the remains of stone between these channels run across them like narrow claws, sharp as the edge of a knife, and then suddenly break off, being interrupted by cross cuttings. They appear again like saws, whose teeth have been broken off at all kinds of heights—a place which has been, as it were, hacked, hollowed out, sawn through, and carved by giant instruments—a stony sea, splintered and cracked, full of the strangest forms, which often resemble glacier 'needles.' Between them are deep funnel-shaped holes, like the crater of a volcano; or they sink into canals which disappear under ground. Then, again, they open into bowls, yards in breadth, and with bottoms riddled like a sieve. In other places a certain law of erosion seems to have prevailed in this chaos, for the masses of ruin have nearly the appearance of cells in a beehive. They are, indeed, a miniature description of the most fearful destruction."

The origin of these Karren fields can be explained by a peculiar weather-wearing of the rock. Every drop of rain that falls on any point, and seeks some downward road, takes a portion, though it be infinitesimal, of the stone with it; the succeeding drops follow in its track, and thus, in the course of centuries, wear furrows in the softer constituents of the limestone. When the rain and snow water has acted in this manner up to a certain point, it continues its operations from all sides by freezing, thawing, friction, &c., and the furrows, at first scarcely perceptible, are gradually deepened into clefts and pits, the form of which depends materially on that of the limestone. Thus what was once an immense surface of rock ends by becoming a sort of sharp skeleton, between the ridges of which houses might be built at some spots, while at others there is scarce space to admit a hand. As not a particle of earth finds a place on this decaying limestone, which in summer reflects an intolerable heat, it is evident that these spots do not offer the necessary conditions for vegetable life. At some favoured points, it is true, these Karren fields are partially covered with Alpine roses and juniper, but higher up they are utterly bare—a mere corroded desert of rock, without trace of a spring or trickling ice-stream, for the waters per-

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forate the rocks, and break out again at the base of the field. Hence the Karren are frequently connected with the "weather holes" to which we have referred. Travellers, chamois-hunters, and neatherds sedulously avoid the Karren fields, on account of their dreariness or the difficulty of walking over them. Here and there may be seen on them a few Greek partridges, which run about the crags with great activity, and house in the fissures. Marmots, also, sometimes settle in the lower portions, and the Alpine fox will at times retire to them during the summer, when not engaged in hunting down birds.

Very naturally, the gloomy character of the Karren has led to popular superstition seizing upon them. Dwarfs and gnomes are supposed by the mountaineers to have bored and crushed the rocks, and to be the deadly foes of those daring mortals who venture on their domain. Another legend, recorded by Von Berlepsch, is also significant for the moral it contains. Once upon a time the Schratten-flüh at Entlebuch was the best pasturage in the country, and belonged to two brothers, who ruled over it in common. One of them having become blind, they resolved to divide their possessions, and the one who could still see was intrusted with the division. He, however, took advantage of his blind brother, put the boundary stones wrong, and took for himself the largest and best part of the Alp. When the blind man was told of this he spoke to his brother about it; but the latter forswore himself, saying that the fiend might take him and destroy his meadow if he had not shared it quite fairly. Then arose a fearful storm; the hill shook, Satan appeared, and the oath was fulfilled. The devil stripped off all the turf and useful soil from the mountain, and that with such zeal and energy, that the marks of his claws are still to be seen in the slope of the channels in the rock. While the blind man's meadow remained unhurt, his brother was carried off.

The most important of these remarkable Karren fields which will merit the traveller's attention will be found in the cantons of Appenzell, St. Gallen, Glarus, and Schwytz; the most celebrated of all being the Silberer, whose stone surface is so white that it is constantly taken for a snow-field. The sub-

ject of illustration this month is the Alpine martin, a very pretty bird, which dwells in the limestone crevices of the Scharren fields.

CHAPTER VI.

ALPINE VEGETATION.

The Alpine flora—Pasture lands—General character of the scenery—The forests—Their gradual devastation—The weather-flr—The leg-föhre—Flowering plants—The Alpine rose—A legend—Other gay flowers—The hay crop—Wild hay cutters—A dangerous livelihood.

WHEN we proceed to examine more closely the forms of life belonging to this elevated zone, we find them all endowed with the strange and peculiar charms of the Alpine character. The new groups of plants which succeed those we saw in the mountain region may not be so various, but they compensate for that deficiency by their fragrance, beauty, and splendid colours. This is the region of the glorious pastures on which thousands of cattle take up their abode; of sunlit grass slopes, where the chamois browses with the goats, the grazing marmot startles the ptarmigan, or the Alpine hare is carried off by the swooping vulture.

But near the odoriferous Alpine pastures stretch out huge wastes of crumbled rocks and Karren; while above and below them walls of rock rise a thousand feet high, and ascend to the peaks in bold terraces. Cold streams rustle through them in deeply-hollowed beds, and chilling glaciers thrust themselves into the green plateaux. Nowhere does grand Mother Nature paint in sharper contrasts, or display richer charms or darker horrors; and nowhere is man so affected by sudden changes from pleasant comfort to startling terrors. People are prone to imagine the formation of the Alpine region as a mere gentle transition from the mountain zone to the extreme heights, and that it presents a uniform gradation of wood, meadow, and, finally, perhaps, snow. This, however, is rarely the case; even in the lower mountain regions the pastures, generally speaking, are steep terraces, rising one above another, with perpendicular walls of rock between. At times the terraces are clothed with patches of wood or grass, or steep fields of *débris*; and when these are surmounted we arrive at the genuine Alpine pastures, extending to the extreme limits of

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vegetation. The mountain summits are rarely green, but usually appear as abrupt stony crags, with patches of grass scattered along them at intervals. Grand as such mountains are, they offer nothing to refresh the eye; no wood, green slope, or chalet is visible on the limestone pyramid. It affords scarce any support to animal life; and a few birds and occasional families of chamois constitute its sole inhabitants.

The Alpine forests have receded, like the cedars of Lebanon, and, even in the central region, glaciers and stone torrents have destroyed them repeatedly. The once richly-clothed Valle di Peccia, above Lavizarra, now hardly supplies the sparse inhabitants with the requisite firewood. On other mountains large patches of dead larches and pines may be seen, from which no after-growth can arise. In the upper valley of Avers, the inhabitants burn goat and sheep dung, and have seen the literal fulfilment of a prophecy to the effect that the time would come when a man would have to descend the valley for two leagues before he could find sufficient twigs to make a broom. Elsewhere, celebrated forests have but solitary representatives to mark their former position. This wholesale devastation may be accounted for by the extravagant use of firewood, and the readiness of the communes to sell their timber. To this must be added the perfect ignorance of arboriculture; for, when a wood has been felled, the ground has been let lie fallow, and the layer of soil became rapidly destroyed.

The character of the still-existing Alpine forests differs greatly from that of the lower zone. They do not form large continuous tracts, but grow in patches on the heights, often broken by beds of avalanches, rivulets, precipices, or loose boulders. In some localities, especially those exposed to bleak winds, whole woods remain stunted in their growth; and there are districts where the trees have not grown above four feet in height. In most forests the "weather-fir" forms a remarkable feature. Its branches, spreading out as if for the express purpose of affording shelter, form a thick dark green pyramid of great beauty, gradually diminishing to the top of the tree. Bearded lichens, the last resource of the chamois in snowy winters, hang sadly from the branches; the

crown is frequently scathed and the trunk torn by lightning; but, for all that, the noble tree sturdily defies the elements. Under its wide-spread branches man and beast seek shelter from the heavy snow-storms; the wild cat and the lynx lurk among its branches, and bears and foxes make their dens among the roots. The weather-fir often attains a height of one hundred feet, and some of them have withstood the elements of four or five centuries. But, as a rule, pines and firs, of nearly every variety, form the staple growth of the Alps. Among these, the most remarkable is the "leg-föhre," or prostrate pine, whose reddish-brown trunk creeps along the ground for some twenty or thirty feet, and then rises to a height of from six to fifteen. These firs grow in masses in the most unpromising spots, forming an almost inextricable labyrinth, in which bears are very prone to take shelter. The prostrate pine, however, though not a graceful tree, is very useful; for its close branches break the fall of the snow, and prevent the avalanches from ravaging the meadows beneath them.

The Alpine flowering plants often grow in dense masses, and their wonderful splendour of colouring lends that magic charm to the fresh green turf which renders the pasture lands of the Alps so world-famous. The most brilliant blues and reds, with a rich brown shading to black, are visible amid the white and yellow flowers of the low countries; and such tints seem to assume a more dazzling hue in these high regions. The fragrance of the flowers is no less remarkable a characteristic; from the brilliant auricula down to the violet-scented moss this strong aroma is widely prevalent. The queen of all the flowers is what is termed the Alpine rose, of whose origin Von Berlepsch tells us the following legend:—

In the dear old days, there lived at Oberhausen a very rich peasant, with an only daughter, the fairest of all the maidens dwelling round the lake. Though she had many suitors, none seemed to her good enough. One, however, was devoted to her with his whole honest heart; but Eisi rejected him like all the rest, and sent him packing. On one Sunday evening, as the lad was treating the maiden to wine, she seemed to listen to his protestations, and

said she would be his wife if he fetched her cliff flowerets growing on a jagged rock wall over the Lake of Thun. Hans started at daybreak on his dangerous venture, and had all but clasped the flowers, when a stone crumbled, he lost his balance, and the next minute, after a frightful fall, lay dead at the foot of the cliff. A few hours later, Eisi went singing merrily past the rocks—one look, and she sank fainting by the side of the man whom her pride had killed. The faithful lad still grasped the flowers in his hand, and remorse broke Eisi's heart. But, on the spot where Hans' corpse lay, a flower sprang from out his blood, and it is the Alpine rose.

Our readers would be greatly mistaken if they supposed this flower to be really a rose; it is, in fact, a rhododendron, which the Germans translate correctly enough as rose-tree. In the Alps there are two varieties of a single species, the rust-coloured and the fringed Alpine balsam (*R. hirsutum*). In some districts of the Alps large spaces are covered with this blooming flower, and resemble patches of bright ruby-coloured flame, visible for a great distance. The Alpine rose is an obstinate plant, and can only be transplanted with difficulty to the low lands. As Von Tschudi eloquently says—"It is the most charming symbol of maidenly purity and innocence. There is scarcely any plant which, when broken from its stem, so soon loses its beauty and colour, and pines to death. Weather and storm, heat and frost, rain and snow, all the assaults of nature, it can bear with patience and courage, only too happy when it obtains a friendly ray of sunshine. But at the touch of man's hand it trembles and loses its colour, for that brings its death. With surprising speed it changes its clear, transparent gold-purple into a bluish tinge, and no one has seen Alpine roses in their full splendour who has not seen them blooming on rocky slopes."

This Queen of the Alps is surrounded by a brilliant court, no member of which, however beautiful she may be, dares to contest with her sovereign the palm of loveliness. Among the number we specially refer to the family of gentians which adorn the turf with varied colours. The tall purple gentian, the spotted and the yellow, proudly raise their gleaming clusters above the low

plants, while the stalkless and spring gentians strew their purple bells broadcast over the young sprouting grass. So soon as the snow removes its dirty outer garment, the graceful Alpine campanula shoots forth impatiently from the damp ground. The bright yellow highly-scented auriculas and pretty saxifrages cover large patches of rock; and among the most graceful flowers of the Alpine world we may mention splendid anemones, blue and white globularias, the ranunculus, the blue and red speedwell, fragrant thyme, the red mountain house-leek, the blue Alpine starwort, the leek, the mezereon, the aromatic artemisia, the columbine, the variegated coltsfoot, the gaily-coloured papilionaciæ, and the magnificent azaleas,* which grow at a height of 8,500 feet above the level of the sea. Some of these plants adorn the bare face of the rock, others the channels of glacier streams; some clothe the pasture grounds, while others seek the seclusion of the snow dells.

Besides its floral wealth—which, as we have shown, is very considerable—the Alpine region is rich in herbs whose nutritious properties are far superior to those of the low lands. Alpine hay, when grown in good situations, is far better than that of the plains; and when this herbage is allowed to attain its full growth it is not got in till August 25th. A peculiarly dangerous trade in the Alps is that of the "wildheuer," or wild hay cutter, who gains a precarious livelihood by cutting the grass at apparently inaccessible spots, which seem only fitted for the eyries of the eagle and the vulture. At many of these spots the daring man cannot take off his cramp-irons the whole day, for he has to drive them into the ground at every step. Sad to say, the dangers of nature are not all he has to contend with, for, ere now, many a wild hay cutter has had to wage desperate fights with rivals on the very verge of an abyss, where an unguarded step would plunge him into eternity. If the weather be favourable, each man may bring home a hundredweight

* Any of our readers who wish to form an idea of this flower we recommend to visit the Midsummer Show at the Royal Horticultural Gardens. Such a magnificent display, as regards colour and growth, as was shown last year, was worthy of that world's wonder, the Great Exhibition.

FREE PHILOSOPHY.

of hay a day. He gains by this three or four francs. If stormy weather occur, however, the wind, which often howls furiously over the heights, frequently carries off the mown swathes, scattering them far and wide, or else swollen rivulets wash them away. When the hay is cut, it has to be removed to a more convenient spot; and this part of the work is not a whit less dangerous than mowing it. If the wall of rock be not too high, the hay-cutter throws the hay down in a net, and descends unburdened to gather it. Should the rock, however, be overgrown with underwood or timber, he is compelled to carry the crop on his shoulders down paths which frequently scarce allow him to set one foot before the other. His greatest peril is when his burden is caught in some projection of the rock and he is toppled over the precipice. If he descend in safety he piles up the hay in the open air, trusting to the honesty of his neighbours, and protects it by driving poles weighted with large stones into the ground. It only too often

happens, though, that the poor fellow, when he goes at winter time to get in his stock, finds it more than half devoured by the mountain hares. When the paths are thickly covered with snow the wild hay maker ascends the mountains with his sleigh, ties down the hay upon it, and then starts homeward over the frozen surface at lightning speed. Wondrous is the skill with which he finds a way along the ravines and beneath avalanches that threaten to crush him at any moment. Accidents constantly happen. Indeed, such a man never leaves his cottage without bidding his wife and children farewell for ever. But, in spite of this, the foolhardy fellows seem to court danger for danger's sake, and think nothing of dashing homewards in a "bee-line" over precipices and ravines, trusting to their good genius to save them from the abysses which yawn to engulf them. And all this for the chance of earning, at the most, half-a-crown a day during two months of the year!

FREE PHILOSOPHY.

CUSTOM, that tyranness of fools,
That leads the learned round the schools,
In magic chains of forms and rules!
My genius storms her throne:
No more, ye slaves, with awe profound,
Beat the dull track, nor dance the round;
Loose hands, and quit th' enchanted ground:
Knowledge invites us each alone.

I hate these shackles of the mind
Forged by the haughty wise;
Souls were not born to be confined,
And led, like Samson, blind and bound;
But when his native strength he found
He well avenged his eyes.

I love thy gentle influence, Rowe;
Thy gentle influence, like the sun,
Only dissolves the frozen snow,
Then bids our thoughts like rivers flow,
And choose the channels where they run.

Thoughts should be free as fire or wind;
The pinions of a single mind
Will through all nature fly:
But who can drag up to the poles
Long fetter'd ranks of leaden soul?
A genius which no chain controls
Roves with delight, or deep, or high:
Swift I survey the globe around,
Dive to the centre through the solid ground,
Or travel o'er the sky.

WATTS.

UP IN THE ALPS.

BY CAPTAIN WRAXALL.

CHAPTER VII.

THE CHAMOIS.

Habits of the chamois—Its appearance—Autumnal frolics—The weather-pine—The reindeer of the Alps—Salt-licks—Speed of the chamois—The sentinel doe—The fawns—Attempts to tame chamois—Their natural enemies—The German bezoar.

THE chamois (*Antelope rupicapra*, the only variety of antelope existing in Europe) is distinguished before all the other animals which impart a peculiar charm to the Alpine regions. These beautiful swift-footed rock-goats traverse in small herds the loneliest regions, animate the highest peaks, or fly madly over the ice-fields which extend for leagues. Sociable and peaceful among themselves, and harmless to other created beings, they would readily join the other herds of Alpine cattle, and might be tamed, were it not that man's ever hostile attitude has caused them to feel an almost unconquerable terror of him. It has often been asked whether the chamois might not be converted, by careful treatment, into a useful domestic animal during the winter, while in summer they would be turned out on the mountains like the other flocks of goats. As it is, the chamois contrives to exist on the scantiest and poorest food; but a richer kind of fodder would indubitably increase its yield of milk and flesh.

The chamois, as our readers are aware, bears a close resemblance to the goat, but is distinguished from it by black bent-back horns, stouter and longer legs, and a shorter and more compact body. The entire frame is flexible and elastic; standing on all-fours, the chamois is able to raise itself till it attains a height of six feet, letting its weight fall almost entirely on the hind legs. Like the ibex, it has no beard. The chamois is lightest coloured in spring, when it is a brownish yellow; in summer it resembles a roebuck, but grows gradually darker in the autumn, and by December is almost black. The black stripe, however, running from the eyes to the nose, and the one along the spine, generally remain of the same hue at all

seasons. It does not always change its coat with its colour; and this change is, probably, dependent on the variety of food, combined with the atmospheric influences and the effect of the light. In winter the coat becomes remarkably thick, and the upper hair, which is coarse and brittle, often grows on old bucks to a length of two inches. The hoofs of the chamois are much stronger than those of goats, and are surrounded by a projecting rim, which is of great service to it in crossing ice and rocks. The points of the substantial horns are very sharp and fine, enabling it to resist the attacks of eagles and vultures, as well as to rip up dogs, though it never tries their power upon men.

The usual summer abode of the chamois is the loftiest and most inaccessible regions of the European Alps (Switzerland, Savoy, Vorarlberg, Tyrol, Bavaria, Salzburg, Styria), as well as of the Pyrenees, the Carpathians, and the Caucasus, up to the snow line. At this season they do not descend to the valley, unless they are disturbed. They are fond of lying in the vicinity of glaciers; at day-break, or on moonlit nights, they graze down the mountain sides, or seek grassy spots protected by walls, and generally remain from nine o'clock to eleven on the edge of some steep precipice. At midday they begin ascending again, ruminate till about four o'clock in shaded gorges, if possible, close to the snow, of which they are very fond, and feed again the whole evening till sunset, spending the night under overhanging rocks.

The chamois appears to be most frolicsome towards the end of autumn, at the pairing season. At this time they may be seen engaged in the maddest frolics and sham-fights; they chase one another on the narrowest ledges, striving to push each other off with their horns, and making feigned attacks in order to take their antagonist off its guard. But if they perceive a human being, even at the greatest distance, the scene changes at once. From the oldest buck down to the youngest doe, they are on the watch, and ready for flight; and even if the

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observer does not stir, they do not recover their good spirits. They slowly proceed up the mountain, watching from every peak, and, when they reach the highest point, they close up, peeping anxiously beneath, and moving their glistening heads in every direction. In summer, the chamois rarely return to their feeding-ground on that day; but in autumn, when the mountains are more solitary, they will gallop down the precipices an hour later, and return to their old playground.

In autumn, when snow silvers the Alpine peaks, and gradually descends lower and lower upon the mountain pasture lands, the chamois also come down to the upper forests, and in winter occupy them as their permanent abode. In these they equally prefer the southern side of the mountain, in the neighbourhood of steep patches, from which the wind constantly sweeps the snow; but they like better than aught else the broad-branched weather-pines, whose arms hang down nearly to the ground, and protect the long, dry grass from the snow. It has been asserted that their fine instinct leads the chamois to choose those forests which are generally safe from avalanches; but many are destroyed, in spite of this, by the falling masses. So soon as spring begins to reduce the snow on the heights, these Alpine animals return to their natural home, and live half in snow and half in verdure.

The chamois are, in many respects, the "reindeer of the Alps," not only through their extraordinary speed, but also through their slight wants, usefulness to man, and tenacity of life. They graze contentedly on the remotest peaks and spots inaccessible even to the sure-footed goat, as if Nature had created them solely to consume this otherwise wasted portion of her products; and they thrive so well on this coarse herbage, that, by the time autumn comes, the animal will weigh from sixty to eighty pounds. In winter it grows much thinner, owing to the poor nourishment which the grass then affords. It usually seeks its food at lower spots in winter, where it will eat the long lichen trailing from the weather-pines; sometimes a chamois is caught in this by the horns, and starves to death. The same lichen which supports the game is used by the hunter as wadding for his gun.

Like all ruminants, the chamois are excessively fond of salt, and hence visit limestone rocks, on which there are saline efflorescences. The animals will travel miles to their "licks," especially when they are productive and in the vicinity of a stream, which they always seek after licking salt. The hunters carefully keep up these "licks," and will even strew salt, but do not shoot the animals at the spot, as that would make them leave it for a long while. The chamois live gregariously in herds of five, ten, or twenty head, though, formerly, herds of fifty or sixty were no rarity. They are frolicsome, graceful, and extremely clever animals, and their every movement reveals remarkable muscular strength, activity, and grace. This is especially the case when they are on the watch, for at other times they stand with bent legs, and awkwardly. But, when startled, they assume an entirely different nature. Their muscles become tense and elastic as steel springs, and they fly with splendid bounds over ravines and ice. Without seeing them it is impossible to form an idea of their wondrous speed, and the incomprehensible certainty of their leaps. They bound across wide and deep chasms, and keep their balance on almost imperceptible ledges; then, standing on their hind legs, reach the landing-place, often no larger than a human head, on which their unerring eye has been fixed. The chamois is far more tenacious of life than the ibex; it will often fly for miles with a bullet in its body, or only on three legs. A hunter of Glarus once wounded a chamois severely in the foot; he saw it for three years in succession strangely disfigured, and was not able to kill it till the fourth. In 1857, an aged buck was shot in the Engadine, which had lost one horn, had a leg broken, and displayed the scar of a bullet which had passed through its body. In the same year some hunters shot a buck and a doe; on lifting the latter up it displayed some traces of life, and received several heavy blows on the skull; aroused by this, it sprang up, pulled the powerful man who held it by a leg for some distance, then hurled him on one side, and escaped. When an animal is hard hit, it separates from the rest of the herd, retires into a rock crevice, licks itself incessantly, and is either cured or dies without profit to

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the hunter. In autumn, the layer of fat often enters the wound and checks the hæmorrhage.

Their wonderful sense of smell, sight, and hearing, and marvellous instinct of locality, protect the chamois from many dangers. When they are collected in a herd, a powerful elderly doe undertakes the charge of the common safety, although all keep their eyes open. While the younger animals are playing, or butting at each other like goats, the doe grazes at a short distance off, sniffs in all directions, and ascends a projection, whence it peers around. If she scents danger, she gives a shrill whistle like the marmot's, and the rest follow her at a sharp gallop. As the does are far more attentive than the bucks, the latter are nearly always shot for choice, and the specimens captured are usually bucks. This may partly arise from the fact that the bucks generally live alone, and hence can be more easily surprised.

It is never the case that a chamois will feel helpless on reaching a rocky pinnacle from which it sees no escape, as goats do. When it is in such a position that it can neither advance nor retire, it resolutely leaps, and is destroyed. Sometimes, however, when in such a situation, it overcomes its fear of the pursuing man, and turns back with lightning speed. In such a case the hunter's only chance of salvation is to lie flat on the ground, and the mad animal dashes over his body. But the chamois' power of judgment is so extraordinary that it manages to steer its way down a rock wall if there be the slightest inequalities of surface. Nay, more: if, in its fall, it notices the slightest level ground which may afford it safety, it will work its body and legs in a curved posture so as to reach it. It is difficult to say anything certain about this splendid animal's agility. It is a well-ascertained fact, however, that it will clear chasms of sixteen to eighteen feet in width, or drop down a precipice with a fall of twenty-four feet. It behaves more cautiously on ice and snow, and hence is more easily caught there.

An old buck is rarely visible with a herd, for they live like hermits, and often attain the age of thirty years, when they become quite grey. The doe generally gives birth, in May, to one fawn, which sucks for six

months, as a rule, and the buck does not care for his offspring. The fawns, which attain their full growth in their third year, bleat at first like goats, and, when only twelve hours old, go at such a pace after their mother, that a man cannot run them down. If the mother be killed, however, the fawn usually returns to the body, and lets itself be captured or shot. It is not difficult to tame young chamois; they first receive goat's milk, then fine grass, or cabbage, turnips, and bread. They are very like goats in their behaviour, follow their master readily, and will even take food from strangers. In winter, they must not have a warm lair, but merely a little straw under an open shed. Chamois which were kept in a stable used to lie, in the middle of winter, under an open window, through which the icy wind and snow could enter. If caught when full-grown, they are always excessively shy and ready to fly. Those caught young are not nearly so powerful as the free chamois. The attempts to breed in captivity have generally failed; but successful crossing of the chamois buck and the domestic she-goat has been effected.

Chamois are pursued by beasts of prey as well as by men. In the Engadine, once, a bear followed a chamois into a village, where it sought shelter in a wood-house. In winter, when they retire to the more sequestered woods, the lynx eagerly watches for them; and in summer the vulture and the eagle prove dangerous foes. The birds carry off the fawns, or drive the grown animals over a precipice by beating them with their wings. At times, too, an avalanche will destroy an entire herd; or loose boulders, that constantly roll down the avalanches in summer, crush them. It seems very improbable that chamois should be starved to death in winter, although a Bernese hunter asserted that he once found five dead, snowed in under a weather fir. They had eaten away all the bark and twigs from the tree, but the snow had lasted longer than this food. In some mountain districts entire herds of chamois find splendid forage in haystacks, and make such holes that they are able to shelter themselves in them from the winter storms.

In the stomachs of chamois, and especially older bucks, what is called the "German bezoar-stone" is frequently found. This is a

ball of dark root-fibres, covered with a leathery, shining, and sweet-smelling coating, and probably formed by deposits of undigested roots. Whole volumes have been written about the curative properties of such balls: they kept off every possible disease, and even rendered soldiers bullet-proof. Hence they used to fetch a sovereign apiece. But now-o'-days people are not quite so credulous, and they have taken rank with children's cauls. Chamois are far more numerous than is generally supposed, because summer tourists see but little of them. The traveller frequently passes a spot where twenty head or more are crouching, and does not catch a glimpse of them. The idea which has been propagated, that the chamois will be extirpated, like the ibex, is erroneous; for they will, in all probability, last as long as the mountains. Even supposing that seven hundred are annually shot in Switzerland, which is doubtful, there is not much chance of the diminution of this interesting animal. Hence, when we hear of mighty hunters who, during their life, have shot 300, 500, or 900, or, like the great Colani, the chamois prince of the Engadine, as many as 2,000, we must not forget that the trade is, after all, an unprofitable and dangerous one, and that the number of hunters is gradually being reduced.

CHAPTER VIII.

CHAMOIS HUNTING.

Character of the hunter—His qualifications—His equipment—A curious rifle—Mode of hunting—Caution of the chamois—Stalking—The Treibjagd—The single chase—An awful situation—Danger from glaciers—Sanguinary contests—A narrow escape—Value of the chamois—Accidents to hunters—A fall down a crevasse—The prince of hunters.

THE regular chamois hunt—which, in Maximilian's reign, was an imperial sport in the Tyrol, and has become so again under Francis Joseph—is in the Alps no lordly amusement, but something too fatiguing and laborious to be reckoned among the occupations of amateur sportsmen. The true chamois-hunters in the Alps belong to the poorer classes: they are sturdy, frugal men, acquainted with the mountains, the habits of the animals, and the mode of chasing them. The hunter requires a sharp eye, a steady head; a strong, hardened constitution, which

can withstand the chances of the icy region; a bold, and, at the same time, cool, courage; a cautious, rapidly-calculating mind; good lungs, and untiring muscles. He must not only be a first-rate shot, but also an excellent climber—better than the most intrepid goat. For the chamois-hunter often finds himself in strange situations, where he must exert every limb to the utmost, and, to use a colloquial phrase, well-nigh “hang on by his eyelids.”

The hunter's equipment usually consists of a warm grey suit of undyed wool; a cap, or felt hat; a strong-shod, moderate-sized Alpen-stock; a game-bag, containing powder, bullets, telescope, cheese, butter, and bread, and, now and then, a flask of cherry brandy. In order to procure something warm, he usually carries with him an iron bowl and a ration of baked, salted flour. Morning and evening he lights a fire, and makes a strengthening porridge of the flour. But the most essential articles of all are strong shoes and a good rifle. The shoes are most important, because his safety mainly depends on them in difficult positions, and they are formed precisely on the model of the chamois hoof. The thick soles are covered with sharp nails, which secure a hold-fast, and have also a horseshoe in front and behind. In Schwytz the hunters are wont to go bare-footed, and rub their feet now and then with pitch, in order to obtain a better purchase. The favourite gun is a single-barrelled rifle, with two hammers behind each other on the same side. This weapon has the advantage of being much lighter than a double-barrel, while, at the same time, offering the chance of two shots.

The hunter starts in the evening, or at early dawn, in order to reach his shooting-ground before sunrise. He knows the haunts of the game, their places of refuge and lies, and arranges his movements accordingly. The great thing is always to keep the game before the wind; for, if the slightest breeze be wafted from him to the chamois, the latter scents him at enormous distances, and his chance is gone. The simplest way is when the hunter assumes the dress of a neatherd, at night, and creeps up to the creatures before dawn. This is, however, only possible in autumn, before the chamois have been thoroughly hunted and rendered shy.

The forest chamois, which are much more frequently within sight of man, are more attentive and cautious, though not so timid as their brethren in the mountains, and can tell a hunter from a neatherd or wood-cutter a long distance off. The hunter avoids letting them see him in the valley, and sends on his gun to the spot where he intends to begin the chase. After marking down the chamois in their night's resting-place, he starts at an early hour, and creeps up, slowly and cautiously, till he gets within gunshot. When the creatures rise and stretch themselves at dawn, he selects, from behind the bush where he is concealed, the plumpest buck, and brings it down. This way of hunting, when applicable, is the safest and quickest.

Another mode is that called the "Treibjagd," or beating, which is also tolerably secure when skilfully managed. The chamois are outflanked by several hunters getting ahead of them during the night, and occupying the defiles through which they must pass. So soon as this is effected, other hunters startle them from below, and drive them up the mountain side till they come within range. Marvellous is the hunters' knowledge of the chamois routes; they frequently arrange to meet an hour before dawn in some gully up the mountains; they go there separately, but always arrive at the appointed time. Formerly, dogs were employed in driving the chamois, but this has been given up since the game entirely retired to the High Alps.

More dangerous is the single chase, in which the hunter does not merely lie in ambush, but daringly follows the chamois into the mountains by very difficult paths. In some steep mountains such a march often takes place on the narrow border left between life and death. One moment's glance down into the abyss from a narrow ledge, a falling stone which drags the hunter after it with magic attraction down the precipice, a loose bush to which the hunter clings—all these are causes of death, and only the most extraordinary presence of mind will secure his salvation. Wild hay makers and chamois-hunters often tell of the treacherous power of attraction which an object falling into the depths exercises over a man standing on a narrow strip of rock. He feels an irre-

sistible impulse to look after the stone, especially if it be loosened close to his foot; if he do so he is hopelessly lost, for many men have fallen victims to this sympathetic feeling. Hence, in such cases, they turn their face to the rock, and halt for a moment ere they proceed. Should the hunter at last succeed in driving the herd into a *cul-de-sac* (called in the Alps a "Treibstock"), the booty is usually great, unless the animals turn back under the guidance of some resolute buck, and dash past or over the hunter. Very often, too, he is himself induced to forget caution, and finds himself at a spot where he can neither advance nor retreat. The celebrated traveller Kohl tells us of a case in which an eager hunter in the Bernese Oberland leapt down on a narrow ledge of slate, which hung over a fearful precipice. As the rotten stonework began to crumble, and threatened no longer to bear his weight, he was obliged to lie down on his stomach, and cautiously crawl along. With a small axe he cut away the loose slate in front, and advanced inch by inch, in the constant fear of falling. After two hours' toil he noticed a fluttering shadow on the rock near him, looked up with difficulty, and observed a large eagle soaring over him, and, apparently, inclined to push him off the rock. In this awful position the daring man was still able to think of self-preservation; he carefully turned on his back, and got his rifle into position by twining his leg round a projection, and hanging with half his body over the abyss. In this way he watched the eagle for awhile till it flew away, and, after three hours' desperate exertion, the hunter at length reached terra-firma again.

A wonderful story, told us by Von Berlesch, will also repay quotation:—

"The following incident is related of a Tessin chamois-hunter. Two of them had gone to drive; one of them fired, and hit the chamois in the shoulder, which, though wounded and bleeding, ran away, and met the other hunter in a defile between two colossal blocks of rock. Covered by the rock, so that the excited beast could not see him, he took aim and pulled the trigger, but the gun missed fire. With quick decision the Tessiner threw his gun away, sprang on the chamois—which could get neither backwards nor forwards between the rocks—

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made a lucky snatch at the horns, first with one hand and then the other, and allowed the animal to drag him thirty or forty paces over turf and rock to the brink of a precipice, where it fell exhausted. Here another struggle began a moment later in a pool of blood. The hunter caught firm hold of a twig of fir-wood with one hand, while he grasped the animal's horns with the other, and knelt on its neck. He waited thus a few minutes till his companion came up and cut the beast's throat, which resisted to the last."

Great, again, are the dangers of chamois-hunting on glaciers, though not so common, as the animals will, generally, sooner be shot than venture on the slippery surface; but, on the other hand, they display a marked preference for the snow-fields. On the whole, though, the proverb holds good, that more chamois-hunters die in the mountains than in their beds. Sometimes a sharp frost cramps the wearied hunter's limbs, and if he yield to sleep it is all over with him. Sometimes he is dashed over a precipice by a huge boulder, or overwhelmed by an avalanche. But his worst foe is the fog, which is only too often followed by a snow-drift that covers every track on the ground before him.

Then, too, he has to take precautions against the jealousy of rival hunters, and bloody combats used formerly to take place, though we are glad to say that they are less frequent now, with the advance of education. Saussure tells us how a Savoyard wounded a chamois, and two Valais hunters gave it the death blow. The Savoyard picked up the game as his; but the others insisted on his resigning it. On his trying to escape with it they fired at him, but the ground was so bad that he was compelled to yield, though with bitter thoughts gnawing his heart. He watched the two men, and saw them take up their night quarters in a deserted chalet. After dark he thrust his gun through a crevice, and was about to fire, when it suddenly occurred to him that the men had not confessed since they had fired at him, and hence would die in mortal sin. He withdrew his gun, stepped into the hut, and revealed to the men the danger they had been in. They thanked him for his generosity, and gave him one-half of the chamois.

The actual profit of the chase stands in no relation to the danger incurred. A chamois, when shot, is worth at the most eighteen shillings, and yet the hunters have a perfect passion for the sport. One at Zurich, who had his leg amputated, sent his physician, two years after, half a chamois he had killed, with a remark that he did not get on so well with a wooden leg, but hoped yet to kill many a fine beast. The man was seventy years of age when he lost his leg. Again, Saussure's guide said to him, "A short time since I made a very happy marriage; my father and grandfather were both killed in hunting, and I feel convinced I shall perish in the same manner; but if you offered me a fortune to give up the chase, I would refuse." Two years after, he fell down a precipice, and was dashed to pieces.

One of the most famous chamois hunters was David Zwicky; but one Saturday evening he did not return home as usual. Some mishap was feared, and people went off to look for him, but in vain. Nothing was heard of him for six-and-thirty weeks; and at the end of that time his body was found, in a sitting posture, on a small mound in the Auern Alp; by his side were his double-barrelled gun, money, game-bag, and watch. His handkerchief was bound round one of his feet; the bone was not broken, but he seemed to have sprained himself. He was resting his head on his hand as if asleep, but the birds of prey and foxes had gnawed a portion of his body to a skeleton. The unfortunate man had probably had a fall, and then crawled to this spot, where he fired shots of distress till he succumbed to cold and hunger. A Bernese hunter once sank into a covered crevasse in the eternal ice-fields of the Grindelwald, but fell without any hurt to the bottom of the glacier, which was fortunately dry. There was no chance of escaping, for he had no pocket-knife with which to cut steps in the sides of the crevasse; but he noticed, in exploring his prison, that the ice at the base was melted by the warmth of the earth, and had formed canals through which it escaped in the shape of water. He lay down boldly in one of these canals, and crept along its course with incredible toil till he reached its outlet in the shape of a waterfall, and managed to escape.

UP IN THE ALPS.

BY CAPTAIN WRAXALL.

CHAPTER IX.

THE LYNX.

The feline tribes—Habitat of the tiger—The lynx—American lynx—hunting—Swiss lynxes—Used as food—Habits of the lynx—Its mode of hunting—Attacks on flocks—Terrible destruction of sheep—A goat and a lynx—Ferocity of the lynx—Modes of killing it—Young lynxes—Their scarcity in menageries.

THE feline tribes are, in tropical countries, the most terrible and numerous predaceous animals. It is generally supposed that they are only to be found on burning steppes, or dense forests and cultivated spots intersected by large rivers; but a great part of these dangerous felidæ do not shun the rough mountains, and are not excessively susceptible to the cold. The Bengal tiger roams as far as Northern Asia; during this century large specimens have been killed on the Obi, and near Irkutsk, on the Lena, in Siberia. The tiger is found in the mountains of Thibet and Nepaul, as high as 9,000 feet above the level of the sea, and in the Himalayas, even in the vicinity of the glacier region. Among the American felidæ, the cougar and leopard ascend to the snow line, and are at times killed at a height of 12,000 feet; and the ocelot, in Peru, at a height of 9,000 feet in the desolate regions of the Cordilleras. It will, therefore, be less surprise us to find the lynx—the only large beast of prey of this genus indigenous to Switzerland—up in the Alps, although it would not despise the lower forests, did it not everywhere and ever meet with obstinate persecution.

At the present day the lynx is not more common in the Alps than the ordinary wild cat; but forty years back it was no rarity for seven or eight to be killed in one year in the Grisons alone; while, at the present time, hardly one is slain throughout the whole of Switzerland. The south-eastern region indubitably contains the largest number of the formerly plentiful lynxes; after this come the forests of the Valais, Tessin, and Berne, while they are extremely rare in Uri and Glarus. The lynx may most certainly be

found in the Engadine, and in the gloomy primeval forest of the Dübenwald, where thousands of splendid firs and larches may be seen slowly rotting, and the never-trodden, bush-covered gorges offer a glorious asylum. It is found somewhat more regularly in the Val d'Aosta, where, in the summer of 1860, two old lynxes were killed, and a cub taken alive.

Lynxes are far more frequent in Northern and North-Eastern Europe. Thus, in Sardinia, 316 were killed in the royal hunting grounds in the course of 1836; in North America, the chief agency of the Missouri fur company annually sends off from two to four thousand skins; while, at the close of the last century, the English North-Western Company produced 6,000 a-year. The skins are a handsome reddish-grey, with irregular dark spots or bars, and a black tail-tip (the colour varies considerably, however, with age and sex), and are much handsomer than that of the wild cat.

The lynxes of Switzerland are said to be rather smaller, and have a thinner coat, than those of Sweden, Russia, Poland, and Norway; for all that, though, they measure from the head to the tail three and a-half feet; the furry tail is eight inches, and they stand two and a-half feet from the ground. Their weight varies between thirty and sixty pounds. The triangular sharp ears are adorned with a stiff black fringe of hair, the clumsy head is round like a cat's, the eyes are large and fiery, the tongue is rough and prickly, the lips are white with black edges, the body is reddish-grey on the top and white below, and in winter longer-haired and greyer, in summer redder. The somewhat smaller, less brilliantly-coloured female has a narrower head. The animal is handsome, but produces a feeling of revulsion, like all the feline tribe. In the Grisons its flesh is eaten, and considered a great dainty, which is rarely the case with a predaceous animal.

When the track of a lynx is discovered in the Alps, every effort is made to get hold of this ravenous and dangerous robber; but it

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manages to conceal itself very cleverly. So long as it finds food in its high forests and mountain gorges, it does not roam about to hunt. Here it lives in the most solitary and gloomy ravines with its mate, and only reveals its presence rarely by its piercing, disagreeable howl. It lies in the deepest concealment, and remains on the watch for its prey stretched out on a convenient low branch in the thicket, where the foliage partly conceals it, without interfering with its spring. With eye and ear ever on the watch, it will lie for days at the same spot, and seems to be sleeping with half-closed eyes at the moment when its treacherous watchfulness is at the highest pitch. It obtains its livelihood by cunning, for its dull sense of smell (as in all the felidæ) and comparatively slight agility do not adapt it for an open attack. Patient watching and extraordinarily gentle, cat-like crawling bring it to its prey. It is not so crafty as the fox, but more patient; not so audacious as the wolf, but more persevering and dexterous in springing; not so strong as the bear, but sharper-sighted and more attentive. Its greatest strength lies in its feet, jaw, and nape of the neck. It takes its ease in hunting, and is only choice in its prey when it is abundant. Whatever animal it reaches with its long, certain leap is pulled down; if it does not reach the animal, it lets it go, and returns to its branch without any display of temper. It is not greedy, but is fond of fresh warm blood, and is rendered incautious through this propensity. If it catches nothing during the day, and grows hungry, it prowls about at night, often for long distances, over three or four Alps. Hunger renders it courageous, and sharpens its cunning and senses. If it comes across a grazing flock of sheep or goats, it crawls up like a snake on its belly, leaps at the favourable moment on the back of the nearest animal, bites through an artery in its neck, and kills it instantaneously. Then it licks the blood, rips open the belly, eats the entrails and a part of the head, neck, and shoulders, and leaves the rest lying. It is not proved that it buries the body; at any rate, it is not the case in the Alps; and it very rarely touches carrion. Its peculiar mode of laceration never leaves the shepherd in doubt as to the culprit. Frequently, however, it will kill three or

four goats or sheep at once, and when starving even attacks cows and calves. One that was shot in February, 1813, in the canton of Schwyz, had destroyed forty sheep and goats in a few weeks. In the summer of 1814, three or four lynxes destroyed in the Simmenthal upwards of a hundred and sixty of these animals.

When the lynx has no scarcity of game, it sticks to it, and seems to have a certain reluctance about betraying itself by the destruction of domestic animals. It attacks of preference the chamois browsing on the Alps; but these surpass it in fineness of scent, and frequently escape, even though the lynx may be lying in ambush at their watering-places and salt-licks. It more frequently brings down badgers, marmots, hares, partridges, &c., and when forced by hunger will even fall to upon squirrels and mice. A roe rarely falls to its lot in Switzerland during the winter, when it is compelled to venture into the lower forests, and even valleys; but, on the other hand, it will try to dig its way underground to the sheds where goats and sheep are wintering. On one occasion a goat that raised the subterranean enemy just as it raised its head out of the ground, butted it so furiously that the robber lay dead in its tunnel.

Lynxes do not propagate to any great extent. In January or February they are accustomed to couple without the usual frightful caterwauling, and at the end of ten weeks the female gives birth in some deeply-hidden cavity, or frequently in an enlarged badger or fox earth, under a root or a rock, to at the most three blind whelps, which it feeds with mice, moles, small birds, &c. No regular lynx-hunts are held, owing to the rarity of the animal. Should traces of its murderous propensities be found, the culprit is probably a long distance off by that time; and when it is chased it at once seeks fresh fields and pastures new. If a sportsman, however, comes upon a lynx unexpectedly, it will not turn, and hence can be easily shot. It remains quietly seated on its branch and glances fixedly at its antagonist, like the wild cat; even the unarmed sportsman will at times get the better of it by sticking up some of his garments on a pole, and going home to fetch his gun. The lynx stares at the clothes until the gun arrives and "fixes

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its flint." But it is most important that the aim should be true; for, if the beast is only wounded, it springs with foaming lips at the sportsman's chest, digs its sharp claws deep into his flesh, and bites furiously without loosing its hold. Very frequently, however, it will merely spring on the dog, and the sportsman gains time for a second shot. Dogs are sure to be conquered by the lynx, because it is much more certain in attack, and springs with great accuracy. Hence it is not afraid of them, retreats at an easy pace, does not take the trouble to ascend a tree, but generally goes to some retreat where, in the case of necessity, it can master three ordinary sporting dogs. The reward for killing a lynx is rather high; in Freiburg 125 old Swiss francs, in Glarus 15 florins, and in Tessin one louis d'or.

The track of the lynx is exactly like that of a cat, but twice the size.

Young lynxes are so easily tamed that they are allowed to run about at liberty without any fear of losing them. Still, the curiosity with which they sniff any strange object frequently becomes troublesome. It must be rather difficult, however, to get hold of young specimens, for they are much rarer in ordinary menageries than bears, wolves, and leopards. As long as the mother is alive, she defends her cubs with extraordinary courage. Cats can no more remain in the house with a young lynx than dogs in the vicinity of a wolf. Tame lynxes are said generally to die of excessive fatness, and the wild ones do not live beyond fifteen years.

CHAPTER X.

ALPINE FOXES.

Character of the fox—Alpine foxes—Their great numbers—Mode of life—Ousting the badger—Fox earths in the Alps—Fox cubs and their training—The Lowland fox—Catching crayfish—Voracity of the fox—Traps—"Dog eat dog"—Stratagems of the fox—Feigning death—Fox-shooting—Meat and fat—Tenacity of life—A curious anecdote—Dogs and foxes—Tame cubs—Nature triumphant—Mad foxes—The Arctic fox.

THE fox, the cousin of the wolf and dog, is a well-known and very common beast of prey in the Alps. More elegant than its kindred in form and bearing; more cautious, calculating, active, and elastic; endowed with a wondrous memory and knowledge of

locality; sensitive, patient, and determined; equally skilful in leaping, crawling, creeping, and swimming; it seems to combine all the requisites of a perfect highwayman; and when we add to these its genial humour and cool impudence, the fox produces the pleasant impression of a thorough virtuoso in its profession. In its craftiness, choice of food, way of hunting, and organisation of the eye, it more resembles the cat than the dog, and this seems to form the connecting link between them. At any rate, the fox possesses all the vices of both varieties, and an admirable universality of talent, combined with such a remarkable corporeal organisation, that it appears the most gifted type of savage animal creation.

The mountaineers distinguish two varieties of foxes according to their habitat. The fox housing in the lower forests and valleys has no special name, but is distinguished from the Alpine fox, which inhabits the highest mountains up to the snow line until the deep snow-falls at New Year drive it down. That is the only period when the sportsman can kill Alpine foxes, for in their mountain retreats they are unassailable.

In spite of all the snares and chasing, the foxes are extraordinarily numerous on mountain and in valley, in forest and field, for their remarkable craft protects them from utter extermination. They dig their earths most cautiously, though they avoid doing so whenever they can, for they are much too sensible to love dull, fatiguing toil. As a general rule, the hypochondriacal badger is forced to give up its quarters to them, and the foxes have the most ingenious devices—which respect for our readers forbids us explaining—for perfuming the poor fellow out. Still, the foxes, like the squirrels, are rarely satisfied with one abode; they have generally two or three in the mountains, the last being at a considerable elevation, to which it retreats when hard pressed by the dogs.

The earths of the Alpine foxes are not very artistically formed; they generally consist of one deep cavity, with two or three entrances connected with each other. These quarters the animal generally inhabits through the year. Here the bitch fox litters at the beginning of May from five to nine blind cubs, which she guards and tends

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with the greatest care. In a few weeks she leads the active little creatures out; brings them small birds, lizards, frogs, chafers, mice, grasshoppers, and worms; and teaches them how to catch, torture, and destroy animals. When the cubs are the size of a kitten, they are fond, during fine weather, of lying outside the earth, waiting for the return of their parents. An observer rarely succeeds in discovering the cubs, for the mother is very watchful, and, at the slightest suspicious sound, flies to earth, with its cubs in its mouth. In July, the cubs go out hunting on their own score; try at twilight to surprise a young hare or lizard, or a partridge in its nest, while the youngest among them tear up a worm or a cricket. They exactly resemble their parents. The long, pointed nose eagerly seeks traces on the ground, the delicate ears stand erect, the small grey-green squinting eyes busily survey the landscape, and the soft brush gently follows the soft tread of the pads. In autumn the cubs leave the paternal earth for good, and live isolated in their own holes till spring, when they look about for a mate. About this time, or earlier during the cold, bright February nights, they may be heard barking for a long distance through the valleys. The peasant then says, "The fox is barking—the weather is changing;" though it only appears to be the pairing challenge of the animal. If the hoarse bark should be heard earlier—in December or January—the sportsmen prophesy severe cold. At other times, the only sound the fox produces is a lengthened growl, or a malicious yell, when it finds itself caught in a trap. Like the wolf, the fox is a strict monogamist, but is even more unsocial than the wolf, and rarely looks for a comrade to share its sport.

On the plains Master Reynard has generally a more cosy life than on the mountains. There he has the sweet grapes—thousands of which he and his comrades destroy—the juicy apricot, and the melting pear; there are unguarded poultry-yards, full beehives to be secured, many hares, partridges, quails, and larks. In the Alps the fox fares much more scantily; but, on the other hand, it frequently catches in the crystalline mountain streams a fine trout (especially at spawning time), or some crayfish, for which

it angles with its brush. While engaged in this sport, the fox often comes into collision with bird-fowlers and fishermen, if it arrive first at the nets, for it has very lax and communistic notions about the rights of property. In case of need, it catches chafers, crickets, wasps, bees, and flies, and can put up with them.

In spite of its universal appetite, the fox is worst off in severe and snowy winters, when it makes in the Alps holes three or four feet long through the ground to its earth. At such times the Alpine foxes descend to join their valley comrades and chase with them. In the morning their fresh tracks are found right up to the stables, and even into the villages, whence they are frequently driven by the barking dogs. We have often noticed how extraordinarily numerous they are at such times in the Alpine valleys. A neatherd at Innerrhoden used regularly to bait for foxes in winter with roasted cats, carrion, &c. The bait was placed in a box, and so arranged that the starving brutes could only catch hold of a small bit. Every night, at first one or two, but then eight or ten, foxes collected round the box, and tried their utmost to upset it. At length one fox hit on the idea of tunneling under the bait in order to get hold of it. All scratched and tore up the earth violently, and would have reached the carrion, had it not been placed on a rock. The herd shot several foxes every week, which, though rendering the rest more cautious, did not drive them away. A horrible scene frequently occurred. A fox was not shot dead, but was seriously wounded, and limped away: the others followed it, and, as if at an appointed signal, tore the poor brute to pieces. Each carried a lump of the mountain; and those that did not get hold of one sought in the snow for a bone or piece of skin. In the end this was repeated, even when a fox was but slightly wounded: even if only a couple of drops of blood were shed, the others fell furiously upon the victim—it was a specimen of their vulpine nature. When the herd used a dead fox once for bait, they all fled for a long time; and he, therefore, asserted that they would only eat warm foxes, which, however, is dubious. Von Tschudi states that he constantly found in winter old skulls and other bones

of foxes, which had evidently been gnawed by their hungry comrades. Fallen goats also become the prey of foxes, as well as of crows and eagles. The fox will even gnaw men buried under avalanches, if it can get at them. The hedgehog even is not protected by his prickles from Reynard's stratagems. He, however, rarely surprises young chamois, because they are very watchful, and keep close to their dam; but, on the other hand, he is down on the marmots. For a half-day a fox will patiently watch behind a stone in front of a marmot's hole. When the animal makes its appearance, Reynard, though licking his chops and thirsting for his prey, wisely allows it to go some distance, then cuts off its retreat, and snaps it up without difficulty.

Many wonderful stratagems have been imputed to the fox, and it has been selected as the representative of cunning; and it is certainly one of the most artful of animals. When caught in a trap and severely wounded, it will not betray its presence by a single yell of pain, but quietly bite through the captured leg in order to escape. If it cannot fly, it will have recourse to the stratagem of feigning death; and many a fox has in this way got safely out of a sportsman's game-bag; and so great are its reflecting powers, that, at the very moment when it is detected in a poultry-yard, and only escapes its pursuers with difficulty, it will kill a couple of geese in passing, and carry off one in its mouth! Persevering pursuit often induces the fox to display the most refined *ruses*, and its resources in flight are extraordinary. A fox has been known to run for eighteen hours at a stretch, and not once lose its presence of mind, for it will take advantage of every accident of the ground, even though a pack of dogs be at its heels. It runs along the narrowest ledges of rock with the certainty of a cat, leaps down enormous precipices without undergoing any injury, and never gets into such a dilemma that it must give in. European foxes are, in this respect, far more ingenious than their American brethren; and for that reason our fox has been introduced into the United States, in order that the inhabitants may enjoy the full glory of an English fox-hunt.

To the unpractised sportsman a fox-chase is an unprofitable affair, but for the practised

it well repays the trouble. The sportsman is accurately acquainted with all the fox-earths in the mountains for many miles round, and the snow reveals to him whether they are occupied or not. He either posts himself near an earth before daybreak, and shoots the fox on its return from its nocturnal sport, or, when he finds the animal is not at home, he sends his dogs to pursue it, and the fox, making straight for its earth, soon becomes his prey. If the fox has been hunted home, or happens to be there already, which is frequently the case in bad weather, the sportsman blocks up all the outlets but one, in which he places a trap. Though the fox will often fast for weeks, it must come out in the end. If caught in a box-trap, which does not kill it, taking the brute out is a ticklish job. The sportsman seizes it by the brush, and dashes its head so violently against a stone that the fox has not time to turn and snap at his hand. Of two foxes which were recently caught in one trap, the hinder one killed the foremost one, which could not turn to defend itself, and during one night devoured more than one-third of its hind-quarters. Such is friendship in adversity! If the fox is followed into its earth by a badger-dog, it only comes out after a violent struggle. While the badger will defend itself for a long time against a dog with its paws, deals sharp blows, and only bites on an emergency, the fox is the first to attack, and, when it is driven into a corner, will often bolt over the back of the dog out of the hole, and be off before the waiting sportsman has time to fire.

The hunters of Glarus are fond of trapping the fox on the banks of the Linth, where they set numerous baits during the winter. By day, crows, ravens, and magpies croak round the carrion, and thus reveal its presence to the foxes, which at night come down from all parts of the mountains. They will often swim through the turbulent river to get at their prey. During the first nights they are extremely cautious, approach distrustfully, nibble a mouthful, and off they go. Afterwards they settle down for a comfortable gorge, and are shot from the huts. The interesting fact has been here proved that in early winter the foxes seek their food between eight and eleven p.m., but after New Year's Day from midnight till dawn,

The fox has on its brush near the root a gland containing a fatty liquid, smelling like musk or violets, which the sportsmen call *viole*. The object of this is difficult to say, for the general odour of the animal is anything but that of the violet. Even its flesh is so infected by this taint that it is uneatable when fresh; but it tastes better when it has been soaked and pickled for some time, and the old Romans considered a fox fattened on grapes an exceeding dainty. The fat is highly esteemed as a salve for wounds, and is sold at five shillings per pound. A sportsman with whom Von Tschudi was acquainted obtained from two Alpine foxes over six pounds of fat, while not half-a-pound was produced from four others shot simultaneously. The coat is in winter very close, rather fine, and shining, and is worth from five to nine francs.

Foxes are known to often display such stoical self-restraint as to die of hunger in face of a suspicious bait. They will carry off a decent charge of No. 2 shot, but a smart tap on the snout will kill them on the spot. The tenacity of life varies greatly in animals. The roe, the hare, and the ibex will fall at a slight wound; while foxes, chamois, martens, wolves, squirrels, and wild and tame cats will recover from severe injuries. A well-known sportsman dug into a fox-earth, and seized the animal in the rear. He cut through the tendons above the knee of a hind pad, and thrust the other pad through them, as he might have done with a hare. He then drew it out and threw it roughly on the ground, with the words, "There, you won't be able to run far." But the fox was wiser. It leaped up, galloped down the hill on three legs, and disappeared in a second.

In different parts of Switzerland the peasants give different names to the fox, generally according to its colour—such as yellow, red, noble, sun, musk, cross foxes. In 1858 a great rarity—a perfect white fox, or silver fox—was shot in the Grisons. In the canton of Berne, according to official returns, head-money is paid for above one thousand foxes a-year, and we may assume that double that number are shot, but not brought in. We have no reason to consider this statement exaggerated, for amateur sportsmen will often kill from fifteen to twenty head in one winter in a small valley.

The dog displays the most decided antipathy for its cousin the fox, as it does for the wolf. It follows it passionately on its own account. A strong dog will always get the best of a fox; but, if it fall in with two, it is cruelly torn, and frequently devoured. If a dog catch a wounded fox, it seizes it by the neck, dashes in its skull, and leaves it lying. Still, it has been repeatedly asserted that the dog and fox will pair, both when at liberty and in captivity.

That dogs and foxes do come together in the mountains is proved by the fact that, at seasons when hydrophobia is raging among dogs, mad foxes are usually found, and the contagion probably originates with the latter. It entirely changes the nature of the fox. It generally keeps its brush horizontal when running; but the mad fox does not raise it from the ground. Sick, wretched, and thin, it crawls purposeless through the woods and fields; it prowls, void alike of design and fear, round the poultry-yards; flees, when driven away, slowly and with repugnance; attacks children, dogs, cats, &c., and dies craven. On one occasion a girl killed a mad fox, which was prowling about the house at night, with an earthen vessel. Foxes are never more numerous than during the mad season, when a mysterious impulse drives them from the mountains and forests into the plains.

The fox is better suited for taming than the wolf, but no great profit or pleasure is derived from the experiment. It never becomes a faithful domestic animal like the dog, but is always a false rogue and cunning thief. When captured quite young, it soon grows used to its master, plays with him, wags its tail like a dog, and really whines for joy. It goes about the house and yard at liberty, and behaves most respectably. The end of it is, however, in most cases, that it bolts on some fine evening, and often returns at night to rob its ex-master. Such was Von Tschudi's experience in taming fox-cubs, one of which grew so attached to a little girl that she could do what she liked with it; and even when it had deserted for several days, her voice sufficed to bring the truant home. Old foxes, when caught, are perfectly untamable, and cannot be kept, owing to their cries at night and stench.

UP IN THE ALPS.

BY SIR LASCELLES WRAXALL, BART.

CHAPTER XI.

THE LÄMMERGEIER, OR VULTURE.

Animal life in the Alps—The vulture—The old woman—Description of the vulture—Its structure—Digestive powers—The nest—The fox and the vulture—Carrying off children—Tenacity of life—Grand bird-nesting—A narrow escape—Ferocity of the vulture—Its habits in captivity.

THE higher the traveller ascends towards the adamantine peaks of the Alps, the more he finds himself abandoned by the pleasant vegetation of the Mid-Alps and the animal life which they support and shelter. Beetles, flies, spiders, butterflies, and dragonflies continue to be found as far as the upper heights, and the watchful eye gladly follows their little busy existence, their pursuit of each other, and the narrow limits of their much-occupied life amid the desolate rock landscape. The accentor and the snow-finch emerge from behind barren blocks and discoloured snow-patches. The wall-creeper scrambles along the jagged terraces with its half-expanded gaily-plumaged wings, and the grey wagtail or redstart tamely allows the wayfarer to approach it. Few quadrupeds are visible. At the most a troop of chamois may be observed grazing in the distance. The solitary path ever rises higher, and at intervals a ptarmigan starts with a chirp from amid the last bushes, and then vanishes far out of sight among the mountain peaks; or a swarm of jackdaws fly with shrill croakings round the loftiest pinnacles. At length the traveller fancies himself really alone with his fatigue, with the grey rocks and the frigid ice-fields, where gloomy death has established its melancholy and omnipotent rule. Beneath him stretches out the stony desert; in the distance the land of human cultivation is floating in a misty haze; around him are Schratzen, peaks, and stone plateaux—the cold thrones of icy tempests. But hark! he suddenly hears far above him a shrill sustained cry of "Pfyii, pfyii, pfyii!" uttered apparently in defiance. He looks up, and at last distinguishes in the dark-blue sky an oscillating point, which floats nearer and nearer to him almost with-

out beat of wing. Soon it comes down with a rustling sound, and the royal vulture of the High Alps soars round the traveller with outspread wings. Descending still lower, it observes and watches, and then impatiently rises again to the higher strata of air, flies in a straight line over the icy summits, which again hide it from view, while its hungry croak resounds for some minutes from behind the peaks, till it once more soars to greet the rising sun.

The Bart (bearded) or Lämmer (lamb) vulture is the condor of the European mountains, and bears about the same proportion to it in size as the peaks of Europe do to those of South America; still it is a gigantic creature, and, through its organisation and mode of life, the most remarkable bird of the Alps. The Swiss vulture is, besides, larger and more powerful than all its other congeners in the Old World.

Formerly this royal bird inhabited every part of the High Alps; but the numbers have been so reduced by slow procreation and constant hunting, that it only permanently builds its nest in the mountains of Tessin, the Grisons, the Valais, Uri, and Berne. The last specimen was shot in Unterwalden in 1851; and on the Gotthard, the last—a famous specimen—was killed in 1859. An old vulture was observed to perch for many years at regular intervals upon an enormous block in the ice-sea of the Grindelwald. Its position was quite inaccessible, and beyond the reach of a rifle-bullet. The shepherds of the vicinity knew it well, and were wont to call it "the old woman," on account of its reserved habits.

Even so late as the beginning of this century the natural history of this remarkable bird remained a mystery, and the great Buffon himself identified it with the condor. Steinmüller was the first to produce about it one of those careful and trustworthy monographs by which this distinguished *savant* so greatly enriched the zoology of Switzerland. Since then his observations have been enlarged by others, and yet much remains to be cleared up touching the habits of this bird, and many

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statements can only be accepted under reservation. The name of vulture is incorrectly given to it. In addition to the bald head, it wants several other characteristics of the vulture family, and it might be called more truly the vulture-eagle (*Gypaëtus*). As is the case with most predaceous birds, the female is always larger than the male. A fully grown (female) specimen measures about four and a-half feet in length, and nine or ten feet from wing to wing. The weight varies principally from twelve to sixteen pounds, and very rarely reaches twenty pounds. The old bird has a beak six inches in length, the colour of horn, ending in a large hook, and with imprisoned birds this beak sometimes grows so large as to prevent them from eating. The head, flat at the top and broad at the back, is covered with short whitish-yellow feathers, and marked with a deep black line over the eyes. A black bristly beard hangs from the chin over the throat (whence the name of bearded vulture), and the nostrils and cere are covered with similar bristles. Very beautiful are the large fiery eyes, whose bright yellow iris is begirt by an orange-red ring, probably as a protection against the oblique rays when the vulture soars over the dazzling snow-plains. The feathers on the back are of a deep glossy brown, with bright edges and whitish quills. The under-plumage is rusty yellow and orange colour. The legs are pale yellow; the feet short, covered with a few small feathers; the claws rather weak, sharp-cornered, and black, while the tail is wedge-shaped at the end.

In their first year the young vultures are black on the head, with white spots between the shoulders, and the eye is brown. After the second moulting a few rusty yellow feathers appear on the belly; after the third, however, the young birds assume their permanent plumage. The internal structure of this giant bird is peculiarly formed. The breast muscles are extraordinarily large and strong; the long bones, which are hollow, as in other birds, become filled by the action of the lungs with air, warmer, and consequently specifically lighter, than the surrounding atmosphere; and the bird is thus enabled to soar high into the air without any great exertion. The vigour of the digestive organs is most interesting. The gastric juice

in a very short period decomposes the largest bones and the horny hoofs of cows and calves, continuing its operations even after the death of the bird. The stomach contents of some shot specimens are at times astounding, and surpass any idea formed as to the voracity and digestive powers of similar European birds. Thus, one stomach, when opened, was found to contain five pieces of bone, two inches thick and ten long, from the back of an ox, a ball of hair, and the entire leg of a young goat. The bones were already perforated by the gastric juice. The largest discovery of this nature consisted of the thigh-bone of a cow, a chamois shin-bone six and a-half inches in length, a half-digested rib-bone, several smaller bones, hair, and the claws of a ptarmigan. These animals had, therefore, been all hunted and swallowed in turn. Nature has, indeed, admirably provided for the preservation of life by this organisation; for, if the great craving for food which characterises the vulture could only be satisfied with flesh, many of these birds must die of hunger; while, on the other hand, their insatiable desire for prey would by degrees exterminate all the game of the High Alps. The ancient Romans were well acquainted with the peculiar nature of the bird, and hence employed as a recipe against defective digestion a dried vulture's maw, which they either ate or held in the hand during meals; but this must not be carried on too long, for fear of the patient becoming thin!

The capacity of the digestion accords with the voracity and greed of this hyena of the air. It frequently happens (at least it often does so with caged birds) that the vulture holds bones in its mouth until it makes room for them inside. That it raises large bones to a great height, and breaks them by letting them fall on rocks, has been frequently asserted ever since the time of Oppian, and expressly claimed for the Spanish vulture by a recent writer; and, though this is not absolutely confirmed as regards the Swiss species, it is certain that it is quite as fond of bones as of meat.

The mode of life of vultures when at liberty has been very insufficiently observed, as much patience and considerable daring are requisite for the task; hence our information on the subject is fragmentary. It

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usually takes its flight at daybreak, steering its course direct to the spot where its last prey was found, with the view of either devouring the remnants or seeking fresh game. The vulture soars tranquilly in the clouds, while its splendid eye surveys the entire hunting-ground, and its wondrously fine power of scent sniffs a victim while still miles away. A world lies beneath its outstretched wing. The Alpine animals graze quietly, without suspecting the death-dealing speck which floats at an enormous height above them. Suddenly the vulture pounces down upon them in an oblique line, and clapping its wings together; escape and concealment are alike impossible; the trembling victims must accompany their captor into the air. The predaceous bird, however, is only able to carry off smaller cattle, such as foxes, marmots, lambs, dogs, badgers, cats, goats, weasels, hares, or poultry; for its claws and feet are not strong, its means of offence consisting in its wings and beak. The animals are sometimes devoured on the spot, at others carried to a certain rock which serves as a butcher's block. If it sees a heavier animal, an old goat or sheep, browsing near the edge of a precipice, it circles over it, and tries to frighten it into going to the brink, and then, falling straight down upon it, frequently succeeds in hurling the victim into the depths by incessant blows with its wings. It then begins by picking out the eyes, slits up the stomach, eats the entrails, and then the bones. It dashes out the brains of live cats, and then swallows them at a gulp. It has frequently happened that a vulture has tried its hurling-down manœuvre upon sportsmen in a critical position upon a rock projection or a narrow gallery, and the persons attacked asserted that the noise, rapidity, and strength of the enormous wings produced a deafening, almost irresistible, effect. In the same way a *lämmergeier* once attempted to scare an ox which was standing on a rocky ledge, and obstinately continued its daring attempts; but the dauntless quadruped was not so easily to be aroused from its equanimity; planting itself firmly on its legs, and holding down its head, it patiently waited till the vulture recognised the futility of its efforts.

When the vulture has completed its hunting foray in the early morn, it retires

for the rest of the day to its usual rock, where it sits quietly and stupidly. Unless it has to provide for a young brood, or is disturbed, it is not seen flying during the day, and hence tourists have rarely a chance of observing it. Although not strictly a bird of passage, the vulture changes its hunting districts with the seasons. In spring it visits the central and upper Alpine region, and builds its nest in cleft peaks, or on the inaccessible slopes of precipices. These eyries may often be descried for a considerable distance, but they are unapproachable, and out of rifle shot. Their construction is simple, but grand; though they have never yet been examined by a naturalist. The substratum is formed of a mass of straw, fern, and stalks, laid upon a number of crossed sticks and branches; the nest, which rests upon this layer, is composed of interwoven branches, and lined with down and moss; the contents of this part alone would fill the largest tray-cloth. Very early in the year the hen-vulture lays three very large white, brown-spotted eggs, of which only two are usually hatched. Of the two young birds only one appears to be fed by the old birds. The young are covered with a white down, and have a very repulsive appearance, owing to their large and clumsy crops and maws; the extraordinarily thick and warm plumage of the parent birds serves to shelter them from the severity of the season.

In summer the *lämmergeier* usually ascend to the highest ice-plains, and sedulously visit the spots where the chamois and goats are grazing. At this period, when their young are able to fly out with them, they appear to be less attached to their eyrie. In winter the extreme desolation of the High Alps forces them to hunt in the mountain region; but they never descend to the plain as the eagles do. The chamois, like most of the Alpine animals that do not hibernate, have retired at that time to the protection of the forests, where the vultures do not hunt. A belated fox returning home at dawn, a startled hare, a few woodcocks and crows—perhaps, too, a marten—are all the prey the vultures are enabled to pounce on. Hence, hunger forces them far down the hill-sides, where they can easily capture a hare, a dog, cat, or small birds. When they repose,

which they only do on the higher Alps, they, like the condor, select a block of stone as a resting-place, for their short legs and long wings would render it difficult to rise from level ground. They only settle on trees for the purpose of collecting wood for their nests.

The mountaineers assert that the colour red has a peculiar fascination for the vultures, and they entice them within gunshot by dropping bullock's blood on the snow. Still, it is more probably the prospect of food than the colour which attracts them, for they will pounce with equal readiness on broiled fox-meat. In Piedmont they are snared with roasted cats, or carrion laid in a narrow cleft. The bird, when gorged, has a difficulty in rising, and is killed with clubs, just in the same way as the Indians kill condors by the dozen on the Andes. A considerable premium is given for killing or snaring vultures. In the Grisons the sportsman goes all round the country with the shot bird, and collects head-money; and the shepherds usually give him some wool in gratitude for the destruction of the sheep-stealer.

The bold bird is not always successful in carrying off its booty. Von Tschudi describes a very remarkable instance, in which a *lümmergeier* succumbed, in its own element, in a fight with a quadruped. In Unterwalden a vulture had seized a live fox, and raised it in the air; but the latter succeeded in seizing its captor by the throat, and biting it through and through. The vulture fell dead on the ground, and Master Reynard went off home, though he probably never forgot his involuntary travels in the air.

The fact of these birds carrying off children has often been denied, but there are many well-authenticated stories of such catastrophes. In Appenzell one of these daring robbers carried away a child before the eyes of its parents and neighbours. On the Silver Alp, in Schwytz, a vulture pounced on a goat-boy sitting on the rocks, began to hack him, and hurled him over a precipice ere the netherds could drive the brute away. In the Bernese Oberland a child of three years of age, of the name of Anna Zurbuchen, was taken by her parents up the mountains to the haymaking, and placed on the ground near a shed. The

child soon fell asleep, and the father, after covering her face with a straw hat, went off to his work. When he returned shortly after with a bundle of hay, the child was missing, and he sought her for awhile in vain. During this time a peasant was going along a wild mountain path, when, to his amazement, he suddenly heard a child's cry. Following the sound, he saw a vulture rise from a neighbouring mound, and soar for awhile over the abyss. The peasant hurried up, and found the child lying on the verge of the precipice, uninjured, save on the left arm and hand, where it had been seized, though it had lost in the aerial trip stockings, shoes, and cap. The girl was henceforth known by the name of Geier Anne, and the story was recorded in the church registers. She was still living, at an advanced age, a few years back. In Mürren the inhabitants point out an inaccessible peak exactly opposite to the mountain village. On this rock a *lümmergeier* once devoured a child it had carried off from Mürren, and the poor creature's red petticoat was long visible among the stones. Another instance is recorded by Charpentier, of Bex:—On June 8th, 1838, two little girls were playing on a grass-plot, about twenty yards from the foot of the rock Majoni d'Alesk, in the Valais. Suddenly, one of them ran crying to the nearest cabin, and stated that her companion, a weak child of three years of age, had suddenly disappeared in the bushes. More than thirty persons examined the rocks and the adjoining precipices of the torrent D'Alesk, and at length noticed a shoe on one side of the gorge, and a stocking on the other. On the following August 15th, a shepherd discovered the child's body on the top of a rock, about two miles from the spot whence she had disappeared. The corpse was dried up, and the clothes were partly torn, partly carried off. As it was impossible for the child to have crossed the gorge alone, it must have been carried off either by a vulture or an eagle.

We have ample reason for believing the vulture to be not only greedy and predaceous, but also daring, even though it behaves in a cowardly fashion when imprisoned. Thus it is reported that a vulture in the Grisons suddenly pounced on a yearling goat and raised it in the air, at the moment when the

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peasant was driving his flock to water. He caught up a stick to drive off the daring robber, and a regular combat of two began. But the bird attacked the man so furiously with its wings and beak that he thought it advisable to seek safety in flight, and the victorious vulture carried away the quivering kid. The peasant, from this time forth, was called the "Gyren männli." The vulture displays an extraordinary tenacity of life, as is proved by the adventure of one Gideon Trösch. He captured an old bird which had torn several sheep for him in a trap, and dealt it three tremendous blows, after which he fastened the body on his back, and carried it down into the valley. On the road the vulture regained its senses, seized its bearer, and they had a regular pitched battle on the ground. At the village the bird recovered again, fought frightfully with its wings, and took an immensity of killing.*

These royal birds are comparatively numerous in some precipitous parts of the Rhetikon, whence they visit in winter the most elevated villages in the vicinity. The hunters, who can never get at them in summer, take advantage of this circumstance, and build small huts of branches, which they bait with carrion. The ravenous birds soon scent the latter, and hover over the huts in gigantic circles. The cabin, however, renders them suspicious, and the deep silence alone induces them to contract their circles and settle eventually on the carrion. Still, many favourable circumstances must concur to insure a certain shot. In former times, vultures were frequently shot in this manner near Ammon, and, in fact, any other mode of hunting them, even when their eyries have been discovered, is most uncertain. A vulture's nest was once betrayed to a hunter in the Domleschg valley by the continuous piping of two young birds. He found it impossible to get at it, as it was protected by an overhanging rock, and he,

* I can confirm this from my personal experience. At Kertch, an officer brought down two golden eagles at one remarkably clever shot, and secured them. He killed them, as he thought, by passing the blade of a penknife through the spinal marrow, and carried them to quarters across his saddle-bow. Six hours later the eagles were brought in for inspection after dinner, and, to our amazement, one of them began pecking at everybody within reach.—L. W.

therefore, placed himself in ambush, in the hope of entrapping the parents. Day after day he waited patiently, with his rifle ready cocked; but though the young ones stretched their necks out of the nest and complained bitterly, the old birds frequently did not make their appearance for twelve hours. If the mother came up she darted like an arrow into the eyrie to deposit her booty, and disappeared with the same speed. Her mate, scenting the presence of a foe, would soar in the air with the prey in his claws, and disappear again without depositing it in the nest. At last, on the fifth day, the mother approached again, and in her haste let her burden fall over the edge of the nest. She attempted to pick it up in the air, but, failing, perched on a ledge of rock, when the hunter shot her. The prey she had brought for her young consisted of the fore-quarters of a lamb, with the skin of the hind-quarters still adhering to it. The hunter was at a loss to know what to do with his game after he had shot it. He pulled out some of the larger feathers and gave them to the village lads, who collected eggs from the poultry-keepers by showing them, and brought half their gains to him.

At times the bold sons of the mountains succeed in securing the young vultures in the nest, but it is a laborious and dangerous task, for the birds nestle on frightfully steep and savage rocks, and defend their brood with equal ferocity and obstinacy. Thus, in Glarus a resin-gatherer noticed an eyrie high up the rocks; he clambered to it with indescribable toil, found in it two young birds engaged in devouring a squirrel, bound their feet together, threw them over his back, and clambered down the precipice again. The shrill cries of the young birds soon called up their parents. The man had great difficulty in keeping the vultures at bay by constantly swinging his axe, and they pursued him for four hours, till he reached the village, and was able to secure his booty.

The celebrated chamois-hunter, Joseph Scherrer, of Ammon, once climbed up bare-footed, with his gun on his back, to an eyrie where he suspected young birds. Before he reached it the male bird flew past him and was shot. Scherrer loaded his gun again, and continued his ascent. When he reached the nest, however, the female bird attacked

him madly, dug her claws into his hips, set upon him with her beak and wings, and tried to hurl him off the face of the precipice. The hunter's situation was fearful: he was obliged to cling to the rock and keep the vulture at bay as best he could, as he could not raise his gun. His extraordinary presence of mind, however, saved him from certain death. With one hand he raised the gun-barrel to a level with the bird's chest, and then cocked it and pulled the trigger with his naked toe. The vulture fell on the rocks dead. For the two old birds and two young ones the hunter received a premium of five and a-half florins, and retained the deep wounds on his arm for life.

Equally frightful was the situation of a Sardinian who went with his two brothers to rob a vulture's nest. The two let him down the face of the rock by means of a rope, and while hovering over the terrible abyss he took four young vultures out of the nest; at the same instant the two old birds attacked him like furies. He kept them at bay with his sabre, which he incessantly waved round his head. All at once he felt a violent oscillation in his rope, and saw, to his horror, that, in the heat of action, he had cut his rope two-thirds through. The other threads might snap at any moment, and the slightest movement hurl him into the abyss. Still he was drawn up slowly and cautiously, and saved, but his raven-black hair is said to have become perfectly white in half-an-hour.

Young vultures, when taken from the nest, can be easily reared on meat, and become tame. All captured specimens behave at one moment savagely and furiously, at another cowardly and lazily. Some valuable observations have been made on this point with two old vultures captured in the Grisons in fox traps. A room was allotted to one of them in which it was attached to the wall by a cord on a cross-bar, but this it regularly severed with a few pecks of its beak. It also bit at a chain, but to no effect, but it toiled so hard at it that it was at length removed. At first it raised its head-feathers against everybody who approached

it, afterwards only against strangers, and rarely wounded anybody. It watched attentively every new thing. When its keeper had put new clothes on, it only recognised him by his voice, but would then let him pat it and pull out its wings. It paid no attention to marmots placed in its room, even when they ran about. It was offended at dogs, and glared at them, but never attacked them. Dogs did not fear it, but cats did, and ran about the room as if mad. Pigeons, crows, and magpies, when placed between its feet, remained quietly seated till the vulture ripped them open and devoured them. It was fondest of bones and any raw meat, and would not become accustomed to anything else. It was also pleased with chamois flesh, liver, and brains, but never ate small birds or fishes. It rarely devoured more than a pound of meat or bones at once, but swallowed large pointed bones without any difficulty. It sat all day long idly on a bar, with open beak, projecting tongue, and drawn-in neck, just after the style of the true vultures. If placed on the ground it would look up to the bar, and take a long time in making up its mind to fly up again, but when it did so the operation was very clumsy. If a tobacco-pipe were placed in its beak, it would hold it for hours without displaying the slightest interest. No sounds affected it, and its eye alone evidenced life. This vulture was very fond of milk-and-water, and, being troubled by vermin, liked to be oiled all over, for which it seemed grateful.

The other vulture fell sick, sighed often exactly like a human being, and was fond of being nursed. When its wings began to be paralysed it dropped off its bar, laid itself on its side with a heavy sigh, and expired with the most perfect resignation.

Of course the confined mode of life entirely disguises the natural temperament, and it would be idle to try and judge the character of the free vulture, whose boldness and strength are so well known to Alpine mountaineers, by that of a half-sick, imprisoned bird.

(To be continued.)

UP IN THE ALPS.

BY SIR LASCELLES WRAXALL, BART.

CHAPTER XII.

THE IBEX.

Diminution of the ibex—Its habitat—The preserves in the Tyrol—Monte Rosa—Appearance of the ibex—Use of its horns—Birth of young—A fight with an eagle—Mode of life—Tamed ibexes—The ibex chase—A terrible situation—Fall down a crevasse—Flesh of the ibex—Present prospects of the chase.

AS in the lofty mountains of Asia the gazelle and antelope species are found populating the highest regions where animal life can exist; and the lama, vicuna, alpaca, and guanaco inhabit the South American Andes chain; so we find in the European ranges the goats and antelopes at places where the conditions of life fail for nearly all the other quadrupeds. In the Alps they are the principal representatives of the animal world, and their range extends from the sub-alpine kingdom to the inhospitable fields of ice. By their side exist but few large varieties; above them none at all; for the eagles and vultures, though they may at times soar about the Alpine peaks, have their eyries and breeding-places lower down.

In order to make use of the highest mountain region, Nature was compelled to select an animal which is satisfied with a scanty amount of vegetation, which, further, is enabled by its physical organisation to resist the hostile influences of the climate, and by its roving habits to seek its food on a variety of pasture-grounds; and for this the goat-like quadrupeds are best adapted. These are spread over the whole world, with the exception, perhaps, of Australia, in an infinitude of species; and, though generally inhabiting mountains, they are also found in forests, valleys, steppes, and even in the deserts of Africa. On the Swiss mountains the ibex or steinbock figures prominently.

Although the Swiss ibex is called the European, it is found but at few spots in our hemisphere, and has a rival in the Pyrenees which differs greatly from it. It seems to be at home only on the highest mountains, and hence takes up its abode in the impenetrable Alpine chains which separate the

Valais from Piedmont, and in the mountains of Savoy, where, in 1821, hunting the ibex was prohibited by a heavy penalty. This animal was formerly the ornament of the European Alps, at least—in the pre-historic age, as is proved by a mighty ibex horn found in the Pfahlbauten* on the Lake of Zurich. The Romans frequently carried as many as 200 head to Rome, for the fights in the arena. The cause of their progressive diminution may be ascribed to their slow rate of propagation, their dauntlessness, which allows the hunter to come very close to them, and the nature of their place of abode. Exposed to so many dangers among rocks and glaciers, many annually must necessarily perish, and the increasing difficulty of procuring food adds to the peril. Several naturalists are of opinion that the ibex was only organised for the lower Alpine region, and that when it was driven thence it inevitably perished among the barren peaks of the high Alps. Probably, ibexes were tolerably numerous in Switzerland during the fifteenth century; the last killed was in the canton of Glarus in 1550, and the horns are preserved in the town-hall. In the Grisons, where the ibex has also been extirpated, it was formerly tamed, and we find in old records that the Austrian Castellans at Castel had from time to time to send living ibexes to the park of Innsbruck. They were most frequent in the mountains of the Upper Engadine, Chiavenna, and Vals, but became so diminished in the sixteenth century that, in 1612, hunting them was prohibited by a fine of fifty crowns. This must have been of no effect, for the animals have gradually disappeared from those parts, although they passed as the symbol of strength and bravery into the arms of the Rhetian Confederation, an honour which has never been paid to the chamois. On the Gotthard they were rather frequent in the last century, and a

* About these most curious of European antiquities I hope to say something to my readers ere long.



ALPINE MARMOTS.

German traveller shot one there about the year 1760.

The noble animals held out the longest in the mountains of Berne and the Valais. In Salzburg and the Tyrol they disappeared more than hundred years back, although the archbishops did their best to protect them. They even went so far as to erect châteaux in the highest mountains for the gamekeepers, but, at the same time, they had the animals captured alive to make them presents to princes. In the north-western Carpathians the ibex has not been seen within the memory of man. Very pleased, consequently, were naturalists when these animals suddenly reappeared in rather a large number on the Swiss Alps, especially at Monte Rosa, where a herd of forty had been seen for the last time in 1770. On the Aiguilles ranges and the Dents des Bouquetins, in the vicinity of the Dent Blanche, it was supposed that the last of the ibexes were shot twenty years ago; and when, a few years later, seven head were found crushed under an avalanche, they were supposed to be entirely extirpated. In fact, no traces of them were visible during twelve years. At the present time, doubtless in consequence of their strict preservation in Piedmont, herds of eighteen and twenty are seen on the southern side of the Monte Rosa. It would be most desirable to have them at once protected by a severe law; but the dealers are already offering entire skins with the horns for a moderate price; and hence naturalists and museums will be the cause of the final and inevitable extirpation of an animal which was the greatest ornament of the Alps.

The ibex is a handsome and haughty animal, four and a-half feet long and two and three-quarters feet high, and therefore considerably larger than the chamois. Its magnificent horns give it a noble appearance; those of the male are from one and a-half to two and a quarter feet in length, bent straight back, and having on the upper side from twelve to eighteen large knotty rings; those of the female are only half-a-foot in length, and less knotty. The colour of the hide is in summer reddish brown, with a few white hairs and dark spots, a brown stripe on the back, forehead and nose brown, cheek yellow, throat brownish grey, back of

the head dark brown and white, back part of thigh rusty, belly white with a few black hairs, and upper side of the tail black. The ibex has no real beard, although bad engravings always represent it with one; the winter coat, however, has a small pencil of long stiff hairs on the chin, which disappears with the spring change of coat. A well-fed male weighs about 200 lbs., and the horns 15 lbs.; but the female rarely exceeds 100 lbs. The animal is of muscular, compact build, with a bold and fierce demeanour. The head is relatively small, the ears are short and set far back, and the eyes very bright, and, as in the chamois, without lachrymal glands. It has white lips; the neck and throat are remarkably powerful and muscular, as are the legs, though they appear to be thin. The ibex is not so lightly built as the more active chamois; the tail is six inches long, and constantly raised as in goats, and ends in a chestnut-coloured tuft; the winter coat is far closer, darker, and longer than the summer one.

The old naturalists troubled themselves sorely about the uses of the mighty horns, and invented wondrous fables. Gessner considered that the animal solely employed them to fall on, or to ward off heavy falling stones. (In the same way he says of chamois that, when pursued to the highest rocks, whereto they could no longer stand or walk, they hung on by the horns, and were hurled down by the hunters.) When the ibex, however, notices that it is near death's door, it ascends to the highest crest of the mountains, hangs on to a rock with its horns, twists itself round and round till they are screwed off, and then falls down and expires.

The ibex appears to feel the cold but slightly. Old bucks have been seen standing for hours in a storm as quietly as statues; and when shot it has been found that their ears were frost-bitten, and they had not noticed it. Pairing frequently takes place in January. At the end of July a woolly-haired young one of the size of a cat is born, which at once runs off with the mother, and bleats like a goat. The old ibexes whistle on the approach of danger like the chamois, but when greatly alarmed they produce a peculiar sound resembling a short, sharp sneeze. They live in herds, but at a later age the old bucks keep aloof. They face

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danger with united strength. Thus the celebrated ibex-hunter, Fournier, once saw six female ibexes feeding with their six fawns in the Valais: when an eagle hovered over them the mothers collected with their young under a projecting rock, and turned their horns against the predaceous bird, while carefully following the movements of its shadow. The sportsman watched the interesting scene for a long time, and eventually scared the eagle away.

At night the ibexes generally descend to the nearest forests to feed, but rarely venture more than a quarter of a league from the open ridge. At sunrise they go higher, and camp on the highest and warmest spots looking east and south, where they spend the greater part of the day in dozing or ruminating. Old ibexes are rather phlegmatic, and lie or stand the whole day through on the same spot—usually a projecting rock—which affords them a safe retreat and open prospect. The mothers and their fawns usually lie somewhat lower down the mountain side. They are very fond of wormwood and other Alpine herbs, but despise the young shoots of willows, beeches, raspberry and rhododendron trees; and, like the chamois and goats, they like to lick salt from the rocks. In winter they retreat to the highest woods, and are compelled to live on buds, mosses, and lichen. They always avoid the vicinity of chamois; still, in the tenth century tamed ibexes were driven out to pasture with goats, and willingly returned with them.

It is almost impossible to form an idea of the enormous muscular strength of these animals. They will scale a rock fifteen feet high in their leaps without any previous run, and they can stand firmly on the top of a gate. A tame young ibex will leap over a man's head, and come down firmly on its legs. One ran up a perpendicular wall with no other holdfast than the rough spots denuded of mortar. When captured young, and brought up on goat's milk, they are easily tamed, and become merry playfellows; but older bucks are often savage and spiteful. One that was kept in the village of Aigle was always gentle, and would hold its head down to be patted, and became so attached to the she-goat that suckled it as to run up on hearing it bleat. Females, when domesticated, are always gentle, timid, and obedient.

At Andermatt a young ibex has been kept for two years on an Alp, which was captured on the Monte Rosa. It was remarkably tame, pastured at liberty, and generally spent the day on the roof of the chalet. M. Nager, a well-known Swiss naturalist, has, during the last few years, received forty shot specimens from the Monte Rosa, and given them nearly all to foreign museums. Several times he also received living ones. In August, 1854, he even had a small herd of eight head together upon an Alp. It cost trouble and expense enough to collect them. He engaged a number of hunters to find the wild females, and watch them incessantly when about to give birth. If the exact moment was seized, and the place accessible, the fawn could be secured; but a second too late, and the chance was lost. M. Nager conceived the laudable project of colonising the St. Gotthard with these animals, but this was beyond the means of a private individual. Indeed, in the lower country they appear subject to diseases from which, on their native heights, they are, doubtless, free.

The ibex has a far more precarious life than that of the chamois. It is killed by a wound which would not prevent a chamois from running for miles. When one is shot, its companions fly madly in all directions, while the wounded animal advances slowly, shakes its head sadly from side to side, and soon lies down to die. Nothing very certain is known as to the duration of life with the ibex, but it is supposed to be twenty years.

Ibex-hunting is one of the most dangerous sports, and followed by countless difficulties. In Switzerland there are but few admirers of the sport, and they are in the Valais. In autumn, when the ibexes are fattest, the sportsmen climb the southern mountains, and either proceed towards the enormous group of the Monte Rosa, or, unobserved by the Italian hunters, penetrate into the Alps of Piedmont and Savoy. As the sport is prohibited in both these countries, the greatest cunning and prudence are requisite. Provided with a scanty store of food, they traverse for a fortnight the most inaccessible heights, and sleep on the rocks or in a standing position, after securing themselves with a rope so that they may not fall over a precipice. The ibex cannot be hunted like

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common game. If the hunter is not above the animal when he is scented, he need not think of getting within shot. Hence the hunter must be on the highest ridges by daybreak, for at that time the ibexes go up. Spending the night on the snow border without a shelter, being compelled to guard one's self against freezing by carrying stones and jumping, are certainly a drop of worm-wood in the cup of sporting pleasure. To this must be added the dangers of glaciers, and a hundred others. Thus, we learn from an old book how a chamois and ibex hunter fell into a deep crevasse while crossing a glacier on the Limmern Alp. His comrades lost sight of him, and as they thought he had broken his neck, or would soon die of cold, they commended his soul to the Deity. As they were going home it occurred to them that he might still be saved. They hurried to the chalet, which was a league and a-half distant, where they only found a coverlet, which they cut into strips, and hurried back to the crevasse.

In the meanwhile the unhappy man was in the most awful position. In falling he had managed to squeeze himself into a narrow part, and thus he held himself hovering over a great depth, up to the chest in ice-water, supporting himself with his arms on the ice, in constant terror and danger of death, and half-killed by cold. "In this unfathomable prison," says our reporter, "there contended against him water, air, and ice, the first of which elements tried to swallow him, the second to oppress him by its weight, while the third would not hold him through its slipperiness." At this moment the rope appeared in the air; he bound it with great care round his body, and his comrades drew him slowly up. A few feet from the top the rope of strips broke, and the almost saved candidate for death fell back again into the abyss. The remainder of the rope was not long enough, and the hunter had broken his arm in the fall. For all that his comrades did not give him up, but tore the strips longways, bound them together as well as they could, and let the rope down again. In spite of his broken arm, the hunter again fastened this thin line round him; his comrades pulled; he helped by struggling with painful efforts, and thus the marvellous escape

was effected. On reaching the top he fell into a fainting fit, and had to be carried home. He spoke all his life long with horror of the hours he had spent in this icy grave.

What a price it must cost to secure a single head of game, and how proportionately paltry is the prey finally captured! Only a violent passion can impel a man to follow this uncertain track. But sportsmen declare no pleasure in the world equals that of getting within shot of the grazing animal. It has been pursued, watched, and tracked for weeks: the hunter has followed step by step the trail of the handsome creature, which he has never seen. On cold nights he has the hope of securing his game to warm his trembling limbs. At length he sees the noble animal lying on an inaccessible rock terrace. For hours he follows a circuitous path over ice, ravines, and ridges. He cannot see the beast, but supposes that it has remained in its position, and at length he gets to windward of it. He cautiously looks for the rock: the ibex is off, and is now airing itself on a dizzy precipice a hundred yards farther on. With a beating heart, trembling with hope and fear, the sportsman approaches, raises his rifle, the shot echoes tremendously through the deadly silence of the Alps, and the quivering ibex lies bleeding among the rocks.

When the animal has fallen, it is at once taken up. The sportsman binds the four feet together at the knees, throws it on his back, and securely fastens down the head and heavy horns, lest they should move about while he is descending the hill; then the gun is hung over the right shoulder and chest, and the brave man, with a burden weighing two hundredweight, and both hands firmly pressed on the Alpine stock, commences his most dangerous homeward route. The flesh of the ibex is very like mutton, but coarser and firmer, and with a rather gamy taste. Ibex-hunting formerly cost many human lives, and ruined many a family. If the animals be driven, as appears probable, by the Savoyard sportsmen from the Mont Blanc range to the Valais Alps, the number of Swiss hunters will be only too rapidly augmented.

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CHAPTER XIII.

ALPINE MARMOTS.

Home of the marmot—Its appearance—Its food—Summer life—How it is cooked—The summer abodes—Winter burrows—Stock of hay—Hibernation—Experiments with a sleeping marmot—Strange notions about the marmot—Digging out marmots prohibited—Mode of hunting them—A terrible death—Father and son—Other foes of the marmot.

ON the highest ranges of the Alps, where no tree or bush grows, and the goat and sheep hardly venture, the marmot finds its favourite home. The Tessiners call it "mure montana," whence are derived the Tyrolese "Urmentea," the Savoyard "marmotta," the French "marmotte," the Engadine "Montanella," and probably the German "Murmeltier." Most of us are acquainted with these pretty little creatures, which sport among the rocks in summer, and are carried by Savoyard boys to the towns and villages, where, by their harmless tricks, they amuse children of larger and smaller growth. As early as the year 1000 the monks of St. Gallen were aware of the dainty nature of the animal, and had a peculiar blessing for the dish—"May the benediction make it fat!"

The marmot is one of the most interesting features of the animal life of the Alps; and so many observations have been made of its mode of life and nature, that we are enabled to offer our readers an accurate account of it. Although belonging to the rodents, it differs remarkably from the other members of the family. It has not the activity of the mouse or the squirrel, or the extraordinary speed and cleverness of the hare. Provided for a subterranean existence, it contents itself with the small stretch of pasture-land in the vicinity of its earth, and defends itself effectually against any intruder by biting and scratching. During that rough season, however, when it would here gain a livelihood with difficulty, provident Nature protects the animal by a lethargic sleep against hunger and the foes to whom it would infallibly succumb during its wanderings.

The marmot lives almost exclusively on vegetables, such as the vigorous Alpine herbs, which are also the best fodder for cows—the motherwort, aster, clover, sorrel, &c.; and also, so it is said, on small birds and their

eggs. In captivity it devours all sorts of cabbages, roots, and fruit, but never meat. At times several marmots confined together will attack each other, and one be bitten to death, though not devoured. A very savage marmot in the same cage with a blackbird, four Greek partridges, and a water-hen, bit off the heads of two of the birds. Two other marmots, younger and tamer, bit through the boards of a hen-house, and, like martens, bit off the heads of the fowls, though without tasting the blood. They must be very carefully confined to prevent them breaking out. They nibble through the thickest boards with incredible speed wherever they can drive a tooth in, bite through the lead of windows, and climb up walls with great agility.

Larger objects given them in captivity they generally devour squatting on their hams; in the open air this is rarer, as they do not often have anything to hold in their fore paws. In captivity they, at times, like a deep draught of milk, which they swallow like fowls, repeatedly lifting their heads. They are very rarely seen drinking when at liberty.

The summer life of the marmots is amusing. At daybreak the old ones first appear at the entrance of the holes, cautiously extend their heads, watch, listen, survey the neighbourhood, and then venture out to take their breakfast. They nibble off the shortest grass with incredible speed, run actively backwards and forwards, and seem to turn their attention chiefly to the buds of the small Alpine plants, which disappear for a long distance round a marmot-burrow. When all have eaten their fill, they regularly lie down on a selected spot, generally a comfortable stone in the sun. This traditional resting-place is at no great distance from the mouth of the burrow, and can always be recognised, like the path leading to it, because both are worn completely smooth. Time is passed in sleeping and playing. Every moment they sit up on their hind legs, clean, scratch, and comb themselves, and amuse each other. Some young ones have even been noticed trying to walk on their hind legs. But the first which discerns any suspicious object—a bird of prey, a fox, or a man—whistles through its nose in a deep, loud key, the others echo the

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sound, and in a moment all have vanished. It is not quite certain whether they post sentries like the chamois, but they are less exposed to danger through their diminutive size, as well as the extreme acuteness of their organs of vision, smell, and hearing. A sportsman rarely succeeds in outwitting them or shooting into their holes, and can only do so by watching for hours. They are, however, often dug out in the beginning of winter, or caught in traps during the summer—a certain and easy mode of capturing them, by which, unfortunately, their number is annually diminished.

The marmot is a stout-built little animal with a thick, flat, large head, and is most original-looking. The upper lip is cleft, and covered with a large moustache. The brilliantly-black eyes are rather prominent, the little, round, hairy ears lie flat against the head, the cheeks seem swollen, and the neck is short and thick; the rather short feet reveal a powerful organisation. Various healing properties are attributed to the flesh of this animal by the inhabitants of the mountains, who use it as a universal remedy. In preparing it for food, it is generally scalded or singed like a young pig, smoked, and, after a few days, boiled. Its flavour is so strong when fresh that it creates nausea in those unaccustomed to it. The marmots are regarded by the shepherds as true weather prophets. If the little creatures are making their hay, there will be fair weather; if they are chattering much, it will soon rain; if they stop up their holes more closely than usual, it will be a severe winter, and so on.

During the summer the marmots dig their abodes deep in the earth, and form passages, at times twelve feet long, which are often so narrow that you can scarce thrust your fist into them, and terminating in a circular hall. Of the loose earth produced by the excavation some is thrown outside, but the greater part is trodden down, so as to make the passages smooth and firm. Pairing takes place at the end of the winter sleep, in April or May. The young are born in June, and the litter is from four to six at the most. The young marmots do not leave the burrow till they are full-grown, and share it with the old ones till the next summer. When the mother is suckling, she

sits like a dog on her hind legs, and the little one reaches the teats through the outstretched legs, as will be seen in the engraving.

The summer burrow is often as much as 8,000 feet above the level of the sea; but towards autumn the marmot constructs a winter abode much lower down the mountain. It is seldom more than four feet below the turf, and, being intended often for a family of fifteen, it is very spacious. The sportsman detects it by the quantity of hay scattered around, and by the mouths being carefully stopped up with hay, earth, and stones, while those of the summer burrows are invariably left open. Before the burrow is shut up, however, which generally takes place towards the middle of October, the hay is got in. It is not known with certainty whether the marmots eat the hay with which they cover the floor of their dwellings, and which is never found in the summer burrows. M. Schinz supposes that they do so when they awake suddenly on a fine spring day, before there is any nourishment to be found outside. Tame marmots are known to eat when they awake, and it would consequently appear that the instinct of self-preservation induces the animal to lay by this store. Pliny's fabulous story that the Alpine mice (marmots) get the hay into their burrows by one lying on its back, being loaded with hay, and then dragged in by another, holding its tail between its teeth, for which reason the hair is worn off their backs, has, amusingly enough, been kept up to the present day, although the slightest examination of the sides of the passages will prove how the hair gets rubbed off.

On opening the winter burrow the whole family is found lying together in a death-like lethargy. The animals are rolled up with their nose on their tail. In this state of preservative lethargy provident Mother Nature secures the existence of the marmots, which would otherwise perish in the Alpine winter of six or eight months. Their bodies seem so organised as to be nourished through the winter by the fat accumulated during the fine weather; for, as soon as storms announce the approach of the former season, the marmot retires to its cave, and ceases to have any positive enjoyment of

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life. It scarce breathes, and does not need food; the warmth is withdrawn from the lungs; the whole frame becomes cooled, and the animal sinks into a sleep from which it does not wake till April. If taken during sleep into the open air it becomes frozen, as the lungs are unable to preserve the vital heat. Professor Mangili has calculated that it breathes only 71,000 times during its six months of torpor, while, when awake, it breathes 72,000 times in two days. Regnault placed a marmot enjoying its winter sleep under an air-pump. It remained under it for 117 hours, and only consumed one-thirteenth part of the oxygen inhaled by a lively marmot, and half of that was found in the carbon exhaled by it.

When captured, marmots live in a warm room the same in winter as in summer, but in a cold one they collect everything they can, build a nest, and begin sleeping. The hunters believe many strange stories about the winter sleep of the marmots. Some think that the animals always awake at full moon; others declare that at every new and full moon they turn on their other side, though without waking. The common opinion that marmots fat in summer are thin in spring appears equally erroneous, for a hunter shot one in April which had worked its way through the snow, and was quite fat, although its stomach was empty. It is probable that they grow thin after

their sleep through the difficulty of procuring food.

In most of the cantons digging out marmots is prohibited, and rightly so. When Nature carefully and wondrously protects the life of a harmless creature, it is an impiety to drag her defenceless *protégé* from its place of refuge and kill it. Fair sport is not objectionable, for the marmots are clever enough to take care of themselves. A marmot-hunt has its dangers, too. In November, 1852, two hunters from Geneva, Carlier and his son, went to look for marmot-holes in the glaciers of Argentières. The father crept into a burrow, and was engaged in widening it, when it fell in and crushed him. The son crawled in to extricate him, but a fresh fall took place and buried them both.

They struggled for two hours to get out, one lying on the back of the other, and then the son died. The father lay for three long, wretched days, without light or food, help or strength, under the corpse of his boy, till friends came and dug him out. He, too, died a few hours later, through the frightful sufferings he had undergone.

As well as by man, the marmot is chiefly pursued by eagles and vultures—in whose nests remains of the animal are constantly found in summer—and also by Alpine foxes. It also suffers fearfully from worms, which at times appear in incredible numbers.



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BY SIR LASCELLES WRAXALL, BART.

CHAPTER XIV.

THE GOLDEN EAGLE.

The stone eagle—Appearance of the bird—Its habits—Mode of hunting—Its food—Building the nest—Carrying off children—Nestlings—The eagle in captivity—An eagle preserve—The imperial eagle.

OF the mountain eagles, the stone eagle, or golden eagle, as it is called when it grows old, is probably the best known, most widely extended, and, at the same time, the most striking. When the Swiss mountaineers allude to eagles, they generally mean the large handsome black eagle, which may be regarded as the representative of the genus.

We will attempt to give an accurate word-picture of this bird. It is a very noble creature through its size and bearing—three to three and a-half feet in length, and measuring nearly eight feet from tip to tip of the outstretched wings. The rounded tail measures fourteen inches, and the wings, when closed, do not reach its extremity. The male bird (usually rather smaller and lighter-coloured than the female) looks at a distance almost all black, but is really blackish-brown. The older the bird grows, the browner its plumage becomes. The young birds are raven-black, with dirty-white down on the legs. The beak is horn-blue, edged with yellow, and two inches long; it is bent from the root (exactly opposite to the vulture, whose beak is merely curved at the end). The iris is golden-hued, and in old age like a live coal. The legs are covered with short, close light-brown feathers quite down to the claws, which distinguishes this eagle from all other varieties. The toes are bright yellow, the balls large and rough, and the black claws are large and very sharp, the hinder ones being nearly three inches long. The weight of an old specimen rarely exceeds 12lbs.

This handsome, powerful eagle is in Switzerland an exclusive denizen of the Alps, and is found sporadically in all the ranges in the rest of Europe; in Asia and North America, however, it is found asso-

ciated with the lowland eagles in the great plains, forests, and on the seaboard. It is only in winter, when the marmots are lying underground, and the chamois, hares, sheep, and goats have retired into the lower forests and the valley, that the eagle leaves its Alpine eyrie to traverse the lowlands, and then only for a short period. In the mountain valleys all sorts of anecdotes are current about specimens which have been caught, shot, or taken out of the nests. The stone or golden eagle is bolder and more agile than the vulture, from which bird it is also distinguished by its hopping movements. It appears to hang for hours at an immeasurable elevation in the blue sky, and to soar there in large circles without any perceptible flapping of the wings. Courageous, powerful, clever, sharp-sighted, and possessing so keen a scent that it is scarce exceeded in this respect by the condor, it is at the same time extraordinarily shy and cautious, generally searching for its prey alone, but at times with its mate. Its shrill cry of "pflip," or "hyay—hyay," echoes far and wide through the atmosphere, and fills the smaller feathered tribes with terror. On approaching its prey the eagle frequently breaks into a cry of "kik—kak—kak," gradually sinks with its eye firmly fixed on its victim, and then pounces upon it in an oblique line with the speed of lightning. None of the smaller animals are safe from its claws: fawns, hares, wild geese, lambs, goats (which it will boldly carry off from houses and barns), foxes, badgers, cats, partridges, dogs, crows, storks, domestic poultry, and even rats, moles, and mice, suit its taste, but it is fondest of hares, which it will carry with unabated strength for hours to its young. The utmost rapidity of flight will not save the quadruped, and even birds but rarely escape. The eagle carries on the chase with equal perseverance and cunning, and wears out the active partridge and the quickly-flying woodcock by incessant pursuit. It will often deprive the falcon of its captured pigeon, or the hawk of its grouse. It likes to return to a spot

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where it has once made a good capture. In winter it will frequently settle on carrion. When in a state of captivity it can starve for four or five weeks without becoming utterly exhausted.

The eagle builds a roughly-finished flat nest of large branches, heather, and hair, amid the most inaccessible peaks. This nest is situated either amid the tops of the oaks or on a covered rock, and the female lays in it three to four white-and-brown spotted eggs. The old birds bring the young all sorts of game, especially hares and marmots, and give them lessons in the art of tearing the food on the edge of the nest. When they are not disturbed they will cling to the same eyrie for several years.

Much has been said for and against the fact of the golden eagle pouncing at times upon young children. However rarely this may occur, the bird is certainly strong and bold enough to do so, and we have at least one authenticated instance that took place in the Grisons. In a mountain village there an eagle pounced down on a two-year-old child, and carried it off. The father, aroused by the shrieks, followed the robber to the rocks, and, as the bird's burthen was rather heavy, he succeeded in recovering the child, which, however, soon died, as it had been pecked about the eyes. The father lay for a long time in wait for the murderer, which always remained in the same neighbourhood. At length he succeeded in capturing it alive in a fox-trap. In his passion he rushed up to the eagle and seized it so incautiously that the bird was enabled to wound him severely with its free leg and beak. Some of his neighbours ran up and killed the captured eagle with clubs, and it can now be seen stuffed at Winterthur.

These greedy birds will frequently make a combined attack upon sheep or goats, and the animals rarely escape them. They are the real lords of the manor, for they incur no danger from any bird and animal, except their own vermin. The Swiss hunters shoot them from an ambush with a bullet or a charge of heavy shot. In Germany they are usually captured in traps or nets.

Sometimes the sportsman succeeds in carrying off the nestlings. There have been repeated instances of this in Appenzell,

Glarus, Schwytz, the Grisons, and the Bernese Oberland. One bold hunter, in 1851, let himself down by means of a rope, in order to capture eaglets in a nest built among the rocks looking down on Lake Säntis. As the rock projected, he was compelled to draw himself up to the nest by the aid of a hooked stick, and, while hanging in the air high over the valley, bind the young birds and have them dragged up with him along the face of the precipice. In the Grisons several nests have been rifled in this way; but there is no instance of the parents defending the young birds while they were being removed. Usually they were absent in search of prey, and, on finding the nestlings gone on their return, they generally quitted the valley for several years.

Young eagles, when captured, are easily tamed, are very ready to learn, and have been successfully trained to hunt. In captivity, when they frequently live for thirty years (at Vienna there was a specimen which was said to have lived a hundred and four years in a cage!), they cannot endure dogs, and set up all their feathers at the sight of them. The Tatars train them to chase small animals, and even wolves, very cleverly.

In the Bernese Oberland, the village of Eblingen, on the Lake of Brienz, is celebrated for sport with the eagles. About three miles above this village, amid wild scenery, there is a remarkable gathering-ground and favourite abode of the eagles, to which they constantly return, and even fly to it from the Valais and the glaciers of the Jungfrau. Here they prefer a few inaccessible rock pinnacles on the sunny side, whence they command the great valley of the lakes. They are, however, rarely shot here, because the foxes, as a rule, eat up the bait. The hunters of Eblingen have ever been renowned for their sportsmanlike qualities; but they also, like true sportsmen, are anxious to attract their game, and are careful to keep a table laid for the birds all the year round. Even in summer they suspend dead cattle on the isolated beech-trees, which can be easily noticed; and, although at this season the eagles but rarely pounce on carrion, because they have plenty of fresh food, still they retain the spot in

sight and memory, and on starvation days attack the proffered food.

In winter the eagle-hunters of Eblingen are accustomed to lay the bait on the ground. They fasten the meat firmly to the ground with wooden pegs, and often select for the purpose roasted cats, which the predaceous bird is very fond of, and scents for a long distance. The baiting-spots are so selected that the hunters can watch them from their dwellings down on the lake. Every minute they walk to the window with their telescope, and survey the baiting-ground, when they expect eagles. If they notice the royal bird approaching the carrion, it rarely escapes them, even though they have to clamber several miles through bushes and over stones; for when the eagle has once settled down on its booty it will remain seated for hours, and when gorged it generally forgets its caution.

For the traveller who may roam into these eagle-hunting grounds the prospect is not remarkably agreeable. Here a half-decayed goat is swinging from the branches of a tree, while further on a half-eaten cat or lump of horseflesh is polluting the air. The sportsmen in this district are engaged in hunting nearly the whole day. They assert that the eagle flies higher than the vulture. They have often seen it soaring over the peak of the Wetterhorn (11,412 feet above the sea) and of the Eiger (12,240 feet). If unsuccessful in their chase of the golden eagle, they try their chance with the fishing eagle on the lakes. In other parts of Switzerland the golden eagles are not so regularly and passionately pursued, as no bait is set for them. Still, there is hardly a part of the Alpine range in which eagles have not built at one time or another. They are also to be found in some parts of the Jura. A couple lived for years at the end of a rock crevice twelve feet deep, and employed the rock shelf in front of the nest as the shambles, which was always covered with strips of meat and bones, while the nest remained clean.

Though less powerful than the Lämmergeier, the golden eagles have a prouder and more dignified bearing, which displays the stamp of liberty and independence. Their strength is extraordinary. A specimen that was caught in a fox-trap flew away with

the trap, though it weighed 8lbs., across the Oberhasli mountains, and was found the next day exhausted and killed with clubs. As regards keenness of senses, agility, and craft, they stand far higher than the vulture, which has never been chosen as the symbol of a royal character.

The hunters in the Bernese Alps assert that they have more than once shot there the imperial eagle, which resembles the golden eagle, but is rather smaller. This statement is probably correct, although the bird has never been certainly discovered in any other part of Switzerland; still it builds its nest in the adjoining Tyrol, and is annually shot in Central Germany and on the Bavarian and Silesian mountains.

CHAPTER XV.

ALPINE CATTLE.

Wild and tame animals—The Alps in winter—Alpine pastures—Cattle in the mountains—Marching out—Life in the pastures—Dangers incurred—The bell cow—Master Bruin—A warm reception—A hailstorm—Terror of the kine—The Alpen-rücken—Savage bulls—Milking—Oxen used as beasts of burden—Shoeing poultry.

In the vast and silent expanse of the Hoehgebirge or higher mountain range, the existence of the domestic animals useful to man forms a pleasing contrast with that of the wild brutes. The free graminivorous animals, surrendering the field to their tame competitors, have recourse to cunning, and obtain their food at night in the most secluded spots, only doing so when the lowland animals have not yet invaded the usurped heights, or have again left them. Rarely do they graze in community; rarely does a chamois join the clambering flock of goats, and the ibex never does so. On the other hand, the beasts of prey incessantly pursue the unguarded sheep and calves, and the vultures will even try to hurl an ox over a precipice, as we have seen. Man defends his property against these absolute lords by a constant war of annihilation, and eventually is triumphant.

The tame cattle of the Alps are the living ornament of the scenery, which is almost oppressive in its character, for the wild beasts are much too scattered and isolated to answer this object. The mountains would lose half their charm if man did not offer in his rustic chalet a proof that he is yet

lord of the world, even of that world which piles up all its terrors to oppose him. The traveller in the Alps well knows the heavy melancholy which broods in autumn over the rocky pastures, when men and herds, horses and dogs, fire, bread, and salt have abandoned the heights for the valleys, when the chalets are deserted and barred up, and it seems as if the ancient spirit of the mountains had spread out his mantle of gloom over his entire domain. For leagues around no sound mingles with the hoarse rumbling of the glacier and the monotonous rush of the ice-water, save the croak of the hungry bird of prey, or the whistle of the marmot as it shoots past. The ground, eaten bare, except where a few small tufts of untouched grass reveal the presence of poisonous herbs, has lost its pleasant hue; the black salamander and the lazy Alpine toad take possession of the mud-lined drinking-troughs of the cattle, and the belated butterflies flutter about with half-torn and faded wings over the morass, in which active frogs seem to be repeating in a dismal chorus, and as if in mockery, the summer songs of the herdsmen.

These inhospitable regions can only be subjected to cultivation through the agency of the peasant's faithful cattle, which exercise a greater influence over those who are more intimately connected with them than do the mightiest revolutions of the political world. The neatherd lives on and with his kine; they are his wealth, fortune, confident, pride, support—his everything. When he speaks of his belongings, he means by them wife, and child, and cattle.

It is difficult to state exactly to what height extend the Alpine pastures, as it is modified by local circumstances. We may assume generally that the soil is regularly tilled for meadow-land and other purposes as far as 4,000 feet above the level of the sea. From this level begin the Alps, properly so called, which are merely used for summer pastures. They are extraordinarily wide tracks of grass, the true pampas of Switzerland, which extend as high as the nature of the mountain admits. We can hardly place the mean upper limit of the Swiss cow ranges higher than 6,500 feet above the sea. Starting from that elevation, ragged Schratzen fields, precipitous slopes, and pinnacles of

rock extend to the snow line. The sheep pastures also embrace this region, and reach on an average to about 7,000 feet, although there are a few scattered oases, used in very fine weather, to be found at a height of 9,000 feet on the Monte Rosa.

The condition of the cattle on the Upper Alps is anything but satisfactory. In most places there is a deficiency of average stalling. The kine roam about the mountain, and graze on the short, juicy grass, and if a snowstorm takes place in autumn the lowing herds collect in front of the chalets, where they hardly find shelter, and the herdsman has scarce a handful of grass to give them. In long-lasting rain they seek shelter under rocks, or in forests, and lose a great portion of their milk supply. The cows frequently drop their calves far away from human aid, and in the evening surprise their keeper by returning with distended udders and a vigorous calf, although things do not always turn out so successfully. In some cantons the building of decent stalls has at length been carried out, but the reader must not envy the "life in the woods" as a rule enjoyed by Alpine cattle. Strangely enough, the same neatherds who behave most kindly to their cattle in the valley cannot be induced to erect the slightest shelter for them on the mountains, where they need it so greatly.

And yet the cattle, badly taken care of though they be, revel in the quiet, lovely season of the Alps. When the great bell (*Vorschelle*), which always accompanies them on their journeys to and fro, is brought among the herds in spring, a general excitement prevails, and the kine all assemble, lowing and frisking, for they recognise the signal for the approaching migration. And when the march has really commenced—when the finest cow is decorated with the bell and ribbons—when the milking-stools are fastened between the horns of the cattle, and the packhorse is laden with cheese-kettles and provisions—the sight is most picturesque and cheering. Kine left behind in the valleys will often follow their companions to remote Alps of their own accord. In truth, it is a glorious life for a cow even up there in fine weather. The bearsfoot, motherwort, and Alpine plantain afford them wholesome and palatable food. The sun

does not burn so hotly as in the valley, and there are no gadflies to disturb the heifers in their mid-day siesta. The fine free air agrees with them better than the stifling atmosphere of the stalls, and the constant motion and natural diet contribute to keep them in robust health.

The cattle on the mountains are said to be more sensible and active than those in the valley, for their mode of life develops their natural instincts. The animal which is compelled almost entirely to look after itself is more attentive and has a better memory than one which is constantly looked after. The Alpine cow knows every bush and puddle, the best grazing-places, the time for milking, and recognises its keeper's call a long way off. It scents the approach of a storm, carefully distinguishes the plants which are unwholesome for it, guards its calves, and carefully avoids dangerous spots. Still, in the latter respect it is not always successful, in spite of the utmost caution. Hunger at times drives it to rich but dangerous pasturage, and while the cow is moving over the pebbles the ground begins to give way under it, and it slips down-hill. So soon as the animal notices that it can no longer help itself, it goes down on its stomach, shuts its eyes, and yields resignedly to its fate, and is either dashed over a precipice, or else brought up by a tree, where it patiently awaits the assistance of the cowherd. Of course, the cattle are unable to foresee landslips and falls of boulders, which kill many fine animals yearly. Curiously enough, that ambition is found among the Alpine kine which causes them to keep up most strictly the right of precedence. The bell cow, or *Heer Kuh*, is not only the handsomest but also the strongest of the herd, and no other cow dares to get before it. The cattle next in strength—as it were, the aristocracy of the herd—follow it. When a new cow is purchased it has infallibly to have a duello with horns with every member of the confederation, the result deciding its position. Frequently two cows of equal strength will have a fight that lasts for hours. It has been noticed that bell cows, if deposed, pine away and become quite ill.

The mountain cattle also display their instinct and courage against beasts of prey, especially the bears, which are still far too

numerous in the Southern Alps. If a bear creeps up quietly on its light, broad paws, the cows scent the assassin a long way off in fine weather, begin bellowing loudly, and hurry to the chalets; should they be tethered, they rattle their chains so perseveringly that the attention of the watchmen is attracted. The bear always tries to get up from the rear, for even the half-grown heifer will use its horns against him in case of need. If the bear succeeds, however, in pulling down and tearing the flesh off a cow, the scattered herd quickly reassemble, and form a circle round him with their heads down, as if anxious to set upon him. According to trustworthy reporters, the bear, in such a case, does not sit long over his meal, and has never been known to attack a second cow. In persistent rain, however, the kine do not smell the beasts of prey at all, and instances have been known of a bear killing a cow close to the huts, and eating it or carrying it away without exciting the slightest sensation.

Although the herdsmen know their kine so intimately, and each cow will readily answer to its name, there are, every summer, hours of utter anarchy in which the herd grow wild, and the keeper is at his wits' end. We allude to the nocturnal storms, which are truly a horror and terror to the denizens of the Alps. The kine, fatigued with the heat and labour of the day, are, perhaps, enjoying their first sleep in the neighbourhood of the chalets, when suddenly the horizon is lit up, and for a few minutes the neighbouring snow-fields appear to be covered with molten lava. A heavy mass of clouds lowers over the peaks, a few flakes of mist chase each other from the west, emitting a succession of quivering flashes, while a death-like silence prevails in the distant valleys. The cows wake and grow restless; hot breezes sweep over the cliffs, or rustle gently among the rhododendrons and mountain pines. Soon the glacier streams burst into life; a hollow rumbling is audible in the distance; the upper currents again meet and wrestle, and the lightning constantly grows more vivid as it plays round the loftiest peaks. At length the kine rise, obedient to the signal of the *Heer Kuh*, and, ere long, assemble round the chalet. Suddenly flames burst out from

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every cloud, and a hailstorm patters on the meadows. The terrified animals bellow furiously, and rush with eyes shut and tails erect in the direction of the tempest. The herdsmen now spring up half-naked, and, throwing their milk-pails over their heads, hurry out to the scattered herd, shouting, cursing, coaxing, and calling on the Virgin by turns. At last a portion of the herd is collected, the hail is succeeded by heavy rain, the kine stand round the chalet up to their knees in water, but usually several of the finest cattle lie quivering and crushed at the base of some precipice.

The "Alpen-rücken" is palpably a myth, but is firmly believed by all the old cow-herd families in Switzerland. They are chary about talking of the apparition to strangers; but at times, when seated round the fire, smoking their cutties and warming their inner man with Kirschwasser, they relate in a few mysterious words how occasionally, after the evening milking, the cows become restless, and on a sudden the entire herd is lifted into the air by mighty and invisible hands, and the animals, lowing plaintively, are borne away over the mountain. Not a single cow is to be found at such a time on the whole Alp, where, indeed, it is uncanny to seek them long; but the next morning finds them all safe and sound again on their grazing-ground. Not long ago it was the fashion to say a nightly prayer to ward off the Alpen-rücken. The superstition is evidently connected with the fable of the "Wild Huntsman."

Among the dangers connected with the Alps not the least is that of meeting savage bulls, especially if you have a dog with you. Once a bull is excited, the traveller must take refuge in a chalet, for the infuriated animal will sooner be cut to pieces than be balked of revenge for the fancied insult

The taste of the milk depends greatly on the nature of the pasturage. Where herbs of the leek species prevail, the milk and cheese taste strongly of garlic. On the flintstone rocks, where many orchises grow, the milk becomes quite yellow, and cannot be made into butter or cheese. In the Bernese Oberland the milk becomes blue from the presence of a certain herb, and has a strong flavour of vanilla. The cows are called home in the morning and evening, and milked either in the chalet or before the hut.

Cows are sometimes found to yield as much as fifty pounds of milk a day for a long period, but the average is about eighteen pounds. Cows live from twenty-five to forty years; but where the custom of stall-feeding prevails they lose much of their milk at an early age, and it is found more profitable to hand them over to the butcher.

Oxen were formerly employed on the St. Gotthard to drag the luggage-sledges in winter, and also for cutting passages through the snow after a deep fall. They were either yoked to the sledges or driven over the snow backwards and forwards till it was firmly trodden down. Horses and mules are now more usually employed for this purpose; but in the Nendaz-en-bas cows and bulls are used in the same manner as horses are elsewhere, and are shod, saddled, and ridden. It is said of the inhabitants of the neighbouring Yserablez that the rock on which they live is so precipitous that they are compelled even to shoe their chickens. Cows and oxen are employed for travelling purposes in the Grisons more than any other part of Switzerland; and the summer produce of Alpine husbandry, as well as wood, is carried down to the valleys almost exclusively by these animals.

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BY SIR LASCELLES WRAXALL, BART.

CHAPTER XVI.

THE BEAR.

A bear after goats—Bear-hunting—Loss of sheep—Narrow escape—Character of the bear—Its way of fighting—A good-tempered animal—The bear among cattle—Love of its cubs—Propagation of the bear—A terrible bear fight—The bear-pit at Bern—Bear-hunting of yore—Tame bears.

IN the Rhaetian Alps, which are but slightly populated and cultivated, several wild beasts still find a home. Amid the steep and inaccessible masses of rock there are dark ravines and small, rarely-visited stony valleys, in which the lynx watches for the marmot, the vulture pounces upon the young chamois, and the inevitable fox tries to catch a stonechat in its nest, or startles an accentor.

On one occasion some herdsmen, whose duty it was to watch over a small flock of goats in a rather remote chalet on one of the roughest Alps of the Rhaeticon, noticed, in the morning, that there were, near the cabin, marks of some large animal, that the grass around had been coarsely nibbled, and that the door was injured and scratched. The goats came out shyly, but not one of them was missing. The herdsmen could not solve the riddle of the nocturnal guest, but supposed there was a lynx or a wolf in the neighbourhood; still, though they carefully searched all around, they could find nothing. They resolved, however, to keep a watch, and, as they had no fire-arms, one of them went to the nearest valley and brought back an old musket, which was carefully loaded.

All through that day they noticed that the goats kept strangely together, and that they displayed a visible repugnance to go any distance from the cows grazing lower down. At night there was some difficulty about driving the animals into their stall. Two of the men resolved to keep watch behind a rock a gunshot off, and, in case of alarm, wake their comrades in the chalet. Still the night passed without any incident, as did the following one. On the third night the sentries fell asleep while on watch, but

were soon aroused by a disturbance among the goats. They saw a bear pushing and scratching at the door, then sniffing round it and looking for an opening. The goats were evidently awake and restless, for their bells could be plainly heard. The men, unused to hunting, began to feel uncomfortable, and one of them crept to the chalet to wake his comrades, while the other tried in vain to get the musket into shooting condition. In the meanwhile the bear was hard at work on the door, and eventually succeeded in opening it. The goats rushed out frightened and bleating, and climbed up the nearest rocks. The bear soon reappeared in front of the stall with one he had bitten to death, and greedily began devouring its teats. The other herdsmen came up with logs of wood, milking-stools, and other extempore weapons, but did so most cautiously. One of them, who, in his younger days, had often gone chamois-hunting, took the musket from the sentry, went up to the bear, who rose growling on his hind-legs, and broke a rib with a bullet. The others then drew nearer, and killed the furiously-fighting animal. It was a brown bear, weighing 240lbs.

Along the whole South Rhaetian plateau, in the side valleys of the Lower Engadine, in Tessin, and some districts of the Valais, bears are to the present day repeatedly come across. Hardly a year passes in which they are not seen or shot on the cattle Alps; and this is specially the case on warm spring or autumn days, when a settled westerly wind induces them to leave their caves. Issuing from the Grisons, they will traverse the whole southern Alpine chain, and, impelled by hunger, visit the open country, where several have been shot in the present century; for instance, in the Pays de Vaud and the Valais, where bears' paws are hung up as trophies in more than one chalet. Numerous specimens have also been shot in the mountains round Geneva. In Canton Uri the hunter Infanger gained a great reputation by his courageous bear-hunting. The Castellan at Zernetz has shot eleven

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bears to his own rifle. In 1840 a sportsman met, on the Brunnig glacier, two bears in company, an old and a young one. The daring fellow waited for a favourable moment, and sent one bullet through both animals. The young bear fell dead on the spot; the old one was wounded in the spine, but managed to fly to a rock crevice, where the hunter found it dead the next day.

Strange to say, bears are very scarce in the mountains of Vaud, while they breed fast on the Jura. They are so numerous in Neuchâtel, that the government was obliged, in 1855, to get up a regular bear-hunt in the forests above Boudry, and offer a reward of 200 francs a head. In 1843 hunters from Cergues followed a she-bear to her cave, from which they took a blind young bear, which, however, was frozen to death in the game-bag. The celebrated bear-hunter Grosilleux, of Gex, brought, in 1851, the ninth bear he had shot to his own gun into Geneva, in the vicinity of which city another hunter also shot an old and a young bear. Shortly after, a third hunter wounded a young bear, seized it, and, with the aid of two comrades, contrived to take it alive.

Still more productive was 1852, when five beasts showed themselves at once on the Engadine. In September of that year a she-bear, weighing 200lbs., was killed at Cama. At the end of October, Forester Gliesch was proceeding to the Val d'Arbora, armed with a double-barrelled rifle, for the purpose of shooting chamois. On the Cysterna Alp he found fresh bear tracks, and soon saw the animal on a declivity climbing up a service-tree, and revelling in the berries. The hunter fired from behind a maple-tree one hundred paces distant, upon which the bear sprang from the tree with loud growls, and, noticing its pursuer, furiously trotted towards him. Gliesch allowed it to come within fifty yards, and then fired his second barrel, upon which the bear toppled over, and with a mighty noise fell backwards through the bushes. This was the third bear brought into Grono within a few weeks. In the autumn of 1849, a sportsman, who was going after chamois, killed a large she-bear at two shots. She was hardly dead ere her two cubs ran up and began sniffing at their mother; they were, however, speedily disposed of by the

hunter, who thus gained in a few seconds several hundred francs merely as head-money. In 1853 several bears were killed in the Rhetian mountains, while others, in August, destroyed sixteen sheep one after another at Davos; and in September, 1853, a third bear destroyed fifteen sheep in the Engadine, some of which he fetched from the midst of a herd of bellowing cattle. In September, 1855, they were excessively numerous in the Prättigau, Munsterthal, and Lower Engadine. In the Tessin valley of Robesacco three bears were killed in 1856, which had destroyed flocks, and even attacked men. In July, 1858, the bears behaved very badly on the Buffalora Alp, and destroyed twenty-two sheep out of a single flock. In the same year a hunter shot a bear about a mile from the Splügen; the wounded animal turned furiously on its foe, but he at once settled it with a second bullet. In the summer of 1860, a bear carried off fourteen sheep in seventeen days at Zernetz, while another remained at Sins, grazing along the high road in broad daylight. On the 18th of August of the same year, a Bergamask shepherd, who was riding through the pass of Buffalora, suddenly came on two young bears. The mother rushed up and furiously attacked the horse, which defended itself with tremendous kicks, while the shepherd jumped off. On a renewed attack his shaggy cloak fell off the horse's back on the bear. The latter savagely groped her way out of it, and tore it in a thousand strips, while horse and man escaped. In the Alps above Prolin, Pays de Vaud, a few years back, a wounded bear rushed at the hunter and killed him after a terrible duel: it was afterwards shot by the comrades of the killed man, and is now to be seen in the museum at Sitten. In the Einfisch valley these wild beasts frequently descend from the barren mountains to the mild, vine-clad valleys. In 1834, a bear even entered some vineyards at Siders, where a young man was shooting small birds. He was daring enough to fire his charge of shot right in the face of the animal, and fortunate enough to kill it on the spot.

The portion of Switzerland where bears most do congregate is, however, the Lower Engadine, with the adjoining Munsterthal and the Ofner mountain forests. When Von

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Tschudi visited this district in September, 1855, he found bears' tracks almost daily, and not a week passed in which Master Bruin was not seen, either alone or in company, in one of the valleys. This was especially the case in the wooded ravine of the Scarl valley, where, shortly before his arrival, an "old black devil," as a neatherd told him, came down from the mountains in broad daylight; and also in the gloomy valleys, covered on both sides with pines to a height of 7,000 feet above the sea. The bear, however, only shows itself here from April till about November, when it apparently retires to its winter sleep, as the woods become impassable through the masses of snow. For the present there can be no hope of extirpating the beast in these uninhabited regions. The steepness of the ravines, the uncertainty of the track among the rocks, the indifference of the inhabitants, and the paucity of hunters are a sufficient protection for the bear. There are no zealous or professional bear-hunters, and the head-money given is not very attractive. An old hunter at Scarl, who had shot many a bear in his time, told Von Tschudi there were, to his knowledge, thirty bears about there, among them a very large and powerful specimen, whose head and back were quite grey. In the Munsterthal live two excellent hunters, who deserve a word of notice. The first is John Nuolf, who has killed many bears, eagles, and chamois (fifty head a year, and once five in one day). A few years ago he was following a bear's track in Val Tavri, and suddenly noticed an old she-bear in some bushes near a stream. After crawling and clambering for some distance he at length reached a covered position behind a rock, whence he fired a bullet into the bear's chest. The wounded beast rushed madly roaring over rocks and shrubs; the bold hunter re-loaded, and went in pursuit of his prey. It had disappeared, but, to make up for that, three young bears stood staring at him in surprise. The hunter shot two down right and left; the other ran up a tree, but speedily shared the same fate. In a few minutes he had gained 250 francs in head-money and bear-meat.

Nicholas Lechthaler, of Munster, an equally distinguished bear-hunter, who yearly brings home his forty to forty-five chamois, and

has shot many vultures got up, in the summer of 1857, a hunt for a family of bears on behalf of two foreign sportsmen, a Prince Suvoroff and an American. Lechthaler shot a she-bear; but the Russian bribed his comrades, and was recognised as the successful shot. In May, 1858, Lechthaler, while partridge-shooting at Valcava, unexpectedly came upon a bear. What was he to do? He had only loaded with shot, and knew that he could not hurt the old brute with it, while he would expose himself to great danger. Still, his hot blood did not allow him to resign so rare a prize, and in reckless daring he shot one of the cubs, which fell dead on the spot. The mother then turned, gave a deep growl, advanced a couple of paces towards the hunter on its hind-legs, but then turned back to the dead cub, sniffed at it, turned it over on the ground, and finally took it in its mouth and carried it away, followed by the others. Lechthaler, half paralysed with terror, watched the scene for awhile, and then went home, where (as his wife afterwards revealed) he wept bitterly through excitement and rage at the loss of his prey.

While naturalists only recognise one species of land bear, which has its habitat throughout all Northern Europe in the larger forests, and in the South in the mountain plateaux, the Swiss distinguish three varieties—the large black, the large grey, and the small brown mountain bear. In addition to these there is a rare silver-grey or white variety, a fine specimen of which, with milk-white ears, was shot at Scans. A very handsome bear, 7 feet 2 inches long, killed at Nion, now adorns the museum of Lucerne.

The Swiss shaggy bear is, in reality, a rather good-tempered beast, especially the black one, which lives on vegetables more than meat. They sleep more in winter than in summer, and lie in their caves, which are frequently mere crevices in the rocks, or large nests roughly made of brushwood and moss, and entirely closed against the breeze. In great cold they will sleep for several days uninterruptedly without freezing; still, hunger must, ere long, awaken them, for it will make itself felt even though they eat less in the rough winter months than at other seasons. They crawl out and nibble with much relish the young rich grass,

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winter corn, vegetables, roots, berries, &c., but they have the greatest liking for strawberries and honey. In order to get at pears or grapes, bears will often in autumn travel for miles down into the valleys, but always return to their quarters before daybreak. They will rove from the Munsterthal and the Engadine as far as the vineyards of the Valteline. A vegetable diet suits them remarkably well, and, ere now, polar common bears have been kept alive solely on oats.

They often destroy the large ant-hills, and eat the insects for the sake of their acid, but after that they become greedy for meat. Unless aroused or tortured by hunger, a bear will never attack a human being; but when once it has tasted flesh it grows quite ravenous for it. It is asserted, however, that, as a rule, the bear is such a peaceable creature that one of them quietly ate the strawberries out of the basket of a girl who was gathering them, without injuring the maid; and it is also said that a crying child puts it to flight.

In June, 1855, a large bear attacked a shepherd's dog in Neufchâtel, but at once let it go when the man assailed it with a bough, and quickly went off to the forest. The bear makes excursions of forty to fifty miles, but likes to return to its temporary home. If it wants to move rapidly it goes on all-fours; when it has anything to carry home it marches upright; and when resting it sits on its hind-quarters like a dog.

The bear is only dangerous either when disturbed in its sleep, dangerously wounded, very hungry, or when its cubs are menaced. At such times it marches erect on its enemy, throws its arms round him, and tries to hug him to death; it often adds to the effect by a gentle bite. It happens, at times, that the assailed bear knocks the hunter's gun or spear out of his hand, embraces him, and rolls down-hill with him, in which, however, Master Bruin generally gets the worst of it. When bears are hunting cattle they generally lie in ambush at their watering-place. Cows are most rarely attacked, and never face to face; the bear leaps on their back, and bites their neck till they fall through loss of blood. Goats, which it never thinks of pursuing, are either driven over the rocks or fetched out of the shed during the night. If the latter, however, scent Master Bruin

in time, they take refuge on the roof, and often wake their keepers by the noise. If a bear ever attacks a grazing herd of cattle it is sure to do so under cover of a fog. It tears the animal open and first devours the lungs and the kidneys; the rest it either buries or carries off. Should it be noticed by the other kine, however, they collect round the offender and gaze at him attentively. In such a case the bear will not attack another cow. It rarely ventures to attack horses, and is generally worsted if it does so. It has a marked preference for sheep; and, some forty years back, the bears robbed the landlord of the inn on the Grimsel of thirty sheep one after the other.

As the bears are excellent climbers, they generally scale a lofty tree before starting on a predatory expedition, in order to survey the country and try to scent some prey. If the bears were not so greedy, and if they did not commit such ravages among the flocks, it would be almost a pity to pursue them so eagerly. No other wild beast is so droll, so good-humoured, and so amiable as Bruin. He has an open, upright nature, without falsehood or deceit. His cunning and power of invention are rather weak, and he trusts principally to his great muscular strength. He has been known to drag a cow up through the roof of a stall, and carry a horse across a deep stream. What the fox tries to attain by cleverness and the eagle by speed, the bear does by open, straightforward force. While resembling the wolf in awkwardness, it is not so greedy, savage, ugly, and repulsive. It does not lie long on watch, does not attempt to outflank the hunter and attack him in the rear, and does not trust entirely to its terrible jaws, with which it can rend any mortal thing, but first tries to fell its prey with its mighty paw, and only bites when it is absolutely necessary, without ever having recourse to laceration.

The bear's whole appearance, with its long, fine, shaggy hair, its flat snout, small brown good-humoured eyes, short scut, broad paws, and jolly walk, has something more noble, confiding, and philanthropical about it than that of the ill-coloured wolf. It never touches a human corpse, does not devour one of its own species, and does not prowl about the villages at night to snap up

a child, but remains in the forest and on the mountain as its own peculiar hunting-ground.

Still, false ideas are formed at times both about the bear's slowness and its good-nature. Although extremely phlegmatic, it can run on level ground so quickly as to easily catch a man, and climbs up trees very actively. It is only in February, when its feet are soft, that it cannot run so well. Old, heavy bears, it is true, crawl very slowly and cautiously. Should the animal be in danger, its character is entirely changed, and it becomes very desperate. A wise hunter will never venture to shoot a cub when its mother is near, for by doing so he exposes himself to extreme peril; and a wounded bear is equally dangerous. It rarely flies, but generally turns and goes on its hind-legs straight at its pursuer, however well armed he may be. It challenges him, so it seems, to a duel, embraces him, unless it has been stabbed to the heart previously, and wrestles with him manfully till one of the two falls. There are instances of the most obstinate revenge among the Carpathian bears; they will pursue a hunter who has wounded them incessantly from forest to forest, rock to rock, swim after him through streams, and only give up the pursuit when killed.

Contradictory opinions still exist as to the propagation of this, the largest of European beasts of prey. The following observations have been made of the bears which have been kept for the last 400 years in a pit at Bern. They attain their full size at the age of five, pairing takes place in May and June, and the female gives birth in January. The first time she has one cub; after that, two, or even three, at a litter. At this time the mothers are so furious that they rush to the door of the pit when they notice a strange visitor. In February, 1575, a she-bear produced two snow-white cubs. The pretty, blind, helpless creatures are at their birth no larger than a rat, of a pale yellow colour, white round the neck, and have none of the characteristics of the bear, except a proportionally loud voice. At the end of four weeks they open their eyes: they already have wool an inch long, and are twice as large as at their birth. The eyes are deeply set, and the snout quite sharp.

During pregnancy, and for some weeks

after birth, the mother rarely leaves the cave, and then only to drink. It eats very little, and merely licks the honey off the bread; but it guards, covers, and suckles its cubs most attentively. The he-bear would probably devour them were he not separated from them. If he approach the cubs, the she-bear rises on her hind-legs, defends her young bravely, and tries to check her husband's most improper behaviour by loud growls and hearty buffets. When in a free state the he-bear probably lives apart during this period, and does not join his family till a later date. At the end of four months the young bears are about the size of a poodle; extremely droll, clever climbers, most playful, but, at the same time, very timid. Their yellow colour gradually changes into brown and black. They remain with their mother till a new litter is born, and then separate. In February, when the stag is getting its horns, the soles of the bear's feet cast their skin, which renders it impossible for them to walk for several days. It is more than probable that all these transitions take place with the free bear. As little is known for certain about the bear's length of life as about that of the wolf. In Bern there was a bear forty-seven years of age, and a she-bear gave birth to a cub in her thirty-first year.

Bear's paws are an acknowledged delicacy; the remaining meat is laid by the mountaineers for awhile in water, to deprive it of its sweet taste, and it then becomes very like pork. The skin is worth from thirty to fifty francs. In several cantons a considerable sum of head-money is still paid; but it will be long ere the last bear is extirpated in the steep, solitary Rhaetian Alps, or those fires which the traveller still so frequently sees on the mountains of the Engadine, and which are kept up by shepherds who have found the track of a wolf or a bear, are eternally extinguished.

In the Tyrol, bears have also become no unfrequent visitors. A dozen or more are killed annually; in the whole Austrian monarchy about 200 bears a year are killed, while Siberia exports 5,000 bear-hides annually to China. In any case the bear is far more common in Switzerland than the wolf.

Formerly there was a foolhardy way of hunting the animal in the Grisons. The

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hunter tried to clutch it, and press his own head firmly under the bear's throat, until a comrade released him by a lucky shot, or he found an opportunity to thrust a dagger between Bruin's ribs. They were, however, themselves often mortally wounded in this most dangerous trial. We hear, on the other hand, that several persons were killed by the mere sight of a bear. Thus, in 1836, a man suddenly met six bears in the valley of Medels (Grisons); he took to flight so hastily that he was killed by the terror and exertion. One of the animals was shot soon after, and the rest disappeared.

A savage, strange bear-fight took place in December, 1838, in the immense cavernous mountains that surround the village of Dissentis like a Cyclopean wall. The hunter Riedi, of that village, had followed the whole day the broad-soled track of a bear till he lost the last footmarks at a dangerous wall of rock. He saw that the bear must have retired into this fearful ravine. The rock here formed a sharp projection, behind which he suspected the bear might be awaiting him for a life and death struggle. Riedi first tried to bring it out by a noise, and, when that did not succeed, he advanced with upraised gun. When he reached the narrow rock-path, he saw that either hunter or bear must remain on the spot, as flight was impossible. On approaching the angle he discovered a hole in the rock, apparently the bear's cave, and he cautiously walked up to it. At this moment he noticed the bear's flashing eyes in the dark hole: one paw was stretched out so far that he might have caught hold of it, while the rest of the brute's form was buried in the cave. Riedi resolved to risk a shot; but twice his rifle misfired, and the bear's eyes were still fixed upon the daring hunter. At length the shot thundered, and at the same time a horrible growling from the cave made the rocks tremble. Riedi retired as far as he could, to escape the animal's anticipated pursuit, and re-loaded his rifle. The growling soon ceased, and Riedi ventured back to the cave, where eyes and paw had disappeared, and all was dark. A gentle scratching and scraping were audible, and, overpowered by the feeling of a panic terror, he rushed out

of the cavern and went home. Was the scratching, perchance, only the last convulsive movement of the bear? It seemed so, and next morning he went with three other hunters, two of whom were unarmed, to the cave again. They went to it from above, and climbed down a fir-tree growing close to the rock, till they reached the eventful cave, Biscuolm, of Dissentis, going first, with his rifle on his back. But he had scarce reached the ground ere the bear, with two mighty bounds, was upon him, and hurled him to the ground. He shouted at the full pitch of his lungs to his mates as he was beginning to roll down the declivity with the beast. By exerting all his strength he managed to liberate himself from the bear, spring up, and take his rifle from his back. But the bear got up too, and, as the lock was still tied over, the hunter held out the butt, which the beast seized with its teeth. In the meanwhile Riedi had slid down the fir-tree, and hurriedly shot the bear in the side. The latter retired a few paces to make a fresh spring, when Biscuolm had time to despatch it with a third shot. It was then seen that the first shot into the cave had destroyed the whole of the bear's jaw, and this and the loss of blood had rendered the struggle less dangerous. Still, the couple had rolled to the edge of a precipice, and, strange to say, had been able to stand on it. But the whole event produced a terrible and indelible impression on the four hunters.

At the present day bears are generally shot singly, and without any great skill, for, unless they are on their travels, they allow a hunter to come within twenty paces of them, and do not dream of flight. In former days a general hunt was set on foot by whole villages, with drums and horns, in order to drive the robber towards the huntsman in a gorge.

Young bears are not difficult to tame. They soon grow used to people, and can be kept alive, without meat, on two or three pounds of bread a day. In Bern they also receive a little butter and honey. In winter they eat still less. It is advisable not to put too great trust in bears when they grow older,

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BY SIR LASCELLES WRAXALL, BART.

CHAPTER XVII.

THE WOLF.

Habitat of the wolf—Its repulsive character—Nature of its food—Wolf-hunting in olden times—A curious association—A strange party in a hole—Attacking sheep—An adventure with a wolf—A remarkable hunt—Dead body-snatching—Resemblance of the wolf and dog—Taming wolves.

ALL over the world the tamed dog is the most faithful helpmate and companion of man; wild dogs, on the contrary, are the most decided foes of his person and agricultural efforts. In return, the cultivated fields prove indomitable foes of the bloodthirsty robbers, and continually drive them back to the few lurking-places left them. The different zones possess different representatives of the wild dog, which is spread as widely over the world as the tame one, in the Wolf, Fox, and Jackal families. The Swiss Alps, fortunately, only possess one variety of the wolf and one of the fox, but they are more than enough.

Wolves have become a rarity in Switzerland since the beginning of the present century, and doubts are expressed as to whether they ought still to be reckoned among the permanent wild beasts that propagate in the mountain region. The truth is, that the forests are hardly extensive enough to serve the wolves as a hunting-ground; nevertheless, the Engadine, with its high woods, inaccessible ravines, and desolate boulder valleys, the Northern Alps of Tessino, and the mountains of the Vallais, may be regarded as the settled abodes of a few wolf families. Here they live in the closest retirement during the summer; they display extreme caution in quitting their dens, for, as they are not so clever, and cannot plunder so slyly, as the foxes, they are compelled to keep aloof from inhabited regions. The she-wolf gives birth to from four to nine cubs, covered with reddish woolly hair, in April. The pretty little creatures lie in the farthest corner of the lair in a heap while father and mother go in search of food.

The two old wolves rarely leave their cubs simultaneously, for, if they did so, the young would in all probability be gobbled up by some of their kindred prowling about the neighbourhood. The old murderer, characterised by a long bony body, and creeping, shuffling gait, hunts stealthily through the thicket, going against the wind, and leaving footprints that resemble those of a large dog, though they are generally broader, longer, and going in a straight line. Repulsive and unpleasant in its manner, greedy, malicious, crafty, distrustful, and insupportable through its disgusting smell, the wolf is a terror to the whole animal creation. With hanging tail it lays wait for its scanty prey, pounces on a heathcock or Greek partridge, watches for rats, weasels, and mice, and swallows a lizard, a toad, a frog, or even a slow-worm or snake, when it can find nothing better. It follows larger animals till they are exhausted, which the Felidæ never do. Still, by its stench and stupid behaviour, it often startles every creature from its vicinity, and crawls about, lean, wretched, and starving, for many a long night in the desolate and barren rocks.

In winter the cold heightens the wolf's almost insatiable appetite; but at that time the chase is better, and the track more certain. It surprises the white Alpine hare, and even the crafty fox; but, ever hungry and greedy, it crawls with its wicked, sparkling eyes, short, pointed ears erect, turning its fox-shaped head in all directions, and dragging its body along as if it were crippled, from mountain to mountain, from wood to wood, its hideous bark re-echoing at night through the clear frosty atmosphere. At that season it perambulates whole mountain chains, going from the Engadine through the Bernese and Vallaisian Alps, as far as the open plains of Vaud, or from the Wasgau up the Rhine, and along the whole Jura chain, inspiring men and animals with terror. Basel, Soleure, Aargau, Freyburg, and Zurich have often been visited by wolves in a severe winter, which killed men, strangled

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dogs chained up, and scraped up the offal. The last was shot at Olten in 1809; while in the Pays de Vaud, which is more thickly inhabited both by men and animals, the wolf appears from time to time, the last having been shot in November, 1849. In 1557, two young fellows killed a wolf near Appenzell and carried off five cubs; the last was destroyed there in the seventeenth century. They also frequently strayed from the mountains of Tessino and the Grisons into the smaller cantons. The authorities of Glarus offered, in 1780, a reward of fifteen louis d'or for a wolf which was committing awful ravages among the flocks of goats and sheep. The robber was, ere long, killed, and weighed 71 lbs. Less than a hundred years back wolves lived freely with bears and wild cats on the Pilatus, and this was probably the case on the whole of the High Alps. When a wolf showed itself in the Uri mountains, in 1853, a beating hunt was arranged, and a poor young fellow killed it with a charge of shot. In the Tessin valleys of Verzasca, Lavizarra, and Magia, some wolf families appear to have their head-quarters; they are seen there pretty regularly, and roam as far as Bellinzona. In 1854, five wolves were shot in the canton of Tessino in three months. In November, 1855, a pack of wolves suddenly fell on a flock of goats, and destroyed a great number of them. In August, 1856, a wolf attacked a calf grazing not more than 200 yards from the village of Grono, and devoured one-half of it. In November, 1857, a hunter came across a herd of chamois which seemed to be sharply pursued; suddenly he discovered that a pack of no less than seven wolves were trotting after them, but he was unable to get within shot of the robbers. In July, 1858, they greatly disturbed the herds on the Uri Alps. In Pruntrut young wolves are frequently found, which were either whelped there or have strayed from the adjacent French forests.

Before the beginning of this century the discovery of a wolf-trail was the signal for a general rising of the parishes, and the old chroniclers say, "Whenever a wolf is discovered, a storm is raised about its ears; a whole district engages in the chase till it is killed or driven away." The latter was more frequently the result of a "general

hunt," for wolves, when they have fed well, hastily quit the district, as if suspecting they will be pursued. Large nets were employed in capturing them, which the traveller can still see at the villages of the Leberberg and the town-hall of Davos, where, till very recently, upwards of thirty wolves' heads and jaws grinned under the roof, and testified to the number that infested those mountains. In the Vaudois Jura there still exists a peculiar organisation for wolf-hunting, belonging exclusively to a certain association, which has its own officers, laws, and tribunals. The leader divides the hunters into two parties, one of which, armed with guns, waits for the beasts, while the other men, armed with bludgeons, act as beaters, and drive the game noisily towards the sportsmen. So soon as the robber is slain the fact is announced by a blast of six trumpets, and there is a public feast at the village inn, the expenses of which its skin defrays; and those sportsmen who have disobeyed the leader's orders are punished by having water to drink, and being bound with chains of straw. As no one can become a member of the association till he has been present at three wolf-hunts, fathers are accustomed to carry their boys with them in their arms.

Excavating wolf-holes was also customary in olden times, and Gessner tells us that a hunter of the name of Gobler once made a triple capture on one of these occasions, consisting of a wolf, a fox, and an old woman, not one of the three having ventured to stir during the night for fear of the others.

The prowling wolf is most addicted to attacking sheep, and its most bitter and savage foes are, consequently, the true sheep-dogs. Sometimes it will burrow at night through the ground into the sheep-stall, though it is not naturally a burrowing animal. With widely-opened jaws, that display the frightful rows of sharp white teeth and the extraordinarily wide red throat, it springs on the largest sheep, holds it down with its fore foot, and tears it with its teeth. The great strength of the head and neck bones and muscles enables it to carry off a dead sheep, or even a roebuck, in its mouth, and to hold the animal so high in running that it does not touch the ground. During the last century it has hardly once attacked human beings in Switzerland: it generally

shuns them, and is very cowardly, unless starvation has driven it half-mad, or a severe wound excites it to turn at bay. Thus, a gentleman of Misocoo, of the name of Marca, on going to his front door on a winter evening, was suddenly attacked by a ravenous wolf; but the cold-blooded, powerful man laid it dead at his feet with one blow of his fist. He then took it by the tail and threw it into the room in front of his wife, who had just before annoyed him. When a wolf is chased it only turns at bay when compelled. With its nose close to the ground, it runs along with flashing eyes, with the hair on its neck and shoulders standing up, and its tail hanging down. If the dogs hunt it into a corner it will fight, rend two or three, and fly again so soon as it has cleared the road. There is hardly an instance where the wolf, on being shot, has dashed at the hunter, as the bear constantly does: in fact, it appears to be a greater coward than the lynx, or even the wild cat. Wolves captured in stalls and poultry-yards have often been killed without offering the slightest resistance.

A very remarkable wolf-hunt took place at Biasca in 1773. A huntsman found a fox-trap he had laid in the wood near the town closed and robbed, and the snow before it discoloured with blood. He suspected the visit of some large beast of prey, and followed the fresh track with a couple of sturdy men. It ran up to a small cave in the mountains, where a wolf was supposed to dwell. The narrow entrance led to the conjecture that the brute was lying in an awkward position, and hence one of the pursuers resolved to crawl into the cave with a couple of ropes. Here he discovered the wolf, which was unable to turn, tied its hind legs firmly together above the knee, and retreated backwards as fast as he could out of the hole. The others wound the rope over the branch of a tree close by, and hauled the struggling snarling brute out till it hung from the bough. The wolf savagely threw its head back, and had bitten one of the ropes through, when the hunters attacked it with stout sticks, and beat it to death.

In the valley of St. Nicholas, in the Vallais, the cowherds establish a patrol when the trail of a wolf or bear is discovered.

They set up a stick in the ground by the spot; every person interested in the matter has to go the rounds in turn, and notch the stick as a token of having done so. If he does not perform this duty he is held responsible for any injury that may be done during the day.

This Northern jackal, it is well known, follows armies readily, and visits at night the deserted battle-fields to prey on the corpses. When once it has tasted human flesh it prefers it to any other, and will dig for dead bodies. When, at the close of the last century, the Russians, Austrians, and French waged a sanguinary war in the highest mountain valleys and rarely-trodden passes, and hundreds of unhooused corpses rotted in the ravines and forests, wolves were found searching for prey, in company with eagles and ravens, at spots they had never visited before. A large number of them were killed, in consequence, in 1799, in the Grisons and the smaller cantons.

The wolf, when sitting at the skirt of the wood or trotting through the forest, resembles in build and colour a mastiff so closely that it might be mistaken for one, and appears to be of the same family. And yet the two animals have always shown a determined enmity for each other. The strong wolf is glad to get out of the way of the much weaker dog. The latter shudders and bristles its hair when it scents a wolf. Only those strong and faithful dogs which guard the flocks of Bergamasque sheep on the Alps of the Engadine dare to attack the prowling robber without help, and fight a deadly contest with it. If the wolf proves the master it devours the mangled dog, while the latter, if victor, loathes a wolf even when dead. But here the wolf's own relatives perform what the dog has left undone by greedily following the trail and devouring their wounded brother. We need no better proof than this of the greediness, faithlessness, and villainy of the vulpine nature.

The wolf occupies a very low rank among animals, and is one of the most offensive of the beasts of prey. It rivals the most savage in greediness, trickery, and perfidy; while at the same time it displays no trace of the nobility of the lion, the bravery of the polar bear, the humour of the brown bear, or the attachment of the dog. Cun-

CHAPTER XVIII.

MOUNTAIN SHEEP.

ning and distrustful, it is daring without cleverness, fearfully repulsive, and the ugliest of animals. It only resembles the dog corporeally. We cannot say that it is the savage dog—the dog in a state of nature: it is rather the utterly corrupted dog, possessing all the bad qualities of that animal and none of the good. The gregarious tendency, rarely found in beasts of prey, is only ostensible and the result of a love of prey and murder. Wolves only join together in packs in order to overcome a powerful animal, and in such a case one of them gives chase while the others try to cut off the retreat of the quarry, and, so soon as they have secured it, they separate. As they very quickly digest food, even bones, they always are hungry and greedy, and almost insatiable, in spite of their starved appearance. After a meal they eat a little grass, as dogs do. The only good quality of the she-wolf is her faithful care of her whelps. She protects them courageously, and always returns to them after a long period. In Jura a suckling wolf was killed, and a few days later three whelps were found starved to death in an adjacent valley.

All attempts at taming these ungovernable beasts are failures. The best-trained wolf returns to its savage life when it has the chance, to become once more the old, ignoble wanderer, and the most watchful care will not kindle a spark of attachment in its low temper. Still, it is an interesting fact that dogs and wolves, in spite of their animosity, will breed, and the cross is frequently used for sporting purposes. Variety of colour is rarely found among the Swiss wolves; but in Gessner's day black wolves were common in the Rhine valley and the Grisons. In the Pyrenees such are common now-a-days; and in the Ardennes a white variety has been found. In Hungary two sorts of wolf are known—the so-called "forest wolf," or common yellowish-grey breed, so frequent in the Carpathians, Poland, and Russia, and the smaller "Pusta wolf" of the plains.

The Moufflon—Summer sheep pastures—Disasters to the flocks—Vallais superstitions—The Bergamasque sheep—Up the mountains—The shepherds—The Alp—The sheep-dogs—Ewe milk cheeses—The Tessini—The return journey.

The rocky mountains of Sardinia, Corsica, Crete, and Southern Spain are inhabited by large flocks of wild, foxy-coloured Moufflon sheep, with white snout and belly, and light rims round the eyes. They are powerful, agile animals, hardly inferior to the ibex in leaping, and are the principal object of the chase in the countries they inhabit. From this wild species our common domestic sheep are supposed to be descended.

Sheep-breeding is not very important in Switzerland, the flocks being small and the pastures shamefully neglected. The most remarkable breed is the Bergamasque sheep, to which we shall presently refer more particularly as an animal peculiar to the mountains. The summer pastures of the sheep are in districts inaccessible to the cows, reaching to nearly 9,000 feet above the sea level, and are often mere oases in the midst of leagues of glaciers and fallen rocks. The sheep are brought to them with great labour, being sometimes carried, or even dragged up with ropes over the rocks, as, for instance, at the "Trift" on the Viescher glacier. They are tended by a boy, who must take especial care not to drive the flocks over the surface of the *firn*, which would render them snow-blind, and to lead them away from the mountains before a snow-storm, for, if overtaken by the tempest, they will often lie down and sooner perish of cold and hunger than leave the spot. The shepherd strews some salt each night before his flock, which they carefully lick up. In remote and desolate Alpine regions, small flocks of sheep are found in a half-wild condition, the property of no owner and whose lambs have fallen a prey to ravens, eagles, and *kämmergeier*. As a rule, the Swiss beasts of prey are more dangerous to sheep than any other domestic animals. So soon as the flocks are driven up the mountains in spring, the vultures collect in many valleys of the Grisons, where they are never seen at other seasons, and pay regular visits to them once or twice a week. The

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bears are still more dangerous to the Rhetian flocks, as they often kill thirty head in one night. In 1854 they made a grand haul; although during the summer a hunter killed a she-bear and three cubs in the Münster valley, others appeared at numerous spots. On one pasture four bears were seen playing together in August, and there appear to be from eight to ten regular lodgers in the forests above Süts.

In Appenzell and other places a few sheep are frequently attached to a herd of kine. In German and French Switzerland only the meat and wool are used, the milk never. The higher the sheep can graze, and the drier the summer, the better they prosper. Unlike the horned cattle, they ascend the mountains as the season advances, and in autumn will not unfrequently go up to the already snow-clad heights, where they are certain to perish unless driven back by force. The flocks often meet with disasters, as, through their instinct of imitation, sheep always follow the bell-wether, even when it leaps down an abyss. Sometimes they are driven to this desperate course by strange dogs; sometimes by a hail-storm, by which no less than two hundred once fell dead on the Hohe Messmer; or at times an unlucky lightning-flash kills the entire closely-packed flock. Not a year passes without such accidents. In Freyburg a storm killed, in 1853, ninety sheep at once; in June, 1859, the lightning destroyed thirty-five on the Glärnisch Alp. On the other hand, the owners suffer very slightly from sheep-stealers, for such offenders are everywhere severely branded by the people, like the reindeer murderers among the Lapps. The people of Zermatt still tell how a sheep-stealer on the Matterhorn pastures was metamorphosed into a sheep, and bleated incessantly till he was set at rest by the exorcism of a priest.*

* The Vallais is very rich in spectres. Popular tradition there is acquainted with several enchanted animals, such as the dancing ass of Zermatt, the flying dragon of Vouvy, the giant bull of the Zauchet Alp, Emperor Maximins's golden calf at La Soye, the three-legged horse and squinting green-eyed Rathhaus sow at Sitten, the goat of Monthey, the treasure-guarding serpent at Lierre, &c. At St. Maurice a dead white trout floats on the surface of the monastery pond when one of the caux's is going to die.

A very peculiar and interesting species of domestic animals is found in the Bergamasque sheep, which annually migrate from the valleys of Brescia and the plains of Southern Tessin to the Engadine Alps, where they pass the summer. This breed is much larger than the common one: the animals are long-legged, generally white, carry their head high, have an arched nose, a sort of dewlap hanging from the lower jaw to the chest, and pendent ears. When snow sets in they bleat in a deep bass voice, and the ewes call their lambs with the same sound. Observers have found that this breed is of a very melancholy turn, and declare that a lamb can never be seen frisking like the young of other sheep.

Every year, when the vegetation of the highest Engadine pastures begins to peep out, the nomadic flocks may be seen on the roads that lead from the marshes of Tessin to the Adda and the Lake of Como. The long train of sheep move on slowly, browsing as they go. Large, thin, long-haired dogs accompany them, and form a vigilant police. At the head of the procession walks a shepherd, and one or two close it. They are inhabitants of the Bergamasque valleys Seriana and Bembrana, where silk-growing and agriculture are carried on, and sheep-breeding in the inhospitable side valleys. The wandering flocks are the property of several herdsmen, generally related to each other, who form a species of partnership, and have led this nomadic life for generations. At the head of them is a chief known as *il pastore*; he goes to the Grisons early in the spring in order to contract for the Alp he intends to use, and make the requisite preparations for the following flock. The weather-beaten faces of the shepherds, shaded by coal-black hair and beards, are often excessively handsome, with their fiery eyes and snow-white teeth. They wear coarse woollen coats and breeches, and a pointed, broad-brimmed hat. In cold or rainy weather they throw a white cloak over them, and their shirts are always white and clean, however poor their general appearance may be. The rear of the procession is formed by one or more well-laden donkeys of a large and stately breed, which carry as much as an ordinary sumpter horse. The members of the society take charge of the flocks in

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turn: while some are with the sheep, the rest remain for awhile in their native valleys and help their families in their agricultural tasks. The *pastore* alone is exempt from the management of the flocks, as he spends his time in selling sheep, cheese, and such things, though he often voluntarily aids his partners in other matters. If the spring weather be at all warm, the flocks only travel at night; but in the cold autumn days of their return, by day. Careful as the shepherds are, they do not hesitate to leave most of their duty to the excellently broken-in dogs, one of which generally looks after a flock. They travel along a familiar road, and always put up at the same inns. In each parish they pay a small sum to cover the expenses of what the flocks have eaten along the road; this frequently amounts to a rather heavy toll.

On the Alp, which is often rented and kept by several proprietors, the expenses being shared according to the number of sheep, the animals are divided into four flocks, consisting of the ewes and lambkins, the fattening sheep, the rams, and the milking sheep. Each division has its special pasturage on the Alp, and is guarded by a shepherd with his dog, who, if the grazing-ground be too remote from the chief *châlet*, builds his own little hut. The chief hut has three apartments—the kitchen, sleeping and store room—with sometimes a species of stall for the flock. The dogs keep careful watch over their flocks, and never leave them. Should a stranger make his appearance, the dog of that district runs to receive him, and silently accompanies him to its frontier; but if he approach the flock it will seize and hold him till the shepherd comes up. The food of the men is very frugal, although they are generally well to do. Morning and evening they swallow a polenta made of maize or millet, with a little whey or cheese. Their sole drink is water, and they never see soup, bread, or butter. They are reserved and taciturn, and are never heard to sing like the other herdsmen. They spend the whole day and half the night with their flocks, and discharge their duties with great care and punctuality. Some old hay piled up on a wooden board constitutes their bed, and over it they throw their cloaks and blankets, using their coat as a pillow. It is

not uncommon to find an old man of eighty among them. As the sheep do not scatter, a certain fixed plan of conducting them to the pastures is pursued. Each division occupies a proportionate space, and the animals follow the shepherd over crags and glaciers, keeping close together. A shrill whistle is the signal to start, and a counterfeited bleat induces the sheep to follow. When they are to stop their leader halts, slowly walks round the flock, and calls up the more remote animals by a sharp cry. When together the sheep graze quietly till the signal to start once more is given. They are thus guided, without the slightest difficulty, to the most remote spots and smallest patches of grass. As these sheep, however, owing to their size and weight, tread very heavily, and march so close together, they frequently ruin the pasture-grounds. Moreover, they eat twice as much as the ordinary sheep.

If, as often happens in the Engadine, the sheep scent a wolf, lynx, or bear, the whole flock keep close together; the dog then goes ahead, and tries, by barking, to summon the shepherd. Courageous as he is, the sheep-dog will not always venture single-handed to attack a wild beast, but two or three together will give a good account of it. The dogs are only fed on bran and water, or whey, and, owing to this and their great amount of exercise, are remarkably thin. The sober and solemn character of the Bergamasque sheep is accounted for by the many hardships to which they are exposed. If surprised by snow, they are compelled to remain in the open air, frequently for days together, without a morsel of food. In such cases they keep close together, and stand on the rocks bleating in a melancholy way. Their wool is abundant, but coarser in quality than that of the common sheep. It is shorn twice a year, and woven into a coarse cloth for the Austrian army. The flesh is hard and unpalatable, but extremely fat. If a sheep dies naturally, the bones are removed, and the flesh is salted and dried in the air on stakes, or on the roof of the hut. Twenty or thirty of these carcasses may often be seen hanging up at once. A high price (tenpence a pound) is given for this dried meat in Italy; and the shepherds are accused of playing tricks by buying common cast sheep and curing the meat in this way.

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The Tessini (the shepherds are generally so called from passing the winter in Tessin) derive a further profit from the sheep milk. Milking is regarded by them as a very tedious job. They drive the sheep into a fold, at the farther gate of which two shepherds are seated, who capture each sheep as it tries to escape, and milk it with two fingers. As, however, a good sheep only yields from four to six tablespoonfuls of milk daily, and three hundred give but one-fourth of the quantity required for churning, the shepherd makes up the other three-fourths with cow or goat milk, so that the celebrated two-pound ewe-milk cheeses are fictions. Probably, though, this admixture of milk imparts their agreeable flavour to them. The *puina*, or sweet whey cheese, is then set apart in canvas bags to drain. This whey cheese is remarkably rich and sweet, and eaten as a great delicacy in the Grisons; but it soon turns sour, and when salted is not so agreeable. The remainder of the whey is mixed up with more milk, and converted into a curd, which forms the food of the shepherds and dogs. This branch of industry is quite peculiar to the Alps, but it is on the decrease, and the Bergamasque shepherds allow that it is growing every year less and less profitable. Of late years, too, they have given up driving their handsome mules into the mountains, and only take

with them a dozen or two of the animals which are out of condition and stand in need of good summer pasture. When they have any business in the valleys to transact, they usually ride down on these animals, and their dark, powerful figures, with their pointed sombrero hats and light-coloured cloaks, form a picturesque feature in the landscape as they trot briskly down the mountain-side.

When September arrives and puts an end to their labours and occupations, the *pastore* pays his rent with great punctuality, and the invigorated flocks commence their homeward march. The asses are laden with the blankets and utensils, on the top of which is placed the polenta kettle, with the stick employed to stir it; and, on an appointed day, all the flocks which have summered in the Alps of the Grisons are collected at Burgofesio to be sheared. To prevent any confusion, the sheep belonging to each flock are marked differently on one ear. The caravan then proceeds to the more civilised plains of Piedmont, or to the vicinity of Brescia, Crema, and the Lower Tessin, where the sheep are again divided into separate flocks, and at night shut up in the folds and watched by the dogs. They rarely pass the winter under shelter, and, being well hardened, are subject to but few diseases.



The Moufflon.

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BY SIR LASCELLES WRAXALL, BART.

CHAPTER XIX.

THE SNOW REGION.

Character of the snow region—Origin of the Alps—Legends—The Wandering Jew—The high peaks—The Bernese Alps—Monte Rosa—The redoubt of St. Theodule—The Finster Aarhorn group—The Bernina range—Human life in the Alps—The scenery—Man amid the peaks.

AN unknown land, a land full of enchantment and fairy-like splendour, glistens above the last verdant strata of vegetation, above the last broad grey rock galleries. It is a land silent and solemn as death, exalted and majestic like the glory of the Eternal, a connecting link between heaven and earth, where man and the warm nature adapted to him no longer find a home—where the proud lord of the world, overpowered by the sense of his impotence, dares only for a moment to approach its mightiest marvels. The denizen of the glacier gazes with a certain traditional indifference at the glistening slopes and glossy snow carpet of the mountain region. He probably admires them when, bathed in the magic light of the moon, they stand out against the dark blue of the night heavens; or in the misty dawn, when the morning crimson dyes the sky, and the peaks of the white rocks seem as if dipped in blood; or, again, a few hours later, when they shine in the flashing gold of the morning light, like altars of sacrifice raised to Deity. But when the charm of the brighter colouring has faded away, and the dull bluish white has assumed its place, sympathy departs also; people have an indistinct idea of the boundless desolation and cold of the snow region, and are content to live on without casting a thought at the grand elementary movements, the animal and vegetable life mysteriously struggling with death and hunger, the wondrous laws, the fantastic natural formations and phenomena, of these mountains.

This unknown world lies between the corn-fields of Germany and Lombardy. Who has thoroughly investigated these regions? Who knows them all so accurately as they deserve to be known? Here and there an amateur clammers over the ice and snow to

the peak of a celebrated horn, or a serious naturalist wanders cautiously through the desert, to which he may devote a few months of his life; otherwise, the only other human beings save these are the ibex and chamois hunter, the wild-haycutter, and the mineralist. No living man is acquainted with the entire world of snow of the Swiss mountains; few know more than a portion of them, and enormous territories have never yet been trodden by a human foot. During the last decade men of science have made great efforts to attain a comprehensive knowledge of them, but they know only too well that they stand but on the threshold.

These apparently lifeless regions, which, standing beyond and above us, seem only to hold communication with the stars and flying clouds, have had their mutations and history. In truth, we do not reflect, when we see the last evening beams dying out on the summit of some primeval mountain ridge, what a long and destructive series of events has passed over their crests from the moment when they were raised out of the deluge by the unbounded force of the fermenting elements, and vegetable forms of the palm species crowned the sultry summit of the virgin island, down to our time, when icy death has put a sullen end to their changes.

The time when the Alps were formed falls in a pre-historic and pre-Adamite period, and probably lasted for thousands of years, as is proved in a grand hieroglyphic text by the various primeval, secondary, and tertiary formations. At the end of this period new and immeasurable changes took place. The highest reservoirs forced their way through the rock barriers, and poured down on the lower regions; others, again, were formed by falling masses hemming and collecting the mountain torrents. Enormous connected mountain ridges, set in motion by subterranean fires, burst asunder and divided into new arms; while other regions, seeking rest, here slowly rose, there slowly subsided. Even at the present day the course of this history of formation may be traced at any favourable spot. In our time this revolution

has been pacified, although fearful changes still take place at intervals in the Alpine structure. But where we now find throughout the Alps frightful deserts of ice and awful regions of ruin, we also find a half-forgotten tradition existing among the people that they were once blooming fields and a smiling country.*

Popular belief evinces a knowledge of these traditions, and repeats them in verse, although with simple anachronisms. For instance, the Wandering Jew is supposed to visit the Wisp valley, in the Vallais. He climbs up the Matterhorn, and finds at the summit a neat town, nestling amid blooming vines and rustling trees. But he prophesies to it that, when he returns again, the town will be lying in ruins, and overgrown by melancholy tangled shrubs.

The snow region, embracing all those portions of the Alps which reach an elevation of 7,000 feet, displays to us the smallest horizontal, but the greatest vertical, extent. The principal mass lies in the south of Switzerland, in the chain of the Central Alps, and chiefly in the two gigantic chains which stretch from Mont Blanc and the Lake of Geneva, embracing the Rhone valley. The northern range of the Bernese Alps is massed together in the majestic knot of the Finster Aarhorn; the southern range is that of the Monte Rosa. A northern chain of primary mountains stretches from the St. Gothard on either side of the Tessin; while eastward from the same point run the Rhetian Alps, with their numberless chains, inclining towards the system of the Rhone and the Inn, and sending out fresh branches in various directions.

The Hohe Säntis is, in the north, the last modified representation of the Alpine region, and, in the heart of Switzerland, the Pilatus (7,100 feet). The chain of the Bernese Alps has many peaks attaining this height; but they are isolated points, and, so to speak,

* Hence the name of "Blumlis Alp," which we find so frequently given to glaciers and rock deserts. Human crimes, especially disobedience to parents, or immorality and pride, are supposed to have entailed the ruin. The culprit is frequently called "Käthri," or Kitty, in the Glarner and Bernese Alps. She is generally followed by a black dog, which is heard barking at times under the glacier, while the cow-bells ring and the gaily woman sings a mournful strain.

outposts, rather than supporters of the snow region, the real development of which is found in the length of the Central Alpine chain. Here there are a great number of peaks between 7,000 and 8,500 feet, and several which attain the gigantic height of 10,000 to 12,000 feet. In the Bernese chain about twenty-four detached peaks near the Finster Aarhorn attain this height; in the southern parallel chain above forty, which have not yet all been measured and christened. Many of these solitary points lie in inaccessible labyrinths of glaciers, remote from inhabited valleys and the most usually-frequented passes, and hence have often been left unvisited.

Above these kings of the Central Alps rise a few imperial giants that attain a height of more than 12,000 feet. They stand in the centre of the Alpine chain, encircled by subordinate groups, so that they appear to be the colossal foundation-stones of the structure. The highest among them is the Monte Rosa, with nine peaks—the highest, 14,284, the lowest, 13,003, feet—the second highest mountain in Europe, and only a few hundred feet lower than Mont Blanc. It descends abruptly in a wall of glaciers 9,000 feet to Macunaga, and possesses silver, copper, and iron mines. In its western continuation this chain forms several extremely lofty peaks, of which the brown-coloured Matterhorn attains 13,901 feet. On the summit of the Matterjoch pass, 10,416 feet above the level of the sea, stands, like a fairy tale of the olden time, the highest fortress in Europe, the redoubt of St. Theodule, built 300 years ago by the inhabitants of the Tournanche valley against the Vallaisians, and almost constantly hidden by the mists rising from the southern crater valleys. The traveller, who reaches this height after a painful ascent, still sees on the ten-foot-high rock walls the loopholes which command the pass.

The chain of snow peaks running northward from the glorious Dent d'Erin (12,012 feet) may be regarded as a branch of the Monte Rosa; and in it we have a pyramid, the Dent Blanche, rising to 13,421 feet, and the round cone of the Weisshorn, 13,895 feet. In the chasm between the Matterhorn and Mont Blanc, which is only broken by a few deep indentations, rises the mighty

Combin (13,261 feet) above the highest peaks of the Great St. Bernard. Altogether in this group we have two dozen measured peaks above 12,000 feet; and above 13,000 feet there are, besides those already mentioned, the Zinalrothorn, the White Brothers, the Silberbast, the Silber-sattel, and the Mischabel.

The second family of this class lies buried in eternal ice-fields, between the Lake of Brienz and the Upper Rhone. It is the Finster Aarhorn group, with a great number of giant peaks. The principal summits are the Schreckhorn (12,568 feet), the Eiger (12,240), the Mönch (12,666), the Jungfrau (12,827), the Great Lauterhorn (12,395), and the Gletscherhorn (12,258 feet).

The third family lies between the sources of the Inn and the Adda, the splendid Bernina group, distinguished by the crystalline formation of its rocks, and possessing relatively the narrowest basis and the fewest known and named peaks. The highest horn, the Piz Bernina, was ascended in 1850, and found to be 13,501 feet; and there are several other peaks belonging to this group which reach 13,000 feet.

The snow region has thus a vertical extent of 7,000 feet in the High Alps. Let us now proceed to give a general idea of this remarkable portion of the earth. It is the region of eternal snow with few and sparse signs of spring, a world full of earnestness, terror, and marvels, with colossal natural phenomena and interminable labyrinths, and there is hardly a spot where man can live, or higher organic life find a permanent abode. Alpine chalets are not built at a height above 6,500 feet: some on the Bernese Alps are at 7,200 feet, and a few shepherds' huts on the Monte Rosa at 8,100 feet. There is also one deserted miner's hut on this mountain at a height of even 10,068 feet. It is an erroneous assumption that the highest European habitation is the inn on the summit of the Faulhorn, for the post-house on the Stelvio stands at 8,610 feet, and both of these are surpassed by the summer hotel recently erected on the pass of St. Theodule.

The surface of the snow region is formed of disrupted mountain strata or ridges more or less abruptly inclined, between which run monotonous valleys strewn with fragments

of rock. There are no plateaux: merely basins filled with ice, and ravines covered with snow and *névé*. The whole region, especially that above 8,500 feet, forms in the heart of the Alps a district of ice and snow connected together in one long chain, frequently broken, indeed, though for no great interval, stretching in a north-east direction from Mont Blanc to the Ortler Spitz.

What has man to do up here? There must be some inexplicable, mysterious fascination that attracts him to defy the dangers lurking everywhere, to drag his warm, frail body over miles of glacier deserts, to defend himself frequently and with difficulty in a wretched hut, built by his own hands, against howling storms and deadly frost, and at last, suspended between life and death, with scant breath and trembling limbs, to reach the narrow footing of some majestic pinnacle of snow. We can hardly believe that the glory of having been up there is the sole reward he anticipates for almost superhuman exertions. Let us rather hope with Von Tschudi that what inspires him is "the feeling of spiritual power that glows in him and impels him to overcome the dead horrors of nature: it is the charm of measuring the power peculiar to man, the infinite capacity of an intelligent will, against the rough opposition of dust: it is the holy impulse to seek out, in the service of the everlasting science of the earth's life and framework, the mysterious connexion of all creation: it is, perhaps, the longing of the lord of the earth to place the seal on his consciousness of a relationship to the Infinite by a bold, free deed on the last conquered height, looking round on the world lying at his feet."

CHAPTER XX.

MEMORABLE ASCENTS.

First ascent of Mont Blanc—The Jungfrau—Difficulties in ascending—Crevasses—Ice-slopes—Accident to Hamel—Snow cornices—Forbes' ascent—Hugi on the Finster Aarhorn—Summits of mountains—Stone men—Impromptu flags—Descending the mountains—Character of the guides—Conclusion.

THE "Story of Mont Blanc" has been so fully and admirably told in a former series of this Magazine that we need only remind our readers that it was first scaled in 1786

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by D. Paccard, of Geneva. Since then it has been frequently overcome by adventurous Englishmen, and even ladies, and the ascent has ceased to be a wonder. The first attempts at ascending the higher summits of the Ortler Spitz were not made till 1804 by one Gebhard. The Jungfrau was next ascended by the brothers Meyer, of Aarau, in 1811. Monte Rosa was first attacked in 1819 by M. Vincent, but, in spite of repeated attempts, the highest peak was only reached in 1855 by the Messrs. Smyth, of Great Yarmouth. All other ascents of important summits of the Alps have taken place since the formation of the renowned Alpine Club, the reports of whose adventures surpass the most daring romance of the sensation school in incident and cool defiance of danger.

The ascent of Alpine peaks would not be so very difficult a task for a man of strong muscles and steady head if the obstacles to be overcome remained the same, and skilful guides could certainly determine the route to be followed under all circumstances. But the aspect of a region is continually varying; the hollow of this year will be a hill in the next, and fissures are found in the path which was supposed to be quite safe. The first great obstacle to progress is found in the crevasses. There is scarce any considerable Alpine peak whose base is not surrounded by an icy stream, or from whose flanks one more or less formed does not glide. These fissures vary greatly, and it is often impossible to follow a given direction; and we need hardly say that, if a fog besets the traveller when among them, there is a great risk of his being buried in one or other of the crevasses. No less dangerous are the snow-bridges formed over the crevasses. When the whole glacier is covered with fresh snow it is very difficult to distinguish these bridges. To provide against their frequent yielding, the guides tie themselves and the travellers together with a rope passed round the body, so that if one sinks the others may drag him out. The neglect of this precaution has led to numerous accidents. Thus, in 1836, a guide fell into a crevasse on the Rosegg glacier, but worked his way up by cutting steps in the wall of ice with his pocket-knife. De Saussure, as he descended from the Aiguille

du Midi in 1786, suddenly broke through the snow with both feet, but remained sitting on a saddle of ice, with his feet hanging down into a deep abyss. His guide, Pierre Balmat, who was close behind him, met with the same accident. He called out quickly, "Keep quiet, sir, don't move the least, or you are lost." Pierre, without moving a limb, called to the other guide, who had not sunk, to search quickly which way the crevasse ran, and what was its breadth. When this man had carefully reconnoitred the ground, he laid two alpenstocks crossways before De Saussure, by the help of which he rose carefully from his unsteady seat, and saved himself, after which he stretched out his hand to raise Pierre. At times it has been found necessary to crawl on the stomach across these snow-bridges, so as to distribute the weight over a larger surface.

Before the ascent of mountain peaks had grown so popular, wonderful fables were told, even in trustworthy books, of the bodily ailments to which travellers at such heights were exposed. Sometimes the air was represented as so rarefied that breathing became almost impossible. Then blood was said to pour from the ears, mouth, and nose, and even a mountain sickness was talked of, resembling the terrible *mal de mer* in its effects. Nothing of this sort is felt nowadays, however; the great inconvenience is a burning thirst, accompanied by what is called "sun blindness," unless the eyes are guarded by blue spectacles against the dazzling reflection of the snow. To refresh themselves, the guides thrust snowballs down their backs, a means of refrigeration which does not appear to have any ill effect upon them.

The snow crevices are not the last obstacles to be overcome in a mountain ascent; there is another produced by the sun or warm wind melting the surface of the snow on steep slopes, frequently to a depth of several feet. When this water freezes again in the night it naturally produces a solid wall of ice, which requires much labour and patience to ascend. Steps are cut in it with the axe, and it is a rule with the mountain climbers to ascend such an artificial staircase as straight as possible, for the foot treads more safely with the point than the side. These

ice-slopes are more dangerous when freshly-fallen snow marks the smooth surface of the ice. Hamel, the Russian *savant*, all but lost his life through one when ascending Mont Blanc in 1830. The story is thus told by him in the *Bibliothèque Universelle*:—

“I was looking at the footsteps through my green spectacles, when I suddenly perceived that the snow was giving way under me. As I thought that I was only slipping, I tried to support myself with my alpenstock in my left hand, but in vain. The snow accumulating and rising on my right threw me over and covered me, and I felt myself being dragged down with irresistible power. At first I thought myself the only person affected; but when the snow accumulated so as to stop my breathing, I supposed that a great avalanche was coming down from Mont Blanc and pushing it on. I cried out, but apparently in vain. I saw my companions no more, and expected every moment to be crushed by the mass. At last I succeeded in freeing my head, and saw a great part of the slope in motion; but as I was tolerably near the edge of the part which was sliding, I endeavoured with all my strength to reach the firmer snow, on which I was at last enabled to get a footing. I now recognised the real danger. I saw that I was on the brink of a crevasse which bordered the slope. At the same time I saw Mr. Henderson's head appear out of the snow still nearer to the crevasse, and somewhat farther on Mr. Dornford, with three guides, trying with desperate efforts to gain firmer ground, as I had done. They fortunately succeeded, but I could nowhere distinguish the remaining five. I still hoped to see them creep out of the snow, when Balmat called to us that there were some of us in the crevasse. This news startled me like a thunderstroke. Five men buried alive owing to our persuasion! I cannot describe the feeling of joy when, on examining one point, we saw the snow move slightly, and after a few moments one of those we had supposed lost came out. An exulting shout greeted him, and was redoubled when, shortly afterwards, we saw another fight his way up. Our hopes of seeing the other three were already bright, but they were foiled.”

The next thing to be feared is the snow cornices, which form broad but hollow shelves

over fearfully deep abysses, without any mechanical prop. A trifling additional weight may loosen such scaffoldings of snow, and send them down. Other obstacles are found in the weather-worn rocks, where the foot is in constant danger of slipping, or through their giving way above and falling in a shower of stones. But the last culmination is often the hardest nut of all to be cracked, and many a man has been compelled to turn back in the moment of victory. When Professors Agassiz and Forbes ascended the Jungfrau on August 28, 1841, and reached the Rothsattel, they thought they could not get any farther. Jacob Leuthold, however, affirmed the contrary, and to prove it took off his knapsack and went forwards, so that he was on the left side of the snow-ridge, while he had the sharp edge under his arm, and his stick was fixed in the right side. He thus went carefully and slowly along the precipice, treading down the snow as much as possible into a path to make a way for the others. Hugi, on making his third attempt to scale the Finster Aarhorn in 1829, found that a literally hanging ice-slope had to be passed, and this could only be done by hewing steps. The guides set to work at once, stuck their feet firmly into the hewn steps, allowed them to freeze on a little, in order to stand firmer, and then went on cutting. It was a neck-breaking moment. The dangerous work was finished at last, and the place had to be crossed. Leuthold came back to fetch Professor Hugi across, but told him plainly that if he slipped salvation was impossible, and that he, on account of his own safety, would not even dare to give him a helping grasp of the hand. The end of repeated attempts was, that not a single man of the whole expedition (among whom were several well-prepared mountaineers) dared to cross the ice-slope. Leuthold and Währen alone reached the giddy top.

The summits of the mountains vary very greatly. Those of Mont Blanc, Tödi, Mont Velan, Cima de Jazzi, &c., present soft, rounded snowy cushions, or a broad base, affording perfectly safe resting-places. The Galenstock (11,480 feet) displays a softly-rounded cupola of snow towards the west, but on the east sinks suddenly and almost vertically for some thousand feet. The top of the Gross-Glockner, in Tyrol, is an un-

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even, rocky space of chloritic schist, giving room for twelve persons at the most. The southern point of the Schreckhorn has a surface of some four square feet in the shape of a bow, with its convexity towards the north. On the other hand, the top of the Finster Aarhorn is formed by an undulating ridge, about twenty feet long, and a foot and a-half broad, sinking deeply on both sides. The Jungfrau presents a similar form. It falls in a hard snow ridge, like the roof of a tent, with a breadth of some six to ten inches, and the icy roof of the Rinderhorn is everywhere so sharp that the boldest mountaineer would be unable to ascend it astride, or slide down it. The Bernina affords just room for three persons to stand close together, and the Grand Combin runs into an absolutely snowy point, upon which no one dares venture.

Very curious are the devices by which mountain climbers of different nations leave evidence of their ascent. Generally they build a pyramid of rock fragments, in which the empty wine-bottles are placed. A page torn from the journal, with the names of the ascenders, dates, and notes about temperature, &c., is placed in the bottle, which is tightly corked and ensconced in the middle of the "stone man," safe from wind, rain, and snow. Weilenmann found in such a bottle on Monte Rosa some broad black and red silk ribbons, left by the brothers Smyth, of Great Yarmouth. He cut off some small slips, which he sent by post to the Smyths, as a proof that he had followed them. When, however, the mountain climbers are prepared to celebrate their ascent, flags wave from the summit in sign of their having taken possession. They are generally improvised banners, red streamers tied to a stick and fastened upon the summit of the "stone man." As such trophies, however, rarely survive the storms, and soon perish in the rains, or are splintered and singed by the lightning, Hugi had one planted on the Finster Aarhorn of iron wire covered with cloth, which was observed through a telescope from the Grimsel, and even from Solothurn, a distance of twelve geographical miles. The most original flag, the invention of the moment, was placed by the Schlagintweits on Monte Rosa, when they fixed a shirt in the absence of the requisite materials for a flag. Studer, in the same way, when he ascended the Rinder-

horn, hoisted an old waistcoat as the sport of the winds.

Difficult as the ascent of the Alpine peaks usually is, coming down again is in some cases even worse; for, though the guides and travellers may be better acquainted with the route, their strength is partly exhausted, the surface of the snow has become more yielding through the day's warmth, and climbing down walls of rock is far more troublesome, and requires more care, than climbing up, because the footing has to be sought below, while in the other case it is at once visible above. It happens, too, that the sun sometimes destroys the traces of the path, and the clue is lost in the descent. Again, towards the afternoon glacier brooks furrow the surface and make the path unusually slippery. These little veins of water are often very dangerous to the careless and exhausted traveller, as was proved during Weilenmann's ascent of the Monte Rosa. One of the Englishmen forming the party slipped in such a glacier brook, and entirely disappeared. The guides sprang after him with a cry of horror, and caught him by the clothes as he was being washed down into a deep funnel thirty or forty feet broad and filled with water.

Daily struggles with the elements endow the Alpine guides with extraordinary boldness and confidence. It is almost incredible with what ease and safety the mountaineer passes the most dangerous places, carrying heavy burdens. When Hugi, on his Finster Aarhorn ascent, could hardly get on, owing to an accident to his foot, Leuthold took him on his back and hastened with him down the glacier, while storm and night were coming on apace. The other two experienced guides emulated him in carrying their master, and Hugi says that it was marvellous to him how these men, without a stick, and holding their burden with both hands, sprang over crevasses in the twilight, when all was deceitful and uncertain.

It is a true adage that familiarity breeds contempt, and this is shown by an anecdote mentioned by Studer. On his return from the Jungfrau he had let his cap fall into a deep crevasse which sank without a break with surfaces of ice as steep as a tower. The crevasse grew narrower farther down, while the opposite wall rose vertically out of

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the darkness, covered with icicles. The guide, Bannholzer, annoyed at the loss of the cap, at once called out that he would see where it was, and, in spite of all dissuasion, had the rope tied round his body, and let himself slide down into the awful abyss. When he had gone some way down, having obtained a footing on an ice pillar that threatened to give way every moment, he saw the lost cap lying still some way below him. The rope held by the two men not being long enough, the foolhardy guide untied himself, and went farther down. After an anxious pause, was heard an exulting shout—he had recovered the cap, and returned once more to daylight. Although he had descended upwards of one hundred feet, he stated that the crevasse continued to an unfathomable depth.

In conclusion, we do not wish our readers to believe that we uphold the system of Alpine ascents merely for the sake of the achievement. Allowing that they are deeds for which courageous decision and firm will, great bodily strength and endurance, are required; that they cannot be carried out without willing abnegation of accustomed com-

forts; still, unless for scientific observation, or with a conscious purpose, such expeditions become idle, worthless, and resultless risks. It is surely no great thing to boast about, after all, that a man has spent time and money, trouble and risk, merely to be able to say that he is among those who have ascended Mont Blanc.

And here we end our wanderings in the Alps, not through want of matter, but because we have exhausted the limits assigned us by the Editor for our series. We feel that much has been omitted which would have interested the reader, but our object has been to give a comprehensive notice of the scenery and character of these stupendous mountains. Possibly the information we have imparted may induce our readers to pursue the subject for themselves, and there is no lack of books at their service. Every season fresh volumes are issued on this inexhaustible subject, and our knowledge is increased; but it will be long ere any one will be able to say that nothing new can be derived from renewed wandering "Up in the Alps."

THE END.



Scene in the Alps.