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THE 'BISSES' OF VALAIS.

By Douglas Stevenson.

(Reprinted by courtesy of the Editor from the August issue of "Chambers's Journal.")

The summer visitor to Switzerland who, on a casual walk in Canton Valais, comes across one or several tiny artificial water-channels (either full or empty, depending on the time of day) in a green meadow, or who sees a rough, primitive scaffolding clinging to the sheer face of a cliff high above his head, may not at first realise that he is being introduced to one of the most interesting manifestations of the power of the human mind to conquer impossible-looking obstacles. These irrigation channels (some even use hollowed-out logs) are the famous 'bisses,' distinctive to the Canton of Valais, much of whose territory owes to them its prosperity and, in certain areas, even the very existence of human life. These veritable little miracles of primitive engineering skill — to the number of over 300, with a total length of some 1,250 miles — carry the life-giving water from the foot of the glaciers across deep gorges and along the perpendicular faces of great cliffs, thousands of feet high, to the too-sunny meadows, giving prosperity to many thousands of acres of land which would otherwise be useless owing to the aridity of the soil (due partly to steepness, deforestation, and lack of heavy rainfall).

In certain regions (as above Sion) the bisses irrigate three zones of vegetation — the high pasture alps, the village meadows, and finally the miles of vineyards, whose entire existence depends on the water that is brought from the far-off glaciers (the bisse of Lentine is 30 miles long, for instance); and thus, in another, crude way, are ice and wine associated! Again, it is wholly due to bisses that such communes as Zeneggen, Vex, Lens, and Savièse are prosperous and have been preserved from the bare and desolate appearance of exactly similar areas in Montenegro and Albania, for example.

Work of real engineering merit, created at great risk of life (many have been killed, both workmen and inspectors) and with practically no equipment, the bisses date from the eleventh century, and have for hundreds of years always been the object of general care and thought by the industrious and kindly Valaisans. They are first mentioned in official documents regulating their use, in 1342; and Münster in 1552 states that they were 'found everywhere in the region' (now Valais), and refers to them as having been in existence for centuries.

The creation of a bisse is nearly always an extremely hazardous enterprise. The works often start from the very foot of glaciers, at a height of 8,500 feet and more (the bisse of Roh, miscalled 'of Montana,' begins at nearly 9,000 feet), and their building and upkeep require the surmounting of great difficulties, especially when their channels must go across the sheer face of high cliffs, over moraines or landslides, and across gorges and overhangs. It is the exception where they can be dug in the higher levels, and for mile after mile they have to be cut out of solid rock or held up by long retaining walls of masonry, where each stone must be laid at the risk of life; or they have to be conveyed through tunnels up to three-quarters of a mile in length, cut inch by inch out of the rock by a kneeling man, for the tunnels are never over a meter high.

In some cases, as in the bisse of Sainte Marguerite, nearly three miles of rock ledges, only a few inches wide, have had to be chipped out of perpendicular cliffs thousands of feet high. For such work the men have to hang for weeks at the end of ropes, sometimes hundreds of yards long.. For the bisse of Gredetsch one rope used was of 1,300 yards — very nearly the height of Ben Nevis above sea-level! Another hard job is throwing bridges (there are seven on the bisse of Clavoz alone) across deep, sheer-walled gorges.

The channels must be cleaned out each spring, and often during the summer; and in many avalanche-exposed spots they must be taken up bodily, or covered in, during the winter. In the dry period they are inspected daily by the 'garde-bisse' (on the 20-mile bisse of Saxon he has his own small cabin, like railway section-hands in North America), and this gives rise to one of the most purely delightful 'discoveries' that visitors can make in Switzerland. Some may have

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already done so, as, following up a queer, dull, regular tapping sound on some high alp or in a quiet wood, they have found a thing like a child's wooden hand-made toy, run by a water-wheel in the current, banging lustily away to itself and to the sky or the trees. This gadget is a 'bisse-alarm,' which, striking on a board or flat stone, lets the guardian know that 'all is well.' It is the cessation of sound that warns of trouble — a fitting difference, *là-haut*, from the habits of the plains!

The expenses of upkeep and inspection are covered by the sale of the water, and any surplus cash goes to improving the bisse. Each proprietor of the owner-commune or owning-group receives water in turn in his fair proportion for his amount of land, for a specified time; and the distribution from the high alps down to the tiny rills in the valley meadows is controlled by a most ingenious system of dams, locks and barriers.

The width of the bisses — from 1½ to 2½ feet — is governed by the nature of the terrain. Five or six may be seen close one above the other (as with the bisse of Hérémence, or opposite St. Nicholas), thus facilitating both flow and upkeep. Small artificial lakes, or 'catch-basins,' are used either as reservoirs or to collect the bisse water during the night, to be released the following day. The lovely Illsee, the placid 'lake' at Lens village, and the one above Visperterminen are examples. The amount of water used in fairly recent developments is such that many formerly flourishing streams — e.g., the Biedbach, Gredetschbach, Lonza, Prinze, and Sionne — are in the hot season practically dried up, owing to the bisses which have tapped their sources.

Most readily accessible to the ordinary visitor are the 12½-mile bisse of Roh (from Montana), the bisse of Lens (from Crans), and the lovely bisse of the Mayens of Sion (postal bus from Sion); but the most daring and magnificent of all was the dizzy bisse of Sainte Marguerite, fed by the Brozet glacier, which winds its giddy way for four miles on end, clinging like a fly to the sheer, terrific cliffs over 1,000 feet above the east bank of the Morge river. Informed ten years ago at one end (*a*) that it had never been 'done' by *un étranger;* (*b*) that it could not be done by the same; and (*c*) that if we were such blessed fools as to try, we should beyond any doubt finish in the *abîme*, we were received at the other end with incredulous hoots by the villagers — until we accurately described the traverse of the worst of several tunnels involved. (This dangerous portion has recently been by-passed by a new 2½-mile tunnel.) In the end the villagers sportingly gave us a bottle of wine.

A contrast is the utterly delightful wood bisse from very near Grimentz (Val d'Anniviers) on the way to Zinal, where the cool, sun-and-shadow dappled freshness of the limpid, crystal, quietly gurgling and laughing water seems to enchant the aromatic pine forest with breath recalling the great regions of eternal ice whence it came.

OUR NEXT ISSUE.

Our next issue will, D.V., be published on Friday, September 27th. We take this opportunity of thanking the following subscribers for their enlarged subscriptions: G. Pape, R. Weber, J. J. Huber, Ch. Fer, E. W. Fehrlin, H. J. Morff, J. H. Speich.

SAINT MAURICE, THE OLDEST ABBEY IN SWITZERLAND.

Wedged in between lofty crags and the roaring, foaming Rhone, the little town of St. Maurice presents the most surprising contrasts both in appearance and history. These crags, the last outposts of the Dent du Midi and Dent de Morcles, conceal the most modern military defences. At the mouth of a tunnel the glittering railway tracks spread out fanwise, forming a railway station with its electric poles and ponderous overhead lines.

And yet within a stone's throw, at the foot of a rocky cliff in the very centre of the little town, an old Rhaetian belfry towers up to the sky and the massive block of a monastery dominates the view. It is the oldest abbey in Switzerland and was erected in memory of the martyrdom of the Theban legion and of its Commander Mauritius and his two officers Exuperantius and Condidus. In the year 302 A.D. this Christian legion, having refused to sacrifice to Jupiter while crossing the Alps, was first decimated and then massacred to a man by order of the Emperor Maximilan.

Towards the end of the fourth century, Theodul, first Bishop of the Valais, built a small basilica against the cliff and placed in it the remains of the holy martyrs. This was the nucleus of the present monastery. However, little importance was attached to this building till the year 515, when King Sigismund of Burgundy granted considerable revenues to the "Royal Abbey." Five hundred pious monks divided into five choirs are said to have sung Mass there alternately, without a pause. Despite the devastations carried out by Francs, Lombards and Saracens, the Monastery always recovered. It stood high in the favour of the reigning princes and Charlemagne bestowed various gifts on it. In the treasure chamber guarded by the monks the most interesting objects are an enamelled pitcher, a masterpiece of Arabian workmanship and probably a present from the great Emporor, a Merovingian casket, a sardonyx vase set in gold with cloisonné decoration, ancient bishops' croziers, and a silver equestrian statue of St. Mauritius, about 20 ins. tall, which was presented to the Abbey in 1577 by the Duke Emanuel Philibert of Savoy.

In 1128 the Abbey was entrusted to the Order of St. Augustine, and in the year 1840 the Abbot was created Bishop of Bethlehem in partibus by a decree of Pope Gregory XVI. with the rank of a bishop and subordinate to the Vatican alone.

Recent archaeological excavations brought to light the successive constructions of church and monastery from the time of their earliest beginnings. Except for the church tower, which served as a place of refuge during the Middle Ages, and the north wing of the monastery (Archives and Library), the present-day buildings date from relatively modern times, for they were built at the beginning of the eighteenth century. They replaced the church destroyed by a mighty landslide in the year 1611 and the cloister burnt to the ground in 1693.

To-day the Abbey authorities are planning to re-erect or enlarge these old buildings. This will give a new form to the century-old religious institution.

S.N.T.O.