

I would have shown had time permitted, stood at a somewhat higher level than at present, but which have been subsequently lowered as the effluent rivers deepened their channels.

13. That since the melting away of the glaciers, though of course denudation has continued in some places and deposition in others, the general structure of the Alps has not been materially altered.

So ends the story of the Alps, as I have been able to read it. There are other points in its latest chapter on which I would gladly have dwelt, but my time is exhausted; and this, I fear, may be true of your patience.

IN MEMORIAM.

ARTHUR THOMAS MALKIN.

AMONG the sad losses which have thrown such a dark shadow over the latter months of 1888, one remarkable figure has passed away which well deserves some notice in the annals of the Club.

Arthur Thomas Malkin, who died in London on November 18, at the age of eighty-five, had been a member of the Alpine Club from the second year of its existence. It is some time now since his tall, athletic form, his open and hearty countenance lighted up by his bright and kindly eyes beaming from under his shaggy eyebrows, had been seen in the Club rooms; but although prevented by advancing age from attending their meetings, his thoughts were always with his old comrades, and to his last days he delighted to gather under his hospitable roof, in Wimpole Street, old companions and young, with whom he could converse of former times and of his beloved Alps. Malkin was a genuine mountaineer, an ardent lover and admirer of nature, whose beauties he was fully able to appreciate with his highly artistic and cultivated mind. He was also a first-rate climber, at a time when climbing was a thing very different from the easy-going and luxurious ways and trodden paths of the present day. Before the majority of the present members of the Alpine Club were born, he had ascended the Mont Vélan and crossed the Strahleck, the Cola d'Hérens, de Collon, du Géant, and the Weissthor. He had also spent summers in exploring the mountain districts of Switzerland, Savoy, and Northern Italy. The journals left by him, written in an easy and graceful style, often sparkling with wit and humour, which, thanks to the kindness of Mrs. Malkin, the present writer has had the privilege of perusing, testify to the depth of the keen enjoyment and intense admiration with which his climbs and wanderings in the high Alps filled his mind.

In 1839 he spent the greater part of the summer in the Oberland and Simplon districts, making also an excursion round Mont Blanc. In August 1840 he first visited Zermatt, sleeping at the little inn kept by Dr. Lauber (opened in 1839), which became afterwards the well-known Monte Rosa Hôtel; he crossed the Théodule, the Cîmes Blanches, the Col d'Ollen, and the Monte Moro, returning to Geneva, where, full of enthusiasm for his newly found paradise, he persuaded his wife,

and his friends Mr. and Mrs. Edward Romilly and Mr. Marcet, to return with him to Zermatt. There the whole party went to the Schwarzsee and Hörnli, and to the Théodule, returning to the Rhône valley and making probably the first traveller's ascent of the Eggischhorn. This excursion, which is described in the sketch-book left by one of the ladies to serve as a visitors' book at Zermatt, deserves to be recorded as what was a very early visit made by travellers to that now favourite and beautiful Alpine station. Summer after summer found him exploring the Savoy, Swiss, or Italian Alps, and in 1878, at the age of seventy-five, he was still climbing, with all his old physical vigour and boyish enthusiasm; it was, as he said not long ago, 'the one early delight which old age did not remove the zest for.'

Readers of Murray's Handbook to Switzerland (second edition, 1842, and third edition, 1846) will be able to form an idea of what Malkin's work in the Alps has been; for the well-known initials A. T. M. are to be found in that volume attached to many most graphic and remarkably accurate accounts of excursions or ascents of passes and mountains, some of them seen or described then perhaps for the first time by an Englishman. He also contributed out of his abundant stores of mountain knowledge to Mr. Ball's 'Alpine Guide.' Few men have helped more than he has to make known in this country the land which has now become to the Alpine Club as a second home; few more fully deserve to have their name enrolled amongst those of the pioneers of the Alps.

Malkin resided during a great part of the year on his beautiful estate of Corrybrough, overlooking the valley of the Findhorn, not far from Inverness; there he was beloved, not only as a friend and neighbour and a keen sportsman, but as a kind and liberal landlord, ever thinking of the welfare of his people.

The last remnant of a generation which has now disappeared from among us, Arthur Malkin will ever live in the memory of those who knew him, as the type of a high-minded, warm-hearted, and accomplished gentleman, and a model mountaineer.

H. PASTEUR.

COUNT PAOLO BALLADA DI ST. ROBERT.

THE 'Rivista Mensile' of the Italian Alpine Club for November last conveys to us the intelligence of the death, at Turin, on the 21st of that month, of Count Paolo di St. Robert, one of the most valued of our Honorary members, and one of the most distinguished of Italian scientific men. The following notes of his life and work are derived, partly from the obituary notice in the 'Rivista,' partly from information kindly communicated to me by Mr. Ball, with whom he lived on terms of intimate friendship for many years, and partly from my own intercourse with him, which I had the privilege of enjoying, chiefly by correspondence, from the year 1862 to within a few years of his death. He was born in 1815 at Verzuolo, near Saluzzo, in Piedmont, within a short distance and almost in sight of the celebrated mountain he was afterwards destined to know so well. Being intended for the

profession of a soldier, he entered the 'Accademia Militare' of Turin in 1825. Following the natural bent of his genius for mathematics, he passed into the Sardinian Army in 1835, as lieutenant in the artillery, and rose rapidly to the rank of colonel. He taught the science of projectiles ('la scienza balistica') in the practical school of artillery and engineering, and received, for distinguished merit, the cross of the Military Order of Savoy. In 1857 he resigned his commission, and thenceforth devoted himself entirely to scientific pursuits.

It was in August 1862 that the writer, in company with Dr. Bonney, first met St. Robert at Crissolo, in the valley of the Po. It was this meeting which led to the first Italian ascent of Monte Viso, made on August 12, 1863, by St. Robert, his brother Giacinto, Quintino Sella, and Giovanni Barocco, as related in a letter from Sella to Professor Gastaldi, first published in the 'Opinione' of Turin; * an ascent which led in its turn to the foundation, on October 23 in the same year, of the Italian Alpine Club.

His Alpine work was scientific rather than sensational, and we must remember, in judging it, that it was commenced at the age of forty-eight. In 1864 and 1865 he explored some of the less known parts of the Maritime Alps, making, in the former year, the first ascent of the Cima dei Gelas (10,286 feet), and in the latter the first ascent of Mout Tinibras (9,948 feet). In the first of these excursions he rediscovered the *Saxifraga florulenta* of Moretti, a plant supposed to have become extinct, which grows on the slopes of the Gelas and nowhere else in the world. In 1867 he spent some time in the valleys of Lanzo. On August 17 in that year he made the ascent of the Ciamarella (12,061 feet), the peak at the head of the valley of Ala. This was the second ascent, the first having been on July 31, 1857, by Signor Antonio Tonini, an Italian engineer. St. Robert found that the peak is wholly Italian, separated by about 800 mètres from the frontier ridge between the Maurienne and Piedmont. He started from the head of the Balme or Ala valley, and reached a point on the ridge W. of the peak, since known as the Col or Roccie St. Robert (3,443 mètres), but, finding the ridge in a difficult condition, retraced his steps to the glacier S. of the peak, and reached the summit by the southern face.† Later he was again in the Maritime Alps, and ascended the Pelvo d'Elva (10,053 feet).‡ In 1871 he turned his attention to the Abruzzi, ascending their highest peak (which is also the highest point in continental Italy south of the Alps), the Gran Sasso d'Italia (9,584 feet).§ His memoir on this mountain is a model of excellence in scientific geography. In 1872 he revisited the valleys of Lanzo, and, with three friends, Signori Lessona, Gras, and Struver, made, on August 12, the second ascent of the Torre d'Ovarda (10,089 feet), the first having been made by a hunter some

* It has been lately reprinted in the *Cronaca del C. A. I.* (p. 1), noticed in the last number (p. 174) of the *Alpine Journal*.

† *Bollettino del C. A. I.* Nos. 10-11, pp. 243-263; *Gita al Monte Ciamarella nelle Alpi Graie*, 1867.

‡ *Boll. del C. A. I.* No. 18, p. 381.

§ *Gita al Gran Sasso d'Italia*, 1871.

years before. This peak is the highest point in the range which separates the valleys of Ala and Viu, and is due north of Usseglio in the latter valley.*

It is rather for his scientific work than his mountain exploration that St. Robert's name will chiefly be remembered. He had a complete command of mathematics, as an instrument for the investigation of physical problems. The versatility of his genius was no less remarkable than his industry in writing. He was a good botanist and entomologist, and so excellent a linguist that when he sent to Mr. Ball for correction the papers on hypsometry, which he contributed to the 'Philosophical Magazine,' they were written in such correct English that only a few trifling errors were found in them.

His contributions to science were very numerous. They include a valuable Treatise on Thermodynamics, which reached a second edition in 1870. His occasional papers alone, published previously to 1874, have been collected into three goodly volumes. I am not aware whether since that date further volumes have appeared. It is impossible in the present notice to give a complete list of his scientific writings. Those connected with atmospheric physics are the most interesting to mountaineers. Among them the following are deserving of special mention:—'Barometrical Formula resulting from Mr. Glaisher's Balloon Ascents' ('Philosophical Magazine,' February 1864); 'On the Measurement of Heights by the Barometer' (*ibid.* June 1864). In this paper St. Robert developed a new and very useful formula founded on the hypothesis that the density of the air decreases in arithmetical progression in ascending from the earth's surface. The subject is pursued in a series of papers published at various dates between the years 1864 and 1867, and was explained by the writer of this notice in the 'Alpine Journal' (vol. iv. pp. 94-106). St. Robert prepared a series of elaborate hypsometrical tables founded on this formula, and constructed a sliding rule by which the height of a station could be read off at sight. Two papers on 'A New Method of Measuring Heights' were published by him in the 'Alpine Journal' (vol. vi. pp. 414-420; vol. vii. pp. 204-211). In these the author explains a method of determining the height of an inaccessible point by using a vertical base line instead of a horizontal one, the height of the former being found by means of the barometer. An interesting paper of his on the vexed question of 'The Retreat of Glaciers,' communicated in 1884 to the 'Reale Accademia dei Lincei,' was reviewed in the 'Alpine Journal' (vol. xii. pp. 134-6).

In his later years St. Robert lived in comparative retirement, and spent much of his time in a country house near Asti, close to which he built a tower which commanded a panoramic view of the entire range from Monte Rosa to the Maritime Alps. He closed a well-spent and laborious life at the age of seventy-three years, and bequeathed his valuable library to the Municipality of Turin as an addition to the Public Library of that city.

WM. MATHEWS.

* *Una Salita alla Torre d'Orarda*, 1873.