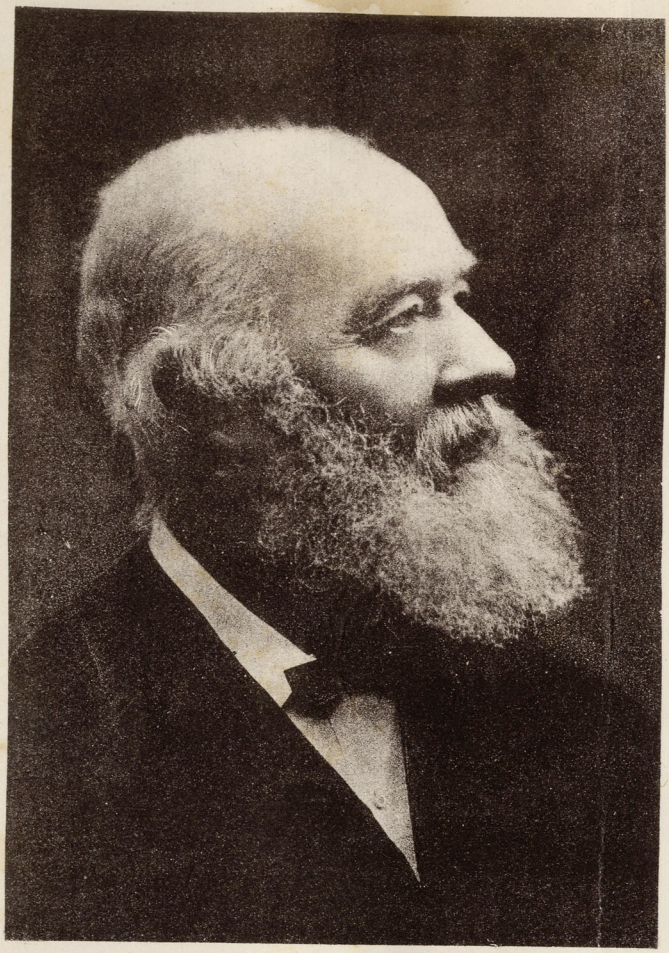


JOHN BALL.

couraged and helped when help was needed, or condoned when shortcomings were only too obvious. And now that it's the last time, why—it's a sort of rough on a man.' And now, gentlemen, my address is over; and my thanks and your President's thanks to you for all your indulgence and all your attention.

John Ball.

THE notice of Mr. Ball which appeared in the November number of this Journal told what was necessary, and all that under the circumstances was then possible, with regard to the main facts of his Alpine work; but it was generally felt that some fuller commemoration was due to one who, though he was not, strictly speaking, among those to whom the Club immediately owed its inception, was nevertheless felt to represent so pre-eminently the spirit in which the Club was formed that he was at once fixed upon as the fittest person to be its first President, and to edit those first records of mountain adventure put forth under its auspices, out of which the long series of this Journal has grown. The natural and obvious form of commemoration would have been a detailed biography; but it was found that this had already been undertaken, on behalf of the Royal Geographical Society, by the person who of all others was most competent for the task, and it was clearly inexpedient to do anything savouring of rivalry or emulation in such a matter. Consequently it was decided to ask certain among the older members of the Club to contribute independent reminiscences of Mr. Ball, and more particularly appreciations of his scientific work in connection with the Alps. This they have most kindly done; and it is hoped that what they have written may be accepted by the Club as a fitting tribute to the memory of its first President, and may serve to show to those of us who never enjoyed personal knowledge of him, and to members yet to come, 'of what sort our patriarch was.' EDITOR.

Mr. John Ball became President of the Alpine Club in 1858. One of the first literary works connected with the Club in which he was engaged was editing the first series of 'Peaks, Passes, and Glaciers,' which appeared in 1859. He contributed to this volume chapter vi., entitled, 'Zermatt in 1845,' with a description of the passage of the Schwarz

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Thor, made by him for the first time and with a single guide. The paper contains some interesting observations on glacier physics and a reference to a paper by the author in the 'Philosophical Magazine' for 1855. The editor has enriched the various chapters in the volume with terminal notes, containing important information on various topographical, botanical, and physical questions. He also contributed chapter xviii., 'Suggestions for Alpine Travellers,' containing 'Notes on the Mode of Travelling in the High Alps,' on the 'Measurement of Heights, Distances, and Angles,' on 'General Physics and Glacier Phenomena,' and on 'Geology and Natural History.'

Mr. Ball's next important work in connection with the Club was the production of the 'Alpine Guide,' of which vol. i., the 'Western Alps,' appeared in 1863; vol. ii., the 'Central Alps,' in 1864; and vol. iii., the 'Eastern Alps,' in 1868. It is impossible to give in this place an adequate description of this remarkable book; suffice it to say that for scientific information, clearness of arrangement, abundance of topographical detail, and charm of literary style it is without a rival.

It was in or about the year 1862 that Professors Ramsay and Tyndall first promulgated the theories, the former that the lakes of Switzerland and Wales had been excavated by ice, the latter that all the great valleys of the Alps owed their origin to the same agency. These theories are advocated in various papers, in the 'Quarterly Journal of the Geological Society,' the 'Philosophical Magazine,' Professor Ramsay's 'Physical Geology and Geography of Great Britain,' and elsewhere, and are discussed at length in chapter xvi. of Mr. Whymper's 'Scrambles in the Alps.' They are held by many of the most advanced glacialists of the present day. Two Italian geologists—MM. B. Gastaldi and G. de Mortillet—had previously published another theory of lake basins, viz. that they had been filled with diluvium which had been cleared out by ice. The first physicist to controvert these theories was Mr. Ball. In the 'Philosophical Magazine' for February 1863 he opposes Professors Ramsay and Tyndall; in the same serial, in December 1863, he opposes MM. de Mortillet and Gastaldi. As an important element in the discussion of the origin of Alpine lakes Mr. Ball had urged the necessity of ascertaining by means of soundings the exact form of the principal Alpine lakes. He published in the 'Geological Magazine' for August 1871 the result of a complete survey

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of the bed of the Lake of Como, executed in 1865 by Signor Gentili, one of the engineers of the Lombardo-Venetian Railway, in connection with MM. Casella and Bernasconi. The glacial origin of Alpine lakes has been opposed by many writers subsequently to Mr. Ball, among whom Professor Bonney, Mr. Whymper, and Mr. Ruskin are the most eminent, and may be said to have completely demolished the theory.

In the year 1861 the late Canon Moseley communicated to the Royal Society* his observations on the movements of a plate of metal on an inclined plane, and their reference to the problem of glacial motion. This communication was followed by various papers in the 'Philosophical Magazine' (May 1869, August 1869, January 1870, August 1871, January 1872). In these papers the Canon developed what has since been known as the 'crawling theory' of glacial motion, viz. that glaciers moved downwards in consequence of alternations of temperature within their mass. The theory was refuted by the late J. D. Forbes, by the present writer, and especially by Mr. Ball in two papers, the first published in the 'Philosophical Magazine' for 1870, the second in the same serial in February 1871.

There are few problems of greater interest connected with the Alpine regions than that of the distribution of plants. In the remarkable lecture delivered to the Royal Geographical Society on June 9, 1879, Mr. Ball discusses the question of the origin of the flora of the European Alps, and supposes it to have been derived in its main features from that of the highest mountain regions in Palæozoic times.

In the year 1877 Mr. Ball made with Sir J. D. Hooker and Mr. Geo. Maw the well-known journey to Marocco and the Great Atlas. The journal of this tour was not published until 1878, and was mainly the work of Mr. Ball. The botanical results of the journey, including the determination of many new species, were communicated to the Linnean Society under the title of 'Spicilegium Floræ Maroccanæ,' and occupy five parts of the journal, Nos. 93–97 inclusive, vol. xvi. 1878.

In the year 1882 Mr. Ball made the tour of the greater part of the coast of South America, visiting the West Indies, crossing the Isthmus of Panama, and visiting successively Guayaquil, Callao, Lima, the Lower Andes, Valparaiso,

* *Proceedings*, August 11, 1861.

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various parts of Chili, Patagonia, Monte Video, and Brazil. The results of the journey are recorded in a volume entitled 'Notes of a Naturalist in South America, 1887.' It contains two valuable appendices, the first on the 'Fall of Temperature in Ascending to Heights above the Sea-Level,' the second on 'Mr. Croll's Theory of Secular Changes of the Earth's Climate.' The botanical observations are contained in full in two contributions to the 'Journal of the Linnean Society' —the first, 'Contributions to the Flora of North Patagonia,' vol. xxi. 1884; the second, 'Notes on the Botany of Western South America,' vol. xxii. April 1886.

In the early part of the year 1888 Mr. Ball made his last journey; this was to Tenerife, in company with Mrs. Ball and Mr. F. F. Tuckett. At this time his physical powers had become greatly weakened, but his zeal for botany and his mental activity were by no means diminished.

Mr. Ball's last important contribution to Alpine physics is the paper on the 'Measurement of Heights by the Barometer,' communicated to the Royal Geographical Society, published in the volume of supplementary papers for 1888, vol. ii. part 3. One of the main objects of this paper, which extends over forty pages, is to ascertain the rate of decrement of the air temperature, corresponding to successive increments of height of 1,000 feet. The balloon observations of Mr. Glaisher, the observations of the Comte de S. Robert in the Alps, of Mr. Whymper in the Andes, and of Sir J. D. Hooker and General Strachey in the Himalayas are fully discussed and considered. W. MATHEWS.

Concerning the expedition to Tenerife, mentioned above, Mr. Tuckett writes to Mr. Mathews :—

'You ask me to furnish you with a few notes of my intercourse with Mr. Ball when, at his invitation, I accompanied him and Mrs. Ball to Tenerife in February 1888; but the state of his health, after a severe bronchial attack, so limited his activity during the time I had the happiness of being with them that I had less opportunity than I had hoped for of noting his characteristic method of work in the department of botany. On the other hand, however, it was my privilege to become more intimately acquainted with him than I had ever been before, and this is equivalent to saying that my appreciation of his character and my affection for him, high and deep as they were before, were largely increased.

'His well-furnished mind, sweet temper, bright manner, exquisite courtesy, clear good sense, and playful humour,

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coupled with a keen and many-sided interest in a wide range of subjects, rendered him a most charming companion, especially in a ramble; and then, when the proposed scene of operations—some barranco, perhaps—was reached, it was very interesting to watch the rapidity and skill with which he would take stock, as it were, of its botanical wealth, and, as one specimen after another was transferred to the vasculum, enlarge, from the rich stores of his reading or personal knowledge, on their affinities, or modifications due to climate, altitude, or cultivation. His was a very bright mind, lodged in a happily constituted and finely balanced nature, and with that enviable capacity for placing itself *en rapport* with a wide range of character and subject which the Italians well describe by the word *simpatico*. He told a story well, and his large and varied acquaintance with leading men in the political and scientific world, both in England and on the Continent, especially in Italy, made him rich in anecdote, allusion, and reminiscence, whilst, thanks to his scientific sobriety and accuracy of thought and expression, the stream of his conversation always left behind more valuable deposit as it flowed along. In action he was delightfully practical, and especially fertile in expedients. I remember how, after sundry disappointing attempts to dry his botanical papers on the azotea of the hotel during the moist month of February, and in the spray-charged atmosphere of Puerto di Orotava, he one day took me to his room and gleefully pointed to his bed, the iron frame above which (for supporting mosquito curtains) looked like the gills of some monstrous fish or the fringes of whalebone in a whale's jaw. He had stretched a number of parallel lines of string lengthwise from head to foot, and then hung on them a mass of sheets of damp botanical paper, which, in defiance of the rheumatism or bronchitis which I prophesied, he proposed to dry by the action of his own radiated caloric as he lay beneath!—a result which was, in fact, successfully realised.

'I do not think that a better idea could be given of his healthy, cheery, practical view of life and its opportunities than by quoting the following portion of some remarks which occur near the end of that most charming book of his "Notes of a Naturalist in South America." They illustrate the spirit in which he himself travelled, worked, and lived, and I cannot but believe that a life which furnished so bright and stimulating an example to others must itself have shared richly in the happiness which it radiated to all who came within its genial influence. The entire passage

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deserves to be quoted, but would, I fear, be too lengthy for these pages:—

'"Often during this return voyage my thoughts recurred to an article in some periodical lent to me by my kind friends at Petropolis, wherein the writer, with seeming gravity, discussed the question *whether life is worth living*. My first impression, as I well remember, was somewhat contemptuous pity for the man whose mind could be so profoundly diseased as even to ask such a question, as for a soldier who, with the trumpet-call sounding in his ear, should stop to enquire whether the battle was worth fighting. When one remembers how full life is of appeals to the active faculties of man, and how the exertion of each of these brings its correlative satisfaction; how the world, in the first place, needs the daily labour of the majority of our race; how much there is yet to be learned, and how much to be taught to the ignorant; what constant demand there is for the spirit of sympathy to alleviate suffering in our fellows; how much beauty exists to be enjoyed, and, it may be, to be brought home to others—one is tempted to ask if the man who halts to discuss whether life is worth living can have a mind to care for truth, or a heart to feel for others, or a soul accessible to the sense of beauty."

'The world is distinctly the poorer for the passing away of such a life, and he will be as widely and deeply mourned as he was truly and deservedly loved and appreciated.

'F. F. TUCKETT.'

It would be presumptuous in me—perhaps in any member of the Club—to attempt to criticise Mr. Ball's varied scientific work, but there must be many who can remember the vigour which he infused into the Club at starting, and the pains that he took to instil into us that the investigation of Alpine phenomena, especially in plant life, would add to, not detract from, the pleasures of the mountain climb. 'If,' he writes, 'the members of the Alpine clubs of our own and other countries will be prevailed upon to use their eyes as well as their legs, and, better still, to preserve a few specimens that will fit in a pocket-book for future reference and verification, we shall get to know much more than we now do of the vegetation of the highest region. Favourable situations become so rare above the level of 10,000 feet that no single traveller has many opportunities for observing them.'*

* *Lectures to the Royal Geographical Society*, June 9, 1879, p. 7.

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My earliest recollection of Mr. Ball takes me back to two delightful excursions in the years 1858 and 1859 to the English lakes and Wales made with him, W. Longman, Hinchliff, and Malkin. Of the party, alas! the writer alone survives; but I well remember that it was on these two courses that I first acquired any taste for botany from seeing the pleasure the flowers we chanced upon gave to two of my companions.

At all points, whether as geographer, explorer, writer, geologist, or botanist, Ball was indeed pre-eminently qualified to illustrate the Alps and Alpine travel. In the first of these branches of science—the extension of geography and the knowledge of the mountains—he has to a great extent succeeded in infusing his spirit into the Club; but in the last, which was that in which he himself especially excelled and delighted, I am afraid his followers, at least among us, are few and far between. Unfortunately few mountaineers are good botanists, and still fewer botanists are good mountaineers. Ball was both, and both in the highest and widest acceptation of the words. He was a mountaineer, not for the sake of ascending a peak that had been thought impossible, still less for beating the record and doing it in the shortest time, but because of the pleasure which a mountain climb afforded him. He was a botanist not so much as a microscopic scientist for investigating the structure of plants and their minutest organs, but as taking a deep interest in the geographical distribution of plants throughout the earth, and especially in the perplexing problem of the origin of the Alpine flora.

In the year 1878 I was with Mr. Ball at Windisch-Matrei, in the Tyrol. He still carried an ice axe, though then only using it, as he told me, as a digger for plants. As an instance of his marvellous acquaintance with the likely habitats of Alpine plants, even the most rare, I may mention that on parting to return by the Brenner Pass he told me that on some of the mountains in that district it might be possible to find *Ranunculus pygmæus*, a rare and most tiny plant, of undoubted Arctic origin, which had descended somehow or other to these parts along the Scandinavian backbone. The plant he himself had never met with, but described to me so well the spots and aspect on which I was likely to meet this little straggler from the Arctic vegetation that I succeeded in finding it in quite a new locality—on the north side of the Kraxentrager, about 300 mètres below the summit (2,690 feet above the sea level).

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The result of Mr. Ball's observations on the origin of the flora of the European Alps are summed up in a most interesting lecture, which he read to the Geographical Society on June 9, 1879. In this he will not admit that the flowers which glow with such warm bright colours on the mountain-tops are mere interlopers drawn down from the Polar regions during some glacial epoch, but he thinks that the existence of identical or at least allied species on remote mountain summits goes to show that these, for the most part, were the original denizens of the soil, probably dating back before the tertiary period. 'With a very few apparent exceptions,' writes Mr. Ball, 'all the mountains known to possess rich and varied floras, with many endemic species, are portions of ancient continental masses that have been at various periods isolated, but never utterly submerged.' We have no space here to give the ingenious arguments by which he supports this theory, and shows that the dispersion of the Alpine flora has been a descending migration from the mountain-tops to the plains, rather than in the reverse and more generally accepted order.

The geographical distribution of plants, especially on the mountains, was an enquiry of undying interest to our first President, and I can hardly doubt that it served as the motive power in many of his ascents and explorations. It seems, then, not unfitting that this notice of him should close with the eloquent words that he addressed to the Fellows of a less aspiring but cognate society: 'Especially do I solicit your attention for those humble plants that dwell in the highest region of lofty mountains, springing from crevices in the rocks or fringing with bright colour the edges of the snow-field. It will not diminish the interest of the search if you believe with me that these organisms, exempted from the vicissitudes to which the ancient world was exposed, may represent the earliest forms of the higher types of plant life; and even that some of the identical species that now adorn the Alpine heights may, during the inconceivably long lapse of geological ages, have looked down unchanged on the revolutions that have slowly destroyed and renewed the various forms of life on the surface of our planet.'* C. Packe.

Although, so far as I am aware, Mr. John Ball did not attempt to keep pace with the rapid strides which geology

* *Lecture to the Royal Geographical Society*, June 9, 1879, p. 25.

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has made during the last thirty or forty years both in petrology and palæontology he had a firm grasp of the principles of the science and knew as much of its details as was necessary for his own purposes. Thus he was well qualified to deal with such geological questions as came before him as either the editor of an Alpine Guide Book or a student of Alpine botany; and in that work the chief physical and lithological features of the mountains are always presented to the reader clearly and sufficiently. The task, however, of writing the prefatory article to the 'Alpine Guide' was entrusted to M. Desor, though one or two brief notes show that it was carefully read by Mr. Ball. The article was not, in my opinion, in all respects satisfactory, and I believe that some parts would have been better executed by the editor himself. The branch of the science in which Mr. Ball felt most at home was physical geology, and on questions of this kind he has written two or three excellent papers; of these the best and longest was published in the 'Philosophical Magazine' (February 7, 1863). It was evoked by two papers which had appeared a few months previously, one in the 'Quarterly Journal' of the Geological Society, the other in the 'Philosophical Magazine' itself. In the former, by Professor Ramsay, the older explanations which had been given of the origin of Alpine and other lakes were examined and rejected, and a new hypothesis was advanced, viz. that these lakes resulted from the erosive action of glaciers, which, owing to special causes, such as some peculiarity in the topography or in the nature of the rock, had produced exceptional effects in certain localities. The second paper, by Professor Tyndall, took a far bolder flight, by ascribing the Alpine valleys themselves to the excavatory action of glaciers. The latter hypothesis indeed repelled by its boldness more than it attracted by its brilliancy, and may be said to have died of a chill caught at its first reception. But the former speedily attracted a host of enthusiastic admirers, and even now, though the lapse of time seems to have told disadvantageously on its charms, numbers several votaries. A few geologists of experience in mountain regions—for example, Sir R. I. Murchison—at once took up an antagonistic position, but Mr. Ball was almost if not actually the first to make a formal attack. His paper is an excellent example of his lucidity of arrangement and expression, and of his invariable courtesy in debate. In one or two places perhaps some exception might be taken to his reasoning, for, like most geologists of the last generation, he was slightly dis-

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posed to exaggerate the power of marine erosion and underrate that of subaërial and fluviatile. But it cannot, I think, be denied that his attack is extremely formidable, both from his acuteness in detecting weak points and because of his intimate knowledge of Alpine topography. His method was in part similar to that followed by myself in a series of papers in the 'Quarterly Journal of the Geological Society' for 1871, 1873, and 1874—papers, I may say, written in ignorance that Mr. Ball had published anything on the subject.* Mortillet's view, which, were it not earlier in date, might be called a modification of Ramsay's, is also criticised, more briefly indeed, but certainly not less effectively. In a shorter paper, published in the 'Geological Magazine' for 1871, Mr. Ball discusses a series of soundings of the Lake of Como made by some Italian engineer, and indicates, conclusively as I think, how irreconcilable are its subaqueous features with Ramsay's hypothesis of its origin.

The papers published in the 'Philosophical Magazine' for 1870 and 1871 in which the hypotheses of Moseley and Croll as to the cause of glacier motion are discussed, belong to physics rather than to geology, but are so closely related to the latter subject that I must not leave them unmentioned. Both show Mr. Ball's wonted clearness of thought and accuracy of expression. Nor must we forget his excellent paper on the origin of the flora of the European Alps,† where geology goes hand in hand with botany.

To this notice of Mr. Ball's geological work—brief, because his main power was turned in another direction—I may add a few words on the man himself. I became acquainted with him some thirty years since, but we met more frequently after I came to reside in London. We were brought into still closer relations about two years before his death, when he succeeded me as treasurer of the Philosophical Club, a body composed of Fellows of the Royal Society, which meets monthly to discuss dinner and science. The duties are not onerous, but they enabled me to appreciate the thoroughness and method with which Mr. Ball carried out everything that he undertook. They could not make me appreciate more highly than I did before—for that were scarce possible—his

* It was rather unfortunate that he published his paper in the *Philosophical Magazine*, for original geological papers do not frequently appear therein; so that they are apt to be overlooked by students of that subject who, like myself, prefer the open air or the museum to the library.

† *Proceedings of the Royal Geographical Society*, 1879, p. 564.

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courtesy and suavity of manner. In him high intellectual gifts were united with a remarkable gentleness. 'Mitis sapientia' might have been taken as his motto. He seemed never hurried, never ruffled, incapable of bitterness, and still more incapable of anything base. When men of his nature die, not only friends but many others also are the losers, because an influence for good is taken away from the world.

T. G. Bonney.

The History of the Search Expedition to the Caucasus.

By CLINTON DENT.

(Read before the Alpine Club, Tuesday, February 4.)

In the following narrative I have endeavoured to abstain from forcing on readers of the 'Alpine Journal' the views generally held, to the best of my knowledge, by the members of the search party, and I have sought as far as possible to state simply the facts, leaving those interested to draw their own conclusions. With the aid of the accompanying map (for the materials for which our warmest thanks are again due to the topographical department in Tiflis, and especially to General Shdanoff and Messrs. Djukoff and Bogdanoff) and outline sketches (p. 37, *infra*) many points of topography, hitherto obscure to those unacquainted with the district, can now be made clear.

Some recapitulation is necessary in order to set forth the nature and conditions of the problem we had set ourselves to work out.* On August 27, 1888, as learned from Fox's diary, the party having made their way up by the Ullu-auz Glacier, attempted the ascent of Dych-tau by the north ridge. They reached a point (shown on the map) on the ridge separating the west basin of the Ullu-auz Glacier from the Kundium Mishirgi snow fields. A tower of rock barred the way upwards. Following Streich's advice, they descended a few hundred feet on the Mishirgi side and then attempted to climb by a rock-rib back to the ridge. I may quote from the diary:—'We left the col at 9.10. The descent took a long time and there was much step-cutting. We then tried the rib and found the rocks, as we expected, quite smooth. We cut up between them and forced our way up slowly, the fresh snow making everything most difficult, but at 11.40

* *Alpine Journal*, vol. xiv. pp. 94, 432, 438.

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