

# THE YORKSHIRE RAMBLERS' CLUB JOURNAL.

EDITED BY THOS. GRAY.

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Gaping Ghyll Cavern.	Gaping Ghyll Hole. Fell Beck.

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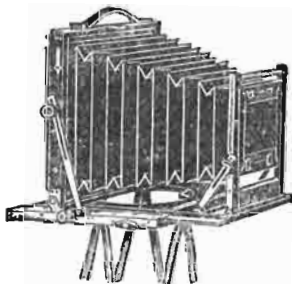
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## THE YORKSHIRE RAMBLERS' CLUB JOURNAL.

THE  
**Yorkshire Ramblers' Club Journal**

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EDITORIAL.

FOLLOWING a custom usually observed, this, the first number of the *Yorkshire Ramblers' Club Journal*, commences with a short preface by its Editor.

The sequence of events which have led up to its publication are briefly reviewed in the article on the formation of the Club by our late Honorary Secretary. With a larger roll of members its advent would scarcely have been so long deferred, but the delay thus occasioned has had one advantage. A certain amount of interesting matter has accumulated during the period of waiting, and the grave responsibility of filling its pages has been partially lightened.

The Editor makes no effort to define the limits of the matter which will be found between the covers of this Journal. It will attempt to be an accessible and permanent record of the Club's work. Articles descriptive of rambles on the highways and in the byways of travel; accounts of mountaineering expeditions; records of climbs or cave-work; and reviews of books or notices of current literature bearing upon the Club's interests, will appear in its pages.

Yorkshire will, without doubt, receive a considerable share of attention. Its dales still cherish many old-world manners and customs, and much that is quaint in habit and speech. They contain some of the most picturesque English scenery, with the added charms of their past and present human occupancy; history, tale, and legend fill them with moving interest. Its caves and pot-holes are only just beginning to yield their secrets to the adventurous explorer. Its fells, perhaps, do not suggest serious mountaineering, but climbers can find

on them interesting short scrambles which afford excellent practice for more arduous work.

Easily accessible, the mountains of the Lake District and North Wales have claimed a large portion of our members' holidays. Norway with its great possibilities of fresh mountaineering work has attracted us. Switzerland has filled many of the Club's evenings in past years with increasing interest, and the fascinations of her alps and valleys, peaks and glaciers, have never waned. Perhaps we are a little too late to achieve much that is new, but we are not too late to enjoy the old, and if other men still continue to make new ascents or to find new ways up mountains the Yorkshire Ramblers hope to do likewise, and to record their adventures in these pages.

From stranger, wilder lands we may have tales of stirring incident, but it is none of the Editor's business to prophesy, and he has said perhaps sufficient to indicate what the Journal will attempt.

It is not proposed to confine it entirely to members of the Yorkshire Ramblers' Club, and the Editor is sanguine enough to believe its readers will also not be limited to that body. If it helps to bring together Yorkshiremen and dwellers in our Northern Counties of kindred tastes to strengthen our organisation it will have attained another of its objects.

The Journal being now an accomplished fact, the Editor hopes the members of the Club will not fail to supply him with interesting matter with which to fill its pages. Its continuity is perhaps most seriously threatened by the disinclination of the average member to put pen to paper. He is therefore especially anxious to disabuse members' minds of any preconceived notions of his editorial severity. Keenly conscious of his own shortcomings, he knows it is easier to criticise the work of others than to do it himself. His anxiety to make the Journal fulfil their wishes must plead his excuse. He asks them to bear with his failings, and credit him at least with a single-hearted desire to do his duty.

THOS. GRAY.

## THE FORMATION OF THE YORKSHIRE RAMBLERS' CLUB.

BY H. H. BELLHOUSE.

HOWEVER willing one may be to give honour where honour is due, it is practically impossible to name the person who first proposed the formation of the Yorkshire Ramblers' Club, or even to point to any particular event or circumstance as its genesis. For many years there has been in Yorkshire a certain proportion of the more active members of the community—at least no smaller than is to be found in other counties—endowed with the happy faculty of combining their love of outdoor exercise with the love of Nature and its very general accompaniment—the desire to travel. There are many ways of travelling, of course, and every man will choose the mode of locomotion best suited to his tastes, his strength, and his means; but one of the class here referred to, though he may sometimes take pleasure in cycling, riding, rowing, like anybody else, will generally be found afoot. He will betake himself to the fields and woods and solitary places, to the “cloud-piercing peak, the trackless heath,” where there is no way of getting over the ground but by walking and climbing. Fond though he be of the solitudes, however, he is usually sociable, and in course of time will become one of a group whose highest ideal of recreation is to get away from the busy hum of cities and commune with Nature.

The tendency among Englishmen to organise and form themselves into societies is so strong that there is nothing extraordinary in suggesting that such a group could not attain to large dimensions without proposals being made to form a Club, and there is no doubt that parallel discussions of this proposition took place in two or three quarters for some time before the Yorkshire Ramblers' Club was definitely projected. It sometimes chanced that parties moving in different circles met in their wanderings through the country,

and during the new acquaintances formed through these pleasant encounters an exchange of views on the subject of the proposed Club eventually took place, and gradually it came to be known that there was a very general desire for the proposal to take shape. Thus the idea may be truly said to be a product of the hills on whose sides it grew—a healthy plant, naturally and freely to bear its fruit in due season.

In the summer of 1892, then, it was abundantly clear that an attempt to realise the idea of forming a Club would be successful, and on July 13th, as a preliminary step, Messrs. Geo. T. Lowe, J. A. Green, H. H. Bellhouse, and Herbert Slater met at the house of the last-named, to consult on the best way of going to work. After an exchange of views, these four gentlemen decided to call a meeting of pedestrians at the end of the season, selecting Mr. Green to invite those known to be interested in the matter, and asking him to fix a date most suitable to the majority.

The meeting was held in Headingley on October 6th. In recognition of the fact that to him, if to one person more than another, was due the credit of bringing matters to this point, Mr. Lowe was elected to the chair, and after he had briefly explained the object of the meeting it was unanimously resolved to form a Club, and the terms of the resolutions which followed stated its objects. These are primarily to give facilities for the organisation of walking and mountaineering expeditions, and to encourage in connection therewith the study of Nature.

The title of the Club was then chosen, also unanimously, though other names besides that adopted were discussed prior to any resolution being put. As a side-light on the history of previous years, showing in what direction the tastes of the original members mostly led them—namely, to the hills—it is interesting to notice the fact that the only one of the discarded suggestions to receive any substantial support was “The Three Peak Club.” About that time there was a craze among a section of those who first joined the

Club for making the ascents of Ingleborough, Wharfedale, and Pen-y-ghent in one day, due possibly to the fact that these hills are so easily accessible to the majority of hill-walkers in the West Riding, and that the expedition fills up an odd day pleasantly. The promenade was familiarly called “The Three Peaks,” and the whimsical notion of perpetuating the name found some favour among a few of its frequenters, until it was pointed out that its adoption would restrict the scope of the Club to a very limited area, and its membership to a corresponding insignificance. The good understanding existing among those present at the meeting enabled them to frame a provisional constitution and appoint officers and a committee before separating. The officers for the first year were Mr. Geo. T. Lowe, President; Messrs. Herbert Slater and George Arnold, Vice-Presidents; Mr. H. H. Bellhouse, Honorary Treasurer; Mr. J. A. Green, Honorary Secretary; and Messrs. Fred Waggett, Charles Scriven, R. N. Lister, Lawrence Dean, and J. W. Swithinbank, Members of Committee. About twenty members were enrolled before the second meeting, which was held on October 18th. On this occasion it was decided to hold two meetings in each month, up to and including April, at which papers should be read; and one in each summer month for arranging expeditions and discussing any special scheme of work that might be suggested.

During this first year the constitution of the Club took shape, and much care and time were spent over questions of government and procedure, particularly in regard to the admission of new members. The question of qualification was early taken in hand, but before any decision was arrived at members were of course admitted with little to show in the way of a walking or climbing record. In this respect, as time went on, it became necessary to insist on a certain standard of proficiency in candidates for admission. To this end, rules very stringent in their application were framed, and a fixed test was laid down as the gauge both of the physical capacities of applicants and of their interest in the

objects of the Club. It was held that the test demanded involved a great deal more than the mere covering the necessary ground, and that it followed that intending members who could pass it had done a considerable amount of work. The experience of the Committee, however, showed that the fixed qualification had two grave faults: firstly, it excluded those who had probably performed the necessary amount of hill-walking, but had kept no record of such expeditions as would meet the requirements of the rule; and, secondly, it was seen that some aspirants for membership might seek to gain entrance by purposely making an expedition which would enable them to comply with the strict letter of the law without satisfying its intention. Either of these objections was fatal to the spirit of the Club, and these rules were altered to their present form at the end of the first year. They allow the Committee plenty of latitude, but the necessity for a good record has always been upheld, and the tendency has ever been to raise the standard. The comparative slow growth of the Club is thus explained. It is not suggested that the qualification insisted on is so severe as to exclude many of those who are really wishful to join, but imperfect knowledge of the aims of the Club and the reasons for the existence of this excellent provision make a large number of desirable men hold aloof. The members now enjoy a closer friendship one with another, but there is no question that their usefulness as a body would be vastly increased were the Club numerically stronger.

A very important step was taken at one of the earliest meetings, when it was decided to ask certain members of the Alpine Club and others of eminence to join as honorary members. The valuable assistance given by these honorary members cannot be over-estimated, and to their good counsel and practical encouragement at all times is due much of the success of the Club. The first honorary member to be elected was Mr. Edward Whymper, who was soon followed by Mr. Wm. Cecil Slingsby and Mr. C. T. Dent.

All original members must have very pleasant recollections of the meetings held during the first year. Everything was in an experimental stage, and a good deal had to be done to get things into working order. Nevertheless, time was also found for the reading and discussion of papers—which used, by the way, to take place in a much more informal manner than nowadays. It is interesting to note that the districts treated of were then, as now, not all contained within the boundaries of Yorkshire, as no attempt was made to confine the scope of the Club within those limits. There is much to interest all lovers of Nature within our borders, but Yorkshiremen—like their Viking forefathers—are fond of extending their conquests in other lands.

The influence of the first session had a very appreciable effect in creating a greater desire for travel and knowledge, as was shown by the increased energy of the members in the succeeding summer. More of them went to Switzerland, for instance, and greater attention was paid to climbing in the Lake District, North Wales, and other mountainous parts of the British Isles. The shorter expeditions in Yorkshire multiplied exceedingly, and cave exploration was the object of more of them than had been the case hitherto. Club meets were also held, one at Hopper Lane, Blubberhouses—a moorland rendezvous between Harrogate and Ilkley, well known to most Yorkshire ramblers—at Christmas, 1892, the first time that members met as a body away from Leeds, and another at Ingleton in October, 1893. Summer meets have since been held with success at Settle, Skipton, Malham, Ribbleshead, and Burnsall.

The formation of a library was commenced in October, 1893, and little by little it has increased, until it is now a presentable and certainly valuable collection of books on travel, mountaineering, science, and history. This is almost entirely due to the generosity of members, as the expenses of management have always been too high for the Committee to set aside much money for this purpose.

At the first annual general meeting the Committee were able to present a satisfactory report of the first twelve months' work, and the Club entered on its second year as a sturdy infant, giving promise of a long and useful life. The election of officers resulted in Mr. Wm. Cecil Slingsby being elected President, Mr. Geo. T. Lowe and Mr. Lewis Moore, Vice-Presidents; Mr. Herbert Slater, Treasurer; Mr. H. H. Bellhouse, Secretary; and, as Committee, Messrs. S. W. Cuttriss, J. A. Green, Ralph Smith, J. W. Swithinbank, C. Scriven, R. N. Lister, and E. Hill.

The meetings of the second winter were of a more interesting character than those of the preceding session, and from the general tenor of the papers given it was easy to see in what direction the taste of the members was leading. They nearly all treated of mountaineering expeditions, and those which were entirely devoted to climbing secured the largest audiences.

Our first introduction to the public was made at the end of November, 1893, by the President, who, in the Philosophical Hall, to a crowded meeting, gave a lecture on "Rock Climbing and Snowcraft." Another public meeting was held in the following February in the same place, when Mr. Edward Whymper gave his lecture on the Andes. These two very successful meetings were the first of the series of public lectures, one of which has been given each winter, and it may not be out of place to mention the others by name here. In April, 1895, Mr. Hermann Woolley gave an account of his explorations in the Caucasus, and on February 4th, 1896, Mr. C. E. Mathews told "The Story of Mont Blanc." At the opening meeting of the following session, Mr. Chas. Pilkington read a paper on the Meije. On this occasion it was seen that the early part of the session was the best time to hold the big public meetings, and arrangements have since been made accordingly, both in the case of Mr. C. T. Dent's lecture on "Mountains," in 1897, and that of Dr. Norman Collie on the Canadian Rockies last November. The latter closes the list for the present.

Papers on other subjects than mountaineering have also been much appreciated, such as those on cave-hunting, camping, yachting, rowing, cycling, and other sports; also those on historical and antiquarian topics, and the sciences which can be studied in connection with the above pastimes—more particularly geology and botany. In this connection, too, it may be said that meetings have been held for other purposes than the reading of papers, and one of these deserves especial mention both for its novelty and usefulness, namely, the Exhibition of Alpine Equipment in January, 1895. Nearly every conceivable article which could be used in mountain travel was shown. The Club-room presented somewhat the appearance of a marine store, but that only gave point to the practical value of the exhibits.

Before leaving the question of the transactions of the Club, as touching its meetings, it is well to mention that originally one of the objects of the Club was to actively support the Commons Preservation Society. There has, nevertheless, always been a reluctance on the part of the members to take part in controversies of any kind, and any proceedings which might have led to litigation would have been extremely distasteful to them and quite foreign to the nature of the Club. While placing on record their appreciation of the objects of the Commons Preservation Society, and the hope that its good work may prosper, a resolution was passed at a special meeting in 1895 that the Club should no longer, as a body, bind itself to assist the society, and the rules were altered accordingly. This step may be said to have completed the formation of the Club as at present constituted.

The development and progress of the Club were exemplified in a concrete form in the beginning of 1897, when the present commodious and comfortable rooms at 10, Park Street, were taken. Here, in a central position, all but the largest meetings can conveniently be held, and the books and other property kept, where they are accessible at all times. Previously the meetings were held at the Victoria Hotel, where, in spite of all



that the management did to make us comfortable, practically few of our present advantages could be enjoyed.

There is abundant evidence that already the objects of the Club have been and continue to be fulfilled in a very large measure. Every year increasing numbers of the members have gone abroad, to Switzerland and Norway especially, and acquitted themselves well. Not in spite of this tendency, but rather as the result of it, our members have scoured the British hills as they never did before, particularly those most easily reached—in Scotland, the Lake Country, and North Wales. Every Christmas, Easter, and Whitsuntide, and in fact the year through, members are busy with all their talents. Parties, excepting for the Annual Meet, are never made up “officially,” but the many informal, not unlooked-for but not pre-arranged, gatherings at Wasdale, Pen-y-gwryd, and elsewhere add not a little to the pleasures and advantages of membership. Perhaps the most pleasing feature of all is the fact that our own Yorkshire fells are found to possess even greater charms than before, and that although other regions have in some respects superior attractions, here at our very doors is plenty of scope for the most energetic. True, it cannot be said that there is much rock-climbing on the grassy slopes of the Pennine Chain, and snow-work, except of a very elementary character, is, of course, out of the question. Of the latter, by the way, what little there is to be experienced south of the Border does not satisfy our members, some of whom occasionally take the liberty of invading the territory of the Scottish Mountaineering Club and the Cairngorm Club. No sort of permission has been asked or given for such an intrusion—the “open door” is taken for granted. The only time the Yorkshire hills have been deeply covered with snow since the Club was formed was early in 1896, when on some of the steeper slopes steps needed cutting here and there, and the novelty of a long glissade on Ingleborough could be experienced.

The short rock-climbs—and it must be confessed they *are* short—to be found on the slippery limestone

and the uncompromising millstone grit afford a certain amount of practice and enjoyment; such climbing as our hills afford, however, would remain unknown if it were not for the singular and inviting beauty of the country.

But the Yorkshire hills possess another great attraction for our members, namely, the vast system of caves in the carboniferous limestone, a large number of which remain yet unexplored. Here, in this almost inexhaustible field for the practice of “underground mountaineering” and scientific research, the Club is busily engaged. The manner in which the work of exploration has been carried on and the results achieved have already conferred distinction on the Club, no less than on the members who are its pioneers. The vigorous pursuit of this most fascinating sport, and the best use of our unique advantages, must always be one of the special features of the Yorkshire Ramblers' Club.

It is highly satisfactory to note that in all branches of work there has been a striking immunity from accidents. The Club started with thirteen members, it now numbers 61, nearly all of whom have practised what are by many more or less well informed people considered to be the most dangerous of sports, yet the personal injuries during that period have been fewer and more slight than those which a cricket or golf club might with reason have been expected to record. So much for the care evidently taken by everybody in all their doings. These remarks are made in no boastful spirit, but with the double object of giving such good fortune due recognition and warning afresh all members that previous freedom from mishaps should never lead them to forget or neglect the slightest precaution.

It has been impossible within the limit of this paper to do more than give a slight sketch of the events which have led up to the present position of the Club. To fill in the details would require many pages. The members have ever been active in carrying on the work of building

up the Club, and much could be written to the credit of every name on the roll. In this connection we acknowledge with much pleasure the assistance given by many members of the Alpine Club, who in a practical manner have shown their interest in our proceedings.

Thus, its objects having been effectively carried out, the Club has gained a status which at once justifies its formation and augurs well for its future.

On the hills, and in the fields, and underground, in sport and adventure, in the vast unexplored domains of science, and in historical research there is plenty of scope for its members, and they will doubtless see to it that the Club will continue to grow and prosper. Were any evidence required in support of this proposition it would be forthcoming in the publication of our journal, which is now begun under favourable auspices. Long may its pages be a record of useful work and a standing witness to the progress of the Yorkshire Ramblers' Club.

## THE NORTHERN PLAYGROUND OF EUROPE.

BY WM. CECIL SLINGSBY.

ONCE upon a time, a long, long while ago, soon after most of the world had been created, the Evil One wandered round and round, over land and sea, and when he saw that all was fair and beautiful, he became very spiteful and seized an immense mass of rock which he threw into the northern seas. It was so large that for many hundreds of miles it stood out of the waters with dark cliffs, sharp peaks, narrow ridges, and stony valleys—a terrible region, without one single blade of green grass or any sign of vegetation whatever.

Then, the good God looked down with pity upon the waste, and threw here and there a little of the good soil which, fortunately, still remained. This caused fertile valleys, dark forests, and green uplands to appear. Moreover, He commanded huge shoals of fish to come yearly to the far north, where the sea cliffs and crags were the wildest and most forbidding. Thus has man been enabled to dwell in peace, happiness, and plenty in this land which is now called Norway.

Whether this origin, which is told in an old saga in picturesque and glowing language, be the true version or not matters but little nowadays, but the fact remains that Norway is one of the most mountainous countries in the world, and is to-day recognised as being one of the most delightful of our Alpine playgrounds. True it is that, when represented in feet, the height of no peak requires the use of five figures. What of that? Does it matter? Not a halfpenny, in a country where in some cases continuous ice-falls of nearly 6,000 feet, and rock arêtes and faces of 5,000 feet, await the climbers who have the hardihood to tackle them.

Though, purely for lack of sufficiently good corroborative evidence, I will not ask you to believe in the legend that the Ark rested on Molden, a mountain near the head of the Sogne fjord, and not on Mount Ararat, it is undoubtedly true that the sport of mountaineering

was established at a very early age, as in "King Olaf Tryggvesson's Saga" in the "Heimskringla" we find the following:

"King Olaf was more expert in all exercises than any man in Norway whose memory is preserved to us in sagas, and he was stronger and more agile than most men, and many stories are written down about it. One is that he ascended the Smalsarhorn [Hornelen, or probably a spur of that grand sea cliff]. Another is that one of his followers had climbed up the peak after him, until he came to where he could neither get up nor down; but the king came to his help, climbed up to him, took him under his arm and bore him to the flat ground."\* When the Viking days were ended the spirit of active enterprise in great measure died out in Norway. Is it the case, though, that it ended elsewhere? "No," a thousand times "No." Is it not at least pleasing for us Northerners to believe that we derive the best of our blood and whatever hardihood and sturdiness of character we may possess from our Norsk ancestors, the Vikings of a thousand years ago? Is it to be wondered at that we, the members of the Yorkshire Ramblers' Club, should take as naturally to the fells as our forelders took to the fjelds? Is it not quite natural, too, that we should do much of the pioneer work in the mountains of Norway? Yes, nearly the whole of the mountain exploratory work left by Professors Keilhau and Boeck, Sir A. De Capell Brooke, Mr. Price, Mr. Everest, Mr. Forester, and Capt. Biddulph, early in the century, and by Herr Emanuel Mohn, Dr. Yngvar Nielsen in the sixties and early seventies, has fallen to the lot of the Northerners of Great Britain. First, we claim Professor Forbes, and can still point to his great work on Norway as one without a rival. Next, my old friend Lieut.-Col. Campbell, whose admirable book, "How to see Norway," should find a place in the library of every lover of Norway, is a Cumberland worthy.

\* As I have referred to this scene before I will not now enlarge upon it, but will merely refer my readers to the first number of "The Year Book of the Norwegian Club, 1896," where also the early history of mountaineering in Norway is treated at some length.

The later sons of the North who have visited Norway have not yet done much in the way of Alpine literature, but they have explored, they have climbed. Ah! you greedy Yorkshiremen, have you not yourselves skimmed off most of the thick cream, assisted now and then by men from the County Palatine? Of course you have. If you doubt it, search the records, go and see. One thing, however, you must not do. You must not come to the conclusion that no good new mountaineering work is left. There is abundance for him who has the mountaineer's eye. Is not that also the case in the Alps, too? As it is not now my business to say "Yes" or "No" to this I will be silent. As a proof that the spirit of enterprise has again entered in full measure into the breasts of the hardy Norskmen themselves, I need only write the name of the hero—Fridtjof Nansen.

"Go to Norway" is, however, the advice which your President still gives and takes, though now and then he turns southward. As he possesses a Scandinavian surname, and was born almost under the shadow of two Craven fells which still bear their original Norsk names, Kirkby Fell—Churchtown mountain, and Sharpah—the sharp-pointed hill, he could not help paying a visit to Norway at a comparatively early age. How can we, who from early childhood have delighted in Miss Martineau's "Feats on the Fjord," resist the call, "Come to Norway, come and see the land from whence your forelders sailed, come and see the weird grandeur of the Jotun Fjelde, the sublimity of the Justedal glaciers, the especial beauty of the peaks whose eerie forms are so clearly reflected on the placid surface of the Hjörund or Sokelv fjords, or of the Raftsund, of Lyngen or Ulfsfjords?" No, the call is irresistible; let us get our kit together and away across the North Sea to old Norway.

I will now endeavour to point out the several districts in Norway where good climbing is to be found, and will state their general characteristics, past and present, the special charm of each, and may be tempted now and then to name various mountains and passes

which were first ascended or crossed by Yorkshire or other north country men.

The district of the Jotun Fjelde or Jotunheim—the home of the Jotuns—as it is now generally called, containing, as it does, the highest mountains of Northern Europe, naturally possesses the greatest attractions which nowadays draw tourists from every country in Europe. It was, however, geographically unknown until the year 1820, when Professors Kielhau and Boeck made an adventurous journey through the heart of it, climbed the lovely peak Falke Næbbe—Falcon's beak—and attempted the ascents of Galdhøpiggen and Skagastølstind. Lieutenant Breton, an energetic Englishman, traversed the region in 1834, and during the same tour he would have ascended the Romsdalshorn, but could not get anyone to accompany him, not even the two adventurous natives who had made their famous ascent two years earlier. The first lady to cross this wild terrain was the sister of the present writer in the year 1875.\*

Jotunheim is best reached by way of Bergen and the Sognefjord through Aardal or Skjolden, and the excellent guide books of to-day give all the information which is required. It is a wild and romantic country, nearly 2,000 square miles in extent, consisting of rolling uplands, 3,500 feet and more above sea level, which in summer are covered with scant herbage and bright Alpine flowers, where large herds of wild reindeer are still to be found. It is the home of the bear, the lynx, and the glutton, and where the golden eagle still reigns supreme. Groups of fantastically-shaped mountains rise, in many cases with abrupt precipices, from the glens which intersect the country, and their rugged crests attain here and there a height of over 8,000 feet. The corries and the higher rolling uplands, too, hold glaciers, in some cases of large extent. Ice-paved "cirques," "culs-de-sac"—or "botner," as they are called in Norway—are common features. Glaciers often terminate in mountain tarns, into which they topple

\* "Den Norske Turist Forening's Aarbog," 1875, "An English lady in Jotunheim."



*Howard Prentiss, Photo.*

DYRLANGSTINDER AND SKAGASTØLSTIND, FROM MIDT MARADAL.



*Howard Prentiss, Photo.*

FARM OF NORDRE NES, SOGN.

blocks of ice, large and small, which float away in the bright sunshine as flotillas of little icebergs.

The presence of three large mountain lakes adds an especial charm to Jotunheim. Gjendin is well known as being the scene of "Three in Norway, by Two of Them;" and Bygdin and Tyin have an especial charm of their own. For many generations cattle-drovers have, in the early summer, driven large herds of cattle from the lowlands to graze on the luxuriant herbage which grows in many places on the shores of these Alpine lakes, and when they become fat, in September, they are driven to the Christiania market for winter consumption. These men often became reindeer hunters, and naturally they unravelled, bit by bit, the secrets of the wild glens, Leirungsdal, Svartdal, and other sanctuaries of the reindeer long before their very existence was known to the educated traveller.

Galdhöpigen, now universally recognised as the highest mountain in Norway, rises out of large snow-fields, with precipitous crags which are crowned, as all high mountains ought to be, by a lovely cone of snow, to a height of about 8,400 feet above sea level, and this range of the Ymes Fjeld, as it is picturesquely called, forms the northern boundary of Jotunheim. It is a noble range, and the outline of the several summits is singularly beautiful. As the ascent is easy, dozens of people make it yearly, and there is a comfortable hut with beds in it at a height of some 6,200 feet. Many persons cross it from Rödsheim to Spiterstul<sup>or</sup> *vice-versa*. At the latter place there is now a little inn where at least good victuals and beds may be obtained. In 1874, when I first visited it, and in 1875, when I stopped a night there with my sister after making the ascent of Glitretind—the second highest mountain in Norway, then first ascended by a lady—if I remember rightly, the cattle at this high sæter were milked in the room where we partook of our frugal meal.

Little does the modern mountaineer know of the wild free life on the fjeld which we enjoyed to the full in the seventies. Little does he know of the difficulties

and even dangers of wading across a glacier stream, perhaps only knee deep. Little, too, of the fun of crossing a river like the Utlea, on a horse, bareback, and holding on like grim death to the man in front of him; when at one time the horse's knees, nay, probably his fetlocks, may be clear of the water, whilst his tail is floating behind, and at the next moment his nose has to be held up high to prevent the water getting into his nostrils, while his hocks are clear behind. Ah! that is real fun, especially when you know all the time that your Norsk leader—who cannot swim a yard—has taken you purposely to the worst of the two fords in order to try your mettle.

I could write for hours about life at the sæters, where I have spent very many happy hours hearing hunters' yarns over the glowing birch logs, both in summer and winter. A sæter is a hut, or usually a collection of huts, each of which belongs to a farm in the lowlands, and, like the Swiss chalet, is built where some bright verdant patch appears when the winter's snow has been stolen away by the rays of the summer's sun. It is occupied, according to position, for two or three months, or in some cases for a shorter period, during the summer. The girls, who milk the cattle and goats and make cheese for winter consumption, have a hard time of it, and must pursue their calling however wet, wild, or cold the weather may be. In some cases they are ten or twelve hours distant from their farms below. If a bear should come and snatch up a favourite goat or a calf, as is often the case, the girls will run pluckily after the intruder if they see him, and will blow a horn, when bruin will drop his prize and bolt across the river, where he knows he will be safe. However, in most cases the bear will come during the short night hours, and probably get off before the fearless girls can get near him. Bears are very common in some parts of Jotunheim, and I have seen traces of them hundreds of times; indeed, I know several paths, very difficult to follow, which have been made by bruin, or "Herr Bamsen" as he is called in Norway. Enough about bears.

It is as well to know that in asking for food and a night's lodging at a sæter it is soliciting a favour. The girls will, without hesitation, almost always give up their bed, and sleep uncomfortably crowded together in another hut. They will give you the best fare they can. It may not suit everyone, but, for a time, it suits me. Indeed, in 1877 I spent a whole month reindeer stalking in this region without ever seeing a farmhouse, and many a good "rømmekolle"—a bowl of thick curds, and plate of "römmegröd"—cream porridge—have I partaken of in Jotunheim. On arrival at a sæter one should take off one's hat and bow to the "sæter jente" as to a princess. She may keep you waiting for an hour until she has finished milking before she can attend to your wants, but that is as it should be, and lessons on patience are very wholesome. A sæter bed, four feet wide, even if it be occupied by three reindeer hunters as well as yourself, does not pull very hard in the morning, and early rising resolves itself into simplicity itself; but at the same time, all the diplomatic powers of which the traveller is possessed must be brought into play if he wishes to get a cup of coffee or a little hot soup before his hostess has milked her kine. Until a night be passed at a sæter (for this one purpose alone a stone-built sæter with a mud floor is preferable) the English traveller in Norway can, I think, hardly appreciate at their full value the great powers of evil possessed by the creature whose saltatory attainments are proverbial. Never mind, it does a man a world of good to pass a few days and nights at a sæter and away from the lap of luxury.

However, nowadays it is much changed. Within a stone's-throw of some of the most uninviting sæters where, years ago, we were glad enough to crave the boon of a night's hospitality, luxurious log-built and boarded-floored Tourist Club huts, to all intents and purposes small inns, have been erected, and the climber of to-day who—this is between ourselves—does not show any startling originality in making his very numerous ascents, can climb every peak and cross every fine

glacier-pass in Jotunheim without either sleeping in a sæter, a tent, or at a bivouac, and what to some of us seems more astonishing still, can, during the whole time he is amongst the mountains, indulge in such unwonted luxuries as *pantekager med sylte löv*. Ah! now is the time for prose and plenty; formerly we had the poetry and the hunger. Fortunately, each condition represents much thorough enjoyment, and probably the balance is well adjusted.

Where was I? At Spiterstul. Strange it is though, as I have not been in Visdal since 1875.

Though Spiterstul is by no means a first-rate centre for making new expeditions—I will not say new mountains, as I fear that Yorkshiremen have long ago climbed the best of them—I will at haphazard indicate a few which I believe are not yet made. Heilstuguhö, by its north *arête*; each of the Uladalstinder, from the north; the regal Galdhöpig, from the south; Tværbotnhorn, from the south; kirkken, from the east; the traverse of the Memurutinder, from end to end. These would give the modern climbing centrist lots of sport.

From Leirdal, further west, Herr Hall, wisely making use of a modern hut, has met with much success. I have, on the contrary, met with defeat. With Store Björn almost within our grasp, and then unclimbed, Herr Mohn and I were driven away by a merciless snowstorm accompanied by a high wind, to wander as best we could over that grand glacier, the Smörstabbræ. The only peak in that range which I have climbed—and alone, too—was the northern one, on which I found the cairn of the Ordnance surveyors. I met with an awful gale on that occasion, and was forced to lie down until the gusts passed away. The views of Galdhöpiggen seen on that day through rifts in the clouds linger still, and always will linger, in my memory though now it is 23 years ago.

Let us hark away to Gjendin through Simle lullet. Ah! well do I remember that interesting but most difficult and futile stalk after a herd of reindeer which, with the exception of their sentinel, were sleeping on the snow

under that grand black rock; how I had to cut steps in the ice of a little frozen waterfall with my *tolle kniv*, how I crawled along the steep mountain side, inch by inch, hour after hour, up hill, down hill, over dry rocks or along wet, shallow gullies, with my rifle sometimes in front of me sometimes behind; how, when I had all but arrived within shot, I knocked down a tiny flat stone which only rolled ten or a dozen yards, and the alarm was given at once. It was a beautiful sight, well worth the hours of toil, and well worth the final disappointment too.

As we walk down to Gjendin, if early in September, let us not tread on those lovely blue Gentians or on the Soldanellas, with their delicately-fringed petals; let us rather, as Vigdal and I once did on returning from the ascent of Heilstuguhö, sit down for three-quarters of an hour and thoroughly enjoy the beauty of these Alpine gems, all wide open to catch the sunbeams.

When at Gjendin, row across those pale green waters and explore the fastnesses of those ice-paved cirques between Knutshultind and Leirungsdal, but do not scare away that lordly and solitary reindeer buck, whose own domain it is.

Let us pass on to lake Bygdin and look at the Torfinstinder. Veritable aiguilles they are. See them from the lake. See them again from Kalvaahögda. Note that little glacier calmly reposing in the lap of the mountain and the couloir which leads from it directly up to a dip in the ridge above. If you are a Yorkshireman you will surely be tempted to do something else next day. Having done that something, and having climbed the highest of the three Torfinstinder, you will, I hope, use your eyes well—I mean your mountaineer's eyes—for there is plenty for them to take in. Just opposite is Knutshultind, whose forbidding precipices I saw nimbly scaled by the rosy-checked Marie in 1881. See those two remarkable horns pointing to the sky beyond the lake, and a whole bevy of grand peaks, then descend direct to Nybod and a rattling good climb I can promise you it will be, but do not attempt to disturb the cyrie on

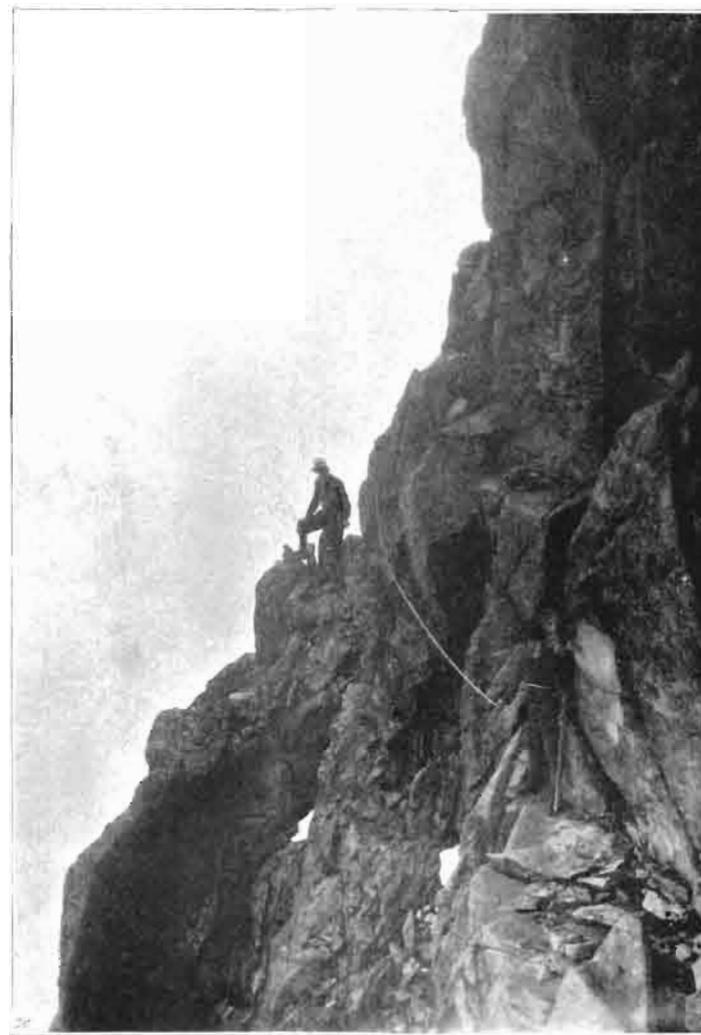
the way down, as if you do, those two noble eagles may do more than soar in grand circles round and round you as they did in our case in 1876.

Away to Eidsbod, the coldest-situated hut in all Norway. Take an evening stroll up Skineggen and happy will you be if you can see the spires of the distant Horungtinder, with the peerless Skagastölstind, gilded by the rays of the setting sun. You will see many of my old friends, you will almost see beyond lake Tyin with its little icebergs the place where I shot my first reindeer.

Away again to Skogadalsböen—the Watch Tower of Utladal—where now there is an excellent tourist hut, with three or four persons in charge of it. On the way you may traverse Uranaastind, and when on the summit can note the erratic behaviour of your compass, as within a radius of half a dozen yards it will point in three different directions; or you may climb Melkedals-tind, which has a habit of drawing a gauze veil over her lovely features when you most wish to admire them, and then, like a coy maiden, of peeping laughingly at you when you least expect it. You can descend from this peak by its western ridge, and thus score a new route.

If the weather be not good enough for high peaks you may take your journey from Bygdin through the Arctic solitudes of Morka Koldedal and thread your way over the ice floes of two of the tarns in this weird glen, and on emerging from it you will have what is probably the wildest view in all Norway, where, beyond a forest foreground, and across the deep gorge of the Utle, you will have the whole range of the Horungtinder and their steep glaciers face to face, a view once seen never to be forgotten.

At Skogadalsböen you are near the thrones of the gods, and, though you can barely see them, you are almost overshadowed by the Horungtinder, whose crowning glory is Skagastölstind. Until quite recent years this mountain was considered to be, not only the highest mountain in Norway, but also the highest in Europe north of the Alps.



*HOWARD FURBERMAN, 1900*

TRAVERSE ON SKAGASTÖLSTIND.



So far as is known, no peak in this range had been climbed and no glacier pass had been traversed until the year 1874, when the first passage of the Riiens Skar from Vetti to Optun was made by a party of four Englishmen, two of whom were Craven men. When we were seen emerging on the north side from the dark portals of the Riiensbræ by the good folk at Riiens sæter, we were supposed to be "Huldre folk," or elves, who live in the heart of the mountains, are enormously rich, and, amongst other possessions, are blessed with—tails. These, as a rule, are carefully hidden under their clothes, which usually are blue. Unfortunately, we did not know of this at the time, but I was told of it some years later. Ah! These delightful days of superstition are now no more, the people have become prosaic and prosperous. You may now do the wildest things you like in Jotunheim without exciting any other remark than "They are Englishmen, you know, and they are rather mad when they take a holiday." You may bathe in the tarn below Skagastólstind when there is a freezing wind and swim about amongst the tiny icebergs. You may encamp on the top of a peak, or sleep out on the crags of Ravn Skar in a snowstorm. You may be snowed up for a week in the winter in a sæter. Nothing now surprises them.

So far, fortunately, the credit of Englishmen stands high in Jotunheim. May this always be the case here! I am sorry to say, however, that on the western coast I have often had cause to feel ashamed of my countrymen, and have seen cases where men, who at home are probably decent, law-abiding citizens, behave rudely towards gentle and refined Norsk ladies. This has often annoyed me, and I have frequently spoken very strongly about it. The fair name of England should never be sullied by any act of meanness or discourtesy on the part of any of her sons. It is perhaps only fair to say that I have seen still greater acts of rudeness shown by other foreigners travelling in Norway.

What a wealth of pleasant recollections linger in my memory of adventures met with in the Horungtinder

region! How, on one bright cold winter's day, Sulheim and I crossed the frozen Ulla, rifles in hand and revenge in our breasts, how we determined to slay that wicked bear which had so recently killed his fatted calf, and had carried it up to the cave on that rock-ledge so far up the mountain side; how we kicked out our way in the hard snow, step by step, hour after hour; how excited we were when going side by side, we peered, rifles in front of us and knives unsheathed, cautiously and noiselessly over the snow wreath at the top! What a strange mixture of feelings we had when we found that, though the bones of the calf were there, bruin himself was away! Disappointment? Yes. Relief? Yes, undoubtedly. The top of a snow slope of 45° is a gruesome place in which to meet a bear.

Shall I tell you of other bear hunts in Utladal; how we found the carcass of a reindeer buried by bruin in a moorland bog, as a dog buries a bone in a garden, how we tracked the king of this valley to its most contracted portion, and ascertained without a doubt that he had swum across those awful rapids? Shall I describe to you the weird beauty of the Vetti's fos frozen from top to bottom, a gigantic icicle of 1,100 feet in height? No, I think not.

The Horungtinder owe much of their especial grandeur to the fact that the Ulla river has carved out of the rocks just below them, during countless ages, the deep ravine of Utladal, probably the wildest gorge in Norway. The three Maradaler and Afdal, which valleys drain the range on the south, all tumble their rivers into the Ulla with high waterfalls. Each of these valleys possesses the grandest Alpine scenery, and is headed by really glorious mountains of the aiguille character.

The portion of the Utladal from Vormelid upwards is so completely cut off from the Aardal into which the river Ulla flows, that all the sæters in it belong to the valley of Fortun on the north side of the range, and the cattle have in consequence to be driven over the high Keiser pass. Years ago the frozen corpse of a person who died at Vormelid was tied on horseback and

led over this pass to its last resting-place in the kirkyard at Fortun.

There is much I could tell about Utladal, and still more about its adjacent mountains, north, south, and east, much too about its people. Sad it is to think that old Jens Klingenberg of Aardal has now passed away. With the solitary exception of Thorgeir Sulheim, who has inherited his great pluck from his ancestor, King Harald Fair-Hair, Jens was the only man among the natives who believed that Skagastölstind would some day be ascended.

I must, however, say no more about this, the most fascinating district in all Norway. I will merely advise my readers to take the first opportunity which may present itself to pay a visit to Turtegrö—the Riffelhaus of Norway—from which place or from Skogadalsböen every fine peak in the Horungtinder can now be climbed in great comfort.

It is surely now high time that I should say something about the other delightful mountain playgrounds in Norway. It must, however, be very little.

As is now well known, the Justedalsbræ is by far the largest snowfield in continental Europe, and several of the glacier arms which descend from it so precipitously, especially towards the west, show wilder ice scenery than can be met with anywhere in the Alps, even upon Mont Blanc. In early days various passes were frequently traversed by the peasantry, but by degrees most of them were abandoned and the routes themselves were forgotten. The shrinkage of the glaciers early in this century, and the diversion of the traffic from the bagmen's backs to the fjord steamers principally contributed to this change. During the last twenty years, north country Englishmen have by degrees re-opened every one of these routes, some of which are still remembered by old dalesmen, and have also added a large number of new passes to the list, some are useful, others perhaps ornamental, but many, including several made by myself, can neither be called useful nor ornamental. At any rate, let us call them "sporting routes." The first old re-opened route was

made by Mr. Trotter and Ole Rödsheim from Krondal on the east to Loen, by way of the Kvandalsbræ. The last, a very beautiful, as well as a new pass, was made by Mr. Cyril Todd, Mikkel Mundal, and myself; this was from the Austerdalsbræ over to the Melkevoldsbræ in Oldendal. Both of these passes are very useful, and have since been frequently crossed. As I have so often written about the grandeur of the snowy solitudes of the Justedal, I will only say that, nowadays, good accommodation and decent food can be had in numerous places on all sides of the snowfield—the reverse of what was the case even a dozen years ago, and that fairly reliable guides—though not quite masters in snow craft—can be obtained. When writing about the Justedalsbræ, which probably I know now better than any other living man, I feel that unless I draw attention to the dangers which may be incurred on the snowfield, which, though not always apparent, are nevertheless very real, I should be courting a very grave responsibility. At the risk, therefore, of being considered an unnecessary alarmist, I insert in this Journal by the courtesy of the Editor some words of warning which I wrote a couple of years ago for “Beyer’s Weekly News” under the heading of “The Justedalsbræ: A Warning.”

Another interesting glacier region, The Aalfotenbræ, at the mouth of the Nord Fjord, was quite unknown until it was visited a few years ago by Mr. Chas Hopkinson and myself.† Since then, Herr Bing has spent a few days, and nights too, on this high range, when he made the ascent of a strangely-shaped little aiguille, which we left severely alone. Messrs. Bill and Congreve have also traversed this snowfield, but it is by no means exhausted, and any climber who goes there prepared to put up with rough fare and bad maps will be well repaid. Bears are very common above and below the snow-line, and red deer in the sub-alpine regions. Several tarns, quite arctic in character, will be found, and the colour of their waters is superb. The rocks are conglomerate, consisting of large and small smoothly-polished red

† “Alpine Journal,” Vol. XIV., p. 380.

and white boulders, stratified and terraced like a huge staircase of some fourteen steps, whose back support has given way: a comical formation when seen on a large scale.

The Söndmøre mountains which overshadow the Hjörund and Sökkelv fjords are indeed delightful, and until they were explored by Herr Mohn and myself in the year 1876 when the first ascent of Kjölaastind or the Gluggentind was made, they were practically unknown. Published records show two additional first ascents of Gluggentind, both since our visit; a fourth is awaited with interest. It is a lovely mountain and much the finest west of the Hjörund fjord. The graceful Slogen undoubtedly is the most beautiful peak on the east of the same fjord.

There are many other mountains very much like glorified Coolins in Skye which have narrow arêtes leading to sharp peaks and the bluest of blue glaciers in their corries.

There are still some grand new expeditions to be made there by men who know how to find them. Go and see if this be not correct.

Little do the climbers of to-day, who now revel in the fleshpots of Söndmøre, realise how often we mountain explorers of twenty years ago longed for a good square meal and clean beds. Bjerke—bonny Bjerke, Sökkelven, and Standal are always associated in my mind with hunger. Söndmøre is in many respects the most romantic region of Norway, and the inhabitants, the descendants of the Scotch folk who re-peopled it after (with one solitary exception, it was completely depopulated by the Black Death in the fourteenth century) are still delightfully superstitious. Long may they so continue.

To climbers who wish to visit this district I recommend most strongly that they should obtain “Söndmøre,” by “K. Randers,” which is a most excellent guide book in every respect.†

In the Romsdal Province here and there excellent climbing can be had. The old Horn itself is by no

† “Alpine Journal” for Feb., 1899.

means yet exhausted, and there is new work to be done in many places. I think, however, that it is now full time to abandon the making of so-called new routes up Mjölñir, unless a little more originality be manifested than has recently been the case.

Why does no one go to the north and west sides of Snehattan; why not also to the ancient Kingdom of Nordmöre? Who can tell?

For many years it has been well known that most excellent climbing could be obtained within the arctic circle, between latitude 66 and 70. This was abundantly proved to be the case in 1897, by Messrs. Priestman, Woolley, and Hastings, and again in 1898, by Mrs. Main and her Swiss guides, as well as by Messrs. Hastings, Haskett-Smith, and myself.† All I will now say about this is that in the far north nature has fully developed her wildest and most eerie forms, and that I for one felt repaid a hundredfold for having made the eight days' journey to the glorious promontory of Lyngen.

Little now remains for me to add to this very sketchy paper, except to suggest to my readers that the best thing they can do is to set to work this very summer to fill in the details, and to insert the results in future numbers of this Journal, and as I began my paper with "Once upon a time," I must certainly bring it to a close in the same classical style by asking those who are unmarried, to become enamoured without further delay, of a fair maid or a doughty swain, or if the inclination lies in another direction, let her or him become wedded to some grand northern mountain. At any rate they must be

"Married and live happily ever afterwards."

† "Alpine Journal" for May, 1899.

## THE JUSTEDALSBRÆ: A WARNING.

BY WM. CECIL SLINGSBY.

(Reprinted from "Beyer's Weekly News," 1897.)

EACH summer as it comes round sees a large increase in the number of—shall I say—tourists or mountaineers? who cross this, the greatest snowfield in Europe, and the demand for guides who possess a good knowledge of snow craft, that highest branch of the art of mountaineering, is, I fear, considerably in excess of the supply. Hence, through inexperience, there is a growing tendency to underrate and indeed occasionally to ignore entirely the dangers which are inseparably connected with a trudge over a snow-covered glacier. Under these conditions it is surely advisable that at least one tourist in each party should possess some little elementary mountaineering knowledge suitable for the occasion.

Briefly, the following points should be borne in mind:—

1. That crevasses of some sort are present everywhere on a glacier, whether visible or not.
2. The real dangers begin when the hard ice is exchanged for snow.
3. Generally, the direction of the crevasses is across the snow basin or valley, except at the sides, where the friction of the rocks, acting against the advance of the glacier, breaks up the continuity of the crevasses and causes a chaos, either visible or invisible.
4. It is safer to go straight up or down a snow-covered glacier and across the crevasses than across the glacier and along the line of the crevasses.
5. Three persons form the smallest party which can with safety traverse the upper snows.
6. A good strong rope, not a piece of window cord or a clothes' line, must always be used, each person must be firmly tied round the waist, and under no circumstances whatever must it be considered sufficient for the leader or any other member of the party merely to hold the rope in his hand without being tied fast to the others.
7. The rope must at all times be held taut, but not tight.

8. The snowy domes and more especially the snowy ridges or back bones, consist, if the snow be deep, of a chaotic mass of more or less rectangular masses of *névé* formed by there being pulls in three different directions, one down or along the ridge in the general direction in which the two adjoining glaciers are moving, and one each towards the centre of these glaciers.
9. These huge cubes of snow are rarely visible before August and not always then. They are, however, always present.
10. Another form of danger, to which I have often drawn attention, occasionally exists towards the end of the summer after a long unbroken spell of fine sunny weather, especially if it be in a year of little snow. I refer to the overhanging eaves or lips of crevasses which I have known to project 25 to 30 feet over crevasses which are, to all intents and purposes, unfathomable, and yet, strange to say, they could not be detected by any hollows on the surface of the *névé*, but could only be seen in profile. These long eaves are never seen in the Alps, and, fortunately, but rarely in Norway. They face, generally speaking, the south, and are formed by the melting of one of the walls of the crevasse by the rays of the sun, which shines in the higher latitude of Norway much more horizontally than is the case in Switzerland. When these eaves are present the very greatest care is necessary in order to circumvent them safely, and, very often, "a strategic movement to the rear" would be a wise course to pursue.
11. What is a pure uncrevassed snowfield with unbroken and subtle lines in June or in the first half of July, may in August be a maze of hungry-looking crevasses and well nigh impassable. An easy route in July one year may be impracticable 365 days later.
12. Never go up or down a gully where you have reason to believe that ice, snow, rocks, or stones are accustomed to fall. There is not much difference in the damage which can be done to a man's skull by a small stone falling on it from a height of 400 or 500 feet or by a bullet shot out of a rifle.
13. Never go on steep snow or ice without having proper nails in your boots. Many a Norskman has come to grief for want of nails. Take an ice-axe too.

14. Always have a map and compass with you. The maps are not perfect, but are better than none at all.
15. Remember that the west side of the Justedalsbræ is, as a rule, much steeper than the eastern side, and that there are, on the former, comparatively few places where it is possible to descend.
16. The snowy solitudes of this weird glacier-region are terrible in driving snow and mist, and should only be visited in fine weather.
17. Warm gloves and goggles (snow spectacles) should always be taken when making a pass over the Justedalsbræ. The changes of temperature may be very sudden and the variation extreme.
18. Whatever your guides may say to the contrary, it is better to start an hour too early than an hour too late.
19. If the pass be long, go fairly slowly, but keep at it, and do not spend more than 20 minutes over each of your first two meals.
20. Do not take a long glissade unless you see a clear way *on snow* the whole way to the bottom of the slope. A dark patch on the snow near the bottom means ice.
21. When descending steep rocks, snow, or ice let the best climber go last, if he has nails in his boots. If he has no nails, put him in the middle, no matter what amount of experience he has had. A man with nails in his boots must always be at each end of the rope.
22. Never relax care and vigilance, however easy the place may be, as accidents usually happen when least expected.
23. Avoid ice-glazed rocks whenever it is possible to do so.
24. At all times the upper snow fields must be treated with the greatest respect, as their dangers are more real than those on the bare ice below, because, in the one case they are hidden, and in the other they are so very apparent that it is hardly necessary to call attention to them.
25. Drink no aquavitæ or cognac until you have finished your day's work, and, if by chance you are benighted, avoid both like poison.
26. Take plenty to eat and to drink. The pass may take longer to cross than you expect.

The notes are of course not written for experienced mountaineers, but rather for the benefit of the many strong and active young men and girls whose love of adventure naturally tempts them at their first opportunity to leave the ease and luxury of the valleys for the joys of the mountains, and who would, if at Zermatt, engage at once a couple of guides and run a tilt at the Matterhorn, usually of course with perfect safety.

Whilst writing about the Justedalsbræ, I take the opportunity of drawing attention to the strange fact that though, owing to the papers written by Herr Bing and myself, the Austerdalsbræ is now much visited, yet the superb Langedalsbræ—still more easy of access—is quite neglected since the time when it was visited and also photographed by Monsieur C. de Seue, who in his excellent but little known work, “Le névé de Justedal et ses glaciers,” page 13, says:—

“Le glacier de Langedal occupant le fond de la vallée de Veitestrand est formé par la conjonction de quatre glaciers, dont deux viennent du côté O. — — — — Ce glacier présente peut-être l'aspect le plus grandiose et le plus magnifique des régions glaciaires, que notre pays puisse offrir à la vue . . . .”

Who will go to verify these statements, made 30 years ago by the gallant Frenchman, who was at that time attached to the university at Christiania?

I think that now only three glaciers join together to form the Langedalsbræ, but am not sure, as I have only seen them from above. It is, however, well worth an exploration in detail.

DENTS DES BOUQUETINS.  
CENTRAL PEAK BY THE E. FACE.

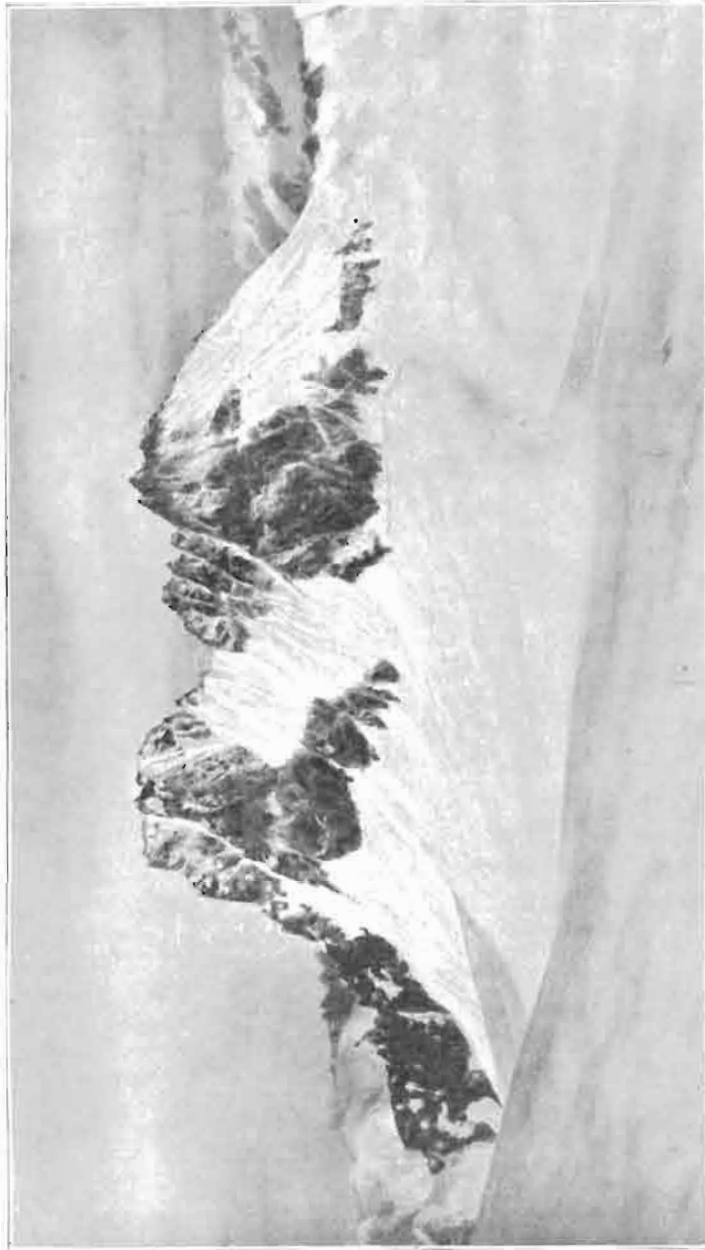
BY THE REV. L. S. CALVERT.

"THIS wall of peaks may be conveniently divided into three parts," remarks the Climbers' Guide!

Somehow this division of things material seems not unfamiliar. A vision of dreamy repose on a warm Sunday afternoon rises before us when we recall early days. Feelings of an opposite nature occur when the triple division of Gaul was explained *sub ferula*. But to business! Our party, that is the climbing section, at Arolla may also be conveniently divided into three parts, of which, so far as this expedition is concerned, two remained at the base of operations, the third being despatched to feel the enemy's pulse.

It was the summer of 1897. Loyalty at home in the air: everywhere and everybody *en fête*. A week's volunteer camp in Scarborough prior to starting for the Alps had put the coping stone on to the patriotic edifice. We had entertained the Colonial troops right royally; battalion had vied with battalion in honouring the occasion. But alas! Nemesis came, the fly in the pot of ointment, to all these rejoicings. Paucity of breath was the obvious penalty for indiscretion, of which truth the first climb gave internal evidence. There was no chamois-like skipping over boulders and moraine, it was puff and dart to the first stream handy. An unsympathetic allusion to this physical infirmity was, in the end, responsible for the subject of the present paper.

Ten days on the Arolla peaks improved matters, then there came heavy snow. The Za, Mont Collon, and other surrounding peaks were clad in the garb of innocence—part of which, later in the day, the sun cleared off. Tubby, one of the three men on a rope, had damaged his ankle two days previously on the central peak of the Aiguilles Rouges, Withers had only recently come out and desired a few days' more training,



TO THE  
EAST

NORTHERN GROUP  
(12,412')

CENTRAL GROUP  
(11,665')

TO THE  
WEST

DENTS DES BOUQUETINS FROM THE N.E.

TO THE  
WEST

so it was arranged for me to take the guides an expedition. The atmosphere and surroundings of the guides' room were thought to be detrimental to the *morale* of our two men, Adolphe Andenmatten and Elias Burgener, of Saas. The self-abnegation of the two aforesaid was touching and obvious. The next thing was to decide upon the peak.

Suggestions were discarded. In the smoke-room was kept a wonderful manuscript guide-book of the district by Mr. Larden. In looking through this my eye caught a foot-note by someone who had made an ascent as follows:—"I think this the most difficult of the excursions from here." There was an element of attraction in these words which induced me to read the description. It was an ascent of the middle peak of the Dents des Bouquetins. Every man gets his chance some time—here was mine to wipe out the slur on camp life in general. Dents des Bouquetins it shall be. The guides were interviewed, and fell at once to the proposal; the other two were not so sanguine. So far good. After dinner, details were discussed, and here the enervating atmosphere of the guides' room was apparent. Adolphe and Elias were less keen, not to say doubtful, of success. The Arolla guides, for some reason, had assured them it could not be done on account of the fresh snow, but an appeal to their *amour propre* had the desired effect, and provisioning then took place.

The summons came at 1 a.m., and going into the dining room I found five other men bent on storming the Aiguilles Rouges—Messrs. Compton, Collier, Valentine-Richards, Brushfield, and Owen. There was a good deal of pleasant chaff about sportsman-like attempts when my little plan was unfolded; it was asserted that one man and two guides could go anywhere, and replied to that two men and two guides could go nowhere. Good fellows all of them, and with the true *bonhomie* of the mountains—and there is nothing like it. The merry party, with whispered *bon voyage*, stepped out into the moonlight—they up the mountain for the Rouges, we down to the

moraine by the side of the Arolla glacier *en route* for the Col de Bertol and the Bouquetins.

In order to warm the proceedings up a little, I asked the usual "What do you think of the weather?" Oh! it was going to be bad. It being about the most faultlessly perfect morning it has been my lot to experience, this reply indicated that the mercury in the guides' barometer needed raising—raised accordingly. Little by little the depressing influence of the *salle des guides* was evaporating like a mist before the November sun. Allusions to the reputation of Saas Thal men tore away any latent shreds of doubt, and as the moon began to wane and the day to spring, life came to the party and all looked hopeful. But an hour before, as I looked back at the Kurhaus nestling in the pines, bathed in moonlight, and thought of my sleeping companions snugly tucked up under its roof, "O! terque quaterque beati," I exclaimed.

Now that is all over—the pace improves—it is distinctly warm. I am carrying a camera. Adolphe says either leave the *machinen* or peak. In a spirit of conciliation the *machinen* is temporarily entombed. The steep zig-zag towards the foot of the Col seems easier in the early morning, and we are at the bottom of the moraine in no time. Here five minutes must be spent in gazing on the most glorious of morning effects, almost unearthly in its beauty. The moon was just about full, a cloudless sky, the morning star itself like a moon. The great white Collon, the Pigne, and all the glorious array to left and right were bathed in the soft, sheeny, mysterious light which one can see but not describe. Then, silently, imperceptibly, a deep violet colour steals over the sky which shades off to purple, a blush rose light strikes Mont Collon, and passes over the circle of mountains, then a golden flash and day has come.

Pounding away up the slopes of the Col de Bertol—which the weather of the two previous days had made very bad going, the crust being not strong enough to bear—with much floundering we reached



the Col at 5.55. A few minutes to explore and we started across the long snow-fields to the right. This snow was perfect; hard and sparkling in the brilliant sunshine like a field covered with diamonds. Passing round the north peak, the pace still improving in the warm sunshine, we came to a point at the foot of the eastern face which was immediately below what appeared to be the highest peak, and facing midway between the Dent Blanche and the Matterhorn.

Here we unlimber on the snow, and get the breakfast ready—not quite a banquet, but selected for the special tastes of the three by Tubby, that prince of caterers. How I wish he were here! There is all the pleasurable uncertainty of the unknown, and we discuss possible routes between mouthfuls. Which is the highest peak? We are too near to decide the point; all look high enough to satisfy the greatest climbing gourmand.

Adolphe suddenly lights up after exploring fore and aft for a short time. "There is the Spitze," he says, "and we can do it—straight up here." Waistcoats, sacks, provisions, and all impedimenta are left on the snow. The rope is adjusted and the storming begins. Past a hanging glacier on the right, across a narrow steep couloir, where the fresh snow when disturbed comes hissing down, then bearing to the right until the Matterhorn was immediately in the rear, Adolphe led straight up the face to—what appeared from below—the true summit. No hesitation now—the instinct of the guide was unerring—the god of the mountains revealed. There was good foot and hand hold; for two hours and a half it was real climbing, and we gained the top at 9.30, only to find it was *not* the top, and separated from us by a deep depression rose the real central peak. "We are done, Adolphe," I said. "Oh, nein!" he exclaimed, and letting me down part of the tower we all got safely to the bottom and commenced the final ascent. This was not so easy, as the rocks sloped the wrong way; but with this exception, and a little trouble from the fresh snow, there was no serious difficulty, and at 9.50 we stood on the highest peak of the Bouquetins.



*G. R. Williamson, Photo.*

SUMMIT (CENTRAL PEAK), FROM THE N.



*G. R. Williamson, Photo.*

NORTH PEAK OF CENTRAL GROUP, FROM GAP BELOW SUMMIT.

DENTS DES BOUQUETINS.

Who shall describe that glorious forty minutes? Where are the forebodings of the Arolla men, now? Bravo, Saas Thal! Bravo, my two good men! Elias produces the flask of whisky; the Queen's health is drunk, and the route christened the Jubilee route. One pipe each as we bask in the sunshine and gaze on the scene too magnificent for words, for are we not in the very centre of all the well-known Alpine giants? The S. Peak, first ascended by Mr. Slingsby, our President, lies below us, the N. Peak behind, and just a few clouds to enhance the effect. A strip of paper with the three names is enclosed, and all-reluctantly the descent is commenced at 10.30. What need to dwell on the return? There was a good deal of "Sind Sie fest?" "Warten Sie," and involuntary glissades, but no mistakes until the bivouac was reached at 12.50. The fragments were consumed, and a bottle of claret which had been warmed in the sun. A comely sardine, left as a *bon bouche*, was unfortunately not improved by the sun; a hasty inquest was held upon him, and he was buried in the snow. If you seek his monument, look around. We "took up our carriages," raced back to the Col de Bertol, disinterred the *machinen*, and reached the hotel at 4.30. Needless to say the two small photographs which are here given are not mine. I am indebted to my friend, Mr. O. K. Williamson, who made the Bouquetins last August, for his kindness in lending them.

So ends my story of a day never more perfect and never more enjoyed, and never was expedition better led than by my two well-tried friends from Saas Grund.

## MOUNTAINEERING WITHOUT GUIDES.

[The conclusion of a Lecture to the Yorkshire Ramblers' Club, given on Oct. 27th, 1896, in the Philosophical Hall, Leeds, by Mr. CHARLES PILKINGTON, Late President of the Alpine Club.]

I BELIEVE climbing without guides in the High Alps to be the finest form of a noble sport, and that Yorkshiremen are sure to be found in the front rank of amateur mountaineers. I would not persuade you, even if I could, to abandon all thought of climbing without professional assistance, but I wish you all to recognise the dangers that may be encountered, and to prepare yourselves to meet them before undertaking difficult expeditions above the snow line.

At the present time there are many Englishmen who successfully attack the High Alps on their own account, and the movement is no longer an experiment; its future success depends on the younger generation.

The older mountaineers who first successfully practised it worked for a long time amongst our own hills, and then gradually feeling their way amongst the snowy peaks—first with, and then without guides—slowly qualified themselves to lead, or descend last, on the more difficult expeditions, or, if without much home experience, had at any rate climbed for years with the best ice-men in the world.

Nowadays there is a rush to reach the end without touching the middle stages of the journey, and there are many athletic young men who are first-rate rock-climbers and walkers, whose enthusiastic ardour it seems difficult to control. They know that most mountains are comparatively easy and safe in good weather for any man who has experienced companions and a good head and legs, and forget that this is no reason why inexperienced young fellows of twenty or twenty-one years of age should organise and lead expeditions on Alpine peaks.

I have been told that there is a small school of scramblers who think that the ordinary Oberland guide and the middle-aged member of the Alpine Club are more or less fossils, and mountaineering now is very different from what it was ten years ago. But the mountains remain the same—stern and unchanging; and those who approach them without due reverence will sooner or later suffer for their presumption. One unfortunate side of the question is that these young men are endowed with those very qualities which, if united with modesty and under proper direction, would place them in the front rank of mountaineers.

It must be remembered that almost any snow mountain may become dangerous in half-an-hour, sometimes even in a few minutes. And it is to guard against and combat these sudden and unexpected perils that so much care, skill, and experience is required to ensure the safety of the expeditions under adverse circumstances. The precautions to be taken, the dangers to be avoided, and the equipment required, are subjects that you can read up for yourselves; but in actual work, the situations develop so rapidly, are so varied and numerous, and the action required must sometimes be instantaneous and always prompt, that no mere knowledge is any safeguard unless made available for instant use by practice and familiarity.

A fair knowledge of rock-work can be gained amongst our own hills, but this is not enough, for most Alpine accidents happen on ice or snow, or through the effect of the weather on ice-covered rocks, and it is to the ice-man that a party has generally to look in time of doubt and danger. I have seen a brilliant and experienced cragsman useless and helpless on an easy ice-fall; and it is a well-known fact that many of the eastern guides, splendid rock-climbers and chamois-hunters though they may be, are often nervous and sometimes dangerous companions on difficult ice, for snow-craft learnt on rocky peaks, or in only one or two years, even in the best climbing centres, is very imperfect and may only lead to rashness.

I therefore say, emphatically, as my most carefully considered opinion, based on an experience of twenty-five years of Alpine work, and after consulting men of equal and some of longer experience, that *no* man, however experienced in British hill work, should climb the High Alps without guides, unless he has had at least four years' experience of ice and snow, and has a companion of longer experience with him on the expedition.

In climbing without guides, it is most important to make up your party before you start for the tour; and it is better that it should consist of four men, so that in case of a slight accident or indisposition of one, there are still three left for the next expedition. Should you unfortunately want another man to make up the party to the required number for safety, do not pick up a stranger of whose powers you know nothing; rather take a guide or a porter, and do the work yourselves.

When you are amongst the mountains take notice of everything around you, whether at your bivouac or on the march; whether you are leading or not, and with whomsoever you are climbing; and thus learn to form your own opinion, so that you may be able to take command and act when the occasion arises. And assuredly it will arise some time or another, whether you are climbing with or without guides; for guides themselves are not infallible, and are not all by any means in the first rank.

Therefore have the patience to learn your work thoroughly before putting it into practice and staking valuable lives on the result; and by the use of every precaution, and by perfecting yourselves, slowly and surely, in every practical detail of the mountaineering art, may you, the younger generation, who are now taking our places and our work, jealously and successfully guard the character and reputation of the sport we love so well.

## A NEW MOUNTAIN ANEROID BAROMETER.

(Reprinted from "*The Times*," Dec. 17th, 1898. CORRECTED.)

29, LUDGATE HILL, LONDON, December 9th, 1898.

SIR,

Mr. Murray published in 1891 a pamphlet ["How to use the Aneroid Barometer," 8vo., pp 61, John Murray, Albemarle St., London], which gave some of the results that had been obtained from numerous comparisons of the Aneroid against the Mercurial Barometer, made by me between the years 1879 and 1890. The earlier of these comparisons were made out of doors up to a height exceeding 20,000 feet; and the later ones were made in the workshop down to a pressure of 14 inches, which is about what one may expect to experience at the height of 20,770 feet above the sea.

These comparisons, or experiments, brought out certain facts. It was found that all aneroids which were tested, upon being submitted to diminution in atmospheric pressure, lost upon the mercurial barometer. It was found, if an aneroid was placed under the receiver of an air-pump (having a mercurial barometer attached, in such a way that one could cause simultaneous reduction in pressure for both barometers), that, although the aneroid might for a moment read truly against the mercurial when pressure was reduced, say, to 20 inches, it would in a very short time read *lower* than it. It was found that this loss augmented constantly, and that in a single day, under a constant pressure of 20 inches, it might grow to half an inch and even more; and that the loss always continued to augment for several weeks, sometimes so long as seven or eight weeks. The lower the pressure, and the greater the length of time the diminution in pressure was experienced, the greater was the loss in any individual aneroid.

It was found also that aneroids commenced to recover this loss immediately pressure was restored; no matter whether it was restored entirely and suddenly, or grad-

ually and partially, as it is when a traveller is coming down-hill; and that in course of time after return to the level of the sea (or if kept artificially at a pressure of 30 inches or thereabouts) an aneroid might recover all its previous loss, even although it might have experienced very low pressures, and been kept at such pressures for months at a time. Hence, in consequence of the *loss*, Travellers or Surveyors may be led to very much exaggerate their altitudes (unless they carry some standard for comparison which will enable them to determine the errors of their aneroids on the spot); and in consequence of the *recovery* they may be led to believe, on return to the level of the sea, that their aneroids have been working well and truly, although they may have, as a matter of fact, been doing quite the reverse.

The publication of these results led to improvements in the manufacture of the aneroid, and *some* instruments of the best class which have been constructed in late years show a distinct advance in accuracy; but it is clear, from references which have been made quite recently by Travellers to their aneroids, that there are *others* which are still a long way from perfection. Mr. E. A. Fitzgerald, for example, says in the "Geographical Journal," Nov., 1897, "Our aneroids played us some very curious tricks. One of them, on being taken to the height of 19,000 feet, registered 12 inches"—that is to say, it indicated an altitude of about 25,000 feet, and was about 30 per cent. in error. This is several degrees worse than the behaviour of the instrument which was employed by Mr. J. Thomson during his journey in Morocco in 1888, though even *his* aneroid is said to have made his life a burden to him. One can well believe it did all that was imputed to it; for after Mr. Thomson's return, when it was tested under the air pump at a pressure corresponding to a little lower than the height of Mont Blanc, upon being kept a week at that pressure, it acquired an error of—1.267 inch, the value of which amount, at the altitude in question, exceeds 2,000 feet.

Manufacturers have endeavoured to tackle the difficulty in one way, and inventors have approached it in another. The former have attempted to abolish the fundamental cause of error, and the latter see that aneroids can be rendered of greater service in the measurement of altitudes by shortening the length of time that they need be exposed to the influence of the atmosphere. The most recent experimental aneroid which has been constructed with this view is the invention of Col. H. Watkin, C.B., Chief Inspector of Position-Finding in the War Department.

In introducing it, Col. Watkin said in effect, though not in these words, "You point out that all aneroids lose upon the mercurial barometer when submitted to a diminution of pressure; that this loss is large when pressure is much diminished; and that the loss continued to augment for several weeks. It is, you say, apparent that the *extent* of the loss which will occur in any aneroid upon the mercurial barometer on being submitted to a diminution in pressure depends (1) upon the duration of time it may be submitted to diminished pressure, and (2) upon the amount of the diminution in pressure; and that it follows that the errors which will be manifested by any particular aneroid will be greatest when it is submitted to very low pressures for long periods. Accepting this as a correct statement of facts, I propose to construct an aneroid barometer that can be put in action when required, and 'put out of gear' or 'thrown out of action' when it is not wanted for use; and I propose to construct it in such a way that it shall not be exposed to the influence of variations in atmospheric pressure when it is *out* of action—in short, that no variations in atmospheric pressure, however large they may be, shall produce any effect upon it except at the time when it is put in action for the purpose of taking a reading." The following description, supplied by Col. Watkin, explains the manner in which this is done:—

"In order to relieve the strain on the mechanism of the aneroid, and only permit of its being put into

action when a reading is required, the lower portion of the vacuum-box, instead of being a fixture (as is the case with ordinary instruments), is allowed to rise. Without entering into details of construction, this is effected generally by attaching to the lower portion of the vacuum-box a screw arrangement, actuated by a fly nut on the outside of the case. Under ordinary conditions this screw is released, and the vacuum-box put out of strain. When a reading is required, the fly nut is screwed up as far as it will go, thus bringing the instrument into the normal condition in which it was graduated."

At first mention this idea did not appear promising, as it seemed that, however quickly an observation might be made, the aneroid would be losing upon the mercurial all the time that the reading was being taken; that when the aneroid should be thrown out of action, this loss would be shut up; and that when readings should be taken on succeeding occasions the loss which would occur during them would accumulate; and that this would go on until at length the error would become almost or quite as serious as in an ordinary aneroid. I was, however, very urgently required to give the instrument a fair trial in the field; and after satisfying myself that, when thrown out of action, it was not affected by variations in atmospheric pressure (amongst other ways by keeping it for six weeks under a receiver in which pressure was maintained constantly at 17 inches), I commenced to compare it against the mercurial barometer in Switzerland in last September, having intentionally refrained from taking a reading for six weeks further, after it was released from the air-pump, in order to obtain confirmation of the opinion that it was, when thrown out of action, actually impervious to the influence of variations in atmospheric pressure.

I commenced these comparisons at Zermatt on the 3rd of September [the height of Zermatt, according to the Swiss Federal Survey, is 5,315 feet], and between the 3rd and the 8th took twenty-one readings—that is

to say, the aneroid was put in action and was thrown out of action twenty-one times in the above-mentioned period. I was interested to observe whether the accumulation of loss would take place. It did occur, but the total amount was small. The aneroid had a plus error of 0.122 of an inch the first time it was used, and this was reduced to + 0.069 of an inch at the last reading. Thus there was, on an average, a loss of 0.00252 (or  $\frac{1}{39600}$ ) of an inch on each occasion that a reading was taken.

On September 9th I carried the barometers to the top of the Gornergrat, but diverged from the way up to the summit of a minor peak called Gugel [S. F. Survey, 8,882 feet]. The error of the aneroid at Zermatt at the last reading was + 0.069 of an inch, and on the top of Gugel it was + 0.057, or  $\frac{1}{17700}$  of an inch. The difference of level between the stations, it will be seen, was 3,567 feet.

From the top of Gugel I came down for lunch to the hotel called the Riffelhaus [S. F. Survey, 8,429 feet], and there the error of the aneroid was + 0.041 of an inch.

From the Riffelhaus I went to the top of the Gornergrat [S. F. Survey, 10,289 feet], and at 4.20 P.M. the error of the aneroid appeared to be - 0.052 of an inch. The readings were:—

Merc. Bar. inches.	Temp. in shade.	Correction for temp. inch.	Merc. Bar. red. to 32 inches.	Aneroid. inches.	Error of Aneroid. inch.
20.923	55.5° F.	-0.051	20.872	20.820	-0.052

I was not satisfied with this comparison. The sun's rays had been piercingly hot during the ascent, and the mercurial barometer had been unavoidably exposed to them. When set up in the shade, its sensitive, attached thermometer speedily took up the temperature of the air. It fell to 55.5° F., and would not fall lower. But the mercury in the barometer continued to fall long afterwards, because it was not cooled down to the temperature of the air. It is not improbable that the temperature of the mercury in the barometer was as high as 75° F. at the time it was read. Assuming that

this was the case; the following would be the correct comparison:—

Merc. Bar. inches.	Temp. of Mercury. F.	Correction for temp. inch.	Merc. Bar. red. to 32° F. inches.	Aneroid. inches.	Error of Aneroid. inch.
20.923	75° F.	-0.087	20.836	20.820	-0.016

On my return to Zermatt, after a descent of 4,974 feet, I was curious to observe what alteration there would be in the error of the aneroid. At the last reading prior to starting it had been +0.069 of an inch, and at the first one taken after the return it was precisely the same! More astonishing than this, the mean of eight readings taken on the four following days (Sept. 10-13) came out +0.068 of an inch.

On September 13th I went again to the Gornergrat, and between 12 and 3 read the barometer three times. The following figures show the means of the three readings:

Merc. Bar. inches.	Temp. in shade. F.	Correction for temp. inch.	Merc. Bar. red. to 32° F. inches.	Aneroid. inches.	Error of Aneroid. inch.
20.780	56 F.	-0.052	20.729	20.717	-0.012

This supported the opinion that the reading on September 9th was taken too soon, and that the temperature indicated by the attached thermometer was lower than the temperature of the mercury in the barometer. The mean of two comparisons at Zermatt after this second visit to the Gornergrat gave, as the error of the aneroid, +0.030 of an inch.

I then went down the Valley of Zermatt, and stopped successively for several days at each of the three villages, Randa, St. Nicholas, and Visp. At Randa [S. F. Survey, 4,741 feet] I made six comparisons on three days, and the mean error of the aneroid came out 0.000. At St. Nicholas [S. F. Survey, 3,678 feet] I took five readings on three days, and the mean error was -0.019 of an inch; and at Visp [S. F. Survey, 2,165 feet] I took three readings on two days, and the mean error was -0.006.

I then thought it would be well to submit the aneroid to a sharp and sudden diminution in pressure, and took the train back to Zermatt to see what would happen through a rise of 3,150 feet, made in 2 hrs.

20 min. At the last reading at Visp the error was -0.002 of an inch, and at Zermatt I found it was +0.011. On return to Visp the mean error of five comparisons made on three days was +0.017 of an inch; at Sierre [S. F. Survey, 1,765 feet] five readings on four days showed a mean error of -0.010, and the mean error of the last two comparisons, made at Geneva [S. F. Survey, 1,227 feet], amounted to -0.030 of an inch. From September 9th to October 17th the aneroid was put in action forty-four times, and its loss upon the mercurial in that time amounted to 0.099 of an inch. A plus error of 0.069 of an inch at Zermatt was changed into a minus one of 0.030 of an inch at Geneva. This was equivalent to a loss of 0.00225 (or  $\frac{225}{100000}$ ) of an inch on each occasion that it was used.

The remarkable nature of these figures will be apparent to anyone who has acquaintance with the barometer, and especially to those who have used aneroid barometers in the field. Upon two occasions Col. Watkin's instrument read so truly against the mercurial that I was unable to detect any discrepancy between the two instruments. At Randa, the mean of six readings gave as a result *no* error. Stress need not be laid upon these happy agreements. It is more to the purpose to draw attention to column G in the following table. If the eye is run down that column, and

A Place of Observation.	B Date. 1892.	C Altitude.	D Merc. Bar. reduced to 32° F.	E Watkin's Mountain Aneroid.	F Number of Observa- tions.	G Mean Error of Aneroid.
			Inches.	Inches.		Inch.
Zermatt ... ..	Sept. 3-8	5,315 ft.	25.006	25.096	21	+0.090
Top of Gugel ...	" 9	8,882 "	21.963	22.020	1	+0.057
Riffelhaus ...	" 9	8,429 "	22.319	22.360	1	+0.041
Top of Gornergrat	" 9	10,289 "	20.872	20.820	1	-0.052?
Zermatt ... ..	" 10-13	5,315 "	24.912	24.980	8	+0.068
Top of Gornergrat	" 13	10,289 "	20.729	20.717	3	-0.012
Zermatt ... ..	" 13-14	5,315 "	24.917	24.947	2	+0.030
Randa ... ..	" 15-17	4,741 "	25.687	25.687	6	0.000
St. Nicholas ...	" 17-22	3,678 "	26.443	26.424	5	-0.019
Visp ... ..	" 23-29	2,165 "	27.26	27.720	3	-0.006
Zermatt ... ..	" 30	5,315 "	24.475	24.492	2	+0.017
Visp ... ..	Oct. 4-7	2,165 "	27.890	27.907	5	+0.017
Sierre ... ..	" 9-12	1,765 "	28.131	28.121	5	-0.010
Geneva ... ..	" 13-17	1,227 "	28.332	28.302	2	-0.030

neglects the hundredths and thousandths of an inch, it will be seen that it reads 0·0 from first to last! Better results might have been attained, and I believe would have been attained, if the readings had been taken with greater rapidity. Attention must be paid to two points when employing this instrument. The first is to keep it constantly shut off from the influence of the atmosphere, except at the times when readings are to be taken; and the second is to take the readings as quickly as possible.

Finally, I feel confident that, in the hands of those who will give the requisite attention, extraordinary results may be obtained from Watkin's Mountain Aneroid in observations made for altitude, and in determining differences of level.

The comparisons were made against a Mountain Mercurial Barometer, Fortin principle, which was graduated to read on the vernier to  $\frac{1}{1000}$  of an inch, and by estimation could be read to  $\frac{1}{1000}$ . Before starting in July, this barometer was compared against its Maker's Standard and it was found to have no error. On return in October it was again examined and compared, and it was found that it had not taken in any air.

The aneroid which was observed was  $4\frac{1}{2}$  inches in diameter, and was divided to 0·05 of an inch. Its scale ranged from 31 to 17 inches, and it weighed, when in its leather sling case,  $2\frac{1}{2}$  lbs. It was made by Mr. J. J. Hicks, 8, Hatton Garden. Aneroids of this type will be called Watkin's Mountain Aneroids, as they are especially devised for mountain travellers, and for survey work amongst mountains.

I am, Sir, your obedient Servant,

EDWARD WHYMPER.

## THE WEST WALL OF DEEP GHYLL.

BY J. W. ROBINSON.

It was Christmas time in Wasdale in the winter of 1894-5, when the question was asked at the breakfast table, "What shall we do to-day?" "Go up Scafell," said one; "Gable, by the Needle arête," was the bold answer of another; "the Central Gully on Great End," suggested a third. "None of these things," exclaimed a Dalesman who had just been out to look at the weather, "it's blowing a regular blizzard high up on the mountains, and looks like snow. I have never been round the Lake, and," he added, "the scree on the other side will be a little exercise for the ladies."

A brisk walk soon brought us to the head of the Lake, round past the Hall farm, and along the easy part of the scree, until the loose, active part was reached, where time was spent in hurling great stones down to the Lake, into which they plunged with a splash that reminded me of some lines by the Oxford Don in commemoration of Blake's expressed preference for moonlight bathing in Wastwater:—

"The cloud-clad moon blushed while the unclad Blake  
Took 'Wasdale Headers' in the deepest lake."

"We will not return without a climb; let us go up and try the Big Gully," said an over-confident youth who is reported to make sport of the difficulties of experienced guides when he visits the Alps. "Not in a storm like this," said the Dalesman, and just then, in support of this opinion, came three climbers in full retreat who had essayed the Big Gully on their way up from the train at Drigg, two doctors of renown—Collie and Collier—and a friend. They reported the blizzard high up as "awful," which froze the snow on to their clothes and hair; we all returned by the road together, conversing on climbs new and old. "Got any new climbs up your sleeve?" said Collie, addressing the Dalesman. "No, not for weather like this," was the



cautious answer, though he knew of one on Scafell, but waited the hour and suitable weather before revealing the important secret.

Long afterwards he wrote to Collie saying, "Come to Cumberland, I know a place that wants climbing, and have kept it for you; it may go easily or it may be hard, but I rather fear it is very easy," and until then he kept the secret dark. Climbing men passed and re-passed up and down Deep Ghyll within touch of the first ladder of the climb and none saw it; they all looked the other way to the more imposing front presented by the Deep Ghyll Pillar. Twice the Dalesman, accompanied by strong parties of Alpine men, went to it, but passed it saying nothing, because the weather was bad and there was ice upon the rocks. "Where is it? Is it near Wasdale?" said a reckless enthusiast one day. "It is a Sabbath day's journey from Wasdale," came the answer. "That means Dow Crag, Coniston, at the very least," said a bystander, but still the mystery remained unsolved.

At length an opportunity offered in the autumn of 1897 on the way to Eskdale sheep fair, which festive gathering an Oxford Don and the Dalesman attend each year in company. Great was the Dalesman's joy on arriving at the inn late one night to find two Oxford Dons ready and eager to join in the attack suggested to them. The pursuit of new climbs was growing hot, and the Dalesman considered that now or never must the attempt be made.

The next day was not promising, but a start was made. The climb began in Deep Ghyll, over the two well-known obstacles, then along the ordinary traverse to a point some twenty yards beyond the top of the right hand escape from the second pitch in the ghyll. Here a deeply-recessed vertical chimney of about 40 feet in height was seen. "This is the start; looks interesting!" was the gleeful comment of the Senior Don. A couple of ledges (some 15 feet) gave access to the chimney, and from it the climbers emerged on to a broad rock-terrace of several yards in length. Just

above this point they were brought to a halt by a steep, recessed rock, with wet and slimy surface, and evidently of a more difficult character above. The Dalesman was well backed up by the Senior Don, but rain came on, the rocks began to stream with water, and the serious question arose, "If we go up this way, are we sure we can get out, because we shall not want to come down it again to-day?" "A safe way is a good way," they all agreed, and round they went to prospect a little from the top in the dense mist and rain, hoping to gain knowledge of the upper and mysterious reaches of the climb. It was too wet to learn anything, so the word was given, "Home once more," and round the inn fire that night they tried the climb over again and eagerly discussed the situation. "Give the climb away! No fear!" said the Senior Don, and the Dalesman said it might safely wait another year until they met again; it now had waited four, and the passers-by did not so much as give it a single look.

Many things happened to the Dalesman in the interval. He was tempted away to Switzerland by a kind and skilful climber of many seasons in the Alps, and had thus an opportunity of comparing, for the first time, the Dent de Satarma with the Gable Needle; the chimneys of Mont Collon and the Aiguilles Rouges with those of the Wasdale Scree; the rock faces of the Dent Perroc, and the Aiguille de la Za with the Langdale Pikes; and the rock towers of the Matterhorn and the gendarmes of the Dent Blanche with the Ennerdale and Scafell Pillars; and it is whispered that Cumberland held its own in the estimation of the perhaps too enthusiastic Dalesman.

On his return to England he said to his comrade, the Alpine Expert, "Come to Cumberland, and back up a Dalesman and an Oxford Don who are going to risk their necks on a new climb." And so it came about that on the evening of September 9th last, amid a storm of wind and rain, the dangers of the Sty Head pass were faced in the dark, until, when nearing the Tarn, the darkness seemed to pass away though dense wet

mists hung all around. The Dalesman thought it was the moon. "Nonsense!" exclaimed the "Expert," in his superior wisdom, "There is no moon." And he was right, for the unwonted lightness was caused, we discovered later, by an unusual display of Aurora in the northern sky.

Wasdale again! Hurrah! The Don is here and eager for the fray. "What has *he* come for?" (with a suspicious glance at the Dalesman) was the whispered question of a bystander to the Don, whose evasive reply is not recorded. "What are you going to do to-morrow?" was the open query of another. "We are going to have a walk round on Scafell to see what we can find," said the Dalesman, and with this answer they were fain to be content. "Breakfast at 7 o'clock and an early start," said one. It was done, and they were away in the morning, with their two coils of rope, by 7.35.

When it became known that the Don, who had been resting for two days, and professed to be unwell, had gone off at that unearthly hour with the Dalesman and the Alpine Expert, it was felt at once by the other visitors that some deadly mystery was on foot, and, without intending it, all found their steps lead towards Scafell. Foolish Dalesman to have given even this much away; for the result was that Deep Ghyll was full of men just at a time when the most ticklish part of the climb was in progress, but the kindly mist hung over the climbers, and obscured them like a pall.

The early start allowed the persistent three to send down stones and rake the ghyll from end to end without doing any harm. They ascended the mountain by way of Red Ghyll, and arriving at the top of the climb the Dalesman went down some distance to prospect. He had often looked at the climb from the ridge of the Deep Ghyll Pillar opposite, and felt there was one doubtful place where a small leaning pinnacle seemed to be undercut. Getting down to this he threw his arms round it, and calling for more rope was soon seen lying flat on the top of a rock below and looking over. "Yes! it

will go," he cried. "Pull in the rope, I am coming up," and as he did so he cleared out the loose and dangerous stones, sending them thundering down the ghyll, small ones being sent first as pilot engines to give warning to unwary tourists and make them run for cover. Round to the foot of the climb in Deep Ghyll was the work of a few minutes, and the chimney was tackled at once—Dalesman leading as before, until the upper ledge above the chimney was reached, when he decided to pass over a corner of rock round to the right. To make this possible, it was necessary to pull out a number of loose stones which rested in the crack of the ledge above, which done, he planted himself firmly on the rock ledge, and, with the Don holding on to the rope, he gave the Alpine Expert a shoulder. The Expert, thinking he was on the face of the Za once more, went up the rocks like a chamois, until a halt was called on a ledge about 20 feet above. There the others joined him, and having passed a detached rock slab (which from Deep Ghyll seems to be a rock post) arrived at the foot of the undercut pinnacle. The Dalesman again took the lead and went up the left-hand side for about 10 feet, then passed over the nose of the pinnacle into a little gully on the right-hand side. Here a rock shelf led to a small recess from which the climb could be finished direct up the arête, or by a traverse on the left to and along the edge of Blake's chimney. Both finishes were taken.

Thus a new and easy climb of interest was added to the list, as the west wall had hitherto been climbed only by the Great Chimney and by an open route rather nearer the head of Deep Ghyll.

## THE CAVES AND POT-HOLES OF YORKSHIRE.

BY S. W. CUTTRISS.

AMONG the many interesting features of England's greatest county, the numerous caves and allied physical phenomena contained within its boundaries form by no means the least important of its characteristics. In no other part of Great Britain, except the adjoining county of Derbyshire, which partakes of the same geological formation, is the rock structure so favourable to their formation.

Within the last few years the sport of cave-hunting, as distinguished from the strictly scientific work of exploration, has received a large addition to its votaries, but while the former may appeal more strongly to the majority of our readers, the opportunity thus afforded for increasing the sum of our knowledge of this feature of Nature's handiwork should not be lost. The study of the formation, characteristics, and relations the caves bear to the topography of the country is one well worthy of close attention, and it is here proposed to briefly outline a few general conclusions resulting from work already accomplished.

The excavations caused by the action of the sea on the chalk cliffs of Flamborough, though interesting as examples of the mechanical erosion of rocks by water, form a class distinct from the caves of the interior, and may here be neglected. The Oolitic Limestones lying to the north of the Vale of Pickering contain a few small caves and underground watercourses, but so far as is at present known they are of no great interest if we except the Kirkdale Cave, made famous by the investigations of Dr. Buckland in the early part of the present century, and which gave occasion to the publication of his "*Reliquiæ Diluvianæ*."\* It is in the hills to the west of the great central plain, where the

\* Buckland, Rev. Prof. W., "*Reliquiæ Diluvianæ*," 1823, London.

Carboniferous Limestones and mountainous character of the country make it particularly suited to the formation of caverns and underground watercourses, that the largest number and finest examples are found.

The base of the hills forming the Pennine Chain—the backbone of England—is composed of the Silurian slates and grits, the oldest rocks in Yorkshire. Upon them has been deposited a mass of limestone, the Carboniferous, Mountain, or Scar Limestone, as it is variously called. This limestone consists of a hard, compact series of calcareous beds, mostly of a light grey or bluish colour. On Gragreth, Wherside, Ingleborough, and Pen-y-Ghent it attains a thickness of about 500 feet from the base to the exposed surface, where the pot-holes are situated. Above this are a series of shales, limestones, and sandstones, collectively named by Professor Phillips the "Yoredales," from the valley of that name, where they attain their greatest development. On the top of the Yoredales lies the Millstone Grit, which merely forms a cap on the mountains named. The direction of the dip of the rocks is towards the north-east, the effect being to bury the limestones far below the surface in the neighbourhood of the central plain, but in the west the valleys have penetrated the entire series, exposing the foundation rocks in several places. On Leck Fells the Carboniferous Limestone has been cut off by a geological fault, known as the Dent Fault, running in a direction north and south.\* The southern extension of the limestone is bounded by the Craven Faults, which run in an easterly direction from Ingleton. So far, therefore, the limestone area is clearly defined, but towards the north and east it becomes gradually obscured by the overlying strata. It will serve our present purpose, however, to make an arbitrary boundary extending from the Leck Fells, round the Kingsdale Valley, up Chapel-le-dale to the head of Ribblesdale, then down the east

\* The Leck Fells, strictly speaking, are in Lancashire, but as they are geologically part of the limestone area under consideration they may fairly be included here.

side of that valley, skirting Cam Fell and Pen-y-ghent, and across to Malham, where it meets the Mid Craven Fault.

The whole of the limestone area in which the caves are found may be divided into three distinct sections, each having their own characteristics:—

- I.—The Yoredales, including the rocks of that formation.
- II. - The Southern Carboniferous or Craven Section, including the Carboniferous Limestone lying between the North and Mid Craven Faults.
- III. The Main Carboniferous Limestone Section, comprising the remainder of the out-crop included within the imaginary boundary defined.

The reason why caves and underground water-courses are formed in limestone may be stated in a few words. The essential constituent of the rock is carbonate of lime, with which is associated in mechanical admixture more or less of earthy impurities. The carbonate is capable of being dissolved slightly in water charged with carbonic acid gas. As rain is precipitated from the clouds it absorbs a small amount of this gas from the atmosphere, and gathers still more from decomposing vegetation in the ground. Finding its way into the cracks and fissures of the rock, the water carries off a portion as bicarbonate of lime. The cracks may at first be very minute, but particle by particle the rock is eaten away, a definite line of drainage is created, and ultimately an extensive system of underground watercourses and reservoirs formed. The mechanical effect of the running water, assisted by sand and stones carried with it, adds its erosive action to the chemical solution, and the channels more rapidly increase in size. In process of time the passages and caverns may become too large to be self-supporting, the roof falls in, and a rugged gorge is formed which atmospheric agencies ultimately convert into an open valley.

As the water oozes out upon the roof or sides of the subterranean cavities evaporation takes place, and solid carbonate of lime is deposited on the exposed surface. Inequalities in the roof lead the trickling water to definite points, where it drops off; the calcareous deposits at these places gradually increase in size and stalactites are formed, often of exquisite beauty and delicacy of form. Some are in the shape of long, thin tubes, full of water, which break off with the slightest touch. Others form solid, tapering masses like petrified icicles, hanging in clusters from the roof; or they may take the shape of beautiful folded curtains. When pure they are semi-transparent, like the finest porcelain, and give a clear metallic ring when gently struck. Usually the deeper the cavern from the surface, the purer the stalactites. Where the drops of water touch the floor further deposits take place, which grow upwards as stalagmites. These often exhibit inequalities of thickness and scattered rising bosses, owing to the more frequent dripping at some places than at others. Sometimes both stalactite and stalagmite unite, forming a solid pillar. Again, the walls and floor may be entirely coated with a smooth, calcareous deposit, having the appearance of ice. The rate of deposition is very irregular. It grows here, stops growing there; is laid on thickly in one place favourable for its rapid precipitation, while it takes ages to form a thin film in an adjoining chamber. After a stream has flowed along a passage for some time it may find a lower level, the old course is deserted and a new one formed. In these dry passages the deposition of lime is more rapid,\* and it is in the darkness and solitude of such lonely recesses the explorer usually finds most of beauty, a charm intensified by the novelty and weirdness of his surroundings.

As a general explanation of the formation of caves, solution of the limestone by water charged with carbonic acid gas is indisputable, but that alone hardly seems

\* For observations on the growth of stalagmite in Clapham Cave, see Phillips' "Rivers, Mountains, and Sea Coast of Yorkshire," pp. 34-5; also Boyd-Dawkins' "Cave-Hunting," p. 442.

sufficient to account for the huge caverns frequently met with. Here local influences must have been at work, not only determining the situation, but actually performing part of the work of production. What those influences were is not an easy matter to determine, and must always remain largely a matter of conjecture.

#### I.—CAVES OF THE YOREDALES.

Turning to a consideration of the caves themselves, and following the classification already defined, the first to be noticed are those found in the limestones of the Yoredale formation. Towards the west the strata are comparatively thin, being intercalated with beds of shale and sandstone, which, being unaffected by water, prevent the formation of high passages and caverns in the limestone. Being small and encumbered with accumulations of fallen rock and dirt, they do not offer much sport to the cave-hunter, nor do they materially affect the general drainage of the ground. Travelling eastwards the limestones increase in thickness and hardness, and contain many caves of considerable dimensions and extent, notably in Upper Nidderdale and Wharfedale, with their tributary valleys. Several of these have been found to contain remains of species of animals long since extinct in this country, also relics of early man, and this district can be recommended as likely to yield still further discoveries of a similar nature to the painstaking investigator.

#### II.—CAVES OF THE SOUTHERN CARBONIFEROUS OR CRAVEN SECTION.

Although geologically all the rocks named which lie above the Silurians are included in the Carboniferous Period, it is convenient for our purpose to give the distinctive title of Carboniferous Limestone only to the great mass of rock forming the basement bed underlying the Yoredales.

The district included in this section is that lying between the North and Mid Craven Faults. From Ingleton the main line of fault runs through Clapham

and Austwick to Settle, forming the bold escarpment of the Giggleswick Scars. Thence it continues in a due easterly direction by the Attermire Scars, through Malham and across Wharfedale to Nidderdale. North of this main line of dislocation is another fault, close to the one just named at Austwick, and continuing eastward in a fairly straight line, about  $1\frac{1}{4}$  miles separating the two at Malham. The area enclosed is in the form of a long triangular strip, 10 miles from west to east, and  $2\frac{1}{2}$  miles from north to south at Settle, its broadest part. Lithologically the limestone is the same as that north of the fault, yet the caves contained in the two areas are entirely distinct. Briefly, the characteristics of those in this section are the absence of running water and the choking up of the entrances to the caves with clay, &c., together with rock débris from the overhanging cliffs. The scars principally face the south and west, and the direction of the rock drainage above the Attermire and Langeliff Scars is towards the north-east, being in the direction of the dip of the strata. During the Glacial Epoch the country was overridden by ice, which flowed down the Ribble valley, and there is strong evidence that this was the principal agent at work in closing the mouths of the numerous caves in the faces of the scars. From a sporting point of view these caves are disappointing, but as a field for the study of cave deposits the district is superior to the Yoredales. The well-known Victoria Cave has yielded a store of archæological remains unequalled by any in the country, and there are many other caves still awaiting careful examination.

The absence of running water in these caves is accounted for by the present configuration of the ground. When they were in process of formation the limestone in all probability lay partially covered by the Yoredale strata draining towards the south and west; the caves would then form the drainage channels. At the present day none of this higher ground remains, the limestone being quite exposed on the surface, or bearing only a thin covering of drift, and the drainage

now follows the dip of the rock. A further marked characteristic of this section is the entire absence of pot-holes. A pot-hole differs from a cave, in the usual acceptation of the word, in the fact of its being a more or less vertical pit or chasm, down which a stream of water plunges, often to an enormous depth.\* Bearing in mind that here the limestone does not receive drainage from higher ground, the one agent necessary to the formation of pot-holes is absent, viz., a more or less perennial stream. The rain and surface moisture at once sinks underground, without collecting in surface streams. For this reason pot-holes need never be expected where limestone now forms the highest ground.

### III.—CAVES OF THE MAIN CARBONIFEROUS LIMESTONE SECTION.

As a field for studying the action of water on limestone, and the effect of the resulting underground watercourses on the general drainage of the district, this section is by far the most interesting. The area includes the whole of the Carboniferous Limestone outcrop contained within a boundary roughly determined by the Leck Fells, Kingsdale, Chapel-le-dale, and Ribblesdale, its southern extension being limited by the North Craven Fault.

The contrast between the caves of this and the previous division, as already mentioned, is very marked. In the former there is not a known accessible cave which has a stream flowing through it, and they are all more or less choked with drift and other deposits. In this section the reverse is the case; the writer is not aware of a single example which is not at present an active drainage channel.† Some have dry passages, resulting from the water finding a lower level, but all in some part of their ramifications have water flowing

through them. Another distinction is the abundance of pot-holes present. Here no hard and fast line can be drawn between the two classes of phenomena of caves and pot-holes. The latter frequently have caverns and passages at the bottom, while the former occasionally include pot-holes in some part of their course.

The caves may be divided into two classes—Caves of Engulfment and Caves of Debouchure. In the Leck Fell and Kingsdale districts they are almost entirely of the first-named variety, while in Chapel-le-dale and Ribblesdale the principal ones are Caves of Debouchure.

Caves of Engulfment—those which receive water—are usually low and encumbered with loose stones, entrance being only possible in many cases by creeping. The passage generally increases in height to 20 feet or more, but rarely exceeds six feet in width. When they expand sufficiently to be dignified by the title of a chamber or cavern, either a present or past waterfall is always associated with them. They usually terminate, so far as it is possible to explore them, in one of three ways. Either a deep pool with smooth vertical walls converging to a fissure perhaps only a few inches wide, or, if the passage is in the direction of the dip of the rock, it will broaden out and the flat roof descend to the surface of the water, or close to the stones choking the channel, or thirdly by terminating abruptly in the side of a pot-hole. When a passage becomes blocked by the lowering of the roof and accumulation of stones, the channel is passing from one bed of rock to a lower, and when an opening can be cleared sufficiently large to squeeze through, the obstruction will be found to continue only for a short distance, after which the passage will gradually open out again. These obstructions usually occur near the top of the limestone, where the beds are thinner. Great care is necessary in exploring Caves of Engulfment, owing to the possibility of a sudden rush of water, and the danger of falling down holes which cannot always be clearly detected by the dim light of a candle, especially when the rock is a black limestone.

\* Unfortunately the terms "cave" and "pot-hole" have been frequently misapplied, so that a particular name may not always correctly indicate the class of phenomenon to which it has been given.

† If any dry caves exist they will probably be found in the neighbourhood of Crummack Dale and the Moughton Felis, and this is the most likely quarter in which to look for caves containing bone deposits.

Caves of Debouchure far exceed the others in number. In Ribblesdale, more particularly, the entrance is generally at the base of a limestone scar or at the upper end of a narrow gorge. It is generally commodious, with a broad flat roof forming the underside of one bed of limestone, a thin parting of softer material separating this from the underlying rock in which the water channel is cut. Some little distance in, a cascade or waterfall will generally have to be negotiated, at the top of which the passage is usually found to be a simple water-worn channel, gradually shallowing and broadening until it becomes too low to permit of further progress. Almost invariably is it the case that where a waterfall occurs, an old channel exists, which may afford a ready means of passing the difficulty.

In channels at or near the top of a bed of rock the limestone is worn into long, thin, vertical ribs, the edges of which are almost as sharp as knives. When the passages are cut through a series of thin strata, such as exist at the top of the main mass of Carboniferous Limestone, these stand out in horizontal slabs with keen edges similar to the vertical ribs.

Although the caves afford varied work for the explorer, far greater interest is attached to the pot-holes which abound in the district. These offer considerable sport to the climber who seeks to penetrate their depths, a sport accentuated by the element of mystery and awe surrounding them. Many attain depths of 300 feet and more, and it is here that the pluck and endurance of the explorer is called into full exercise, especially when the difficulties are increased by falling water.

Pot-holes are always found at or near the top of the Carboniferous Limestone, at an elevation of between 1,100 and 1,300 feet above sea level, and only in such localities where there is higher ground above to give birth to the streams which have been the active agents in their formation. The appearance of these chasms on the surface varies considerably, the size of the opening being no criterion of their depth. Gable Pot on the Leck Fells is 450 feet in circumference, being the largest

in area of any in the country, yet its extreme depth does not exceed 115 feet. In contrast to this is Long Kin West, on the south side of Ingleborough, a narrow fissure at the top, which though it may be easily stepped across, attains the great depth of 325 feet. The bottoms of the chasms are usually covered with fallen rocks and water-worn stones, between which the water sinks out of sight, or forms a pool. Sometimes they open out into large chambers, with one or more passages extending for some distance, but these eventually become blocked with stones or water, or become too narrow to squeeze through. In the chasms themselves there is necessarily an absence of stalactites and other concretions, owing to the continually falling water uncharged with lime, but in protected fissures and passages there will often be found an abundance of these rock decorations.

The question is frequently asked whether there is no danger to be feared from the presence of foul air in these chasms. Experience in caves and pot-holes, which are absolutely dry as well as wet, leads to the belief there is no danger to be apprehended from that cause in limestone formations. Sometimes the carcass of a sheep or other animal, in a more or less advanced state of decomposition, will be found, the presence of which becomes unpleasantly evident, but this may be considered rather an inconvenience than a danger.

Local reports of the depth of pot-holes and length of caves should never be trusted, and unless there is strong evidence that particular care has been taken in making measurements, the figures given in even comparatively recent publications should be accepted with reserve. It is practically impossible to correctly estimate distances or depths when exploring these places owing to the novelty or difficulties of the situation, which magnify distances enormously. Many instances could be given where there is an astonishing discrepancy between published figures and actual facts as proved by later measurements.

The sport of cave-hunting and pot-holing, apart from its scientific interest, has fascinations and charms

peculiar to itself. Though possibly not apparent to the uninitiated, its pleasures are none the less real, and the explorer often becomes fascinated by his weird surroundings when peering into the recesses of these secret chambers of Dame Nature, where she carves the rocks into fantastic shapes, and clothes them with drapery and ornaments of delicate and beautiful form. Like the kindred sport of mountaineering, the mere fact of facing and overcoming difficulties strengthens the nerves and develops a spirit of self-reliance and resourcefulness which react in the battle of everyday life.



## GAPING GIIYLL HOLE.

BY EDWARD CALVERT.

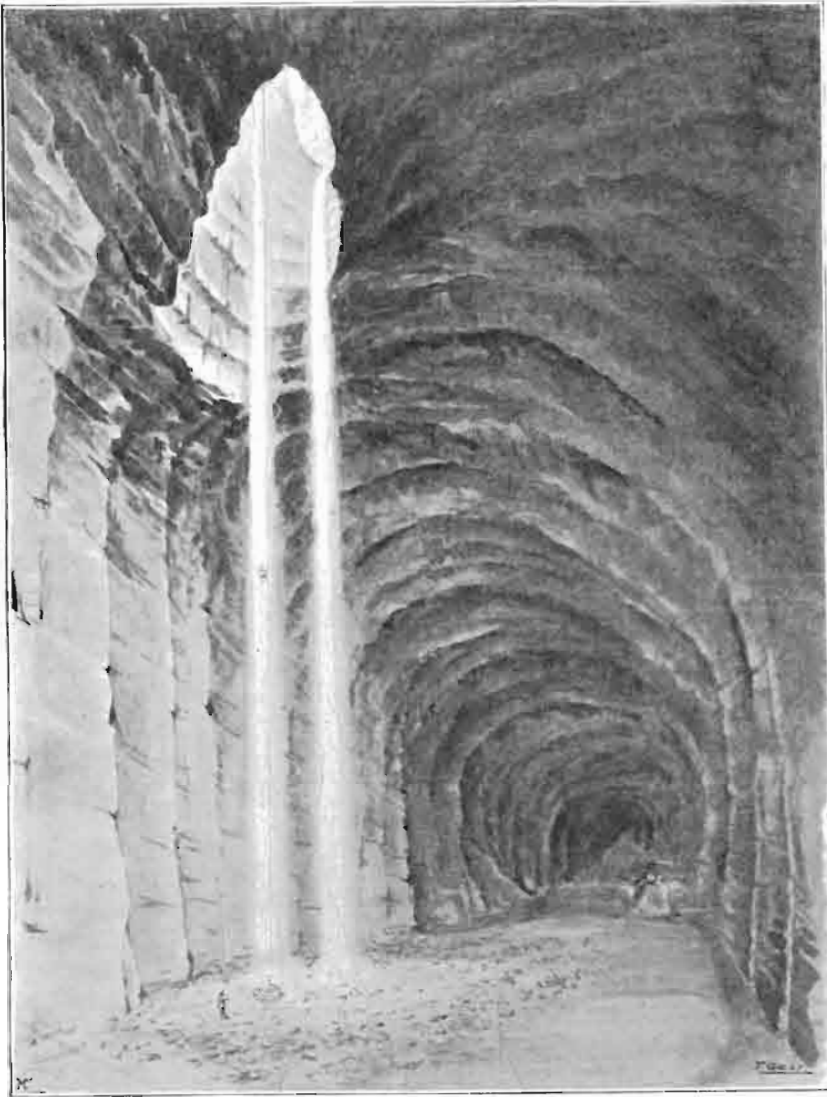
VERY little mention appears to have been made of this "gruesome chasm," as it has been aptly termed, previous to the early part of this century.

One may reasonably suppose that the earliest residents of the neighbourhood knew of it, and possibly that the dwellers in the Victoria and other caves of the district looked upon it with superstitious awe.

Then again, the Romans can hardly have failed to notice it, there being distinct evidence of their residence on the neighbouring summit of Ingleborough; and being of a practical turn of mind it may have afforded them a convenient receptacle for prisoners and others who, for political or social reasons, were thought better out of the way. Indeed, it seems not unreasonable to suppose that at even later periods in the country's history it may have been used as an *oubliettes*.

What rather surprises one is the meagre legendary history of such a place; it is distinctly the sort of gulf to be guarded by fiery dragons—more fierce too than Scheuchzer's—and grim enough looking to fit it for the mouth of an "Inferno." The Rhenish legendaries would have revelled in its possession; and now, after heavy rains, the torrent roaring down, a "thunder of infinite ululations" reverberating in the immense cavern far below, and the fine spray rising smoke-like from the orifice, it may well strike even the matter-of-fact Englishman with a feeling of awe.

In recent times, on more than one occasion, attempts have been made to measure the depth of Gaping Ghyll Hole, but for the most part the results were vague; in fact, some were actually misleading. On one occasion an enormous length of string was run down without apparently finding any bottom, but this futile attempt to ascertain the depth only confirmed the idea in the natives' minds that it was in truth a bottomless abyss.



GAPING GHYLL CAVERN.

It was not till 1872 that any accurate information was obtained, when Mr. John Birkbeck, of Settle, made known the depth to be about 360 feet. He then followed this investigation by an attempt to reach the bottom.

As far as can be gathered he saw that the stream, Fell Beck, which flows into the chasm, would prove



*From a block tent by M. Martel.*

GAPING GHYLL HOLE, FROM FELL BECK.

a source of great inconvenience and danger, and therefore constructed a trench more than a thousand yards long to divert the water along the side of the ravine and

over into the adjacent valley. He then descended to what is now known as the ledge, which really forms a bottom to, and is almost directly below, the mouth of the well-known hole, and about 190 feet from the surface. Mr. Birkbeck probably concluded there would be some difficulty in descending below this ledge, as he returned to the surface without having gone lower. This expedition appears to have left the pot-hole still surrounded with a halo of mystery, and there is no record of any other attempt being made up to the year 1895.

During the early part of January in that year I nearly made an involuntary descent of the hole while crossing Ingleborough with a friend in rough weather. The wind had driven quantities of snow across the funnel-shaped opening and almost completely corniced it over, reducing what is usually an opening of some 40 feet across at the top to a hole barely 6 feet in diameter. I am happy to say the cornice did not break through, so we still live to tell the tale. About a year previous to this I had conceived an inclination to investigate the chasm, and having so nearly succeeded without any formulated scheme, my enthusiasm was stimulated, and I proceeded to make my plans and enlist the co-operation of several friends. As is usual in an expedition of this character and magnitude, much time was absorbed in discussion, and owing to the difficulty in settling on a date which would be convenient to every member of the party, the expedition was repeatedly postponed. Alas! fatal procrastination. One morning in August, 1895, the Yorkshire papers announced in large letters that M. E-A. Martel, of Paris, then over on a cave-exploring tour in England and Ireland, had fixed his ladders and descended. We learnt subsequently that M. Martel had been for some time in communication with Mr. J. A. Farrer, of Ingleborough, with a view to attempting the descent, and who had instructed his agent to have the Birkbeck trench repaired; this practically meant re-cutting it in many places, the still existing indications, however, saving the trouble of resurveying. M. Martel then arrived at Clapham with

his ropes and ladders, and, after allowing the stream to drain for two days, proceeded, with the assistance generously accorded him by Mr. Farrer, to cart his apparatus up to the scene of operations.

The actual details of this historic descent are so well known to all interested in cave exploration that only a brief recapitulation is necessary here. The ladders by which he intended to descend being only 300 feet long he attached a double rope to their top end, which again was made fast to a stout post driven into the ground. This done, he proceeded to descend from the centre of a goodly and awe-stricken crowd of spectators. On reaching the ledge he found the lower portion of his ladders in a heap and had to disentangle and throw them over the edge. He then continued the descent and landed on the floor of the great cavern, the sight of which impressed him greatly. After a brief survey, being wet and cold, he telephoned to be hauled up again, but unfortunately his telephone would not work, and when ultimately he did manage to make those on the surface understand his wishes they concluded he was in a hurry to come up, and so unduly exerted themselves on the rope to which he was tied. To quote from his beautiful book, "*Irlande et Cavernes Anglaises*," he says, "I had barely time to grasp the rungs as I passed them." Twenty-three minutes were occupied in descending; he remained  $1\frac{1}{2}$  hours below and was 28 minutes in ascending. During his visit to the lower regions he made a rough survey of the cavern, which, he says, "ranks among the most impressive that I ever expected to come across in my underground wanderings." Thus ended the first successful attempt to descend Gaping Ghyll Hole, and M. Martel may well feel proud of his achievement. The descent of 300 feet of rope ladder can only be appreciated by those who have attempted it, and to do so with the knowledge that probably—indeed, I have since heard it asserted—none of his assistants would venture after him in the event of an accident, could hardly be calculated on as a moral support to the explorer.

To have a ripe plum taken out of your mouth just when you are going to put your teeth into it is not pleasant, and it is a pity we were not acquainted with M. Martel's intentions, as he assures me he would have been pleased to have had our company had he known we were contemplating a descent. It is scarcely necessary to add we should have been delighted to have joined him.

Spurred on by M. Martel's success, Messrs. Bellhouse, Booth, Gray, Green, Lund, Thompson, and myself arrived at Clapham on September the 14th, 1895, with a considerable quantity of tackle, and proceeded to the mouth of the chasm. The tackle was carted up by way of Clapdale Farm, which, though perhaps the best way, can by no stretch of the imagination be called a *road*, as, when going over one particularly steep piece of moorland, the cart traces having broken the tackle was instantly shot out and deposited at the bottom of the slope. Little incidents such as this retarded the transport, and darkness set in before anything could be done that day.

On the following day half the party made a dam some distance up the beck to divert the water into the trench previously mentioned, the other half fixed planks, pulleys, and other necessary gear over the mouth of the hole; a windlass was placed a few yards away, and, when the parties had finished their respective work and partaken of a good lunch, I attached myself to the safety line and prepared for the descent. In spite of much damming a considerable quantity of water that joined the main stream from a tributary stream below the dam could not be diverted; this, together with some leakage from the now damaged trench, was still flowing down the beck into the hole, and my descent unfortunately had to be made in the shower bath this formed. In due course I reached the ledge on which Mr. Birkbeck first stood, and where M. Martel found his ladders entangled. Here I spent a few minutes in examining the surroundings.

Standing on this ledge I saw there was a huge rift in the side of the main shaft, connecting it with another and still larger shaft. I could see up this latter into

inky blackness, behind an immense rock curtain which apparently divided the two shafts, and below, in the dim light which only faintly penetrated the darkness there, the larger shaft was continued to a great depth. Having observed this I again signalled, and was lowered over the edge of the ledge. The rope now began to sway against rocks which appeared dangerously loose, and after several attempts to keep it clear of them I concluded tackle would have to be fixed at the ledge to avoid the danger of a running rope dislodging and sending down rocks on the head of the explorer. As time would not allow us to make this provision I signalled to be drawn up, and being cold and wet to the skin was heartily glad to reach the surface again. Mr. Booth then made an excursion to the ledge, and after his return we packed up our tackle and went back to Clapham disappointed, but having gained valuable experience and being more determined to make another attempt at an early date.

In the "Memoirs of the Geological Survey,"<sup>1</sup> attention is called to a small lateral passage near the mouth of the main hole, leading to the top of a vertical drop of about 350 feet. It is satisfactory to note that the surveyors must have given the place much more than a passing glance, as the entrance to this passage is not at all easy to find; yet it played an important part in subsequent events.

The passage, which is entered by crawling under an immense block of limestone<sup>2</sup> a few yards from the mouth of Gaping Ghyll Hole, on the right bank of the stream, is, roughly, 5 feet high by 3 feet wide, but gets smaller towards the inner end, and at about 15 feet along it terminates abruptly over a shaft about 6 feet in diameter with the tremendous drop mentioned.

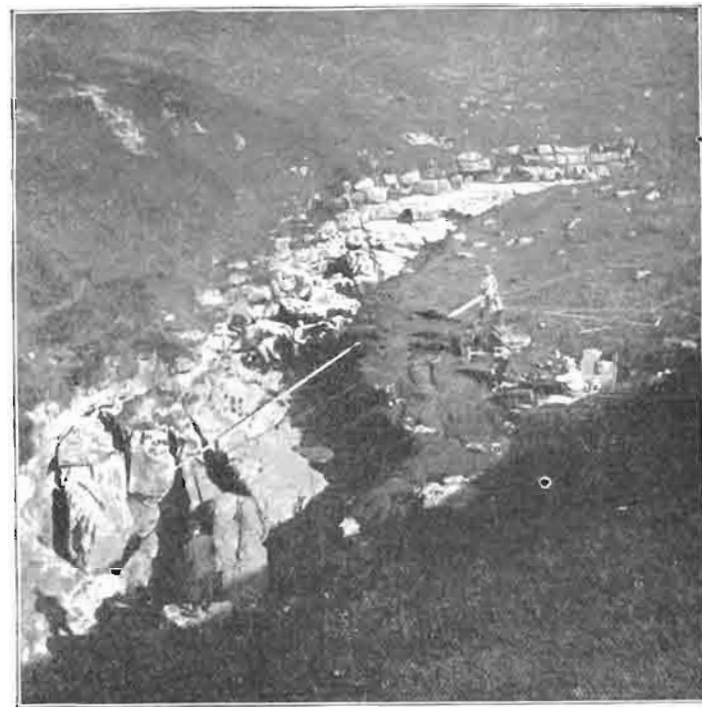
It occurred to me that if it were possible to fix tackle at the end of this passage, and descend by the shaft there, the difficulties at the ledge down the main hole would be avoided. I therefore descended this shaft some

<sup>1</sup>"Geology of the country around Ingleborough," by Dakyns, Tiddeman, and others. 1899, p. 37.

<sup>2</sup> Seen above the bottom left-hand corner in the picture opposite.

distance on a rope ladder, and satisfied myself that the drop of 350 feet or so was apparently direct, and clear of such obstructions as ledges or projecting rocks.

It was evident, then, that if ropes could be guided from outside into the passage so as to work clear of all rocks, this way would be much more expeditious and altogether safer, by which to make the descent, than the other.



*S. H. Curtis, Photo.*

LOOKING UP FELL BECK, FROM GRASS SLOPE ABOVE THE MAIN HOLE.  
(The Hole lies just below the bottom left-hand corner of the picture.)

On May the 9th, 1896, as the weather had become reasonably dry, our party again went to Clapham, this time with more tackle. I sent up a number of lengths of large galvanised tubes for conveying the beck water

past the damaged portions of the old trench in case we should have to make use of that again; but the advantage of our new route rendered this unnecessary, as the small quantity of water which ran into the passage was easily diverted down the main hole, and no matter how much water ran there we could be very little inconvenienced by it.

Considerable time was required to fix our gear, as, owing to the confined nature of the passage, only three men were able to work inside it at a time. The windlass was placed much in the same position as before, pulleys being set at suitable places and angles to guide the ropes under the stone block previously mentioned, at the entrance to the passage.

The tackle consisted of a main rope, which passed from the windlass under the stone block, then along the passage and over a pulley carried on a timber structure erected over the intended line of descent. At the end of the rope was a boatswain's chair, on which the explorer was to sit. From this chair another rope, with its twist opposed to the first, hung down to the bottom of the hole, its effect being to diminish the tendency of the seat either to swing or gyrate. A separate rope, tied round the explorer's body, was held by several men, so that in the event of an accident to the main rope (to which he was also attached) or gear, he would still be held by the safety rope. This was paid out round a stout post, the explorer being thus almost directly in touch with those having control of it. Signals were given during the early part of the descent by firing a revolver, but a telephone was lowered after the first man had reached the bottom, and afforded a much more perfect means of communication.

Having completed preliminaries, I put on the oilskins, safety-line, belt, etc., and, seating myself on the boatswain's chair, a signal was given to the men at the windlass outside to "Lower slowly!" and down I was lowered.

The sensation at the commencement of the descent was distinctly novel and exhilarating. The weirdness of

the faint flickering light from the lamp above soon gave place to a magnificent black-and-white effect, as the sides of the main hole, contrasting dazzlingly with the dark shaft I was in, became visible behind the jagged bottom edge of the rock curtain dividing the two. In a very short time I was conscious of the sound of falling water, and then further meditations were abruptly stopped by my being immersed in a shower bath, which I had just time to perceive was poured from an underground passage in the shaft side. After this sudden shock, however, I soon gathered my wits together, and looking down could see, far below, the ledge on which Mr. Birkbeck had stood, with water streaming over its edge into the darkness below.

I was by this time descending more rapidly, and, the ledge being passed, the sides of the shaft down which I had come, and which until now had been comparatively near, disappeared completely, leaving me feeling somewhat like a spider hanging from the inside of the dome of a large cathedral. The surroundings were so immense that it was some little time before I could distinguish anything at all. Again my meditations were abruptly cut short, for I found myself plumped down on a bed of loose, rounded boulders at the bottom of eighteen inches of water. As soon as I had managed to get clear of the shower bath which had persistently deluged me since I entered it, I gave a cheer (which, however, could not be heard above), for the second descent of Gaping Ghyll Hole was accomplished.

Having signalled for my friends above to "Stop lowering!" I disconnected myself from the ropes. Unfortunately, the lamp, which was slung from my chair, having been broken by its sudden contact with the boulders at the bottom, I was unable to wander far from the beam of daylight which dimly illuminated a portion of the floor.

Looking upward, a bright spot of sky was visible through one corner of the main hole, which from here looked almost like white marble. Below the ledge the whiteness ceased, as the darker surfaces of the cavern

roof and walls reflected little or none of the faint light falling from above. The full height of the waterfall from the ledge to the floor was visible, but my attention was more engrossed by the other waterfall—the one in which I had descended. The beam of light struck this at about the level of the ledge, and I could see the column of water descending out of the darkness far away overhead. Down the sides of the dark shaft water streamed and splashed over broken rock ledges. The sight of all this—the “swish” of the water through the air, the roar as it fell among the boulders in the pool beneath, and the reverberation of the noise in the cavern, were unlike anything I had ever experienced before, and were most impressive.

It now being late in the afternoon, I once more put on the safety line, sat on the chair, and again entering my shower bath—the highest known waterfall in England—I signalled to be drawn up, and was soon at the surface again. My descent had been timed, and though it appeared long in the making, it was accomplished in the short period of two minutes. The ascent occupied only four minutes.

The evident safety and rapidity of the descent and ascent were highly gratifying to me, and the advantage of our method and line of descent over the arduous labour of rope-ladder work and the risks of the main hole, were now clearly demonstrated where a large exploring party are concerned. Thus ended the second descent to the cavern, and our party returned to Clapham for the night.

In my next paper I shall describe the cavern, and give an account of subsequent descents, when our party discovered and explored the wonderful passages leading out of the ends of the cavern.

[*To be continued.*]

#### SOME WORDS FROM THE SILENT.

THE advent of a Club Journal has at last given us, the silent members of the Yorkshire Ramblers' Club, the longed-for opportunity to express our appreciation of the many strange tales our more venturesome fellows have told us of their wanderings among the wrinkles of Mother Earth. They have scorned to selfishly hide their talents in a napkin, but have used them freely for our delight. Many folios of foolscap and countless lantern slides—eloquent witnesses to much burning of the midnight oil—have compelled our gratitude. Poetic fervour and subtle wit, burning eloquence and kindly humour, have ministered to our pleasure.

Recent books of travel, with their weird story of savage wanderings and Homeric exploits, make us suspect that even modern travellers tell strange tales. Our travellers feared to taint our simple minds with guile, and told us only plain tales from the hills. We have been spared the usual preliminary columns in the press ere they embarked upon their perilous adventures, and with the night of their recital their narratives have passed into silence. With beautiful self-denial they have resisted the wily publisher, and his insidious designs upon our attenuated purses.

A President of the Alpine Club (the writer mentions him with due reverence) has spoken of us as “a mild body.” Could he have known these Yorkshire Ramblers, or has he judged them by their modesty? To us, at least, remains a record of silent heroism, which has carried us speechless through nearly a decade of meetings with Spartan courage.

While turning deaf ears to the voice of the charmers in the chair, who have invited us to make fools of ourselves, we have privately encouraged members to believe in their literary ability. With sympathetic tact we have eulogised their elocutionary attainments, and prophesied for them a dazzling career on public

platforms. Yet, with a modesty as singular as it is unanimous, they remain content with the common round, the daily task, and an occasional private display of their brilliant possibilities.

We have listened with the uplifted hair of unwavering belief to the deeds of "derring do" narrated by our rock-climbers. Our hearts have thrilled with the difficulties of jammed stones, the terrors of face-climbs, and the dangers of holds for feet and hands—so scant that only the nail of a boot or the tip of a finger could find a purchase. Indigestion by suggestion has troubled us as we heard of traverses which, like pills, were frequently and painfully stomachic. We have fidgetted in our chairs while they backed in here, ventured on the face there, or stood—unflinching veterans—under a heavy fire of falling stones. A stern sense of duty, or perhaps a desire to conciliate the Philistines who don't climb, has induced many of them to make involved scientific observations under many and great difficulties, and we have forgiven them. Their doubtless necessary, if violent, declamation of those idiots who violate all the laws and canons of the art of treading where the foot of man was never meant to tread, has carried conviction with it. Our premature ice-axe will never know the eternal snows; relegated to the coal cellar it has, in other hands, become a domestic implement of much utility.

We have gaped at the foolish hardihood of men, apparently respectable, who sought adventure in caves and pot-holes. Have we not heard how, when standing on the brink of some great abyss, magnesium ribbon and a plumb-line revealed a depth exceeding—twenty feet!!! The bottomless pool beneath, with scum and froth swirling upon its horrid surface, has failed to cover even a Rambler's foot. Reassured, we carried tins of paraffin and solid baulks of timber incredible distances and at unheard-of hours to other pot-holes. We cut multitudes of sandwiches and made gallons of tea for intrepid explorers, and thankfully gnawed the mutton bones they left us. Disillusioned our hearts

have hardened, and we are going to submit to the comforts of home a little longer, despite a consuming passion for fireworks and a fierce desire to be called speleologists.

In spirit we have wandered through the pillared aisles of many churches. We have seen countless Norman naves standing on a similar number of Saxon crypts. We have deplored the absence of the triforium, and even criticised the stained glass by judicious references to "Murray." We have pondered deeply on the state of Sir Rufus Robbair's liver when he gave three carucates of land to the Abbey of St. Dufferus for ever. We have recognised the latent poet in members who veiled the commonplaces of lunch in such charming phrases as "lubrication of the tonsils" and "distortion of the alimentary canal." We still reserve our judgment upon the expediency of port wine and brandy for the former operation, and upon the wisdom of performing the latter with the sausage of modern commerce; but we have never failed to give the heroic survivors their meed of applause.

With others we have foolishly slept on rock ledges in Norway, spent arduous days on ice-slopes, and chased legions of furtive fleas in the climbers' huts and chalets of Switzerland. With De Foe we have made the ascent of Cheviot, viewed, like Moses, the climbers' Promised Land from Scafell, and the Pillar Rock from Pisgah, and, unlike Moses, been permitted to pass the Jordan. Up the Dolomites with *scarpelli's* feet we have been dragged on double ropes. We have shuddered upon the verge of the Stygian courses of hidden rivers, and sung Christmas carols in snow-drifts. In the Yosemite Valley avalanches of quotations from the poets have overwhelmed us. We have exhibited an intelligent interest in the Parallel Roads of Glen Roy, and become mildly enthusiastic over a plaster model intended to represent them. In caves and pot-holes innumerable garments have been spoilt, and countless geological specimens brought forth for our edification. The Grépon Crack has become our own familiar friend, and

bids fair to oust from our affections our quondam boon companion, the Napes Needle.

Some compensations have been granted us. Few, if any, Ramblers know Gaelic. When they return from "Caledonia stern and wild" their tremendous adventures lack location, and our share in them is but shadowy.

We have discovered an impressionist school of photographic art, and with some success seen the artists' meanings in their mysterious pictures. We have learned to look unflinchingly upon photographs of our familiar friends clinging like flies to stupendous rock faces, well knowing the foreground has been removed for our pleasure and their glory. In earlier days we listened with patient resignation to speeches relevant to everything but the matter under discussion. Some of these, if irrelevant, had evidently a purpose and a warning, but we have never been able to decide upon the state of mind which induced a speaker to declare "the beauties of Canterbury make it incumbent upon every right feeling member to spend Christmas and Easter in the Lake District."

By the help of an exhibition of scientific Alpine equipment, held in the Club-room, we have attained at least some knowledge of the things not needed for a pleasant holiday. When "the winter of our discontent is made glorious summer," we shall seek the happy shores of dear old Scarborough. There, by the summer sea, conscious of a duty discharged, of gratitude expressed, our strained minds will relax, and we shall return to listen with increased zest to those wonderful tales our brother Ramblers tell us of their marvellous adventures by flood and field, on peak and glacier.

"A SILENT MEMBER."

## REVIEWS.

THE ANNALS OF MONT BLANC: A MONOGRAPH.

BY C. E. MATHEWS.

(LONDON: T. FISHER UNWIN. 1898.)

"This book is in no sense a record of personal adventure. It is a History of Mont Blanc."

Many books have been written relating experiences on and around the mountain, and in the pages of the "Alpine Journal" and scattered in Magazines there is an amount of information relative to it, but until now there has been no work in which could be found a collective account of all the more important ascents. Mr. Whympers' excellent little book, "Chamonix and the range of Mont Blanc," contains much historical matter, but a guide book to the whole chain cannot be expected to give an exhaustive history of the mountain itself. Mr. Mathews' book deals essentially with Mont Blanc and the ascents of importance which have been made by the various routes.

Beginning with a brief early history of Chamonix, particulars follow of the first attempts to ascend the mountain, from those encouraged by the hope of securing the prize De Saussure offered in 1760, to the successful ascent by Dr. Paccard and Jacques Balmat in 1786.

In recounting some of these the author has been aided by a note-book made by Paccard, which Mr. Mathews tells us has been treasured unseen in the Doctor's family until it was placed at his disposal a few years ago. This manuscript is of importance. It was begun several years before the first ascent of Mont Blanc and carried down to the time of Clark and Sherwill's ascent (1825).

Unfortunately, we are still without Paccard's own story of the first ascent. Only a very meagre note of the event appears in his manuscript. It is known he wrote a longer account, which was printed, but a copy cannot be found, and the question Mr. Mathews takes up, and in which the interest in a considerable portion of his book centres, is whether the self-glorifying tale dictated by Balmat to the elder Dumas forty-six years after the event is still to be believed. A free translation of this is given.



According to it, the poor Doctor needed all the encouragement and help Balmat says he gave him on the way up. Mr. Whymper, however, threw another light on the matter when he called attention to the declarations signed by Balmat which were printed in the "Journal de Lausanne" in 1787.

These appear to have been either "overlooked or ignored" by writers on Mont Blanc, and, in justice to the Doctor, this and the further evidence now brought forward in his favour should be made widely known and the honour so freely bestowed on the memory of Balmat shared by his companion.

Mr. Mathews weighs the available evidence and concludes the case as follows:—

"The story that Balmat left Paccard on the snow and made his final effort alone, and then returned and took his companion to the top, must be abandoned, as a piece of Chamonix "blague,"—invented, after the ascent, by a man greedy for praise. The position of the Doctor must be rehabilitated. The two men ascended the mountain for the first time together. No doubt Balmat was the stronger man of the two, probably he led all the way; no doubt he inspired the Doctor with that animation of which he stood in need; no doubt he was a few steps in advance on reaching the summit; but every reasonable man must now admit that both the pioneers were equally entitled to the honour and credit of the undertaking."

Mr. Mathews recounts De Saussure's and many subsequent ascents, particulars of which are very acceptable, as some of the original works upon which he has drawn are not now easily accessible. We are given a history of the formation of the Alpine Club, in which Mr. Mathews took a part. This, as he says, "is strictly relevant to the Annals of Mont Blanc," as "every discovery of a new way [other than by the Grands Mulets and the Grand Plateau] to the summit was made either by a member, or by one who afterwards became a member." It is most fitting that this History comes from one of them. He divides the routes into seven, not counting variations, and further suggests that a way should be tried "direct from the snow fields below the Col de la Brenva to the summit, entirely on the southern [? eastern] side." We venture the opinion that whether taken as a direct finish from above the ice ridge followed by Messrs. Moore and party, in 1865, and by Messrs. Mummery, Collie, and Hastings in 1894, or by the avalanche-swept slopes immediately south of the ridge, this must prove a mountaineering feat of a very high order. The latter—if at all feasible—

will probably be found to equal in risk Messrs. Pendlebury's route up the Dufourspitze of Monte Rosa by the east face.

In a chapter on the Chamonix guides, Mr. Mathews properly condemns the system still practically in use for regulating their employment. This might suitably have been followed, instead of preceded, by the one on fatalities which have occurred on the mountain. A reference to his table at the end of the book shows how largely these have been attributed to incompetent guiding.

The book contains some beautiful photogravure plates and other illustrations of interest, amongst them being a reproduction of a sketch by Mr. Adams-Reilly of the first hut on the Grands Mulets. In a chapter on the Huts, Refuges, and Observatories we are told that this was "a wooden building," but reference to an existing photograph of the old hut, shows that the side and Chamonix end were of stone, and apparently Mr. Adams-Reilly's sketch—taken from the same position—bears this out.

An excellent fac-simile of Windham and Martel's extremely scarce "Account of the Glacieres or Ice Alps in Savoy" is appended to the volume, also a fairly complete bibliography, mainly taken from the French edition of M. Louis Kurz's "Climbers' Guide"; a chapter on the geology of the *massif*, by Professor Bonney, and a map showing the routes, which, though on a rather small scale, will be useful to the reader.

The book is a distinct acquisition to Alpine literature. Mr. Mathews knows his subject well. That Mont Blanc has been a "constant and irresistible fascination" to him is evident. He has ascended it twelve times. In his 'Gleanings and Reflections' he gives expression to the feelings of the true mountain lover in such charming words that this notice may well conclude with the following excerpt from it:—

"Mountaineering has its lights and shades, but it is a pursuit which has added greatly and permanently to the sum of human happiness. Who shall measure the amount? Who is there who can sleep on a glacier in the moonlight, or by the camp fire amongst the lonely hills; who can listen to the music of the wind against the crags, or of the water falling far below; who can traverse the vast white solitudes in the night time under the silent stars; who can watch the rose of dawn in the east, or the great peaks flushed with carmine at sunset, without thoughts which it seems almost sacrilege to put into words, without memories which can never be effaced, for they sink into the soul!"

LIFE OF MAN ON THE HIGH ALPS. BY ANGELO MOSSO.  
(LONDON: T. FISHER UNWIN. 1898.)

THIS book is practically a work on Physiology, and is interesting mainly to men of science and mountaineers. To the latter it appeals especially—though all may not find it entirely easy reading—as it is the record of a series of researches which were made to ascertain, as far as possible, the causes of mountain sickness, and how it may be prevented or relieved. Though this may seem a simple enough problem, it is far from being so, as a glance through the book will show.

Sig. Mosso describes a great number of experiments, all characterised by extreme thoroughness and care, which he made on the functions of the various organs of the body at different altitudes and under various atmospheric pressures. In carrying these out he endeavoured to separate the effects of fatigue and cold from those of diminished barometric pressure.

The experiments, made mainly on the author, his brother, some soldiers, and various animals, were begun at Turin, and continued at various altitudes up to the summit of the Punta Gniffetti (14,965 feet) of Monte Rosa.

The author first gives the effect of different altitudes on muscular power, and proves that up to the height of Monte Rosa it is very little diminished, especially after training. When the body is at rest the pulse rate is shown to be increased by diminished barometric pressure alone; arterial tension is lowered, and respiration made both slower and shallower.

The effect of fatigue on the bodily temperature is found to temporarily increase it, even to such an extent as to cause fever, and this, the author says, is due to the production of what are called 'fatigue poisons,' which may be obviated by training.

The results of exertion on the circulation at high altitudes are then shown to be increased pulse rate, some dilatation of the heart, and diminished arterial tension, all of which make the circulation of the blood very sluggish in the small vessels of the skin, and cause that blueness so frequently seen when climbers are suffering from the effects of rarefied air. These results, the author finds, are mainly due to the action of the diminished atmospheric pressure on the nervous

system, especially the *vagus nerves*; and he goes on to prove that fear and excessive mental strain are important factors in causing fatigue.

Mountain sickness is carefully described, and is divided into the acute and chronic forms. Fifty pages of the book are devoted to prove that want of oxygen is certainly not its main cause, and then it is shown that the dulling of the mental faculties, and sleepiness under these circumstances, is not due to excess of carbonic acid in the blood.

Sig. Mosso endeavours to prove that mountain sickness is mainly due to a condition which he calls "*acapnia*," meaning a *want of carbonic acid* in the blood. This is an exactly opposite theory to that hitherto held, viz., that deficiency of oxygen was its cause. He seems to prove that the old theory is not correct; but the amount of evidence he produces and the results of his experiments are far from convincing that "*acapnia*" is the real one.

The amount of detail in describing some of the apparatus and experiments is rather unnecessary, otherwise there is not much in the book that could well have been omitted. The author has taken due notice of the work of other investigators, whom he freely quotes; he has exploded some of the old ideas and given us new suggestions; but the whole subject is so intricate, that one finishes the book with the feeling that there is still much more to be worked out, before there will be elucidated the way in which the rarefied air of high altitudes acts on the human system, so as to cause what is termed mountain sickness.

F. H. M.

#### BIBLIOGRAPHIE NATIONALE SUISSE.

Descriptions Géographiques et récits de Voyages et Excursions en Suisse: Contribution à la Bibliographie de la Littérature Suisse des Voyages (de 1479 à 1890). Par A. Wäber (Berne; K. J. Wyss, 1899).

SEVERAL years ago a commission was appointed by the Swiss Federal Government to arrange for the compilation of Bibliographies of everything relating to Switzerland and its inhabitants. Fascicule III., dealing with Swiss travel, has just appeared in a closely-printed octavo volume of over 400 pages. It has been prepared by Herr A. Wäber-Lindt, sometime Editor of the "S.A.C. Jahrbuch."

The work is divided into three sections:—

- I. Previous bibliographies.
- II.—Publications of the numerous Alpine Clubs.
- III. Works of travel and those relating to the geography and topography of Switzerland.

Here are arranged, in order of issue, particulars of what must be nearly all the books and papers of any importance on these subjects that have been published or privately printed during the last 400 years.

The names of the authors, the full titles of their books, the sizes and number of the pages, dates of the different editions and their place of publication are all given, when it has been possible to do so.

In Section III. the works on West, Central, South, and East Switzerland are separately divided, and again subdivided for the different districts and Cantons. Excepting the difficulty there must have been in procuring information respecting early and obscure works, the portion of this section which includes the articles in the publications of the numerous Alpine Clubs has doubtless entailed the greatest amount of labour. For these it forms an excellent index, and will be especially useful to the mountaineer seeking for what has been written about any particular Swiss mountain.

The labour of research called for in a work embracing thousands of titles of books, and articles in books, must well have tested the enthusiasm of Herr Wäber, and only a specialist with an exceptional knowledge of the topography of Switzerland, as well as its travel-literature, could have accomplished it with such a degree of success. Its magnitude may be realised when we say that the double-columned Index alone takes up no less than 50 pages of the book.

It will be evident therefore that the task of gathering and arranging such a quantity of material has been no light one, even with the assistance of the French, Austrian, German, Italian, and Swiss collaborators whose help Herr Wäber gratefully acknowledges. Mr. Coolidge, whose knowledge of Alpine Literature is probably unrivalled, has assisted in supplying the titles of English publications.

Herr Wäber is to be congratulated on this painstaking work of years. He scarcely need apologise for the comparatively few imperfections it contains, as in a work of this

kind and magnitude, slight errors are almost unavoidable, and absolute completeness can never be assured.

The work must long remain the standard reference book on Alpine Literature, and it is to be hoped that in due course it will be supplemented by a list of the publications which may appear during, say, each succeeding decade.

#### CAVE EXPLORATION.

"THE ENCYCLOPÆDIA OF SPORT." VOL. II., pp. 48-53.

(LONDON: LAWRENCE & BULLEN. 1898.)

FOLLOWING Sir Martin Conway's article on mountaineering is one on cave exploration above the names of four members of the Yorkshire Ramblers' Club—Messrs. Calvert, Ellet, Gray, and Green. The article says cave exploration has been aptly called "mountaineering reversed." Frankly describing it as a sport, its writers make no apologies for pursuing it, regardless of public opinion, which always condemns climbing more or less, and cannot too utterly abhor the more apparent futility of its allied sport.

Yet the futility is more apparent than real. Science cannot fail to benefit by the increase of knowledge. Its lessons of hard work and endurance, its varied responsibilities and opportunities do much to strengthen the muscles and minds of its pursuers.

The technical side is dealt with at some length, and the article gives a careful explanation of the most successful methods of exploring caves and descending pot-holes. Attention to details is properly emphasised. Carelessness is always unjustifiable, yet it is so easy to be careless, and it may be so fatal.

If there is a point upon which it is possible to join issue with the authors it is upon the form of rope-ladder best adapted for this work. In spite of its extra weight, a ladder with alternate rungs of wood and rope, or at least every third rung of wood, is to be preferred to the ladder with one wooden rung in every four or five recommended. Climbing a rope-ladder for even a short distance is exceedingly arduous, and the stiffness and rigidity imparted by the additional wooden rungs more than balance the increased difficulty in getting the ladder to its point of usefulness.

Curiously, all mention of provision for the sustenance of the explorers has been omitted. This matter is of some

importance, and might have received some attention with advantage. Its necessity is obvious. Some of our larger pot-holes and caves have involved expeditions of ten, twelve, or even fourteen hours' duration. They are more or less wet, and the success of an expedition often depends in a greater degree on an efficient food supply than is commonly suspected. Cave exploration is hard work, quickly exhausting vitality, and there are possibilities of temporary imprisonment, when things would go hardly with a party unprovided with food.

The article is illustrated by a sectional diagram of a pot-hole, showing method of descent, &c.

L. M.

WIT, CHARACTER, FOLKLORE, AND CUSTOMS OF THE  
NORTH RIDING OF YORKSHIRE, WITH A GLOSSARY.

BY RICHARD BLAKEBOROUGH.

(LONDON: HENRY FROWDE. 1898.)

WE welcome Mr. Blakeborough's book on the North Riding as containing in a handy volume a record of the Wit, Character, and Folklore of the shire. Compiled with care and written with judgment—we might almost say with diffidence—it reflects the author's knowledge and love of his subject. The book is so arranged that it can be either read and enjoyed, or used for reference equally well.

Though the anecdotes illustrative of Yorkshire wit are not all new, they are well chosen and told with humour. Our people do not always consider the feelings of others when they feel called upon to make a few remarks, but they can and often do say good things without being offensive, as the following among many others shows:—

"Lady — said to one of her under-gardeners, 'Thomas, the maids tell me that you often say very nasty things about women; do you ever do the same of the men?' And then her ladyship looked him squarely in the face, but Thomas was equal to the occasion. 'Neea, my lady, that Ah deean't, acoz i' that case it 'ud be trew, ya knaw.'"

Hospitality, kindness, fairness, and gratitude are virtues naturally extolled, but less admirable traits are by no means covered up—

"It is admitted on all hands that the Yorkshireman is fairly 'cute'; he always has an eye to the main chance."

Even so. The advertisement of the author's calling, which unfortunately disfigures its pages, is as good an illustration of this point as the book contains.

The chapters on customs and folklore are especially interesting, and as is proper in a work covering a wide area those beliefs only are noticed which are common to the whole district. The observances of all the seasons of the year—many of them dating from the earliest days of Christianity and doubtless of Paganism—are described, and the reasons assigned for them are generally well grounded.

The rites, ceremonies, and charms to be used for the discovery of future spouses, and other prognostications, are very numerous, and provide plenty of interesting reading.

Customs in connection with birth, death, and marriage die hard, though they are observed in a very modified form nowadays. The memories of many old people still contain a fund of witchlore, and volumes could be written on the doings of witches who lived and did a large business a generation or two back. Wise men flourished at the same time, and for a consideration they were ready to provide antidotes for the spells put upon their clients by witches. Wickenwood was universally employed as a charm, but recipes generally of most repulsive ingredients had to be employed in various ways in conjunction with elaborate ritual and incantations. The writer, in order to record that witches sometimes did good even if they committed evil to bring it about, quotes a tale of a widow's son who was dying presumably under the spell of a certain Nanny Appleby. The mother saw the witch with the idea of appeasing her, but Nanny swore she was innocent, and undertook to visit the lad and cure him.

"In much fear and trembling, the widow returned with Nanny, to the astonishment of the whole village. After having been left alone with the young fellow for some little time, Nanny told the weeping mother that her lad was possessed of a devil, which she promised to drive out. By what means she managed to induce the devil to let go his hold 'of the vitals' is not known; but a terrific fight took place, furniture was smashed and pots were broken, amidst yeais Satanic, and Nanny came off victorious. Having got the devil out of the young fellow, the next thing was what must be done with the little imp? Nanny, however, seems to have been equal to the occasion. Of course, such a doubtful customer could not be allowed to roam about at his own sweet will; oh, dear no, Nanny would not grant a favour of that kind. The spirit

was commanded to enter the body of a certain Tom Moss. Probably she had a spite against Tom; anyway the order seems to have been most promptly obeyed, for within a month Tom was found drowned in Grantley Lake. The invalid recovered, and so there is no doubt about anything."

Legends of the hobman and the fairies complete this section, which is full of interest to the student of folklore.

The grand old Yorkshire folk-speech—"not a dialect, but a language," has a champion in Mr. Blakeborough. How we wish the people who speak it as their mother tongue were all as proud of it as he is! We should then have no fear of its disappearance. But it is already doomed, and we are not quite sure that many Cleveland boys old enough to grasp the meaning of its equivalent in their own speech would not fully understand the slang phrase which is quoted in one chapter as something unintelligible to them. There are too many weekly "comic" papers circulating for this to be possible. It is hardly fair, by the way, to hold up such a hideous deformity of the language as a type of Southern English. We do not like to look forward to the day, but the time will surely come when education, the press, railways, and the post office shall have elevated (or is it *lowered*?) the country to one level, when the ancient beliefs, the ready wit, and the quaint tongue shall give way to the scepticism, the superficial sharpness, and the cant of the large towns. Mr. Blakeborough's book is thus all the more valuable as half of it is entirely devoted to the folk-speech. There are chapters one being by the Rev. C. F. Morris-- on idioms, similes, proverbs, and characteristic sayings, a short grammar and a valuable glossary, which might be improved by derivations of the words which differ much from accepted standard English. This part of the work reminds us much of two other books on Yorkshire which have been published in recent years, the imitation of which, however, if it is a fault at all, is a good one.

On the whole, this is a book for which all Yorkshiremen owe their gratitude to the author, and one which everybody, whether natives of the broad-acred shire or not, will find very entertaining reading.

H. H. B.

## RECENT BOOKS.

GENERAL INTRODUCTION TO THE "ALPINE GUIDE." Hints and Notes Practical and Scientific for Travellers in the Alps. By the late JOHN BALL. A New and Revised Edition. Prepared on behalf of the Alpine Club by W. A. B. Coolidge. Size  $7\frac{1}{4} \times 5$ , pp. clxiv. (London: Longmans, Green & Co. 1899. *Price 3s. net.*)

THE ALPINE GUIDE. Vol. I. THE WESTERN ALPS. By the late JOHN BALL. Memorial Edition, Reconstructed and Revised by W. A. B. Coolidge. With 10 Maps. Size  $7\frac{1}{2} \times 5$ , pp. xlix. and 612. (London: Longmans, Green & Co. 1898. *Price 12s. net.*)

THE ANNALS OF MONT BLANC: a Monograph, by C. E. MATHEWS, with a chapter on the Geology of the Mountain, by Prof. T. G. Bonney, with photogravure and other illustrations, and a map. Size  $8\frac{1}{2} \times 5\frac{3}{4}$ , pp. xxiv. and 368. (London: T. Fisher Unwin. 1898. *Price 21s. net.*) Reviewed on p. 79.

LIFE OF MAN ON THE HIGH ALPS. By ANGELO MOSSO. Translated from the second edition of the Italian by E. Lough Kiesow. With illustrations. Size  $9\frac{1}{2} \times 6\frac{1}{2}$ , pp. xv. and 342. (London: T. Fisher Unwin. 1898. *Price 21s.*) Reviewed on p. 82.

THE EARLY MOUNTAINEERS. By FRANCIS GRIBBLE. With 48 illustrations. Size  $8\frac{1}{2} \times 5\frac{1}{2}$ , pp. 352. (London: T. Fisher Unwin. 1899. *Price 21s.*)

THE PLAYGROUND OF EUROPE. By LESLIE STEPHEN. A New Edition, with 4 illustrations. Size  $7\frac{1}{2} \times 5$ , pp. xi. and 339. (Longmans, Green & Co. 1899. *Price 3s. 6d.*)

We are pleased to find the publishers issuing another and cheaper edition of this well-known classic. Five years ago, before the second edition was issued, a copy of the work could only be obtained with difficulty for almost as many pounds as it can now be purchased for shillings.

HOURS OF EXERCISE IN THE ALPS. By the late JOHN TYNDALL. A New Edition with an Index. Edited by Mrs. Tyndall. With 7 illustrations. Size  $7\frac{3}{4} \times 5$ , pp. x. and 481. (London: Longmans, Green & Co. 1899. *Price 6s. 6d. net.*)

THE HOUSE ON SPORT. By Members of the London Stock Exchange, with a chapter on Mountaineering by J. O. MAUND. (London: Gale & Morgan. *Price 21s.*)

THE COST OF SPORT. Includes a chapter (pp. 348-355) on the cost of Mountain Climbing in the Alps by EDWARD WHYMPER. Size  $8 \times 5\frac{1}{4}$ . (London: John Murray. 1899. *Price 6s.*)

WILD LIFE AT HOME. By R. KEARTON. With illustrations. Size  $7\frac{1}{2} \times 5\frac{3}{4}$ . 1899. *Price 6s.*

Chapter II. (pp. 20-45) contains hints on the use of the rope and manipulation of cameras on cliff faces.

THROUGH THE HIGH PYRENEES. By HAROLD SPENDER and H. LL. SMITH. With 69 illustrations and 5 maps. Size  $8\frac{3}{4} \times 5\frac{3}{4}$ , pp. xii. and 370. (London: A. D. Innes & Co. 1898. *Price 16s.*)

It is so long since a book on the Pyrenees was published in England that we welcome this brightly-written account of two camping and climbing expeditions made by the authors in the summers of 1896-7. Climbers will find in it useful information on the comparatively little visited higher parts of the Pyrenees. A judiciously compiled bibliography adds to the value of the work, which deserves a more extended notice than this.

NEW CLIMBS IN NORWAY: An account of some ascents in the Søndmore District. By E. C. OPPENHEIM. With illustrations. Size  $7\frac{1}{4} \times 5\frac{1}{2}$ , pp. x. and 257. (London: T. Fisher Unwin. 1898. *Price 7s. 6d.*)

EARTH SCULPTURE; or, the origin of Land Forms. By Prof. GEIKIE. With illustrations. Size  $8\frac{1}{4} \times 5\frac{1}{2}$ , pp. xvi. and 320. (London: John Murray. 1898. *Price 6s.*)

VOLCANOES: their structure and significance. By Prof. BONNEY. With illustrations and a map. Size  $8\frac{1}{4} \times 5\frac{3}{8}$ , pp. xiii. and 351. (London: John Murray. 1899. *Price 6s.*)

THE WAY ABOUT THE ENGLISH LAKE DISTRICT. By A. W. RUMNEY. With an appendix on Crag Climbing by J. W. Robinson. Illustrations and Map. Size  $6\frac{1}{2} \times 4\frac{1}{8}$ , pp. 160. (London: Iliffe, Sons and Sturmev Ltd. *Price 1s. net.*)

SPROGUES ON THE FELLS. By A. W. RUMNEY. With Illustrations. Size  $6\frac{1}{2} \times 4\frac{1}{8}$ , pp. 68. (London: Iliffe, Sons & Sturmev Ltd. *Price 6d. net.*)

A PICTURE-SQUE HISTORY OF YORKSHIRE. Being an account of the History, Topography, and Antiquities of its Cities, Towns, and Villages. By J. S. FLETCHER. With illustrations. Size  $10 \times 7\frac{1}{4}$ . *To be published in 18 One Shilling parts. Parts 1 to 4 have been published.* (London: J. M. Dent & Co. 1899.)

WENSLEYDALE AND THE LOWER VALE OF THE YORE, FROM OUSEBURN TO LUNDS FELL. By EDMUND BOGG. With 125 illustrations. Size  $7\frac{1}{4} \times 4\frac{3}{4}$ , pp. 190. (Leeds: Henry Walker. *Price 1s. net.*)

WIT, CHARACTER, FOLKLORE, AND CUSTOMS OF THE NORTH RIDING OF YORKSHIRE, with a Glossary. By RICHARD BLAKEBOROUGH. Size  $7\frac{1}{4} \times 4\frac{3}{8}$ , pp. xxi. and 485. (London: Henry Frowde. 1898. *Price 5s. net.*) Reviewed on p. 86.

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ii. *The Yorkshire Ramblers' Club Journal.*

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## RULES.

### I.

The Club shall be called the "YORKSHIRE RAMBLERS' CLUB."

### II.

The objects of the Club are to organise walking and mountaineering excursions, and to gather and promote knowledge concerning Natural History, Archaeology, Folklore, and kindred subjects.

### III.

The management of the Club shall be vested in the hands of a Committee, consisting of a President, two Vice-Presidents, a Treasurer, an Honorary Secretary, an Assistant Secretary, and seven other members, who shall retire annually, but be eligible for re-election. Five shall form a quorum.

### IV.

The Club may, on the nomination of the Committee, elect Honorary Members, on account of their eminence in advancing the objects of the Club, who shall be eligible for any office, and have the same privileges as ordinary members, but shall not be liable for any subscription.

### V.

Before any person is eligible for election, he shall have shown himself to be interested in the objects of the Club to the satisfaction of the Committee.

### VI.

The election of members shall be in the hands of the Committee. Every Candidate for admission shall be proposed and seconded by members of the Club. A list of the candidates for election, stating the name of each candidate, his address and occupation, together with the names of his proposer and seconder, dated and signed by the Secretary or some other person appointed by the Committee, shall be

posted in the Club-room during two meetings immediately previous to his election. The election shall be by ballot, two black balls to exclude.

### VII.

Any member shall be at liberty to invite strangers to the meetings of the Club, subject to such regulations as the Committee may from time to time deem necessary.

### VIII.

The Club-year shall commence 1st November, the Annual General Meeting being held on the third Tuesday in October, for the transaction of business and the election of officers for the ensuing year. The proposer and seconder of the name of any gentleman other than a retiring member intended to be proposed as a member of the Committee, or for any office in the Club, shall give at least twenty-one days' notice thereof previous to the Annual General Meeting, to the Honorary Secretary; and the notice so given shall be posted up in the Club-room, at the meeting preceding the Annual General Meeting. Without such notice no new name can be proposed at the meeting. The election shall be by ballot.

### IX.

The Committee have power to fill any vacancy among the officers of the Club occurring during the year

### X.

The subscription shall be half-a-guinea per annum, payable in advance on November 1st. Any member whose subscription is in arrear shall be dealt with by the Committee.

### XI.

Membership shall be held to continue, and the subscription be considered due, until a written notice of resignation has been received by the Secretary.

### XII.

The Committee may at any time call a Special General Meeting, and must do so within fourteen days after receiving a requisition signed by five members, giving not less than seven days' notice, and specifying the object to which alone the discussion shall be confined.



vi. *The Yorkshire Ramblers' Club Journal.*

XIII.

No Rule shall be made, altered, or rescinded, except at a Special General Meeting called for that purpose, of which seven days' notice in writing shall be given, specifying the proposed alteration.

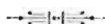
XIV.

The Committee shall have power from time to time to make such Bye-laws as they may deem necessary for the proper government of the Club.

XV.

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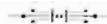
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