

W. H. MURRAY & J. E. B. WRIGHT

The Craft of Climbing

WITH 16 PAGES OF PLATES



NICHOLAS KAYE

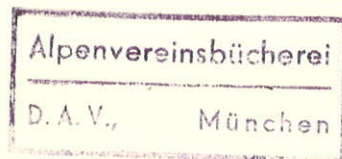
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1

The Great Decade of Mountaineering

TIME has brought the Himalaya and the Andes nearer to modern British climbers than the Alps were to Edward Whymper.

The long approach marches to high summits will soon be unnecessary; the aeroplane and the helicopter are already dumping equipment and stores at camp sites and injured climbers are being taken from the scenes of accidents direct to hospitals.

The age in which we now live is a stimulating one for mountaineers and the last ten years may be looked upon by posterity as a great decade.

Between June 1950, and May 1960, the thirteen highest mountains in the world were climbed and this decade rivals the greatest of Alpine surges of the Victorian Golden Age of mountaineering. The following is the record of these remarkable achievements:

ANNAPURNA I, 26,493 feet. June 1950. French Expedition (led by Maurice Herzog; Sirdar, Ang Tharkay), comprising nine Frenchmen and eight Sherpas. The number of porters used was

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200. Herzog, Lachenal, Terray and Rébuffat were benighted a few hundred feet below the summit after the first two had reached the top; there followed a nightmare descent and a difficult return march, during which Herzog had most of his frost-bitten toes amputated. In the previous weeks this great team had made a reconnaissance of Dhaulagiri.

MOUNT EVEREST, 29,028 feet. May 1953. British Expedition (led by John Hunt; Sirdar, Tenzing Norgay), comprising ten Britons and twenty-eight Sherpas. The number of porters used was 350. Hillary and Tenzing reached the summit, two days after Evans and Bourdillon had reached the South Peak. Between 1921 and 1953 there had been ten previous attempts by the British and two by the Swiss, in which many British (including Mallory and Irvine) and Sherpa lives were lost.

NANGA PARBAT, 26,642 feet. July 1953. German Expedition (led by Karl Herrligkoffer; Sirdar, Geyley), ten Germans and Austrians, and twelve Sherpas. Three hundred porters were used. Hermann Bühl reached the summit alone, spending the following night in the open at 26,000 feet. There had been eight previous attempts, including Mummery's in 1895, in which fourteen climbers and seventeen porters lost their lives.

GODWIN AUSTIN K2, 28,250 feet. August 1954. Italian Expedition (led by Ardito Desio). Twenty Italians, no Sherpas. Five hundred porters were used. Two Italian guides, Campagnoni and Lacedelli, reached the summit.

CHO OYU, 26,750 feet. October 1954. Two Austrians and six Sherpas, led by Herbert Tichy; Sirdar, Pasang Dawa Lama; Tichy, Jöchler and Pasang reached the summit. Forty-five porters used.

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MAKALU, 27,790 feet. May 1955. Remarkable French Expedition (led by Jean Franco; Sirdar, Gyalgen Norbu), in which eight Frenchmen, and Gyalgen reached the top.

KANGCHENJUNGA, 28,156 feet. May 1955. Nine British (led by Charles Evans) and eleven Sherpas (Sirdar, Dawa Tenzing); Band, Brown, Hardie and Streather reached the summit. An undramatic and efficiently organized expedition on a mountain with a terrible reputation; ten previous attempts, in which many lives were lost.

MANASLU, 26,658 feet. May 1956. Fourth attempt by Japanese (led by Yuko Maki; Sirdar, Gyalgen Norbu); Imanishi and Gyalgen reached the top. Twelve Japanese, sixteen Sherpas and 280 porters were used. Yuko Maki made the first ascent of the Mittellegi Ridge of the Eiger in 1921.

LHOTSE, 27,890 feet. May 1956. Eleven Swiss and twenty-two Sherpas (led by Albert Eggeler; Sirdar, Pasang Dawa Lama). Climbed on the way to make the second ascent of Everest. Luchsinger and Reiss reached the top. Three hundred and fifty porters were used.

DHAULAGIRI, 26,900 feet. May 1960. Swiss-Austrian Expedition (led by Max Eiselin; Sirdar, Nima Dorje), which succeeded at the fifth attempt. Diemberger, Duner, Forrer, Schelbent and two Sherpas reached the summit.

GASHERBRUM I, 26,470 feet. July 1958. American Karakoram Expedition (led by Nicholas B. Clinch); Schoening and Kauffman reached the top.

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BROAD PEAK, 26,414 feet. June 1957. Austrian Expedition (led by Marcus Schmuck); Bühl, Diemberger, Schmuck and Wintersteller reached the top.

GASHERBRUM II, 26,360 feet. July 1956. Austrian Expedition (led by Fritz Moravec); Larch, Moravec and Willenpart reached the top.

During the same decade, scores of Himalayan peaks under 26,000 feet were climbed.

One of the most remarkable of these, and a milestone in Himalayan mountaineering, was the ascent of Mustagh Tower, climbed in July 1956 by John M. Hartog and Tom Patey; technically, the hardest climb ever done in the Himalaya although the height was only 23,800 feet. Joe Brown and Ian McNaught Davies reached the West Top, ten feet lower, so they ought to be included as having climbed this fearsome mountain.

If the successful climbs mentioned above are the spectacular achievements, many of them were preceded by grim tragedies. The ascent of Annapurna by the French climbers had a great impact on modern Himalayan climbing and marked the beginning of the whole fabulous story. The first ascents of Tirich Mir, Nun Kun, Rakaposhi, Machapuchare, Trivor and Haramosh during the same decade are, perhaps, some of the high-lights under which the Indians, Jayal and Singh, the Frenchwoman, Claude Kogan, the Britishers, Greenwood, Banks and Noyce, and the Scotsman, Patey, have made their contributions to these remarkable years.

Climbers suffered great hardships and many died in this fantastic surge; the same dynamism has cut through every mountain area in the world, from the Andes to the Alps, and deep into English outcrops.

The team work has been praiseworthy; the adoration of the climbers disgusting, but human. The conflict of men v. mountains has been extended to nation v. nation and adulation has

THE GREAT DECADE OF MOUNTAINEERING

been stimulated by official glorification of national prestige. Many hoped that when Dhaulagiri had been climbed this tragic and farcical competition would end. Has this hope been realized?

One sage has observed, 'the shift of interest from the mountain to the climber, from the adventure to the skill, threatens to become all too complete. In the growing emphasis we place on self-realization even our Welsh mountains, their greatness and adventure, are vanishing in the background behind the assertive brilliance of the climbing hero's halo'.

These words, stripped of their hyperbole, mean that both armchair and active climbers are adopting the mentality of film fans. Unless there is some 'shift of interest from the adventure' to even more emphasis on skill, the death roll will increase. A halo vanishes under the cross-fire of literary debunking.

When an examination of the records of this decade is made the Saints are outnumbered by the lesser-known practical men and women who have trekked through unknown valleys and endured on high passes to fill in the blanks on the maps and find new mountains for our delight. In these great contributions to our knowledge increasing skill goes hand-in-hand with adventure but the drama is missing; there is no death roll to enliven journals. Reject these tasty morsels of the popular Press and turn to the splendid stories in mountaineering journals. Here you will find little praise for heroes but a good deal of debunking and the main content is a vast record containing millions of words about mountaineering proper. This latter word is taken from *The Story of Everest*:* 'Mount Everest ranks with the North and South Poles, and attempts on the first named should not be confused with mountaineering proper.' Improper would seem to be the appropriate antithesis when the cost is counted of adventure without sufficient emphasis on skill and equipment, thirty-one lives lost on Nanga Parbat and fifteen on Mount Everest. Of Whymper and his contemporaries a great Queen said, 'something ought to be done to stop them'. Would it not have been

* By W. H. Murray. Dent, London, 1953.

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wiser to have said, 'what can be done to help them'? A proper balance too should be maintained between Queen Victoria's condemnation and a rational approach to climbing.

Queen Victoria's question was asked again as recently as 1962 when eleven climbers lost their lives in ten days and this was compared with the heavy fatalities of long ago on Nanga Parbat, Kangchenjunga and Everest. One survivor of an Eiger disaster said that the effect of mountains upon him was like a powerful drug; he could not resist it. This is one of the bad effects of the climbing bug, but it is not the usual effect of mountains upon rational climbers.

There is another side to the picture of mountaineering, unseen and unpublicized; it is an attractive side and within its sharp focus are many thousands of men and women enjoying easy and difficult ascents.

This side of the picture shows the safe return of many high-altitude expeditions, the evening exodus from hundreds of glaciers and icy ridges to the refuge of the huts, the daily downward trek from a thousand cliffs to cottages and farms where rock climbers live decently in health and security.

This side of the picture shows, too, many thousands under training at courses and schools of climbing all over the mountain world. Instructors watch and correct the first inept steps and the fumbings with knots of the learners and from these pupil-groups will come the experts and the competent middle-grade climbers of tomorrow.

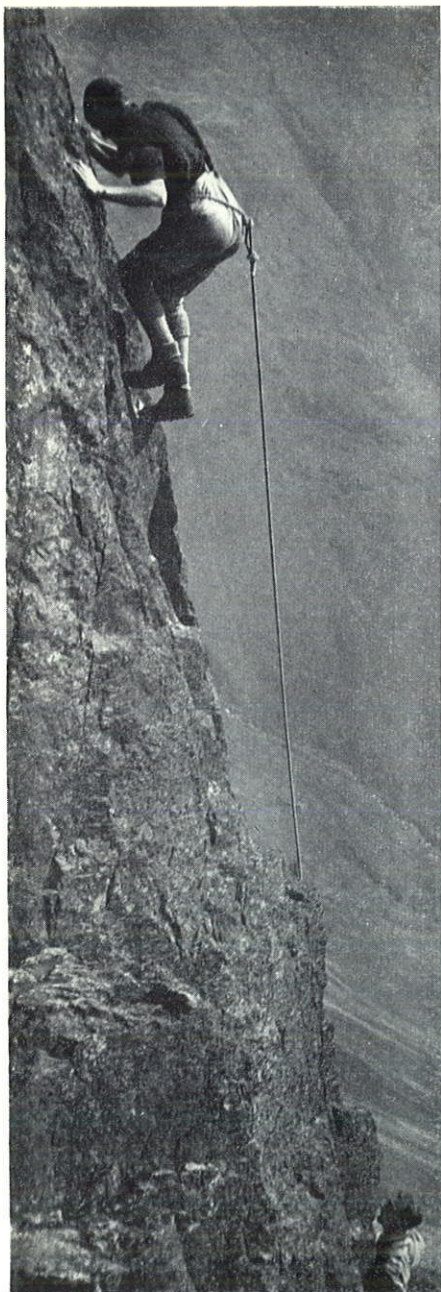
The men and women who have died on mountains have ended their lives following a pleasant and attractive pastime. That is the dark side of the picture. On the other side there are a million others who roam over the high places of the earth in safety.

However much that is new and spectacular which has illuminated the records since 1950, the Free Climbing Age fills most of the pages. The faults of this age were its taboos on ironmongery, its exclusiveness and its establishment of a Roll of Honour for its own first-ascenders. The taboos have been disobeyed, the exclusiveness has been invaded and the disobedient children, with knowledge gained from their masters, have forced the pace



BEN NEVIS: The overhangs on Titan's Wall

(Photo: Ian Clough)



GREAT GABLE: Slow, careful movement with flexed arms and legs on the small holds of Eagles' Nest Direct



GIMMER CRAG: The awkward move across the Bracket; only the leader's hands keep him in balance and the run-out is seventy feet

(Photos: Mayson Keswick)

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and claimed their rightful place on the scrolls.

Many experienced mountaineers have given long years of service to passing on their knowledge to a new generation. Has training played any part in a rational march towards modern standards of equipment? Is the future route of the march being properly planned? Is the full impact of the present decade realized, and understood? These are important questions for mountaineers.

The precepts long followed in mountaineering training have been Safety, Competence and Quality; these are harmonious where teaching is concerned with established methods. What of new methods? Good camping equipment and stockpiling above 20,000 feet, well-constructed ice-caves, good food and plenty of warmth for bivouacs, the sprag, the handjam, the pinch hold, the cross pressure, and all the other new rock techniques with their safeguarding ironmongery, have essential places on high glaciers and overhanging rocks. We can close the rift between technician and climber if the climber accepts them as useful and the technician does not use them on climbs after these have been done by free leaders. There is no conflict between competence and safety; there ought to be none between adventure and skill, if competence is the aim and safety is the end of all planning.

J. E. B. W.

ON ROCK

2

The Rope in Rock Climbing

THROUGHOUT the years, a series of most valuable articles on rope has appeared in *Mountain Craft*. I could add to these articles no new technical matter but as a mountaineer I have practical comment to make.

As more and more climbers respond to the call of the greater ranges, I feel that I cannot give greater help than by reminding them that the greater scale demands for success a pace and rhythm not commonly practised in this country. In rope-work, pace and rhythm demands from all members of the party a further alertness and awareness of the movements made by the men ahead and behind. Where the party are moving all together along pinnacled ridges or up buttresses, the second man has much more rope to manage than his leader, and if he knows how to manage it well he can save his team much time, and this saving of time is his duty.

One way he can do that is to watch the leader, note carefully what route he takes and the holds he uses, and then himself take these same holds. He should not have to waste time by doing the leader's job all over again. This practice of the follower watching

THE ROPE IN ROCK CLIMBING

the man ahead, at the same time as he watches the rope and climbs, will seem difficult at the first attempt, but like many other things in mountaineering it grows easy with practice. His imitation of the man ahead becomes almost unconscious, so that he can take the same holds at a passing glance. He reaps benefit too, in that the leader, knowing that his own line is followed, knows when to go slow. No man likes to be hustled, and on mountains no one should be—in the interests of safety. At the same time, it is of more importance not to jerk the man in front than for the second to climb in ease and comfort. His membership of a team means that he has to think more of others than himself.

The leader, revelling in his leadership, is apt to forget that latter rule, or to think himself less subject to it. If he knows his job he will constantly spare thought for his second and temper his pace according to the difficulties of rock in his rear rather than the easiness of that ahead. If he fails to do so, his second should bring him to book in strong terms.

Whatever a man's place on the rope, from the moment he ties on he has renounced for a short while his personal independence to establish a greater strength of team. He has to be careful not to throw away the latter after losing the former. When moving together he must learn the deft swing and flick of the rope that clears snags, sends down no stones, avoids jerks, and is ready for quick belays. When moving one at a time, he should remember that the rope is a surprisingly sensitive telegraph wire. This means that when his leader is battling with the crux, and wanting the moral support given by his second's attention and interest, the second should not be gaily chattering with the third or admiring the distant views. It is a psychological fact that a leader, closely watched by his second, will climb better and more confidently. And the leader likewise, once he is up, can help his second by showing his own interest, playing him up like a trout on a line, never too taut or slack.

Where a pitch is so hard that rucksacks must be sent up on a line, time is saved if the team (all too rarely) can tie simple hitches instead of granny knots.

There has been much discussion over the years on the subject

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of hip belays versus shoulder belays, and dynamic belays versus static. Although it is generally accepted that the hip belay is better, the notion that it should be invariably used is in practice an extreme view that forfeits the greater advantage of a shoulder belay in certain constricted stances. There are certainly a few invariable rules in rope-work, but no particular type of belay is invariably right. So too with the dynamic belay, whose principle is the friction brake: it has a time and place proper to itself. Some of its protagonists state their case with excessive enthusiasm, causing opponents to react with a show of excessive caution.

The opponents' case is the practical one of experience: that when a leader falls his second has no time to weigh up the respective merits of dynamic and static belays in his own particular situation. The demand is instant action. If he has to choose, his mind may wither and that moment of indecision may cost life. Hence (it is argued), better stick to the static belay because in any event he will be hard put to it, under the shock of impact, to halt the run-out of rope round his waist. Moreover, unless the whole drop is indeed vertical, which would be unusual, the leader will strike rock as he falls, and the quicker he is stopped the better.

I witnessed an accident on the Dent du Géant, where a party of two Americans were a hundred feet up above the base of the tooth. The leader climbed a further fifty feet and came off. His second either gave a dynamic belay but failed to control it, or else swithered a moment too long in decision: in any event the entire rope ran out. The leader struck the bare ice at the foot of the cliff, when the stretched nylon sprang back to normal extension, holding the dead and gyrating body ten feet up in the air.

The second's position had been ideal for the dynamic belay had he only worn gloves and been able to retain control. Had he given a static belay, and had his mind been set on that in advance, the leader might have stood a better chance. It can well be argued that if his second had only had practice in holding falling leaders, he could safely have given a controlled dynamic belay and no death would have occurred. But how many of us have had this practice? Have we held even one falling leader? Or

THE ROPE IN ROCK CLIMBING

two? Do we plan to get ourselves this practice in the very near future? Having answered these questions, are we in a position to criticize the second man on the Géant?

I witnessed another leader fall off the overhang at the third pitch of Raven's Gully. His second, at the midway cave, gave a static belay round the hips from the sitting position. The rope was manilla. About six inches ran out, skinning the second's hip and hand. The leader was stopped with his head about two feet off the scree. It is interesting to speculate what his fate would have been had the rope been nylon, or if the second had applied a more 'dynamic' brake.

I cite these instances from innumerable others to give support to the static school, who seem in need of it, rather than in deprecation of dynamic technique as such. The latter is here to stay. There is in reality no dispute between the two methods, and the difficulty of deciding which to use in the event of a fall need cause no delay, even of a fraction of a second. The solution, or reconciliation, is offered in the opening paragraphs on teamwork and duty, which apply to all mountain routes, whether long or short, easy or severe. Follow with your eyes the climber you are responsible for belaying. Climb with him in sympathy. Constantly think what you would do if he fell. When you take a stance and anchor, decide then—not later when you have no time to think—whether to use a static belay or dynamic. This decision, taken in advance, removes the danger of a divided mind. The practice of that foresight should become habitual.

The dynamic belay has a most valuable use when the leader falls on a runner. If a static belay is used, then the second's own weight is all that prevents his being pulled upwards. A former writer in *Mountain Craft* advocates that he tie on to a piton driven in low down (in addition to his normal anchor). That is good practice, provided that he is not encouraged thereby to hold the rope so static that he can be lifted off his feet, for the danger then is that the runner may fail or more likely the karabiner. Points to be borne in mind, before reading farther, are (1) that loops have 80–90 per cent of original rope-strength if spliced, 95 per cent if joined with a fisherman's knot; (2) that

nylon breaks across a karabiner at 79 per cent of its strength; (3) that when the BMC tested the lighter-weight foreign karabiners—the Stubai (4½ oz.), the pear-shaped Austria (4 oz.), the Asmu (4½ oz.) and the P. Allain (2½ oz.)—they either opened or broke and sheered hinges at weights of 2,500 lb., 2,800 lb., 2,240 lb., and 1,100 lb. respectively.

To continue, it has been shown by Cumming and Slesser (*SMC Journal*) that if a leader, weight 200 lb., falls when twenty feet above his runner, which is a 4-foot circumference sling, and the runner is twenty feet above the second man: then 1,640 lb. is the rope-strength required to hold the leader. The stress on the second man is 935 lb., which he could hold. But the stress on the karabiner is 1,640 plus 935 = 2,575 lb.

The lesson is that the leader must be attached to his rope by a karabiner of equal strength to the rope. But on runners, the karabiner must be at least 1½ times the rope strength if the runner is *NOT* to be the weakest link. Therefore, if the karabiner is weaker than this, a dynamic belay must always be used and the second must wear gloves.

The leader must bear this in mind too. If he is climbing on a doubled rope, which is certainly the safest system, and using runners, he clips on his ropes alternately to reduce friction and also to increase safety where the rope may run over sharp edges, but a leader has snapped four such runners in falling; he must accordingly remember not to run out all his rope. His second can only give a dynamic belay if he is left with free rope to run out.

W. H. M.

3

Slings and Pegs

THE advances made in technique by use of nylon rope, pegs, slings, clips and ladders (*étriers*) are the seed not only of handsome and sturdy plants but of lush, smelly weeds, which left unkilld will choke the rock-garden.

Artificial technique is of great aid to exploratory work; exploration is one of the principal joys of mountaineering; therefore artificial technique is good. Tension climbing is worth learning and practising for the sake of access to many Alpine climbs, splendid routes on which the artificial passages are short and the free passages long and exhilarating, but which are closed to all lacking the means of access. There is no menace to mountaineering from practitioners of that technique, for two reasons. First, those who are adept in this country find it a merely mechanical process, not worth using for its own sake when mastered, boring compared to free climbing, but necessary for reasons cited above. It must accordingly be practised. Secondly, where it is practised for its own sake, it is a new sport, as distinct from climbing as ski-ing, although, being on no par with the two latter as sport, it must inevitably fail to command a

large following. In brief, faced with tension climbing, we can declare *Nihil obstat*.

The weeds to be plucked out are of more subtle, spreading, and choking kind. The introduction of nylon rope released the leader of a long run-out from the weighty drag of manilla, especially when his rope had to run through rings set at angles, and this was good. At the time that Peter Harding discovered the secret of the hand-jam, his companion Tony Moulam demonstrated the free use of slings for running belays. The two together gave a great boost to a leader's confidence on hard climbs, and confidence is the secret of high-standard climbing. In the main part, the secret of confidence is practice, practice, practice—but granted that, a new technique such as Moulam's can push it still farther. And this was (and is) good. We may say the same of pegs, whose origins are swallowed up in the mists of antiquity, so that no credit may be given for their introduction. All these items help in the development of rock-climbing. What we now have to fear is the flagrant misuse of them.

Their misuse becomes plain when we see them undermining a leader's self-confidence in free climbing, so that he cannot accept exposure on rock graded Severe or less without the interpolation of slings or pegs between himself and his second. Slings and pegs thus used are a substitute for the courage and skill that he lacks or is losing, and mean that he is climbing beyond his powers. His greater gain would be found on less difficult rock, where he could build up confidence instead of further undermining it.

The writer has been much dismayed by witnessing, on Lakeland and Welsh climbs graded Very Difficult, the timidity of leaders more skilled than himself, who were yet unable to move without the protection of slings in exposed positions where no need should have been. The same timidity has been too evident in Scotland. In recent years, pitons have been knocked into the Crowberry Ridge at the left traverse from Abraham's Ledge, and on Route I, Rannoch Wall (both Very Difficult in Vibrants). These are mere examples chosen from a host of similar incidents. It is uncertain whether such misuse of technical aid

springs from smallness of spirit, bigness of vanity, or ignorance, but the disease appears to be infectious.

Mountaineering and rock-climbing mean many things to many men, but we can all agree that whatever else they are both adventurous sports. Adventure is of their very essence, and can mean anything from exploratory wanderings to the overcoming by sheer technical skill of short obstacles on rock, snow, or ice; whatever the form it must be adventurous or become a mere taking of exercise amid fine scenery. Suspense or uncertainty of result are not of themselves the essence of real adventure, for we can find them in playing a round of golf or a hand at bridge, or in filling up a football pool coupon. The essential ingredient in any real mountain adventure is the promise, threat or presence of danger.

If we are sane, we keep danger within manageable proportions. This is the very subject of our mountain craft and the object of good technique. Yet danger there must be, lurking however discreetly in the background, ready to pounce and impose penalty for sloth and slackness, else our so-called adventure has in it no reality. Croquet, tennis, golf are excellent sports with a high degree of suspense, but they are not adventurous. We only pretend that to win or lose is important. We play our hardest. When we lose, our bluff is called and pretence exposed; neither life nor limb is imperilled; we suffer no benightment, we escape even a ducking. But climbing, sailing, white-water canoeing are essentially adventurous; here there is no pretence, and for that reason they rank at a higher level in their demands upon character.

Any movement tending to debase mountain climbing to the level of the unadventurous sports should provoke our hostility. And this movement is upon us, often in the guise of an extra-special toughness in behaviour. Some of the symptoms of disease are comical. We often meet in the mountain pubs and hostelries those hard-swearing, tough-talking young men skilled in gamesmanship, whose lives seem to be spent disparaging climbers better than themselves, and depreciating fine routes which they are incompetent to lead—unless at every step of the

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way their precious skins are protected by running belays. Around the base of the crags we meet them in increasing numbers, festooned with a dozen slings and karabiners, girded with waist-loops and slung around with great bundles of jangling pitons. The writer questioned one such formidable party in Coire Lagan, Skye. They were complete with 400 feet of rope for three men. He was told that their goal was the West Buttress of Sron na Ciche—a Very Difficult on perfect gabbro. Such climbers are becoming known in Scotland as 'cream puffs'.

Safe climbing is to be encouraged. The accident list is big enough to make even a fanatic blink. But the man to whom safe climbing means safety at any price has inwardly sold his soul for a mess of potage. Would he not be happier on the bowling green, where he could share vicariously in the lustre shed by Sir Francis Drake? Let him acknowledge truth, that mountains and seas are not for him, and preserve in himself integrity, and in mountaineering some wholesomeness.

On a higher but no less sinful level we discover the happy-go-lucky banger-in of pitons. We have declared no quarrel with tension climbing, nor yet with the occasional pegs needed on Severe routes of the harder variety. But when pegs are used on rocks of Severe standard or less the time has come to pronounce anathema. This kind of trouble is perhaps prevalent only in Scotland, where there is still so much scope for new rock-work, for the climbers who commit this crime have only too often a good eye for a new route. The writer was first introduced to their species on editing the rock-guide to Glencoe, when he discovered that new routes were sometimes forced by aid of pitons of which no mention was made in the report claiming a first ascent. The pegs had been removed and the rocks left clean.

The immorality lies in the fraudulent omission, but even when this is not so, and truth is stated, the nailing of new routes that are only Severe is mean practice. There was a time, not long ago when action so poor-spirited was unheard of—men who could not force a new route without a piton turned back and left it for someone who could. Later events always justified them. The

SLINGS AND PEGS

writer has been lucky enough to climb many new routes, but would have climbed few had his predecessors chosen to nail the cruxes. If we cannot make a new route go, and the rock does not appear altogether impossible, it is a reasonable humility in us if we reckon that a better climber than ourselves somewhere exists, or will exist—and then leave to him his chance of a clean new climb. Equally, it is irrational vanity to nail that obstinate pitch for the sake of a claim to a first ascent. Who is the best climber in the land? The slam of hammer on piton cries 'Me—me—me!'

We plead for no impractical ideal. The ideal was practised in the recent past, therefore it could be practised in the future if the climate of opinion were again to change. The weeds of disease in climbing are dangerous because they creep upon us by slow degree, and they are never fostered by deliberate intent. Their source is in things good, for every good thing ignorantly used can be made by men to generate things ill. Our hope must be that if intelligent notice is taken of these weeds they will vanish away, as if withered by a wind off the hills. Meantime, they smell, and there is no sign of that wind breezing up.

W. H. M.

4

Balance Climbing—Aided and Unaided

It was the recognition of the paramount importance of unaided balance movement on steep, perpendicular or overhanging cliffs which set the standard for British rock climbing for fifty years during the first half of the present century. It was the rule that if a perpendicular or overhanging pitch was without the essential holds for fingers and toes, the pitch would not go.

The aims of all practice in mountaineering are the conservation of energy by balanced movement, judgment and intelligent choice of route; these aims are the same for all forms of skilled movement over mountains, walking, rock climbing, snow and ice climbing, ski-ing and high altitude climbing.

In free climbing on rock, climbing in balance (unaided by any artificial equipment) is determined by the existence of natural holds for hands or feet.

Because of this insistence on unaided balance the ultimate for the free climbing leader is of a comparatively lower standard of difficulty than that which the modern artificial leader achieves with aided balance.

Fifty years ago rock climbers knew of the existence of the peg

and the sling, they were skilled in combined tactics and in the use of the doubled rope for abseiling. The Vernier Safety-Sling was invented by a Frenchman in 1906, but it was rarely used in this country except by pot-holers.

Why then was balance climbing, aided by artificial means, so long in coming? One answer is that unaided-balance was a convention, a practice established and accepted by the unquestioning consent of the majority of climbers.

There was a wilful rebelling minority; men like Collie who cut a step out of solid rock in Moss Ghyll in 1892. There were others who did the same thing later to aid the start of the Direct Obverse Route on the Napes Needle and I am old enough to remember the pilgrimages of the conventionalists to Great Gable to examine and declaim upon the vandalism of this particular stonemason.

In those days, too, there were the teenagers who scratched on that sacred pinnacle, 'went up in four and down in three minutes—found it easy'; later a wag underwrote their boast with, 'went up in four minutes and down in three seconds—found it damned hard'.

In more recent days of the Free Climbing Age the rebels were joined by Jack Longland who, in 1928, drove his peg into the upper reaches of the long groove on the West Buttress of Clogwyn du'r Arddu. These were but the mild murmurings of rebellion against convention before the modern age stormed the gates and banged home their defiance with their back-breaking loads of ironmongery. I must admit that I was among those who chuckled when the gates were breached by the modern avalanche; the select and the privileged were snowed under.

Do any of us regret the passing of this age of climbers who plodded up the uncaired tracks in 14 lb. of nailed boots with the three-red-stranded rope of thick hemp and a pair of cheap rubber plimsolls in their rucksacks? I feel a great deal of regret!

Their rules were few, their skill was unsurpassed, their techniques traditional and their established methods the best that mountaineering has ever known.

The records may speak, and speak loudly, for them but

archives have no meaning for the young in heart; youth wants action, not history.

It is not easy to fix the date when the unaided balance climbers started their devastating assault upon the face climbs of British crags. As a boy of ten years I remember Archer Thomson's first ascents on Lliwedd; the Avalanche Route was talked about as if it carried the calculated risks of rock climbing beyond the legitimate limit.

Less than seven years later Herford and Sansom had climbed Scafell Central Buttress by 'combined tactics and rope engineering' on the Flake Crack. This ascent held first place for many years and ranked 'among the world's hardest'. Twenty-five years later Birkett climbed it free and descended it in nailed boots. In 1934 I was in Balcombe's party when he led the Direct Finish from V-ledge and I have climbed it twice again, once in nailed boots.

Pigott, Harding, Edwards, Longland and Kirkus turned their attention to Clogwyn d'ur Arddu and especially to the West Buttress of that crag about which Archer Thomson had written, 'it is neither possible nor desirable'.

In the meantime the unaided balance climbers began their long list of first ascents in Scotland and made many remarkable climbs in winter under snow and ice conditions.

These historical landmarks of this remarkable age are those which made a memorable impression upon me but there were hundreds of others, the great girdle traverses, the Cuillin classics (the Cioch Direct was first climbed in 1907 by Harland and Abraham and is still graded Severe), the two routes on the Carn Dearg Buttress of Ben Nevis and Kelly's amazing *tour de force* in the Lake District.

Herford reached the ultimate in unaided balance climbing in 1914 and that standard has been maintained, and perhaps surpassed, in this day and age but it began in the Gully Era, for Slingsby and Jones were among the greatest of the free leaders.

What were their methods? What was their mental approach? They taught us that exposure was only intimidating psychologically, that if the holds were there, then a high standard of

skill in the use of body angles and friction could make a pitch go in perfect safety. Skill and the strength of mind to retreat, before the impossible had been taken to a point-of-no-return, were the paramount considerations.

Their skill was developed by the delicate use of toes, whether in plimsolls or clinker nails and their concentration on this was as deep as that of the ballet dancer. I have heard the older men argue against aided balance climbing by contending that there would be no pleasure in watching ballet if the dancers wore belts with snap-links and lines attached which ran through roof pulleys to aid their balance in prolonged tip-toe dancing. They did not like Tricouni nails because they slipped on serpentine rock, they did not like plimsolls because they skidded on wet rock. They liked soft steel clinkers because they adhered by pressure to harder rock and they liked tweed clothes because they stuck to wet rock and gave them assurance.

Their most highly developed skills were in using their fingers, hands and arms. They learned to caress (to fondle, to stroke affectionately) the rock until they found the incut hold or the smallest sloping angle for pressure which would enable a safe movement to be made on unaided balance. By these means the bloody ravages of gabbro were defeated for even the first skin layer was not penetrated. Their hands were used at every conceivable angle for pull-and-pressure holds, up, down or sideways. Their arms were always flexed (to take the weight off their heavily loaded feet) and in them they developed great strength.

Their hands, arms, head, shoulders, knees and feet were superbly skilful at the lay-back, and the backing-up techniques. They could climb up Amen Corner without faltering; they could go up the main chimney in the Great Gully of Craig Yr Ysfa without grunting.

Individual climbers became noteworthy for the high development of these skills, some for their ability to stand in unaided balance on steep polished holds in plimsolls and others for their skill in gaining uplift on one clinker nail. In the 1920s and 1930s these free climbers led high Severs regularly in nailed boots—Eagles' Nest Direct, Kern Knotts Crack, Inno-

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minate Crack and Scafell Central Buttress. Many were skilled in using single finger holds, combined with split-second timing, to enable them to take weight for a quick move; this strength in a single finger joint could be matched by few.

Between these mountain leaders on steep rock and those who followed there was a void; there was no dependence upon deliverance by the double rope or runner in moments of stern trial. Upon the correct balance between their mental and physical qualities they depended for their lives; they knew they were beyond the help of anyone or anything when a long run-out of rope had been taken up steep rock or ice, their own minds and judgment were the sure aids and these attributes were able to work out whether or not the next few steps ahead were possible. Such judgment was based on the mental and physical fitness of a climbing leader at a given moment; his *form for the day*. A safe leader of unaided balance climbers must have that rare courage which can accept defeat and, in retreat, call upon sufficient reserves of strength to climb down rock or ice which has been ascended a few moments previously. Failure to observe this rule of safety turns enjoyment into misery.

It would be easy to say, and probably untrue, that once Collie had cut his step in Moss Ghyll the gates were opened wide to the advent of artificial, or aided balance, climbing. But the full flood of the incursion did not come for half a century and it is more likely that cliff-assault training in the armed services started the deluge.

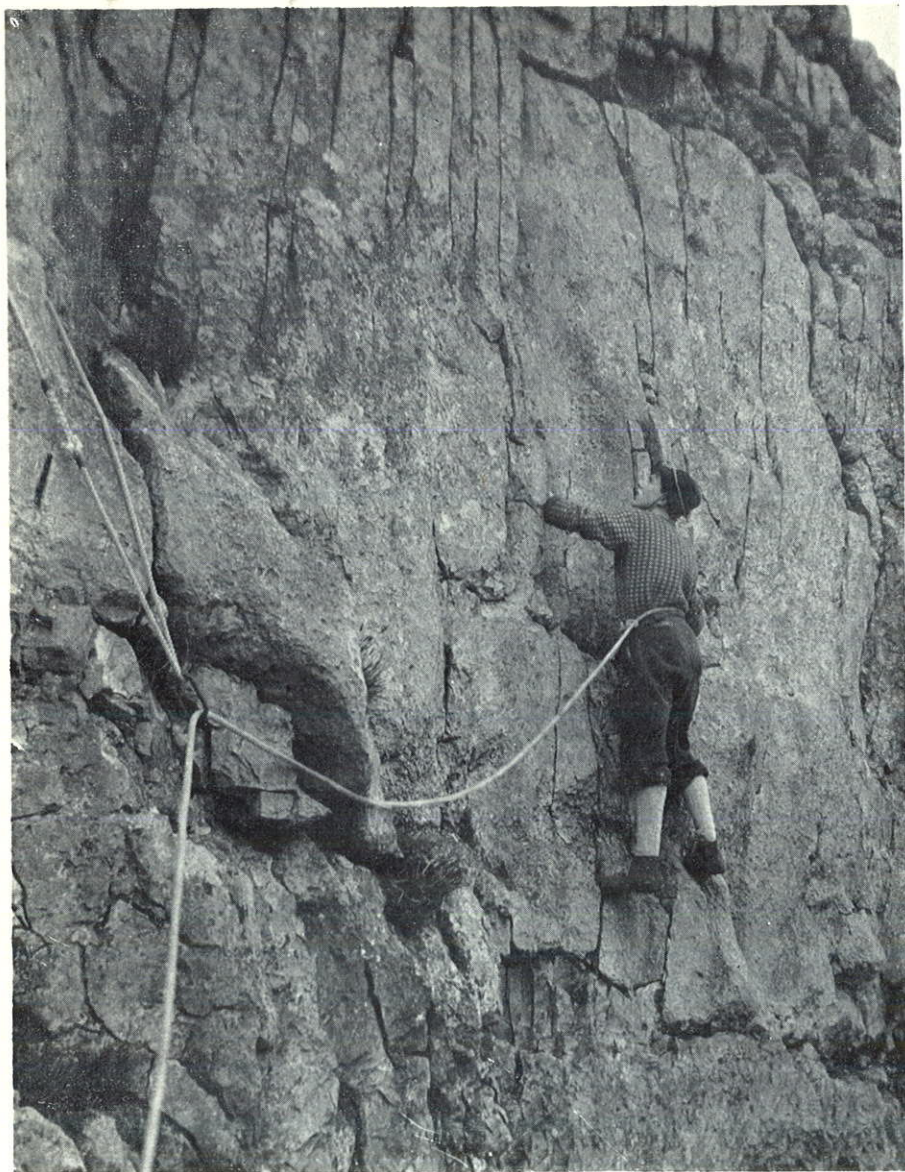
Are we to regret this revolution in mountaineering technique? It would be pointless to do so.

Artificial climbing is an enforced way of progress; the free climbers developed so superb a technique and explored the crags so thoroughly that they left little still to be done except the smoothly perpendicular or the overhanging. Was it to be expected that the young artificial would be less dynamic than the young unaided balance climbers? The new cragsmen are developing their modern craft with great skill and restraint; I know of no classic rock climb which has been pegged, not even Central Buttress and a peg might be justified below the start

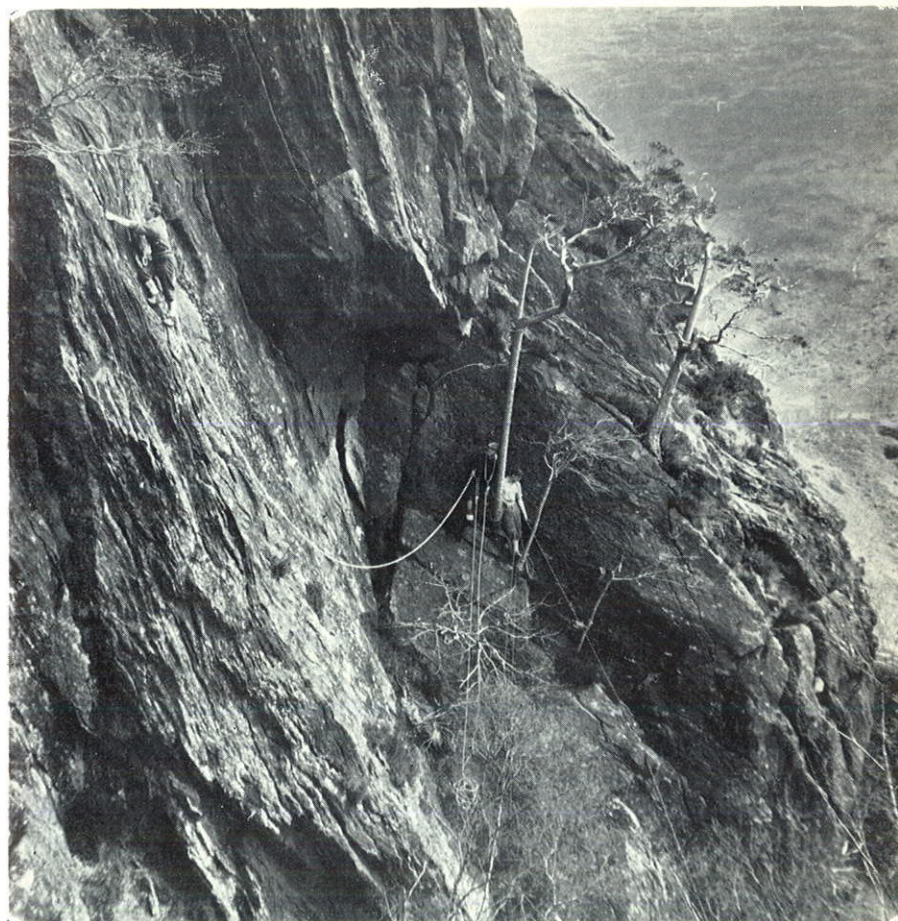


MILLSTONE EDGE, DERBYSHIRE: Climbing Lambeth Chimney, a hard severe route, very sensational and difficult at the top; the line of white piton marks on the extreme left shows the artificial route up London Wall.

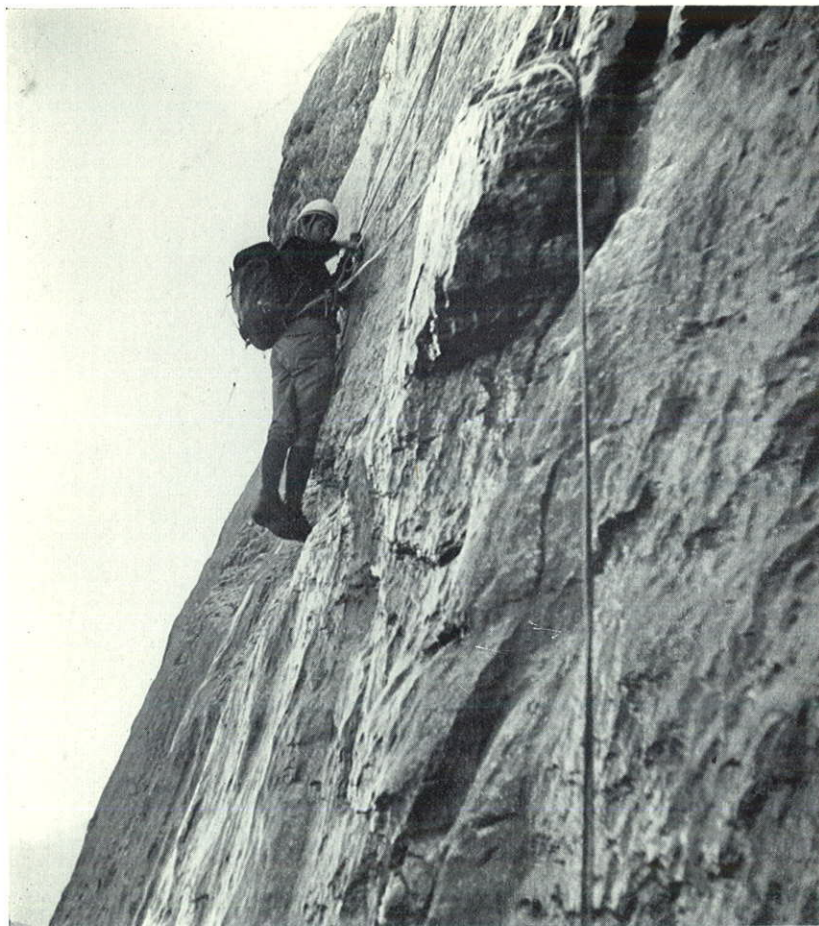
(Photo: M. A. James)



ATTERMERE SCAR, YORKSHIRE DALES: Using runners on the Windy Gap
Climb of the South East Buttress (Photo: Michael A. Mitchell)



BEN NEVIS: The Phantom Slab on Pandora's Buttress, Polldubh Crag
(Photo: Ian Clough)



THE NORTH WALL OF THE EIGER: Crossing the Hinterstoisser Traverse
(Photo: Ian Clough)

BALANCE CLIMBING—AIDED AND UNAIDED

of the Direct Finish.

There is plenty of evidence that appeals for restraint have been heard, at least in Wales and the Lake District. There have been cases in Scotland where new routes were forced by the aid of pegs of which no mention was made in the report claiming a first ascent. The pegging of any new route which is less than Very Severe is a disgraceful act; it is even more disgraceful in Scotland where thousands of new routes are waiting to be done, routes which will make superb free rock climbs.

Once a wave of progress starts gathering momentum nothing can stop it. Only by the impact of condemnation of evil practices can it be diverted to its proper sphere of action; both must be high-lighted. The pegging of any route which can be led by an unaided balance climber is an affront to the best traditions of mountaineering.

Where is the line to be drawn? Somewhere in the high Very Severe grade and the rock climber who is in this class knows where the line should be drawn.

Style is the sign of quality in both the rock climber and the alpinist; and it is immediately recognized by the cool performance and the effortlessness of perfect balance.

On granite or gritstone the rock climber is fortunate in having such splendidly secure material on which to climb; the touch of hands and feet on rough rhyolite or gabbro gives a feeling of confidence.

On ice the climber has nothing to grip and a good sense of balance becomes the paramount attribute. On north walls of alpine dimensions, especially on the North Wall of the Eiger, the greatest of rock climbers have failed because they have been out of their element, the unfamiliar element of ice. Their incompetence on ice, backed by over-confidence in boldness, has resulted in most of the deaths in that ill-fated icy amphitheatre. The supreme test of the art of balance climbing comes on ice, much more than on rock, and a lack of understanding of the wide differences between climbing on rock and ice has proved an expensive lesson for modern climbers.

J. E. B. W.

5

Delectable Difficults and Tense Severes

THOUSANDS of rock climbs in Britain are featured in more than forty guidebooks; the routes are described pitch by pitch in a few words, the length or height is given for traverses and ascents and the standard of difficulty listed for each climb. In Britain there are six main grades, Easy, Moderately Difficult, Difficult, Very Difficult, Severe and Very Severe. Those who read these books must appreciate the significance of the gradings; they must understand that they can only be correctly interpreted by an experienced climber. For the inexperienced Easy and Moderate climbs may be superemely difficult and the Difficults are, in most cases, likely to be impossible. It is wise to learn to climb cliffs in experienced company and nowadays there are training facilities available in most mountain areas in Britain and the Alps.

Alpine gradings are almost comparable with British and they are named I, II, III, IV, V and VI; to these will be added an artificial grading if there are pitches which have to be pegged and these grades are A1, A2 and A3.

The modern trends in mountaineering are alluring in the

fascination of winter climbing in low temperatures, in the skill of pegging vertical and overhanging rock or ice. Winter climbing requires wide knowledge for the choice of equipment and supreme skill in the use of ice-tools and balance climbing. Pegging on artificial pitches is a slow operation, movement is mostly Tension Climbing. On the other hand Free Climbing (movement of a leader without safeguards from above) is much more stylish and rhythmical, but the risks may be greater because all balance is unaided.

During the last four years, while working for periods of several days on Snowdon, the call of the cliff and blue sky sometimes proved too strong for me and I would walk up the mountain through Hafoty Newydd to Llyn Arddu to watch, through binoculars, the hammering and the Stop-Go climbing on the East and West Buttresses of Clogwyn du'r Arddu. On one lovely July day I counted forty-three climbers on top-grade routes. Going higher to the easier routes of the Far West Buttress this part of the cliff was deserted. Hoping that no other binoculars were focused on me I solo-ed up the Slab Climb and came down the Western Terrace to watch two climbers pegging for a direct attempt on The Great Slab.

Bang, bang, bang went the hammer, clip went the karabiners and clip, again, went the rope. Wipe, wipe, wipe went the rubbers and up four steps went the leader; up came his right hand to feel hopefully for a hold and after an interminable time down the four holds he retreated back to his belayed companion. I was amazed at the endurance of the leader's toes being able to hold him so long on such inadequate sloping holds. I went on my way westwards to the head of the Traverse and up the springy turf ridge overlooking Cwm Brwynog to see the fine views of Llyn Ffynnon and the Moel Eilio horseshoe and then down again into the valley on my way to the hut. Two hours had passed and the Great Slab climbers were still stationary; a few steps up and a few steps down like mass production automation.

My thoughts went back to 1934 when I was seconding a *tiger* of those days below the overhanging take-off for the Direct

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Finish of Scafell Central Buttress. We were Free Climbing from the V-Ledge, probing for the solution of a bulge with space beneath our feet 'as straight as a beggar can spit'. The tension was acute and two of the causes of the strain on me were that I must hold the leader if he came off and we were attempting a first ascent of 170 feet of Very Severe face climbing to make a variation finish more in keeping with the lower pitches of this great rock climb. Time had no meaning in such exposed situations.

At that time I was thirty-six years of age and conscious of the fact that I had enjoyed tension climbing for sixteen years. Even then, as well as now, when the years are beginning to stiffen my arm and leg muscles, easy rock climbing was always enjoyable. All around me, now, are young men and women, eager for artificial routes, who seem to have no time for the flowing style for hands and feet or the glorious rhythm of free movement up and down the capacious holds of moderate climbs.

Not long ago I was in charge of a training course of beginners in North Wales; with them during a glorious summer week I walked along the Heather Terrace and into Cwm Idwal. I have never seen, except on Gable Traverse, so many rock climbers on low grade routes. I watched a woman lead up the two long grooves below the Knight's Move on Grooved Arête; she climbed without faltering, in attractive style and perfect rhythm like a ballet dancer; it was a joy to watch such mastery of climbing technique. The next day I was on Flying Buttress and I tried to emulate the woman's style. I enjoyed the handling of familiar holds on this delectable Difficult. I had to pause to step round to the left to the large block above the tree but for all the rest of the hundreds of movements for hands and feet I made progress without faltering; it was exhilarating to feel the security of technical competence, the light touch of fingers on rough granite and the joy of unhurried speed.

The experienced rock climber knows that familiarity with a mountain route can breed blind moments when judgment becomes faulty; this is dangerous. There must be the same unrelaxed alertness on easy as well as on hard climbs, on familiar

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as well as on unfamiliar routes. Precision and smoothness of movements, good balance, sustained muscle power from flexed arms and legs, timing, rhythm and co-ordination come with long practice and these attributes produce a graceful, flowing style. The mountain guide and the mountaineering instructor can rise to a remarkable standard of competence but for urban climbers this is rarely possible.

Professional men and women, office workers and manual workers have only a few days or weeks each year when they can go to the high mountains and even then, in many cases, there is the nagging spectre of social responsibilities to daunt the casual climber when he may wish to accept the challenge of a difficult pitch.

Beginners should be encouraged to progress one step at a time, to master the techniques necessary for easy routes before they move up to the Very Difficults and Severs.

Writers of mountaineering guidebooks have a very complicated job and most of the criticisms of their work are little more than differences of opinion about assessments of grades due to varying standards of performance. Unintentionally they can mislead and confuse the less experienced and this arises, sometimes, when different climbers are writing about the same route.

Scafell Pinnacle by Slingsby's Chimney is 335 feet and listed as Moderately Difficult. The Chimney is 25 feet and it has an overhanging entrance which is the crux of this classic route. This is a very low grading for this pitch; I have climbed it over 100 times and I can now do the twenty moves without faltering; but this requires a knowledge of the correct sequence of complicated moves and of the key to the final problem. From the sloping containing wall of the Crevasse slab the leader should face inwards, until at eight feet it becomes possible to jam the left shoulder in the crack. This turns the body right, face to face with the angled wall of a huge corner. Pressure with the right foot, at full stretch on the right wall, which is smooth, will raise the whole body out and over the bulge of the chimney for two or three feet until a Thank God hold can be reached with the left hand. This hold is a superb piece of natural sculpture

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which has never seen the light of day, it is so deeply hidden and entombed. It is in cut at a convenient angle and as accommodating as a jug handle. Many have tried to look upon this masterpiece with the aid of a torch but it has never been seen. Many leaders never find it, some of them in the top class, and this makes the ascent a grunting struggle in ungainly and clumsy style. Slingsby's route to the Pinnacle is unique for it makes a direct way between the great Pisgah and Pinnacle buttresses and from it the vertical Central Buttress pitches can be seen. On the only comparable Welsh cliffs of Clogwyn du'r Arddu, there is no such moderate classic route through the *tiger* country of the East and West buttresses. This is the only one on Scafell Crag; it has everything, slabs, ribs, arêtes, a fine chimney and magnificent views of Great Gable.

Almost all the great rock climbs in Britain in the grades below Severe were first climbed by the Victorians, or by the pioneers of the Free Climbing Age. The Free leaders left little that was new to be done by the Modern Age; it is not unnatural that the younger generation should turn their attention to artificially aided climbing. On almost every cliff in Britain new great routes have been made by the moderns; on Ben Nevis, Scafell Cliffs, Clogwyn du'r Arddu and the Llanberis Pass cliffs, tension climbing has made great progress.

Appended is a list of climbs and I have had the temerity to call them all classics. Each of these has given me outstanding enjoyment.

Classic Rock Climbs

Scotland

- AONACH DUBH—East Face; Archer Ridge (S)
 " " Lower Bow (D) Quiver Rib (D)
 " " Roman Wall (S) Weeping Wall (S)
 —North Face; Shadbolts Chimney (S)
 BIDEAN NAM BIAN—Church Door Buttress (VD)
 BEN NEVIS—North Face; Central Trident Buttress (D)
 " " Evening Wall (S) Ledge Route (E)
 " " North Trident Buttress (VD)
 " " Observatory Buttress (VD)

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- BEN NEVIS—North Face, Observatory Ridge (D)
 " " Rubicon Wall (S)
 " " Orion Long Climb (VS)
 " " Slingsby's Chimney (M)
 " " Platform Rib (VD) Tower Ridge (D)
 " " Raeburn's Buttress (S)
 BUACHAILLE ETIVE MHOR—North Buttress (M)
 Agag's Groove (VD) Fracture Route (S)
 North Climb (VD) Ravens Gully (VS)
 The Chasm (VS)
 Crowberry Ridge Direct (S)
 Central Chimney Route (S)
 THE CUILLIN OF SKYE—Central Buttress of An Caisteal (D)
 S.E. Ridge of Sgurr A'Ghreadaidh (D)
 Inaccessible Pinnacle of Sgurr Dearg (M)
 Pinnacle Ridge of Sgurr nan Gillian (D)
 Western Buttress Direct of Sgurr Sgumain (S)
 Sron na Ciche, A'Ghrundna Face, White Slab Climb (D)
 " " " Coire Lagan Face, Cioch Direct (S)
 " " " Coire Lagan Face, Crack of Doom (S)
 " " " Coire Lagan Face, Girdle Traverset (VD)
 " " " Coire Lagan Face, Median Route (D)
 ISLE OF ARRAN—Cir Mhor, Rosa Pinnacle (S)
 ISLE OF RUM—Harris Buttress, Archangel Route (VD)
 GARBH BEINN OF ARDGOUR—East Face, Great Gully (S)
 " " Great Ridge (D)
 " " South East Chimney (VD)
 North Face, Route I (D)
 " " Route II (S)
 LOCHNAGER—Eagle Ridge

North Wales

- CARNEDD DAFYDD—Craig Lloer, West Buttress (S)
 CARNEDD LLEWELLYN—Craig-yr-Ysfa, Arch Gully (D)
 " " " Amphitheatre Buttress (VD)
 " " " Great Gully (S)
 CARNEDD SYLYN—Craig Cwm Syllyn, The Great Slab (D)
 " " " Fay Cee Rib (D)
 GLYDER FACH—Bochlwyd Buttress, Gargoyle Traverse (VD)
 Gribin Facet, Zig Zag Climb (VD)
 Holly Tree Wall, Ordinary Route (S)
 Idwal Slabs, Central Rib (S)
 Main Cliff, Chasm Route (VD)
 " " Direct Route (S)
 " " Hawk's Nest Buttress (VD)

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- GLYDER FACH—Main Cliff, Little Buttress (S)
 " " Oblique Buttress (S)
 " " Slab Route (VD)
- GLYDER FAWR—Upper Cliff, Central Arête Direct (VD)
 " " Variation (D)
 Dinas Cromlech, Flying Buttress (D)
 " " Spiral Stairs (VD)
- MOEL HEOG—Y Diffwys, Anaconda (VD)
 " Explorers Traverse (VD)
 " Trap Dyke Route (D)
- SNOWDON—Clogwyn Du'r Arddu, West Buttress, Longland's Climb (VS)
 " " The Great Slab (VS)
 " Far West Buttress, The Slab Climb (D)
 Crib Goch, Crib Goch Buttress (S)
 Cryn Las, Main Wall Climb (S)
 Llechog, Central Ridge (M)
 " Cloister Route (VD)
 Lliwedd, Avalanche Route (VD)
 " Longland's Continuation (VD)
 " Red Wall (VD)
 " Route II (VD)
- TRYFAN—East Face, Grooved Arête (VD)

The Lake District

- BORROWDALE OUTCROPS, Raven Crag, Corvus (D)
 " " Shepherd's Crag, Chamonix Climb (S)
 " " " " Little Chamonix (VD)
 " " Black Crag Buttress (VD)
- BOWFELL—Buttress (D)
- GREY KNOTTS—Gillercombe Buttress (S)
 " " Rabbit's Trod (M)
- HIGH STILE—Eagle Crag, Western Buttress (S)
 Grey Crag, Central Route (VE) Chockstone Ridge (M)
 " " Dexter Wall (VS) Fortiter (VS)
 " " January Crock (M) Mitre Arête (S)
 " " Mitre Buttress Direct (VD)
 " " Mitre Buttress Ordinary Route (M)
 " " Rib and Wall Climb (D)
 " " Sauviter (VD) Spider Wall (VS)
 " " West Route (S)
- LANGDALE PIKES—Gimmer Crag, Bracket and Slab Climb (S)
 " " Girdle Traverse (VS)
- PILLAR MOUNTAIN—Pillar Rock, New West Climb (D) North Climb (VD)
 " " North West Climb (VS)
 " " Savage Gully (VS)

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- PILLAR MOUNTAIN—Pillar Rock, Rib and Slab Climb (S)
 " " South West Climb (VS)
- SCAFELL—Scafell Crag, Central Buttress (VS) Moss Ghyll (VD)
 " " Moss Ghyll Grooves (VS)
 " " Slingsby's Chimney (D)
 " " Woodhead's Climb (S) Jones's Route (VS)

Modern trends everywhere in Britain are leading rock climbers into technical realms of action and thought which demand more and more gadgets. To the rock piton (there are now forty different types), the karabiner (now thirty known types), the harness, the fifi-hook, the descendeur, the étrier, the wedge, the sling there have been added the golo and the rawlbolt. On the limestone cliffs of Malham Cove there is a Central Wall, 270 feet high, which has been pegged and wedged, bolted and golo-ed throughout; the fitting and manipulation of the gadgets on a single pitch taking twenty-two hours. But among the newcomers, as well as the veterans, there are many thousands of rock climbers who use the higher mountains in North Wales, the Lake District and Scotland for the practice and enjoyment of total mountaineering; they are an overwhelming majority. They include many who still enjoy fell-walking and many more who use the easier rock climbs as a means to reach the summits. From North Wales and the Lake District, they go to Scotland and the Alps, experts at a craft which begins with walking and proceeds logically up easy rock climbs to the high ridges and the summits.

J. E. B. W.

ON ROCK AND ICE

6

The Story of the Eiger

THE last great ridge route to the summit of the Eiger was climbed for the first time in 1921 and the Mittellegi Ridge is now a classic alpine ascent; it is an airy crest of magnificent situations free from rock falls.

In the same year Hans Lauper, a young Swiss university graduate, began to look at the north face; his aim: to find a safe line of ascent, avoiding the danger of avalanches. He had already made first ascents of the north face of the Mönch and the Jungfrau but these now appear to have been training climbs for the greater undertaking on the Eiger. For eleven years he haunted the lower summits on the opposite side of the Kleine Scheidegg until he knew every feature of the Eiger north face. In 1928 he traversed the mountain up the east and down the west ridges.

The central area of the great walls is divided by the North Spur; on the right of this (facing the mountain) is the true north-east face, now called the North Wall. This is a hanging valley, 5,000 feet high; in it are many subsidiary amphitheatres, steep ravines and buttresses which make a succession of overhanging

THE STORY OF THE EIGER

roofs. During every thaw there pours down over these eaves thousands of tons of avalanching debris in an uncontrolled and chaotic flow until the whole of the north-east face is swept by a catastrophic belching of Nature. It is an obvious mantrap from which there is no escape for any climber except by pure chance. Lauper had observed that the North Spur was the least disturbed line and offered a safe ascent from its base; although the initial steps lay in the path of the tumbling rubble. His plan was to negotiate the rocks and couloirs at the foot in the freezing night hours; through this lower area he planned to push the first half of his route in a left hook to gain the steep ice cliffs of the North Spur. On the right of this lay the chalky overlayers of thousands of square feet of friable limestone which needs but a touch of weight, during the melting hours, to start the whole hanging valley avalanching with rock and ice.

Lauper's team comprised Alfred Zürcher, an equally intrepid alpinist, Alexander Graven and Joseph Knubel, two of the best Grindelwald guides. For ten days in August 1932, these four had together climbed seven 13,000 feet peaks as part of their training for the North Spur. They had reconnoitred the ice slopes of the Eiger between the Mittellegi Ridge and top of the North Spur; they had also laid a line of cairns in daylight hours to mark their route by night through the complicated couloirs and outcrops at the foot of the climb.

On 20th August their morale was high as they followed the cairns at 2 a.m. up the long scree, up the rock steps and ice ledges of the lower area until at 5 a.m. they saw the first avalanche sweep down the north-east face. Crossing the bergschrund they climbed to the base of the North Spur and here they breakfasted at 8.30 a.m. At 9.15 a.m., they followed the long spur by a direct line overlooking the deep pit of the hanging valley. Here, between the menacing ice wall on one side and the tearing roar of the avalanches on the other, they climbed for seven hours (with 30 minutes' rest at noon) up friable rock and ice crest ('like necks of green bottles') to the final overhang under the top buttress. The tension eased as they reached the main summit at 4.15 p.m. The only remark recorded was

Knubel's, 'We must be just a bit mad.' At 9 p.m. they were back at their base and the north face had been ascended for the first time, and within the hours of a single day. It was a remarkable realization of rational route-planning.

Following the success of these four intrepid Swiss alpinists the Editor of the *Alpine Journal* wrote: 'The last great problem of the Bernese Oberland has been solved by this unsurpassed all-Swiss party.'

Far from being the last great problem to be solved in the Oberland it was not even the last problem of the Eiger; it was only the beginning of a great surge to explore the narrowing confines of the North Wall, particularly the black, avalanching pit between the Central Spur and the Western Flank.

Lauper's route is a very severe but safe ice route; it was not repeated until 1945 when Graven showed his consistent skill by leading one of the two parties which made the second and third ascents.

Willi Welzenbach, of Munich, was a contemporary of Lauper. He had investigated the north face of the Eiger and was ready to make an attempt in 1932 but left it alone because he knew of Lauper's plans. He wrote to Lauper to congratulate him, 'I, too, thought the route you took was possible.' He also thought that the north-east face was too dangerous.

Alpinists were aware, therefore, that highly skilled men, both German and Swiss, had rejected the north-east face because of its objective dangers but this did not stem the flood of do-or-die Germans. Stimulated by nationalist ideology and inspired by Hitler-Nietzsche myths, they poured into the black, avalanching pit from 1934 to 1938. Eight climbers were killed or frozen to death and eight were injured, including Kasperek, Harrer and Heckmair.

Between 1946 and 1958 Germans and Austrians were joined by Frenchmen and Italians and the pied piper surge continued to meet with increasing disaster.

In July 1952, four parties, comprising eleven climbers in all, led by Bühl, Maag, Leroux and Rébuffat, got up the north-east face; the first two ropes required three, and the last two ropes

two, bivouacs. The Maag party caused delay by their incompetence on ice and they had no bivouac equipment; Bühl had to go to their assistance. 'All of us sat there' (in the second bivouac) 'with our legs dangling or in stirrups of frozen rope, on these two miserable ledges; two staircase steps worn and rounded and sloping outward, yet somehow suspended on this gigantic wall. The higher one was comparatively spacious, about eight inches wide and three feet long and we managed to squeeze five on to it.' Bühl, with another Austrian and two Germans, was a hundred feet above on equally incommensurable belvederes; they were doomed to spend a third night on the wall. Injuries were sustained by all four parties and the avalanche situation brought devastating catastrophe very close. The long queue made slow progress, and often the waiting hours were made fearsome by falling debris. Yet the two Austrians and seven Frenchmen were highly skilled.

Ten more attempts, during which nine men were killed, takes the record to the end of 1957.

In August 1957, two Italians, Corti and Longhi, and two Germans, Nothdurft and Mayr, made the most sensational, and the most publicized, ascent of the North Wall of the Eiger. The Germans were last seen by Corti climbing up the White Spider to get help for the injured Italians; they had been on the wall seven days. Nothdurft and Mayr were not seen again for four years and were found dead on the West Ridge descent route in 1961. The injured Corti finished the climb after eight bivouacs—on the back of a rescuer. Longhi's body was left dangling from the wall just below the White Spider for two years and his corpse was eventually recovered by Swiss Guides.

In these four years a million words were written and almost the same number of pounds spent on covering this story. The dangling corpse of the Italian became a spectacle for gaping tourists while the living Corti gave conflicting accounts about the mystery of the missing Germans.

Disgust is not too strong a word to describe the reactions of mountaineers the world over and Corti's ineptitude as a climber on ice was largely responsible for the raging controversy which

THE CRAFT OF CLIMBING

followed; good tradition had been dealt a severe blow and the mountain world wanted to forget this ascent of the Eiger.

In August 1962, two British climbers, with Himalayan experience, Bonington and Whillans, followed two other Britishers, Brewster and Nally. Each party was unaware that the other was making an attempt until they met on the North Wall. By their greater speed, and experience, Bonington and Whillans soon overtook Brewster and Nally and drew ahead. Brewster was knocked off the wall by avalanche debris and fell to his death dragging Nally with him until the rope broke, 'as I watched with horror the body of Barry Brewster hurtle 3,000 feet to the foot of the face from the Second Ice Field, I, a climber, asked myself, "what are they trying to prove?"' so wrote Whillans. He and Bonington, by a feat of great valour, abandoned their attempt and top-roped the injured Nally off the face.

Later the same month Bonington and Clough made their successful attempt, followed by Carruthers, a Scot, with an Austrian. They made only one bivouac and completed the climb in one of the fastest times on record. 'We were lucky to have it so easy,' wrote Clough. On their return to the Kleiner Scheidegg they learned that Carruthers and his partner had been killed.

THE RECORD

<i>Date of Attempt</i>	<i>Height Reached (feet)</i>	<i>Party and Nationality</i>	<i>Falls, fatalities and other reasons for withdrawals</i>
July 1934	9,500	Beck, K. and G. Lowinger (Ger.)	Fell.
Aug. 1935	11,200	Sedimayer and Mehringer (Ger.)	Died at Death Bivouac after 5 nights on the wall.
July 1936	11,200	Hinterstoisser and Kurz (Ger.), Rainer and Angerer (Aus.)	Fell to death. Died from exhaustion. Strangled in the rope.

THE STORY OF THE EIGER

<i>Date of Attempt</i>	<i>Height Reached (feet)</i>	<i>Party and Nationality</i>	<i>Falls, fatalities and other reasons for withdrawals</i>
June and July 1937	9,500	Heckmair and Losch (Ger.)	Numerous reconnaissances as far as 2nd ice-field.
July 1937	8,900	Fraisl and Brankowsky (Aus.)	Withdrew because of bad weather.
July 1937	9,200	Liebl and Rieger (Ger.)	Found dead body.
July 1937		Primas. Gollackner (Aus.)	Rescued by Heckmair. Died on Lauper Route.
July 1937	9,200	Zimmerman, Lohner and Wollenweber (Ger.)	Withdrew because of bad weather.
July 1937	8,900	Bonnant and Boulaz (Fr.)	Withdrew safely.
July 1937		Detassis and Piravano (It.)	(Recon. via Lauper route; epic climb to Mittelegi by Detassis leading the injured Piravano after exploring wall for guided parties.)
July 1937	11,100	Rebitsch and Vorg (Ger.)	Many reconnaissances.
June 1938	10,500	Sandri and Menti (It.)	Both fell to deaths.
July 1938	10,500	Fraisl and Brankowsky (Aus.)	Injured—withdrew.
July 1938	13,042	Heckmair and Vorg, Kasperek and Harrer (Aus.)	FIRST ASCENT. Kasperek died in 1954 (Andes).
Aug. 1946	11,500	Schlunegger (Swiss) and Krahenbühl (Ger.)	Withdrew safely. Killed later on Engelhorn.
July 1947	13,042	Terray (Fr.) and Lachenal	SECOND ASCENT. Lachenal killed in 1956 (Mt. Blanc).
Aug. 1947	13,042	Jermann and Schlunegger (Swiss)	THIRD ASCENT. Killed later by avalanche.
July 1950	10,200	Monney, Fuchs, Hamel and Seiler (Swiss)	Several Recon. Withdrew safely.
July 1950	9,500	Reiss and Blach (Aus.)	Injured—withdrew.
July 1950	13,042	Forstenlechner and Waschak (Ger.)	FOURTH ASCENT.
July 1950	13,042	Monney, Fuchs, Hamel and Seiler (Swiss)	FIFTH ASCENT. Fuchs injured.
July 1952	13,042	Coutin and Julien (Fr.)	SIXTH ASCENT.
July 1952	13,042	Larch and Winter (Aus.)	SEVENTH ASCENT.
July 1952	13,042	Jochler and Bühl (Aus.)	EIGHTH ASCENT. Bühl killed in 1957 on Chogolisa.
		S. and O. Maag (Ger.)	
		Rébuffat, Magnone, Habran, Bruneau and Leroux (Fr.)	
Aug. 1952	13,042	Vanis, Ratay and Lugmayer (Aus.)	NINTH ASCENT. Injured by stonefalls.
Aug. 1952	13,042	Blach and Wellenkamp (Aus.)	TENTH ASCENT. Killed later in Bregaglia.

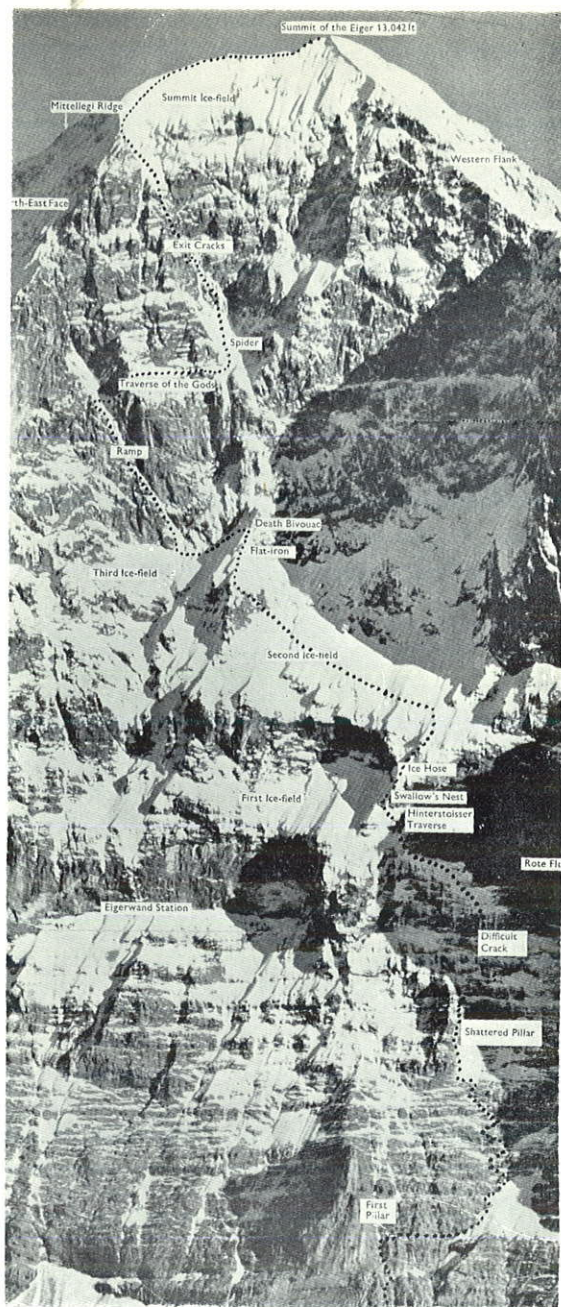
THE CRAFT OF CLIMBING

<i>Date of Attempt</i>	<i>Height Reached (feet)</i>	<i>Party and Nationality</i>	<i>Falls, fatalities and other reasons for withdrawals</i>
Aug. 1952	13,042	Jungmeier and Reiss (Aus.)	ELEVENTH ASCENT. Killed on Saipal in 1954.
Aug. 1953	12,800	Wyss and Gondau (Ger.)	Fell and were killed.
Aug. 1953	10,800	Vass and Korber (Ger.)	Fell and were killed.
Aug. 1953	13,042	Riedl and Hirschbichler (Ger.)	TWELFTH ASCENT.
Aug. 1955		Rébuffat, Tairraz and Baquet (Fr.)	Filming to show objective dangers of the route.
Aug. 1956	9,500	Moosmuller and Sohnel (Ger.)	Fell and were killed.
Aug. 1956	9,400	Brandler and Buschmann (Ger.)	Hit by falling bodies and withdrew.
Aug. 1957	10,500	Nothdurft (Ger.)	Solitary attempt.
Aug. 1957	9,200	Stefan and Mayr (Aus.)	Withdrew safely.
Aug. 1957	12,100	Nothdurft and Mayr (Ger.)	Fell and were killed.
		Longhi (It.). Corti (It.)	Died from exhaustion. Rescued after 7 nights.
July 1958	10,800	Noichl, Brandler and Raditschnig (Aus.)	Withdrew because of injuries.
Aug. 1958	13,042	Diemberger and Stefan (Aus.)	THIRTEENTH ASCENT.
Aug. 1962		Bonington and Whillans. (Brit.)	Brewster fell to his death and Nally rescued by Bonington and Whillans.
	13,042	Bonington and Clough (Brit.) Carruthers (Brit.) and an Austrian	FOURTEENTH ASCENT. Both killed.
Aug. 1963	10,900	Bonatti (It.)	Injured—withdrew safely.
Aug. 1963	13,042	Haston and Bailey (Brit.) with two unnamed Austrians	FIFTEENTH ASCENT.
Aug. 1963	13,042	Darbellay (Swiss)	First solo ascent.

The above record is compiled from Othmar Gurtner's 1958 list, Heinrich Harrer's 1959 list and articles by Whillans and Clough in *Mountain Craft*; the first being the most comprehensive. Forty-one climbers took part in the successful attempts and six of these were killed later in climbing accidents; of the remaining thirty-three, nineteen sustained minor or major injuries during their ascents of the Eiger's North Wall. Forty-five climbers took part in the unsuccessful attempts; of these twenty were killed and ten sustained minor or major injuries.



THE NORTH WALL OF THE EIGER: Looking back across the Second Ice Field
(Photo: Chris Bonington)



THE NORTH WALL OF THE EIGER: The complete route (5,000 feet) (Photo: Gyger and Klopfenstein—taken from the Mannlichen)



MONT BLANC: The Brenva ice cliffs from Mont Blanc de Tacul
(Photo: Anthony Smythe)



THE SUMMIT OF MONT BLANC: Cloud clings to the tops of the Grandes Jorasses; the background peaks are the Weisshorn, the Mischabel group, the Grand Combin and the Matterhorn in the Swiss Alps

(Photo: John Cleare)

THE STORY OF THE EIGER

	<i>No. of men in all attempts</i>	<i>No. killed</i>	<i>No. of parties in successful attempts</i>	<i>No. killed later</i>
Austrian . . .	27	4	7	4
German . . .	31	11	4	0
French . . .	11	0	3	1
Swiss . . .	8	1	2	1
Italian . . .	4	3	0	0
British . . .	8	2	2	0

Writing with the authority of a leading member of the Swiss Foundation for Alpine Research, Dr Othmar Gurtner draws conclusions from this dismal record. 'After the first world war dozens of incredible climbers increased their mastery of space beyond the limits of the vertical by finding technical means to overcome gravity. The dozens were followed by hundreds, reaching out without hesitation for ever more daring tasks which the new dogma had brought within their reach: From now on nothing is impossible.' After the second world war Gurtner quotes the Germans as saying, 'we must force our way through so long as there is life left in our bodies. The death of so many good comrades must be atoned for once'. Says Gurtner, 'Flourishing lives were sacrificed as atonement to the Baal of Nibelung loyalty, the passion for mountaineering being quoted as justification. The tragedy ran its course.' Finally Gurtner recalls the 1945 ascents of the Lauper Route and says, 'These Swiss mountain guides were not inferior in endurance and ability to any of the Eiger face climbers, but they surpassed them in reason: they remained mountaineers, and did not become dervishes of the new dogma.'

There is too much conclusive evidence available for anyone to deny the power of the original stimulation of German myths, and its nihilism lives on today. It is as strong today as it ever was, and as deplorable for rationally-minded mountaineers who feel that there is little glory and no joy for any climber whose complete planning does not include a safe return.

But the story of the Eiger should not provide a philosophical whipping-post for Germans; this kind of assessing of re-

sponsibility should be carried to its logical conclusion. None of those who forced the Eiger, and other North Walls, planned to die and they may, for all we know, have been unaware of the logical outcome of their philosophy. The Eiger casualty lists include Frenchmen, Italians and British.

Was no part of the British Everest attempts from 1921 to 1953 aimed at adding to national prestige? If not, then why hold back news of success until the morning of a coronation? Did prestige play no part in the ascents of Everest and Lhotse by the Swiss? Were not Herzogs' sufferings on Annapurna and Duval's end on Nanda Devi a do-or-die attitude? K2, Manaslu, Makalu, Dhaulagiri all point to a similar attitude by some Italians, Japanese, Frenchmen, Americans, Argentinos and Britons. The death of Bühl on Chogolosa stems from the same diseased tree as Duval's disappearance on Nanda Devi, and many others, who preferred a gamble to a cautious technical plan in which good judgment calls for retreat.

The trunk of the diseased tree is human aggression both individual and aggregate. It attacks us all. Let us not close our eyes to it. At least, mountaineers try to hurt no one but themselves.

Even in perfect weather when the rock is dry the Eiger North Wall is no place for rock climbers; its ascent calls for supreme skill in ice climbing.

J. E. B. W.

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7

The Rope on Snow and Ice

A ROPE improperly used can spread delay and disaster. Everything said in the chapter on team work and simultaneous movement on rock applies with equal force to movement on snow and ice, and need not be repeated. As before, I will assume that the traditional technique of rope-management is known, and make my contribution from personal observations.

One of the first difficulties may sometimes be not so much to inculcate good rope-management as to persuade a party to wear a rope at all. There are three kinds of terrain on which I have seen this trouble arise, all at easy inclination. The first is on level or sloping ground like the crests of broad ridges or plateaux like the Cairngorms, when mist and spindrift cause a white-out. Surprisingly often, men are then diffident about tying on a rope, simply because the ground underfoot is easy. This diffidence leads to annual accidents in Scotland, when men fall over crags and cornices and down unexpected ice-slopes ending at cliffs. Such weather conditions caused the death even of Hermann Bühl, when he walked over the cornice on Chogolisa.

The two other kinds of terrain are found in the Alps. A roped

party that has made its way up a difficult but dry icefall will be much tempted to remove the rope on the higher snow-slopes, whose invisible traps may be far more dangerous than the open crevasses of the icefall. Likewise, an easy slope on the upper mountain, in itself known to be free of crevasses, is no safe place if its surface is hard and the lower parts invisible. There may be cliffs of rock or ice down there. The rope should be retained unless the surface is soft enough to stop anyone whose step breaks or foot slips. This situation occurs more obviously in the Alps than Britain, but one of the most notorious killers in Scotland is that icy slope of Ben Nevis inclining so gently eastwards from the summit—to the flank of the North-East Buttress (en route to the Carn Mor Dearg arête).

Provided the anchor stays firm it is less difficult to stop a man falling on snow and ice than on rock. He should himself be arresting his fall by braking. But snow is not ice, and if steps are easier to make they are easier to break. It is unwise to rely on them to hold more than one's own weight. For this reason I am opposed to giving hip-belays based upon snow-steps, however large (unless there is a rock platform under the snow). Nor do I feel that this hip-belay is made safe and certain by using an ice-axe driven in above as anchor. If the belayer's steps break under the double weight, then that double weight is more likely to pull out or snap the axe than would the weight of one man had his leader belayed him direct to the in-driven shaft.

This poses the question, 'Is it better to rely on the axe-belay, and to lose all if the shaft snaps, or to interpose a body-belay and still have the shaft, however unreliable as a final hope?' To this kind of question one is tempted to answer, 'The leader must not fall!' and to leave the subject in haste. But this time I can be more constructive.

The axe-belay is usually adequate if given from above the person falling. If the leader falls, then the likelihood of his second's steps breaking and the axe-belay or anchor being snapped or torn out are obviously great—and duly happened on the one occasion I have seen a leader fall on steep snow. This accident converted me to the use of the ice-axe-hip belay—the

method used by Pete Schoening when he held the five men who came off (below him) on K2. It appears to me the method of belaying on snow that offers maximum safety. Briefly, it is this:

The second man stands below his in-driven shaft. His leg nearest the probable line of fall must be straight. The other leg is bent, knee against the axe-shaft. The rope from the leader (or from men below) must come to the axe from the same side as the straight leg, then around the shaft and around the second's buttocks to the hand of his outstretched arm, which is the braking hand. The jerk of the falling man thus comes almost equally on axe and buttock in opposite directions, forcing the knee on to the shaft. If it is possible to brace the shoulder against the axe-head, this should be done too. The belay has proven its worth, but it is of no use against a sideways pull away from the line of the straight leg.

When a party is moving together up or down a snow-slope, there will be no time to give the Schoening belay if a man falls. If a quick axe-belay is given, make it dynamic but try to avoid any sudden tug on the shaft by leaning the weight of the body on the rope between belayer and axe, crushing it hard into the snow and so reducing by friction the final jerk.

In steep gullies, where the leader has to climb an ice-pitch, good belays can usually be had on the rock walls, or on ice-pillars, or pitons, but failing these the two lower men, if there are two, should both take a stance under the pitch and give belays at the same level, or as near to it as possible. Even where pitches are known to be short, 120 feet is wanted between each man, for the leader will often need a long run-out above the actual pitches to find suitable snow for a stance and belay.

Ideas on the best rope-management for glacier travel abound, bewildering at first sight because they differ so widely. It is generally agreed that 15 to 20 feet is the correct distance between each man. For the rest, opinions vary even on so simple a matter as whether the rope should be held clear of the snow or ice surface. Geoffrey Winthrop Young, for example, whose *Mountain Craft* is still a classic, recommends that the rope be allowed to skiff along the surface, arguing that this decreases

the drag of rope on the climbers and does the rope no harm. I myself see no gain. The rope should be kept high off the surface although not too tight.

The value of Prusik slings for self-defence from crevasses should now be well known to everyone. But how many climbers have the good sense to practise in advance and so be forewarned of its difficulties? When the leader of a rope comes on to a snow-covered glacier he should Prusik-knot his three slings on to his rope if he has not already done so. It is all too common practice for a leader simply to carry the slings in his pockets. This must be condemned. Once he has fallen in, the chest-constricting rope and cold will distress his lungs and numb his hands more quickly than he ever imagined. If he has still to grope through pockets for slings and then knot them on to his rope, this will take longer than he calculated, and his subsequent efforts to get out will be weaker and more prolonged. This danger must be avoided by attaching the slings while still on the surface. The battle is won when his feet are in the loops, but his difficulties may by no means be ended.

If he has to climb up his own rope, the third and shorter sling will be wanted to hold his body in to the standing rope, otherwise the strain on his hands will be too severe. There is a better and speedier method advocated in *The Technique of Mountaineering*.^{*} The men above should at once attach two Prusik loops to the spare rope and lower away. The fallen man should then step into these from his own loops. He will thus climb up the spare rope, while his own waist rope is held taut and taken in by one of the men above. As he nears the top, he may be stopped by a snow overhang. If so, a karabiner must be lowered on a spare line; he clips this to his waist loop and switches it from front to back while a man above goes to the opposite side of the crevasse and pulls hard to raise him off the projecting lip and to let him get an arm over it, or to let the man holding the main rope give a helpful hoist. By these means the problem of extraction can be solved.

^{*} By J. E. B. Wright. Nicholas Kaye, London, 1955.

Spare rope and line should always be carried.

A party of two should not be out on snow-covered glaciers, if they obeyed the counsel of perfection. But if one falls in and gets stuck under the lip, his companion, who will have anchored the rope to his own axe by a Prusik sling, unties and fetches up the victim's axe on a line. The axe is driven in on the far side of the crevasse, the spare rope is passed through the victim's waist-loop karabiner, anchored to the axe, and the other end hauled in, raising the victim with a mechanical advantage of two, and holding him much freer of the lip. The advantage is theoretical. A piton-hammer shaft or other smooth object would obviously have to be thrust under the rope near the lip to ease friction and prevent further digging in.

Other snags may arise. Prusik knots made from nylon often slip, when wet, on the standing rope. The Austrian Alpine Club have therefore recommended the Bachmann knot, which uses a karabiner, and which they say grips firmly on wet nylon. The loop is hung from a karabiner, passed round the standing rope and through the karabiner, and so to the feet. Jumar climbing clamps may be even better if they can be found.

Whatever rope methods are used on glaciers, in whatever crises, the main demands are for common sense, for speed without haste, and for a full stock of ropes, line, slings, and karabiners.

W. H. M.

8

Axe and Crampon

THE climber's eye, when its owner is inexperienced, or nervous, or disinclined to spoil a good story, is prone to exaggerate angles on rock, snow, and ice. But first, 'cast out the beam out of thine own eye'—knowing my human weakness, I once bought myself a clinometer. I used it to check angles on my own climbs in Scotland. The results were chastening. Pitches I thought to be absolutely perpendicular turned out to be eighty degrees; those I had loosely called vertical were nearer seventy degrees; as for long open snow slopes—these fell back in a way that made me blush. Since then I have been wary; wary not only of myself, but even more so of blithe companions and august pundits, when they speak or write of angles. So let me now define my terms.

By high angle snow, I shall mean henceforth snow lying at angles of forty-five degrees, and by high angle ice, ice above sixty degrees. These figures are not chosen arbitrarily. Snow does not lie on open slopes above forty-seven degrees, after which it becomes ice—although in suitable conditions it can and does lie at all angles up to an overhang in gullies. As for ice,

when the slope lies at sixty degrees the climber is able to touch it with outstretched hand while standing erect. My experience is that from sixty-three degrees onward he will cut handhold as well as foothold.

The technique of axe and crampon work need not be dealt with by me. Most readers of this book will be readers of *Mountain Craft* and can be expected to know the text books. Instead I want to talk around these subjects and to shed more light on them by dealing with aspects that the text books, I have noted, omit, and which some misrepresent.

There are three defects in every beginner's cutting, which tend to persist through all his more experienced life unless they be consciously dealt with. First, as angles steepen towards high, he cuts his steps too wide apart. I have seen this defect coming out in climbers of international repute, have rarely seen it absent in skilled amateurs, and never in the unskilled. When a slope steepens, the step-cutter has less and less room between legs and slope in which to swing an axe. Thus he cuts the steps higher, where he has room, which means farther apart. He then has to expend too much energy in heaving himself up from one step to the next, often having to help himself by thrusting his pick into the snow above and pulling on it—which is very bad practice: he is less in balance and the risk of a slip grows greater. He is led to pare down his safety margin until none is left. The remedy is simple. As the slope steepens, he should cut two steps in front of him before moving up on the first, and if need be three. They can then be properly spaced.

The second weakness is slow pace in cutting. He tends to peck at the slope when he ought to hit hard from the shoulder; he meticulously excavates when often he could burst the crust with just one slash and let his in-driven foot make its own good hold; he uses two hands when he could make faster progress with one. Every climber on steep snow should be able to cut from either arm, passing the axe from one hand to the other as each arm tires.

The third weakness is a most gross incompetence in cutting downhill. A climber is not soundly guided in mastering this art

if he goes by the old text book illustrations, or by the Pelican *Climbing in Britain*, which show the climber facing outward, bent nearly double, and cutting two-handed. It would be hard to find a posture less likely to help him than this. Whenever possible, and that is nearly always, he should cut down standing sideways to the slope, and should cut one-handed with the outer arm. If direct descent is wanted, nothing is to be gained by cutting diagonally from side to side of the slope; time is wasted thus to no good purpose. The better method is to cut the steps directly below each other, and to cut not for the heel but the side of the boot, that is, with a deep slash. At the outset, before moving down, cut two, one below the other, and then drop the outer foot into the lower step, the inner into the higher. The rest follows in natural order. Outer foot first each move. This method is quicker than any other, and will be found safer. A large step can be cut when a turn is wanted for change of arm.

My counsel to parties embarking guideless on snow and ice climbs in the Alps is always to start by concentrating on crampon practice. I feel that I cannot say too often how urgent is the need to avoid late descents in bad snow by starting early enough to allow the use of crampons high on the mountain, before the snow deteriorates. However experienced the guideless climber may be, I find it impossible to exaggerate his need to provide for his party more time than he thinks they will need. Delays are always unforeseen. But much time will be saved by good cramponing, and that demands practice on routes chosen to give a rising standard of difficulty. In illustration of these points we may turn to the chain of Mont Blanc, where one should never go for a big expedition like Moore's Brenva, until satisfied that the party's crampon work is reliable. It would be better to think first of the North Face of the Aiguille de Bionnassay, which provides a perfect rehearsal for crampon climbing, less relentless and critical than Moore's Brenva, or else an easier training piece, like that afforded by the Courtes traverse or by the Aiguille d'Argentière Middle Glacier.

The point about crampons is not that climbs cannot be done without them. It is that we do not, today, think it justifiable to

incur the grave risks that previous generations were used to face. Many older climbers see the development of Alpinism only as the search for difficulty. But that is just half the story. There has been in fact a powerful though less publicized development towards the avoidance of objective dangers at the cost of extra effort and difficulty. Two well-known examples will suffice. The Furggen Ridge of the Matterhorn was shunned for many years because all the early parties had reported heavy stonefall danger. In 1943, Dittert discovered that a modern climber can cope with the crest of the ridge at sufficient speed. Being thus free of stonefall danger, the ridge has become a classic route. Likewise, the more difficult but much easier route up the Grépon from the Mer de Glace is preferred to the older and dangerous route from the Nantillon Glacier.

To return now to the snow and ice of the Old Brenva, and the specific case for crampon training, let me quote as example three ascents all made within a few days of each other, in similar conditions, by crampon-shod parties.

The first climb is by four pre-war tigers, two of them Himalaya men, heroes of many French first ascents. They are more skilled in step-cutting than crampon work. They start from the Col de la Fourche at 2 a.m.; reach the famous ice-ridge at 7.30 a.m.; exit from the face at the Col de la Brenva about 4 p.m. after eight hours' continuous step-cutting and great nervous strain—just able to reach the Vallot Hut at nightfall, exhausted.

The second has no comparable width of experience, but is more fully trained to crampons. They start from the Fourche at 2 a.m., reach the ice-ridge at 5.45 a.m., and exit from the Col de la Brenva at 9 a.m., after only two hundred feet of step-cutting in hard ice at the very top of the big slope. They arrive at the summit fresh, with time in reserve for rest and descent.

The third party is young and quick-moving, full of dash and old English casualness. They aim to descend the route, but fail to make an early start. They begin work on the big slope at 8.50 a.m. The snow deteriorates and starts balling on the crampons but they feel they have no time now to doff crampons and to cut all the way down. Result: their lives are lost.

It must not be thought that I am objecting to step-cutting. It is a craft, and fun. But sometimes the true question with which a climber will be faced on a long Alpine route is whether he dare increase the immediate safety margin by cutting steps on a certain section of the climb at the cost of a delay of an hour or more at the particular time of day. If the answer is No, then there ought to be no step-cutting; either his party's safety margin is sufficient without step-cutting or else he goes home.

The technique of climbing on high angle ice has been developed in Scotland to a high pitch of efficiency. It is a technique hardly won, which yet can be learned safely and therefore enjoyed. My own first efforts were made up well-iced boulders in corries. A sérac or an ice-wall on a glacier serves equally well. On these we speedily learn to cut hand and foothold properly spaced—a less difficult job than it looks, but more tiring. It is best to learn on ground where the penalties for miscalculation are light. From such humble beginnings we move on to longer and exposed climbs, where we soon discover that climbing on high angle ice is more exacting than summer rock work. An ice pitch on a Scottish climb may be anything from ten to two hundred feet at an angle of anything from sixty-three to seventy-five degrees (not counting bulges). A pitch of fifty feet may take anything from thirty minutes to one and a half hours to climb, according to quality, personal form, and angle. On account of this high angle all cutting has to be done one-handed above the head, and balance being delicate no great weight can be put behind the axe blows. We are forced to cut from the elbow, often from the wrist alone. The blood runs out of the axe arm and great strain is placed upon leg muscles from long standing on small holds. On long pitches we have sometimes to climb to what seems the limit of strength, then grip the mind, stir up energy, and go farther.

The prime secret of high performance is confidence—born not only of familiarity with rock and ice, but also of physical fitness—confidence that every muscle will take the strains that come on it. This fitness is more important on ice than summer rock and should be deliberately acquired by exercise. I note in myself that

provided I strike good form I am able to climb severe rock and enjoy it even though I start at the foot feeling like death after a late night. But this good form has never been enough for severe ice. On these latter climbs physical fitness counts for more; more than once they have beaten me for no other reason than my lack of sufficient training—an experience I have never had on rock. We all have different bodily constitutions, and power to weight ratios vary greatly from man to man. I myself, being light and lean, find that when able to run a mile, and to do thirty press-ups, I am then in good enough training for severe ice. When I cannot do these things I am not able to cope. This rough and ready guide has served me well. Another man will have some quite different training standard. If he discovers what it is, he will save himself disappointment on high angle ice. He will get himself confidence, and have at command the reserve of energy that a good climb will certainly call out.

Two minor aids to ice work are worth noting in passing. Woollen gloves should be worn, not leather or cloth. Wool gives a non-slip grip on ice, which the others do not. It seems to be known everywhere now that on long ice climbs the leader will increase his speed and lessen the strain upon his arms by using a short axe or a slater's hammer. It seems to be less well known that the shaft ought to be fourteen inches and the head heavy. A heavy head does more work for its weight than a light one, especially at very high angles.

If training has been imperfect and one arrives near the top of a pitch exhausted, a fatal temptation often occurs—a temptation to spare oneself the labour of cutting the last two holds, and just to strike the pick of the axe into snow on top and pull up. I have never had the courage to yield to this temptation myself, but bolder spirits than I have done so and peeled off in a backward somersault.

The only pitons worth using in pure ice are the channel-bladed type or the tubular. The long saw-toothed piton is reliable in névé or snow-ice, but positively dangerous in pure ice, where it tends either to jump out or to split the ice vertically when a heavy jerk comes on it. Ice pitons serve well enough to support

weight. Have no faith in their power to withstand jerks. It is not so much the piton as the ice that must be held suspect.

On neither snow nor ice is there such a thing as a wholly satisfactory ice-axe belay. We must use it, but should be constantly aware of its unreliability. It must be used with intelligence in regard to direction of probable jerk, and save in dire necessity should never be used unsupported. The simple passing of a leader's rope round the indriven shaft has no doubt served to arrest many a fall, but this is largely a matter of luck, due to the leader's own act in braking with his pick, or to his fall being slowed by soft snow. On the other hand, I have seen a leader's fall (balling snow on crampons) snap his second's axe after a slide of only twenty feet. The shaft had been driven in to its head, and when examined later proved to be sound ash. The truth is that an axe-shaft is not designed to take such strain unsupported. The best method for giving support is that used in the ice-axe-hip-belay—the belay used by Pete Schoening on K2, when he stopped the fall of five men on ice at nearly 25,000 feet as described in the preceding chapter. His method is for snow, not ice. On K2 it worked on ice because he had the shaft braced against a rock frozen into the slope (the spike was not even buried).

However good one thinks one is on snow and ice, it is important to practise annually at the beginning of each season the technique of braking with the pick. Choose a hard slope with a clear run out, cast yourself down, and brake, one hand on the shaft and one on the head held at chest level. The technique is simple and effective—but only when properly done. If the pick is jabbed in too abruptly, or the axe held too high control is promptly lost and usually the axe too. A little practice gives the beginner much-needed confidence—he will stand straighter in his steps thereafter—and gives the expert fresh reminders, which he needs more than he knows.

I feel strongly on this subject, as I do too about belays and crampon work, as a consequence of some harsh experience. One such episode is worth recalling since it illustrates all three points. I was climbing in the Dauphiné Alps with two excellent moun-

taineers, John Barford and Michael Ward. We had climbed early one morning on to the Col de la Coste Rouge of the Ailefroide with the intention of climbing down the far side to the Glacier Noir. Below us lay a couloir of four hundred feet at an angle of forty-five degrees, with a bergschrund below. The snow was iron hard and we started down in crampons, myself first. One hundred feet lower down we ran into soft snow lying on the hard. This surface layer tended to ball on the crampons. So I stopped and declared for removal of crampons and cutting of steps. Barford, as last man, shouted: 'Nonsense! Go on, man—just a waste of time!'—and moved down a step. With these words, off he came—the snow had balled on his crampons. He shot down at high velocity. By a stroke of what might have been good fortune, Ward was standing on a patch of deep, firm snow frozen to the underlying ice. Quick as a flash he drove in his axe and whipped the rope round it. Two seconds later the jerk came. The shaft snapped. The two swept past me. I had no belay and was torn off. But the second man had hung on to his broken axe-head and all three of us were braking hard. Inside a hundred feet we stopped ourselves. It will be seen that we had made two successive mistakes; we had not taken off our crampons in time, and we had failed to give a belay proper to the situation, which had been ideal for the axe-hip-knee technique. This was a failure in training. It is not often we are given a third chance—not inside half a minute. But we were well-practised in braking. At an angle so critical, had any one of us failed in this matter, all three must have ended up in the bergschrund.

To dire examples there is no end, but to climb on snow and ice is of all sports the most satisfying and joyous. It is to help realize the latter that I cite the former. I confess that I myself turn a somewhat irreverent eye upon technical articles. If the potential gardener were to read all these weighty tomes on gardening, he would never dare to pick up a spade. But just let him turn over soil and throw in a seed, and behold!—it grows—wonderfully well. Likewise with mountaineering. It can be made to sound very complicated. Yet if we just go out on to the mountainside, everything suddenly becomes simple and straight-

THE CRAFT OF CLIMBING

forward. When we come down to brass tacks, two things are needed to make a good mountaineer. The first is plain good sense, the second an alert mind. The snag is this—they must be maintained day long. There it is that technique and training come in.

W. H. M.



AROLLA: Unroped simultaneous movement on an Alpine Glacier

(Photo: G. H. Ellison)



PIGNE D'AROLLA: Roped simultaneous movement on an Alpine crest
(Photo: G. H. Ellison)



THE NORTH FACE (right) OF THE MATTERHORN: In the foreground is the
Schonbühl Glacier rising to the Zmutt Ridge on the extreme right
(Photo: Tom Carruthers)



HIMALAYA: Ernst Forrer gasping for breath in the rarefied atmosphere at 24,000 feet on the ridge leading to the summit of Dhaulagiri

(Photo: Kurt Diemberger)

ON SNOW AND ICE

9

The Relation of Scottish to Alpine and Himalayan Mountaineering

1. *The value of Scottish experience in Alpine climbing*

A comparison of Scottish, Alpine and Himalayan peaks is hardly required by readers already aware of the great differences in height, form, and glaciation. But a useful end is served if we relate the techniques of climbing in Scotland to those on high mountains; we may then see where a Scottish training helps us and from that draw profit, and, equally important, observe in what respect it does not help, and so become more alert when climbing abroad.

All qualities of snow and ice found in the Alps and Himalaya are to be found also in Scotland, although certain qualifications are to be noted. Firstly, in Scotland new snow tends to cohere on the slopes from its first falling, and thereafter consolidates much more rapidly than Alpine, so that steep slopes may usually be safely traversed shortly after a snowfall, when, were they Alpine, they would be in a highly dangerous condition. Secondly, fresh dry powder lying on old hard snow is common in the Alps and liable to avalanche, but cannot be called common in

Scotland although found there. The commonest source of avalanche in Scotland is the collapse in spring thaw of big cornices. After any very sharp rise in temperature, snow gullies should be avoided, even when not corniced, for rock and ice are both likely to fall from the retaining walls. Penalties are paid annually by climbers who disobey this rule. However, in cold weather excellent climbs involving much axe-work are to be had in the Scottish gullies, whereas Alpine gullies are to be avoided when possible, for at all times they discharge debris.

Rock-climbs either in the Alps or on lesser Himalayan mountains may often resemble the longer Scottish routes, and may occupy very much the same length of time. I am here comparing climbs I have done on Ben Nevis (for example, Basin Route, Slav route, and in winter the three big ridges) and in Glencoe (Garrick's shelf and Deep-cut Chimney under snow and ice) with Alpine climbs like the Meije from the Promontoire, the Grands Charmoz, the frontier ridge of Mount Maudit from the Col de la Fourche, etc. Although the Alpine climbs are longer, the Scottish climbs may consume more time. However, that is not usual, and my main point is that they have left on my memory the same general impression in regard to the type of difficulty encountered.

The lesser Himalayan peaks I have in mind are those between 16,000 feet and 19,000 feet. These have given routes reminding me strongly of Cuillin ridges and Lochnagar buttresses. I speak here only of similarities in general character; likenesses can be still more marked when we come down to detail. Difficult pitches in the Himalaya are like difficult pitches anywhere else.

It is a merit of the long Scottish rock-climbs that pitches are usually separated by long stretches of easy rock. On these routes, and on snow and ice climbs, and on summit ridges like those of the Black Cuillin, or An Teallach and Aonach Eagach under snow, we learn the art of moving all together roped-up and at speed, on both the ascent and descent. It is important that we should become able to move safely without stopping to take belays on rock graded Difficult, that is if we aspire to the better Alpine climbs. The ability to climb Severs is a further

good help to this end, for it leads to greater confidence on difficult rock and so to less waste of time. Here I would stress the importance of quick rope-management and sustained rhythm, which are better learned in Scotland than in England or Wales.

Practice in rope-management for Alpine work should include practice in abseiling. It is not adequate training to select one short crag and practise only on that, except as a beginning. Scotland abounds in cliffs of 800 to 1,500 feet on which descent can be made by abseiling a known route. This gives excellent training for the Alps, where the prior experience saves precious time, probably when really needed—for descents by abseil are not to be thought of as being the order of the day.

The most important contribution made by Scottish climbers to British mountaineering is (in my view) not in rock-climbing but in the development of difficult snow-rock-ice-climbing. It is for this reason that Scottish mountaineering makes such a valuable introduction to Alpine. The best season is mid-January to mid-March. Easter is almost always too late. Ice-pitches of the kind met in Scottish gullies (like Comb gully on Nevis or Crowberry and SC gullies in Glencoe) are not normally encountered in the Alps but in acquiring the ability to deal with them we acquire all the skill to cope with the upper walls of Alpine bergschrunds, where these are climbable, or the ice-wall barriers on Himalayan ice-falls or open ice-slopes too steep for crampons only.

The Alps and the Himalaya, being inland ranges, get much less wind than the Scottish plateaux, which are seaward mountains lying in the storm-track of North Atlantic hurricanes. In the Himalaya, the high-velocity winds, made notorious on Everest, are encountered above 23,000 feet. Below that level the Himalaya are relatively windless. The clothing that is adequate for a Scottish winter season is fully adequate for the Himalaya below 23,000 feet. Thus, at an early stage of my own climbing career in Scotland, I found that one windproof anorak was not enough in winter storm, nor was one balaclava helmet (it must be reinforced with a windproof hood) nor one pair of woollen mitts, nor one pair of trousers, nor were two sweaters. If only

we can learn this early enough it may save our lives. One of my friends died in a recent hurricane through not learning it in time.

The rapidity with which storms rise in Scotland, the possibility of winter severity at any time of year, the speed with which snow conditions alter, more especially on Nevis where soft wet snow is apt to turn to ice overnight without a warning sign seen below, and the heavy punishment these deliver to unwary climbers, are at least a useful preparation for the quick-change Alpine weather (big peaks make their own), which, although less violent in itself, has more dire effect on the body by reason of altitude.

A genuine skill in Scottish mountaineering is fully sufficient to let a climber do good Alpine climbs guideless in his first season, and to deal competently with all ordinary difficulties—provided that he keeps off the bigger routes and has the company of a more experienced man than himself. The latter point is important; the Alpine scale gives rise to certain difficulties, conditions and dangers which a purely British-trained climber has not yet encountered, and with which he cannot expect himself to deal safely in that first season. If he can raise no such experienced companion, then let him still go but keep to easy peaks in good weather.

The aspects of Alpine climbing that cannot be experienced in Scotland, and of Himalayan climbing that cannot be experienced in the Alps, are the subject of the following pages.

2. *Alpine craft as distinguished from Scottish climbing*

The primary differences between Scottish and Alpine climbs are the same as those between Alpine and Himalayan—height, scale and geographical latitude. All the other differences derive from these. Thus the first difference to be noted is the incomparably greater bulk of snow and ice that distinguishes Alpine from Scottish peaks.

Glacier work tends to cause Alpine beginners more anxious concern than the subject merits. Alpine glaciers are for the most part to be regarded less as obstacles than as highways to and

from the peaks. Much of importance regarding their negotiation may be learned in advance from the textbooks and the rest is a matter of common sense, and of cramponing, axe-work, and rope-management—simple skills in which hard but intelligent practice will soon make an active man proficient.

As a consequence of more southerly latitude, Alpine snow becomes mushy from sun-heat after midday and dangerous where it lies on steep or exposed slopes. Scottish snow does not change appreciably in the afternoon; thus it is not Alpine in character, but Arctic.

On Alpine buttresses and big ridges, route-selection even on moderate climbs can be baffling and time consuming, because of the greatness in scale. The problems of route-selection are met in Scotland on a scale insufficiently great to give us skill or confidence on first trying Alpine routes.

Sudden bad weather, catching us high upon a long Alpine climb, will more often be a serious threat to survival than its heavier Scottish counterpart.

These triple risks of deteriorating snow, time-wastage on route-selection, and sudden bad weather, we can in large measure escape by the employment of good guides. If we are determined to do our own mountaineering, then we must learn and study the art of Alpine speed and pace, and discipline ourselves most thoroughly. We must adopt a much more business-like attitude to our climbing than we do in Scotland. In Scotland we must be tough in dealing with our climbs, but in the Alps we must be tough in dealing with ourselves. We never learn this discipline at home, for we are unregenerate. The Egyptian street Arabs who never tire of telling us we are 'hard cases' are telling us the truth.

Speed in the Alps implies not so much fast moving as not wasting time. We cultivate rhythmical pace and hold to it. We cut out long halts for tobacco and talk; we handle the rope expeditiously; and whenever possible we move all together. We must be prepared to keep driving the body onwards, despite its marked inclination to ease off. And our starting time is anything from midnight onwards according to peak, route, and hut.

By these stern means we aim to get off our peak before noon and so avoid the descent of bad snow, and we are able also to earmark time for unforeseen delays in route-selection. I find it quite impossible to exaggerate the urgent need for the unguided amateur, however experienced he may be, to provide for himself much more time than he thinks he will need. This, indeed, is almost the whole secret of carefree and enjoyable Alpine climbing—and of gaining objectives.

But we must follow up four further devices for increasing our speed or saving our time.

First, on the afternoon before our climb we should reconnoitre our route in its lower part. If this task is omitted, much time can be lost despite good weather on starting a modest climb like the Hornli ridge of the Matterhorn.

Second, in bad weather, it is always worth going up to a hut, and it is always worth starting out if conditions are not hopeless, for good weather comes just as suddenly as bad. We can withdraw before committing ourselves if the hoped-for clearance fails to materialize. The climber must not tempt the weather unduly as he may often do in Scotland. Penalties are too heavy. But the point is that we should not sit idle in the hut waiting to see if a promised clearance will really come.

Third, cramponing should be assiduously practised (I assume here that we have learned to deal with steep snow and ice without crampons). Guided parties can often dispense with crampons because guides cut ice at high speed, and the route being known they have plenty of time in hand. Guideless parties will save a vast amount of time if able to crampon well and safely, and if they start early enough to be able to use their crampons high on the mountain before the snow deteriorates. Good cramponing is not so simple as the confident beginner imagines. It demands practice on routes selected in rising standard of difficulty before a climber can with safety be let loose on a big snow and ice climb. Ignorance of these hard facts has led to much trouble, and to disaster.

Fourth, we can often increase pace by ensuring an adequate fuel intake. In Scotland most climbers in good training can

keep going all day on very little food. A habit is formed of eating only a bare minimum on the hills. And if this habit accompanies the climber to the Alps, his performance will badly suffer. He becomes slower, more readily tired, and loathes to press on, despite good training. This trouble can often be traced to a low fuel intake. The truth is that Alpine climbing is much more exacting than Scottish. Food of high calorific value should be eaten frequently in small quantity. The more sugar an Alpinist can bring himself to eat the better the performance he is likely to give. (This truth has its limits.)

There is often a temptation to save time in the Alps, especially during an unexpectedly late descent, by taking a 'short cut', which seems obvious to the eye although not mentioned in the guide-books. In Scotland, if it be a gully, our yielding to temptation is folly; but in the Alps it is dangerous lunacy.

The chief objective dangers in the Alps are falling stones and ice. So are they too in Scotland, but the difference in scale needs no labouring. The fact that an Alpine route is much frequented does not make it safe. The Nantillons glacier, for example, is a notorious danger spot; it is sounder practice to climb the Grépon by the much harder route from the Mer de Glace. In fine, dry seasons, remember that the ice-pointing will be melting off the rocks, and that stone-fall may be expected from cliffs that are reputedly harmless. At such time avoid routes that are notoriously loose (for example, the Brouillard ridge).

The most important quality that a climber can acquire is one that he may win on homeland mountains—an alert intelligence maintained day-long. This he must consciously practise until it becomes second-nature to him—an unconscious habit or instinct. That alert awareness has to be turned to every movement by the climber and his companions and to the state of snow, ice, rock, and weather, and be used in scrutinizing all routes proposed. For the peaks themselves he must foster a profound respect. Alert intelligence ranks above all other qualities that a mountaineer may possess, for with it he may go to any range abroad and be safe, subject to good fortune, which he may earn but not command.

3. *Himalayan climbing as distinguished from Alpine*

A prior training in Scotland or the Alps is by no means an essential prerequisite for Himalayan mountaineering. A contrary opinion tends to creep into general acceptance as a result of the high qualifications rightly demanded by the big expeditions. But during these last twelve years I have met many men with good Himalayan records who had never climbed on other ranges. One can learn one's mountaineering in the Himalaya. For us, this would mean lost time and opportunity.

Scottish mountaineering, in itself, is by no means all-sufficient for successful Alpine climbing although a great help to that end. Still less does it give in itself an adequate training for the Himalaya. An experience of Alpine climbing, preliminary to Himalayan, is highly to be desired. It now remains to be said that Alpine experience in itself is not fully adequate for Himalayan problems and conditions.

The Himalayan scale is so great that Scottish and Alpine experience are almost equally useless in estimating it, save when we get high on our peaks—say about 4,000 feet from our summits. It is then our Alpine experience that gives any meaning to what we see.

From lower down on our Himalayan peaks, or from farther away, I have found it extraordinarily hard both to appreciate the real size of nicks and steps in ridges and the true angle of all slopes seen *en face*. The foreshortening is gross and deceives the eye beyond all belief. The real situation is ordinarily very much worse than it looks. For example, the average angle of a long Himalayan ridge may not be so very great. It looks easy. However, we note along its length a number of little walls and steepenings of angle. Drawing on our Scottish experience, we reflect that any step not climbable direct can be turned on one flank or the other, and that angles seen *en face* are always less than they look. Or, drawing on Alpine experience, we may reflect the ice-slopes are probably as steep as they look, but will not be more. We have then to learn the hard way that angles seen *en face* in the Himalaya are normally steeper than they appear. (A good example is the Lhotse glacier of Everest, which

looked a very easy angle when we first saw it *en face* from Pumori in 1951.) Ridges tend to be rawer and narrower even than we feared, and when we try to turn their steps we find the flanks so steep and uncompromising that they offer but poor alternative. Consequently, the very common error made by parties new to the Himalaya, however experienced they may be as Alpinists, is an underestimation of both difficulties and distance, and the consequent attempt on their summits from final camps that are pitched too low. The result is that climbable peaks tend to be lost through exhaustion and lack of time. If they are won, it is with quite excessive strain on the climbers.

We do well to bear in mind Mallory's remark that the three golden rules in Himalayan climbing are (1) Reconnoitre, (2) Reconnoitre, and (3) Reconnoitre. They have additional merit in providing us with time and opportunity to acclimatize to altitude. Our bodies have power to adapt themselves to oxygen-lack, and like all powers it improves with practice. Previous Alpine ascents up to 15,000 feet are distinctly a help, for our bodies will afterwards adapt more quickly at least to that height.

Himalayan snow-conditions can be very different from Alpine. Under a clear sky before the summer monsoon it is not unusual for sun temperatures to exceed 160°F. at great heights where atmospheric cold protects the snow. But at lower temperatures and altitudes—say below 20,000 feet—the sun's effect on snow can be alarmingly quick and devastating; especially so on southward-facing slopes, which must be dealt with most warily. I have committed myself to northward-facing snow-slopes in June and seen them turn dangerous shortly after 8 a.m., although they had been hard-frozen at night.

Himalayan snow will avalanche at lower angles than Alpine, and in enormously greater mass. Side glaciers will sometimes shoot an avalanche across the full breadth of the main glacier; and to complicate the matter further, the snout of a side glacier or hanging glacier may be hidden from below by a cliff or buttress. It is well to keep aware of these points and to exercise the utmost circumspection when siting tents. In glacier-filled valleys, it may

often be better to pitch camps on the glacier rather than in the nullah between the moraine and mountain-flank, and so use the moraine as a protective screen. On upper glaciers, pitch camp when practicable at the toe of a ridge, so that anything falling goes to one side. If tents are sited on or under a long open snow-slope (for example, the Swiss on Chaukhamba or the Poles on Tirsuli), be aware that providence is being unduly tempted and be prepared in mind and soul for disaster. My experience of monsoon snow is that under no conditions can it be trusted, and that one must keep to the crests of the ridges.

Autumn snow-conditions appear to me to be very much more like the Alps in summer than are spring conditions. There is more opportunity for crampon and axe work.

Autumn night frosts high up are extremely testing, save in the Everest region below 20,000 feet, where temperatures seem to be higher than in spring. For peaks below 22,000 feet, clothing remains the same as for Scotland in winter, save that three pairs of socks will be wanted. But if three pairs of socks are crammed into boots made for two, the result is the reverse of that desired and will induce frost-bite.

In my opinion, moulded rubber soles are the best for Himalayan as for Alpine boots, but I cannot regard this matter as important. They should have nails in the heels to secure the descent of steep, wet grass, long slopes of which are encountered in the central Himalaya. This again does not apply to the Everest region.

For the biggest Himalayan peaks, the most valuable training we can have is of long snow and ice climbs in the Alps. The long Alpine rock-climbs, so much favoured by British climbers, are distinctly less important. The most important lesson of all, however, which we do learn in the Alps, is the need of perpetual vigilance and common sense. As a general rule, the pioneers and pundits-to-be of mountaineering do their best work when they are young and relatively inexperienced, not when they are old and wise. They live to become old and wise because an alert man with a basic common sense can safely go anywhere.

W. H. M.

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