

would clamber over the skyline summits and descend that evening to a camp site all laid out on one of the many delightful, pasture-like vlaktes which abound, with a meal cooking away.

A Cedarberg sunset, in all its rich redness as the clouds slowly soak the colour out of the rocks, is a beautiful sight indeed, while the mornings are crisp exhilarations when the sun strips the shadows from the gargoyle-like, freakish rocks and pillars, which fence the camp and now stare sphinx-like at your breakfast.

The contrasts and fascination of the Cedar Mountains will stay in the memories of any visitor or climber to this area. Now that it is preserved as a Wilderness area, future climbers are assured of enjoying the delights of discovering naturally all the colours, scents, scenes and climbs of a unique mountain range.

Underfoot information

The story of the climber's boot

Bob Brigham

My bench used to be in the cellar, some 20 ft by 20 ft, underneath the old shop, which was on the outskirts of Manchester and at the poorer end of the City. Crammed into this small area were leather presses, splicers, sewers, rollers and cutters, boot finishing, eyelet punching, and lasting machines and a long bench with places for 2 people.

It was never really cleaned out as there was no room to shift anything and in any case we didn't want to disturb the leather dust. The two positions were for my father and me, but he died suddenly just as we were all growing up and so our 400 sq ft cellar factory never did see 2 people working at the bench together. Business was slack in those days—I had time to repair anything from an old pair of Clark's sandals to a pair of Wellingtons. The cellar was busy, but the shop was not, and I recall that we were the only mountaineering specialist outside London and the Lake District. Robert Lawrie had moved out of Burnley and I am sure the clog makers were doing what business there was around at that time.

Reminiscing, I remember every evening at about 5.15pm, the noise of footsteps growing louder on the street pavement above my head, with people walking past after getting off the no. 33 town bus just a few yards away, on the corner of the street. This was my signal to emerge from the cellar and stand in the shop hoping for customers, and then hoping that I would have what they wanted. Standing there wearing an apron, waiting to get back to the bench, for workers always seemed to finish work just as I was in the middle of some challenging part of the shoe-making trade, and for fear of missing customers on the one hand and losing the feel for the boots I had had in my lap all day on the other hand, I could never decide between shop and cellar. As Joe Brown entitled his book—those were the 'Hard Years'.

Our specialist shop, behind which we were all born and brought up, was not much larger than the cellar. It was lit by a 100 watt bulb hanging in the window with another in the shop itself. The only climbing equipment available was ex-Government surplus. The only socks were hand-knitted Harris Tweed wool; the only weatherproofs, camouflaged drill anoraks and sticky gas capes (which had a hump on the back to take a rucksack); and of course there were boots and more boots. In fact, the shop walls bulged and overhung with towering rows of boot boxes, for my father had built up a good reputation for knowing all about boots.

We had only 2 types of welt construction to offer. Firstly, the Army boot style with its upper lasted over the insole, and the heavy double leather middle soles and bottom soles which were heavily pinned to the insole with brass screw-nails and rivets. These sandwiched the upper so tightly that water could not possibly squeeze through. This type of boot was made on a curved last with plenty of toe spring. It had to be, for the construction made the boot so stiff that the wearer walked as if on rockers! Only when the boot was wearing out would the sole begin to flex. The leathers, construction and style combined to make a superb boot; very practical with its large area of heel and broad sole, and very comfortable and strong.

Uppers varied only in quality—style did not change much. The uppers were without a toecap, half leather lined, eyelet laced and with slight bellowing at the base of the tongue. The English leathers were Zug, Toughide and Beaver. The shop had the fabulous smell of tanned leather with all the different hides and this was especially strong after a new delivery. At a guess, I would say that these boots must have weighed about 6 lbs a pair, but after nailing they would approach 10 lbs.

As for nailing: every climber worth his salt knew exactly what suited him best and which nails suited which rocks best. The general rule was soft steel Birmingham clinkers and triple hobs for hard granite rock, where the rock would bite into the nails and hold. Hard nails, such as Swiss Tricouni, were used for soft Gritstone and sandstone, where the nails would bite into the rock. The wrong nails on the wrong rock naturally made routes incredibly hard. Boots were nailed to customers' specifications and every pair sold in the shop would mean 2 hours that evening in the cellar, nailing them up for the customer. A busy day in the shop could mean 8 hours work after closing time, so that the boots would be ready by the next day.

The second type of welt construction that we had was Veldtshoen. Here the upper was turned outwards and one row of stitching encircling the welt held on to the insole, whilst the other one—sometimes 2 rows—held on to the middle soles and bottom sole. The use of thread, instead of metal grindery, made these boots very much lighter; this sole construction is excellent when using lighter and more flexible leathers. Although more expensive to produce, it was very popular with ladies because of its lightness, and with the men because of its better foot-forming uppers and its comfort.

Both types of construction are still used on modern mountaineering boots. Modifications and improved manufacturing techniques have made them more reliable, but the basic principles remain the same. The more dedicated climber would wear an assortment of nailed boots, plimsolls (which had to be Dunlop Seaspray as they had the best friction and the thinnest 'feeling' sole, and cost

only 4s 11d a pair!), rope-soled shoes as worn on slippery wooden decks by yachtsmen (these were tremendously successful on wet rock but certainly not the thing to be wearing if there was any slime or mud around, and then they did uncoil at most inappropriate times!), or hand-knitted Harris Tweed socks worn over boots (expensive but worth every penny). This last technique I am sure enabled many famous climbers to lead the 'impossible' and to come through with honours in emergencies and take pride in relating the epic over a pint of beer in the Dungeon Ghyll.

So this was the situation when I came in on the mountaineering boot scene, and I would now like to outline some of the history of construction methods, and also to describe some of the most up-to-date ways of manufacture.

Probably the earliest description of 'mountaineering boots' is by Senofonte (432-353 B.C.) when he writes about Armenians attaching sacks to their feet to enable them to walk through snow. Through the ages, not much was ever written about climbing boots, but naturally enough, shoes and footwear in general developed gradually. There are reports of shoes made from wood with big iron nails on the soles to avoid slipping, and with leather strips nailed on top, being used by hill farmers, and more sophisticated models with thin leather uppers covering the ankle, which were used generally by soldiers. Early Alpine conquests were made with the latter type. One of the very few references to mountaineering footwear was made by Henriette d'Angeville in 1838, after completing her famous climb on Mont Blanc, for which she used two pairs of waterproof shoes with crampons of different widths—one pair being used with silk stockings covered by woollen ones, and the other pair taking an extra pair of woollen stockings to add more padding to the feet.

Over the years the 'Alpine Journal' reports very little on mountain footwear construction, but I would like to relate a number of small mentions of footwear which, from a very sober pen at the time, make light and pleasant reading now.

Nothing was mentioned before 1890, but in the 'Alpine Journal' of 1892-3, under the heading of 'Equipment for Mountaineers' was a report of a special committee which had been set up to look into equipment on behalf of the Alpine Club. It stated that boots should be stout, have large heels, a bellow tongue, and that the soles should protrude out from the upper. There must be a leather tab at the back and wrought climbing nails should be used, not cast. The nails should be on the outside edge, as close together as possible, and a spare pair of laces should be carried. Members of this select committee were famous old climbers—C. T. Dent, W. M. Conway and J. H. Wicks.

In 1901, it was reported that the boots at an Alpine Club exhibition were made from coarse grained cowhide or Crupp (horse hide). They were golosh side linings (no side seams) and outline heel (large). The article remarked that Swiss boots were as a rule made from one piece of leather, but added that they tended to be rather bulky around the ankles. (I just cannot imagine this type of upper which is completely seam-free, and feel that a very important design has been lost somewhere in the past, if they were so constructed!) The report goes on to say that the first layer of sole and heel should be sewn and pegged under the instep with 3 rows of pegs to the first layer of leather. There should be large toe-caps on the uppers and the sole should project.

Extra leather layers must be provided for the heel and then nailed with cliner nails. This is the best old description of welt construction in boots that I could find, and it does show that not a great deal changed in welt construction, right up to the 1940s.

The first high altitude expedition which recorded notes about boots was the Italian expedition to Mount St Elias, led by the Duke of the Abruzzi in 1897. He mentioned that his boots were lined with fur or wool. A certain George Wherry, in *Alpine Notes*, wrote in 1896 an article called 'Notes on the Climbing Foot' in which he described carefully his study of mountain guides' feet. In 1909 in 'Notes from a Knapsack' the same gentleman wrote a chapter about why both legs on a person are of equal length. Unfortunately he mentioned nothing of boots in either article, but I am sure that if he had, it would have been well worth repeating verbatim.

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Illustrated Price List on application.

54 Advertisement from 'Mountaineering' by Claude Wilson (1893). Photo: AC. Collection

An advertisement appears in 'Mountaineering' by Claude Wilson, published in 1893, in which an Alpine bootmaker, James S. Carter, of 16 South Molton Street, Oxford Street, London W, shows a photograph of a pair of mountain boots, which he offers for 26s. 0d. a pair. The copy under the photograph says that he is patronised by the English and foreign Alpine Clubs and that these boots have stood the test of 25 years. (This dates them back to 1868!)

He goes on to say that suitable nails cannot be obtained in England, but that he has made special arrangements with the famous Grindelwald guide, Ulrich Almer, who in turn has special arrangements with his local blacksmith, whereby Ulrich can buy them as required, for the price of 6s. 0d. per set, which is enough to nail three boots. The blacksmith only makes them as and when required. Although early Alpinists wrote about equipment and climbing

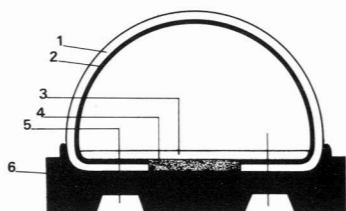
boot nails, not a great deal was said about actual footwear, and judging from old drawings and paintings that I have seen in the Alps and in old magazines and books, the boots seem to have been modified from the army pattern of the period.

It seems that there was very little in the way of new development in boot construction between the Great Wars, and this brings me back to where I came in, over twenty years ago, in a cellar 20 ft x 20 ft, at 187 Conran Street, Manchester 9, with still those same two styles of boot to offer climbers—one with army type welting and the other Veldtschoen. About that time things began to happen. People began to demand boots for more specific purposes and this led to diversification by the bootmakers. With harder and harder routes being accomplished, and the 'impossible' barrier continually being pushed back, very specialised boots have only really evolved over the past 20 years. First of all, my own personal interest was centred around the Manchester rock climbers. They needed something special to keep their feet on the very rounded Gritstone footholds. Nailed boots then, as pitons now, were ruining the crags; small footholds were scratched away as more and more people completed each route.

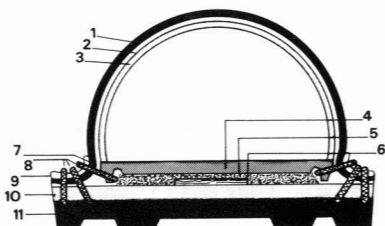
Klettershuhe came to our notice—they had been seen in use in the Dolomites by English climbers able to get abroad for the first time since the War. Klettershuhe seemed to be more readily available in Austria and the first models imported into England came from the Tirol. They were a lightweight boot with an upper of comfortable suede which formed around the foot, hugging and creating a good feeling of lightness and acrobatic agility to the wearer. The sole, with its lightweight, thin 'Vibram' was not rigid but firm and flat. We were soon making improvements, here in Manchester, to the Austrian model, to adapt it to local requirements. A fibre plate inserted under the middle sole, we found, gave better width rigidity, and with the popularity of these boots, many experiments were carried out with steel shanks of varying stiffness. Eventually, the 'FEB Klett' became standard 'Gritstone Footwear'. This is a climbing boot that is still popular today and, in many respects, is the most enjoyable type of rock-climbing footwear.

However, the hard lads passed on to greater things. Pierre Allain, the famous French Alpinist, was having a special boot made for himself and the local patrons of his Paris climbing shop. It had an upper of split leather and canvas, but what was more astounding, the boot had no heel and the climbing sole was completely smooth. Rumours crossed the Channel that climbers were standing on only the hint of a hold with their new 'PA' boots. We heard, but have never confirmed with our friend the Partisan Cordonierre who makes the boots, that in the beginning the climbers carried a small bag of resin and dusted down every small foothold before placing the boot. The boot's friction came from the excellent rubber used on the sole and the rand around the boot. The welt had been scoured carefully to make it undercut to compensate for the slight bending of the sole which, when weighted, would bring the line of the welt vertical and so allow the climber to take advantage of the smallest of holds. But this was not the full secret of EBs (as they are now named)—the shape of the boots had been designed in such a way that the foot was held tightly and exactly in length. Having created this 'fist-like' effect with the foot, the result was that the foot was able to direct all its

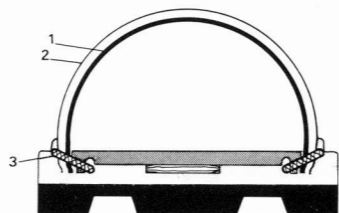
THE CLIMBER'S BOOT



- 1 Upper
 - 2 Lining
 - 3 Insole
 - 4 Filler containing varying stiffeners
 - 5 Upper tack-lasted down
 - 6 Cleated sole cemented to upper
- A lightweight rambling boot construction.



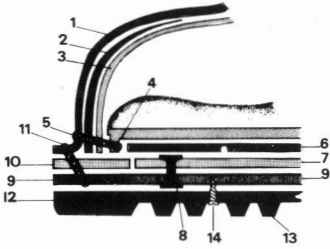
- 1 Upper
 - 2 Interlinings
 - 3 Lining
 - 4 Insole
 - 5 Filler
 - 6 Shanks of varying materials
 - 7 Extra welt rand
 - 8 Three rows of stitching
 - 9 Extra welt
 - 10 Middle soles
 - 11 Vibram type sole
- Traditional method of sole construction for heavy Veldtschoen footwear



- 1 Lining
 - 2 Upper
 - 3 Upper stitched to insole
 - 4 P.V.C. injected mid-soles
 - 5 Stiffener
- The PVC is injected between upper and Vibram giving a perfectly waterproof construction. The PVC middle soles can be stiffened to suit the need.

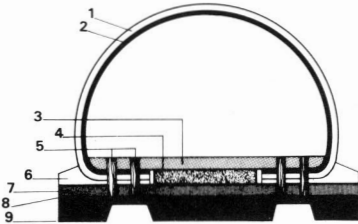
strength to one part of itself, whereas normally the foot moves, continually adjusting to the shifting weight of the body that it is supporting. Extremely fine and delicate balance was accomplished by this innovation and because of this, standards of climbing ability shot up phenomenally. Copies of the EBs have come and gone and some are still around, but it is accepted almost unanimously, that EBs are still the best.

Currently, a great deal of work is being carried out by specialist manufacturers in producing a light rock boot with a flat, rigid sole. Already a few



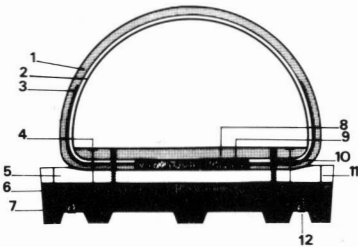
- 1 Upper
- 2 Side stiffener interlinings
- 3 Leather linings
- 4 Premier leather insoles with channel to take stitching
- 5 Norwegian rot-proof stitching
- 6 Internal reinforcement up to the perimeter of the channel
- 7 Fluted and shaped galvanised steel stiffener
- 8 Rivet front and back holding steel stiffener to middle leather sole
- 9 Middle sole of leather and rubber mixture. Patented system
- 10 Middle sole rand of special material
- 11 Synthetic stitches holding upper to bottom
- 12 Patented Jannu sole and heel unit
- 13 Sole designed for maximum grip and minimum of snow clogging
- 14 Rust-proof screws

Currently the most successful way of making strong, high mountain boots.



- 1 Leather upper
- 2 Leather lining
- 3 Leather insole
- 4 Bottom filler
- 5 Wood pegging: 2 lines
- 6 Leather rand
- 7 Leather butt-midsole
- 8 Adhesive
- 9 Vibram Gold Mark sole and heel unit

The double row of wood pegs tightly sandwich the upper between insole and middle sole, making a watertight construction. In wet conditions the pegs and leather swell to tighten construction still further.



- 1 Upper
- 2 Leather lining
- 3 Interlining
- 4 Galvanised rivets
- 5 First leather middle sole
- 6 Second leather middle sole
- 7 Vibram Gold Mark sole and heel unit
- 8 Best quality insole
- 9 Filler and stiffener
- 10 Brass screw
- 11 Synthetic thread
- 12 Rust-proof screws

Galvanised rivets and fine continuous brass screws firmly clench the upper between leather midsole and insole. Double leather middle soles are used for strength and life. This boot repairs exceptionally well.

are on the market. The use is for long, difficult rock climbs. The boot would obviously have a greater appeal outside English outcrop circles and the demand is great, especially in America. Experimentation into various types of sole stiffeners is playing an important part; shaped steel, fibreglass and poly-

urethane are the materials being used. The aim is to produce a boot which will allow the climber to stand on small toe holds without difficulty or strain, and yet be wearable for hours, if not days, at one stretch. Naturally, a revised upper design must be proven and also a new type of climbing sole. Vibram have already introduced two new sole units into their range, specifically for this type of boot—the Sestrogrado and the Chouinard-Vasque sole unit, which is for the American market.

The most successful welt construction on the best, modern, high mountain boots is that of Galibier—now very much emulated by other manufacturers. The system is not new by any means, but Galibier put it all together and got their permutations exactly right. Employing a Veldtschoen welt construction, and using excellent thread and adhesives, they gave us a system which did not fail at the point where most heavy Veldtschoen boots used to fail, that is at the waist, where the stitching rubbed away with the constant friction of middle sole rubbing middle sole. The secret was in the use of a spoon-shaped, sprung steel stiffener that maintained the strength of the sole, and which was riveted to both middle soles, the middle soles being laminated together and are made one from rubber and the other from composition board. Time has shown that this blend has been as near perfect as possible.

It is virtually impossible for a boot that is continually flexing underfoot, no matter how slightly, not to break down eventually. The slight friction alone, between two middle soles of leather sewn together but flexing over slightly different radii, is enough to rub away the thread that holds them together. Constant wetting and drying does nothing to alleviate the problem. Stitches, brass screw-nails, wood or steel nails, adhesives—all are being put to tremendous strain. Leather breaks down with the acids in the soil and, living near Kinder Scout in the Peak District, we have a good knowledge of how peat bogs can destroy good boots. Perspiration can rot away the boot's leather insole, which is the heart of the boot. Yet still leather remains the king material for mountain boots.

Boots need to breathe and only leather or skin will do this. Great progress was achieved in waterproof leathers by using reverse leathers. The waterproof skin side is inside and therefore protected from the possibility of being scratched. Otherwise, leathers for uppers must be full chrome tanned. I was always told as a boy—and I have never heard it contradicted—that the thicker and stiffer the upper leather, the more waterproof it would be. (However, 'stiffness' should not be confused with 'stiffeners'. All boots have heel and toe stiffeners inserted between linings and uppers, and Alpine boots have stiffeners on the sides of the boot to give greater support and take the pressure of the crampon straps.)

However, recent developments have brought into use a system whereby the middle soles of leather are omitted; in their place is PVC which is injected into the middle sole area whilst the boot is held in a steel mould. The PVC forces its way through, into every small cavity, forming a waterproof bond with the upper and Vibram sole. This, I believe, is a tremendous breakthrough (in the long run, time is saved and a reliable waterproof welt has been created at less expense). By using varying strengths of steel stiffeners, the strength of the sole can be adjusted for each particular design of boot. There are a number of manufacturers now using this method in mountain footwear,

but as far as we know, La Dolomite are the only manufacturers who are sewing the upper to the insole before injection; others are simply tack-lasting the upper to the insole, leaving a weakness which becomes apparent as the boot gets well used. La Dolomite's method is by far the more thorough.

The Blake sewn method, known in the States as Mackay sewn, is a lightweight construction method whereby the upper is trapped between insole and middle sole by a row of chain stitches which go around the inside of the perimeter of the insole. Before adhesives made such tremendous advances fifteen years ago, this was probably the only successful way of making running shoes, rugby boots and cycling shoes. The sewing allowed the sole to be very flexible. On its own, Blake sewing will not support heavy middle soles and Vibrams. The stitches, because they appear in the insole, must be smoothed or covered with a leather fleshing insole for comfort. Both EB Super Graton Boots and the new PA Climbing boots, are Blake sewn. Recently, Scarpa of Italy have used both Blake sewing and modern cements to produce a number of very successful lightweight boots.

Wood peg construction is a very old method. Theoretically, the wooden pegs which sandwich the upper between insole and middle sole, swell up in damp conditions and make a tighter construction and therefore a more waterproof welt, as conditions deteriorate. The system works and is still used today in a number of factories in Europe. A double row of wooden pegs around the perimeter of the insole is usually necessary and this wood pegging gives a good measure of stiffness to the sole. Good quality bottom leathers are essential in this method of manufacture. Wooden pegs are used in many boots simply to add strength to the construction, and in this case they are spaced out at long intervals. Repairing boots made in this way is not a routine operation and requires patience and expertise.

There are two other types of boot construction that should be mentioned. The first is now very popular with lightweight boot manufacturers; it is a boot which has a welt construction fully dependent on modern adhesives. The sole unit is cemented directly on to the laster upper. The edges of the sole unit are firmly stuck to the upper, creating a waterproof seal. The speed and low cost of producing these boots allow many beginners to use the hills with safety regarding footwear, who, in the past, would not have made the effort due to expense or discomfort from heavy work-type boots; and so, although I personally tend to discourage people from buying these types of boots, they certainly play an important part in mountain footwear.

The second type is an unusual welt construction, old fashioned but very sound and one that has been used by Alpine troops. The upper is turned over the last and tacked down onto the insole. With heavy shoemaker's thread, the upper is then sewn to the insole by hand with a felling stitch. Middle soles of leather and the insoles sandwich the upper, with the insole, and these are then wooden pegged in double rows. The middle soles are themselves sewn together round the edge to avoid parting. Cements are used at every stage of production. Obviously, this is quite an expensive method of construction, but one that is still being used by the smaller specialist factories.

Lowa of Germany appear to have made the original breakthrough in double boots, quickly followed by Galibier and Val d'Or of France. The extra insulation properties gained by the inner, more than compensate for the extra

bulk and weight, but it must be remembered that for a double boot to look (from external appearance) like a single boot, and the weight to be similar to a single boot, something has to be left out and quality must suffer. Most inner boots are made separately and linked up with the outer at the end of the production line. It is a definite advantage to have a boot such as the one La Dolomite manufactures, where the outer boot is put on to the last with the inner boot having already been made and left in position on the last. This method of building guarantees that the inner will fit perfectly and that no looseness can develop between the inner and outer boots.

It is very worth while to mention at this stage the value of insulating gaiters of the type which fasten down to the welt of the boot. We have listened to excellent reports on their insulating and waterproof qualities from bad, wet Scottish winter conditions to extreme, cold winter Alpine climbing.

I would finally like to give a number of general observations, some of which may seem obvious, once pointed out, but which are not usually remembered readily.

Wear: Boots, being of soft and mostly natural materials, are not as resistant to wear as rock is, and so leather toes scratching on rock faces will result in the toes wearing out. A welt protects the toe from a great deal of this wear, but on the other hand, a climber finds a protruding welt to be a hindrance to his climbing ability. The same applies to rows of upper stitching.

Larger sized boots have to undergo greater strains than smaller boots, firstly because the person wearing large boots is usually heavier and stronger than the smaller footed person, and also the leverage forces applied to the sole and welt construction are greater. As the materials used are really no better than in the smaller sizes, I find that large boots do not last as long as smaller ones.

Made-to-measure: With such a wide choice of fittings available in Britain, from all the countries of Europe, I do not believe it is necessary to go to the expense of made-to-measure boots, unless the foot is badly deformed. A slight variance in thickness in a new pair of socks can make the difference between perfect fit and too tight a fit, just as a hot day on valley roads, compared with a day in snow on the hills, can make similar differences.

Price: I was always told that a good pair of mountain boots would cost the same as a good week's wage and I do not believe that anything has changed for this rule not to apply still. The question is, which type of mountain boot do you want, and do they deserve a good week's wage? I leave the decisions with you.