

the good of climbing in general. His attempts to change the honour to a team award were not successful. Shortly before the award was to be given, and just before a TV interview about it, Scott discovered in fact no money was involved, and at the last minute reversed his decision to accept the award. This action was immediately interpreted by the media in the worst possible light. It was supposed that he had refused because he saw no personal gain for himself. Only then did it emerge that the award was not for his performance on the Ogre, but for his courage in getting fit to climb again so quickly. Evidently there were several breakdowns in communication along the line—one hopes that in future the club will make the reasons for the award and its nature more plain to the potential recipient from the outset.

The following guide-books have been received or are noted:

Climbers' Club Guides to Wales 3—Llanberis Pass Geoff Milburn (Climbers' Club/BMC, 1978, pp 160, diagrams and map, £3.75). This single guide replaces the previous Llanberis North guide (D. T. Roscoe) and the Llanberis South guide (P. Crew). It lists 323 routes graded according to 11 adjectival classifications ranging from Easy to Hard Extremely Severe. Over a third of the routes are in the top 4 categories, ie Hard Very Severe or harder.

Borrowdale S. Clark (Fell and Rock Climbing Club, 1978, pp 257, diagrams and map, npq). This is a new edition of the FRCC Borrowdale guide, the last being the 1968 edition by P. J. Nunn and O. Woolcock. Like the previous guide it uses an adjectival grading system of classification, but unfortunately a different one. There are 12 basic grades of which the hardest, Extremely Severe, is subdivided into 5 categories E1 to E5, thus making 16 grades in all. It seems a pity that we have such an unnecessary proliferation of systems.

Rock Climbs in the Peak—Recent Developments Steve Bancroft (The Peak Committee of the BMC, 1977, pp 94, diagrams, npq). There are 9 BMC guides to the Peak District, and this additional volume is intended to update them after a period of intense development.

Sea Cliff Climbs in the Aberdeen Area Bill Marshall (Etchachan Club, £1.60).

Lake District North Clegg, Read and Wilson (Lakeland Climbers' Guide Books, £2.70).

Recent Developments in the Lake District Armstrong, Botterill and Whillance (Fell and Rock Climbing Club, £1.20).

Gogarth Alec Sharp (Climbers' Club, 1977, pp vi, 138, photo topos, £3.25). This latest Climbers' Club guide follows the format started by the Carneddau and Clogwyn du'r Arddu volumes, with clear print and pleasant layout. The photo topos are well reproduced and that of the Main Cliff shows only too clearly how the number of climbs has multiplied since exploration started in 1964. There is little here for the 'average climber', but then there do not seem to be that many average climbers around any more. One little quibble in an otherwise excellent guide—the voluntary ban on climbing in the Mousetrap/Red Wall area from February to July could have been emphasized by inclusion in the relevant section instead of confining it to the Introduction.

Helsby and the Wirral Alan Rouse (Cicerone Press, £1.50).

Equipment and Technique 1978

Tom Connor

Prusiking An article in *Off Belay* (40 5) by its editor, Ray Smutek, compares the traditional method of using prusiks for crevasse self rescue with a newer modified procedure (The 'Texas Method'). A number of disadvantages of the former are pointed out, eg the considerable strength and endurance needed to climb up even a comparatively short rope length to safety. In addition, if the climber's strength does give out, his legs swing out from under him and he

ends up in a collapsed position which is constricting and difficult to recover from, particularly if he should lose a foot sling; also the climber is not tied into the prusiks and if his crampons cut the slings or his feet slip out, a further fall may result.

The new method described was developed by cavers who regularly need to ascend long ropes safely and without undue strain. The ability to stop and rest or even collapse completely are built into the system. The article gives a detailed description of the technique with a number of diagrams and photographs which illustrate the necessary movements and equipment required; the reader is referred to the original article for these. The method has been taught for 4 years in a climbing school and considerable experience gained in its use. It does appear to have a number of real advantages over the traditional practice.

Nuts Another article in *Off Belay* (39 5) entitled 'Is your Nut a Friend', written by Ian Wade, deals with new camming devices known as 'Friends' which have been used in a number of recently completed 5.12 climbs in Yosemite. Their advantages are easy insertion and removal with one hand, although a clear disadvantage is the price, quoted as \$17.80 and by now no doubt higher. The device uses 4 independently actuated notched cams which take up positions determined by the crack dimensions. The article compares it with a number of other types of protection device and a later edition of the same magazine (40 12) contains some further correspondence on this topic. An earlier article (37 9) by Bob Dill describes the favourable performance of a series of cam nuts made following a design developed by Vitali Abalakov, the head of the Soviet Mountaineering Federation. The curved surface of these cams is a section of a logarithmic spiral.

Gore-Tex *Crags* 14 36 contains an assessment by Jim Ball of the new breathing waterproof fabric Gore-Tex, which we mentioned briefly last year (*AJ* 83 249). There is a review of items currently available in Gore-Tex, ie jackets, overtrousers, a bivouac shell and Gore-Tex covered sleeping bags. An important point mentioned is that Gore-Tex needs regular cleaning to keep its pores dirt-free and therefore breathing. Salt from sweat and body dirt can block the pores which would otherwise allow the transport of water vapour to the garment's outer surface—the recommendation is to follow the makers instructions; tests with a number of proprietary detergents gave good results. Gore-Tex recommend Fairy Snow. The overall assessment is that although equipment using Gore-Tex is expensive, it ultimately represents good value for money.

Nordic ski-ing equipment A group of Norwegian manufacturers has developed a new type of waxless ski sole for cross-country ski-ing known as the Mica system. It is based on a composite material built up of a thermoplastic (polyethylene or polypropylene) into which hard particles have been baked. These particles are so oriented that they form an acute angle in relation to the direction of travel. Wear tests showed that with the new sole new tread was continually exposed, keeping the frictional properties constant, whereas the pattern in other waxless ski sole progressively grips the snow less firmly as it wears away. The new sole gets a grip on the surface right from the 'kick-off' as compared with waxless soles with a patterned sole which slips a couple of centimetres at each stride before the ski grips the surface; this is because the pattern in the sole has to get packed with snow before it takes a proper grip. Another Norwegian manufacturer, Witco A/S, internationally known for its ski bindings under the name Rottefella, has introduced 2 entirely new models of step-in/step-out bindings for cross-country ski-ing. One of these has been tested in the Norwegian cross-country championship, and was used by all the winners. These bindings are distributed in the UK by YHA Services Ltd. A further innovation from Norway is a competition ski pole constructed from a combination of aluminium and carbon fibre. An extremely thin aluminium tube is covered and internally reinforced by carbon fibres and results in what is claimed to be the world's lightest and strongest ski pole for top class skiers. It is expected that the poles will cost less than traditional carbon fibre poles after the manufacturing process has been rationalized.

Ropes *Mountain* 61 40 contains an article by Helmut Microys (which originally appeared in the 1977 *American Alpine Journal* in its full form) in which he considers the theory and practices which affect the operation and life-span of a climbing rope. In particular, the UIAA

guidelines for climbing ropes are discussed, as are the effects of knots and edges (eg a rope running over a karabiner) on rope strength, the effects of damp and ice and the working life of a rope. He concludes that the UIAA recommendations give a minimum standard of safety only and that for a given price, the choice should be based on the highest number of UIAA falls held (indicating life expectancy), the lowest elongation under impact forces, the lowest weight per metre and the lowest impact force. The last factor is of less importance than the others because of the possibility of providing dynamic belays through a variety of methods which reduce the initial impact force. The UIAA *Bulletin* 79 May 1978 contains a list of equipment, including ropes, which meet UIAA specifications as of 15 April 1978; the other items listed are karabiners and ice-axes.

The use of altimeters Altimeters are essentially aneroid barometers whose scales have been altered to read altitude rather than pressure, assuming a known relationship between atmospheric pressure and the height above sea-level of a particular location. In fact, a uniform decrease in pressure with gain in altitude is assumed; this is about an inch of mercury for every 1000 feet, or 10 millibars for every 100 metres. If the state of the atmosphere always corresponded closely to this standard condition, then the altimeter would be an accurate means for determining unknown mountain elevations. In fact, there are often wide deviations from this standard state, and a number of corrections need to be made if reliable altitudes are to be measured. The standard pressure lapse rate corresponds to an analogous temperature lapse rate (see *AJ* 81 81) which is about 1°F for every 300ft, and since temperature and pressure are related, temperature measurements provide a means for correcting altitude measurements made with an altimeter for departures from the ideal pressure pattern. If account is not taken of the necessary temperature correction, altitudes which are too high are recorded in cold weather and low heights in warm weather.

The use of altimeters to measure accurate heights taking account of temperature and other corrections is described in an article by K. O. O'Connell and J. Davies in the *Canadian Alpine Journal* 61 62. They wished to determine altitudes in an area of Baffin Island where only 2 mountain heights had previously been measured, one by an accurate survey and the other by radar altimeter. They were interested in using altimeters because of their usual great advantage of portability. A procedure was worked out using 2 accurate aircraft altimeters and a thermometer to measure the temperature correction. One altimeter was employed to determine the pressure variations at Base Camp, whose altitude was known to be 200ft above sea-level, while the other was taken to the peak whose height was to be measured. The method thus allowed for corrections due to ambient pressure variations and also for changes in temperature. It gave results in good agreement with the known heights and has the merit of combining simplicity with reasonable accuracy.

Science Notes 1978

Tom Connor and Edward Pyatt

Ice dynamics The behaviour of large ice masses such as the Greenland and Antarctic ice-caps is attracting the wide interest of glaciologists as indicated by 2 simultaneous conferences held in Ottawa in 1978. The flow of such large ice deposits and the possibility that they may be subject to sudden surges is becoming of increasing practical importance in the context of the exploitation of Arctic oil deposits and in the design of hydroelectric projects. The meeting indicated that while the knowledge of the internal deformations undergone by ice-sheets is advancing satisfactorily, the interactions occurring at the glacier bed are much less well understood. Various factors are likely to affect the passage of the ice over the underlying rock. Thus the ice may slide directly over the rock. However, the debris carried in the bottom layer of the ice may prevent this. Again, the pressure of the ice above can cause melting which would lubricate the interface and facilitate movement. Until the relative importance of these different mechanisms is understood, it will be difficult to construct an adequate model of the behaviour of large ice masses. It is becoming clear that the elementary but simplified concepts used to describe the behaviour of individual glaciers are inadequate to account for the dynamics of more extensive ice systems.