ACCIDENTS IN AMERICAN MOUNTAINEERING TWELFTH ANNUAL REPORT OF THE SAFETY COMMITTEE OF THE AMERICAN ALPINE CLUB 1959

This is the twelfth annual report of the safety committee of the American Alpine Club. Only those accidents which occurred in the United States of America are included. No additional accidents from previous years have been brought to the attention of the committee.

Various tabulations used in earlier reports are included in the back of the report. In addition accidents have been selected from the period covered by previous accident reports 1947 through 1958 as a 12 year survey of accidents. Those accidents which were not truly mountaineering have been excluded. A mountaineering accident for these purposes has been defined as an accident occurring in mountainous terrain where the intent has been to climb. Accidents which occurred to hikers have been in general excluded, however certain ones have been included; for example those occurring on Mt. Washington during adverse weather conditions and winter hiking or walking episodes that were out of the ordinary have been included. Admittedly our selection tends to be arbitrary but it has been the decision of the committee that these should be included since Mt. Washington and winter climbing which includes hiking and skiing present special problems. Furthermore, climbers and hikers should be made aware of the hazards so that they can profit by the experience of others.

The numbers of fatal and non-fatal mountaineering accidents are shown in figure 1. The fatal accidents constituted 38% of all accidents. Figure 2 shows whether the fatal or non-fatal accidents occurred on the ascent, descent, or under conditions in which the direction of climbing was unknown. Despite the fact that more accidents occurred during the descent, it is interesting to note that fatal accidents made up 37% of the accidents on both the ascent and descent.

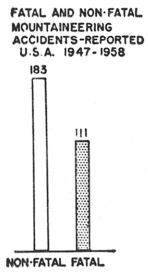

Figure 1

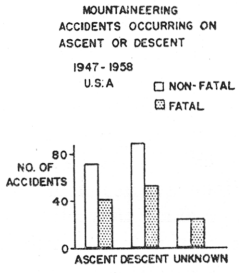

Figure 2

The distribution of fatal and non-fatal accidents as they happened on rock or snow are presented in Figure 3. From these data it is apparent that more accidents took place on rock than on snow. This probably reflects a greater incidence of rock climbing rather than a greater danger. On the other hand fatal accidents made up 43% of the accidents on rock whereas only 30% of those on snow were fatal. This does indicate that when an accident occurs on rock it is more likely to be fatal than when it occurs on snow.

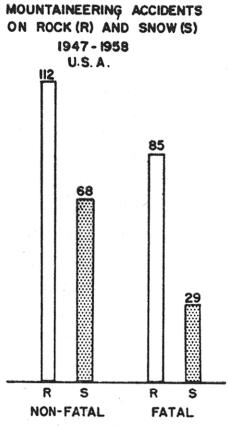

Figure 3

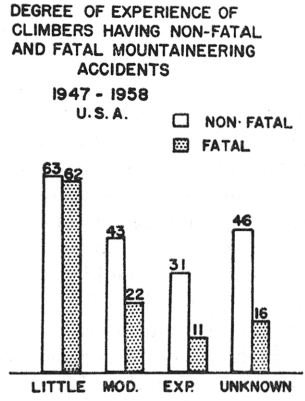

Figure 4

Another pertinent point is clearly demonstrated in Figure 4, where the estimated degree of experience is related to fatal and non-fatal accidents. When climbers with little experience had an accident there was a 50-50 chance it would be fatal. This may be a slight over estimation since the unknown category probably would be included in the group with little experience. As the experience of the climbers increased the percentage of fatal accidents decreased, to 34% for those with moderate experience, and to 26% for those with considerable experience. If the reporting of the accidents was comparable in all groups then we can conclude that if the more experienced climber has a mountaineering accident it is less likely to be fatal. Since we do not have any good data to estimate the number of climbers or how much they climbed we are not able to say that the experienced climber carries less risk than the inexperienced climber. Intuitively, however, one would expect the experienced group to have a lower accident rate and a lower fatality rate.

From Figure 5 one can draw similar conclusions to those from Figure 4. In Figure 5 the fatal and non-fatal mountaineering accidents are related to years of age. In the two younger age groups the fatal accidents made

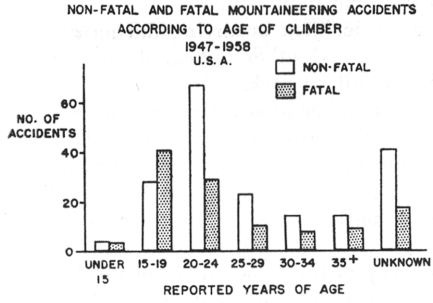

Figure 5

up more than 50% of all the accidents. These age groups in general are included in the group with little experience. The peak in the number of accidents in the 20-24 year age group undoubtedly means that this group is doing most of the climbing. If they had an accident there was a 33% chance it would be fatal. It is interesting to observe that with increasing age this ratio of fatal to non-fatal accidents remains approximately the same. A variety of possibilities might explain this:

1.) There is a limit beyond which more experience is of little help in reducing the ratio of fatal to non-fatal accidents;

2.) With increasing age and more experience more difficult climbs are attempted with more risk involved;

3.) With increasing age physical condition is not maintained and when an accident occurs even to an experienced climber he is unable to protect himself adequately. (There is a slight rise in the 35 plus age group which could be interpreted to support this).

An explanation of the relatively constant ratio with increasing age is undoubtedly complex, however, it does seem to be evident that fatal accidents in the youngest and less experienced account for a large percentage of the mountaineering accidents.

Figure 6 presents the fatal and non-fatal accidents according to apparent primary cause. As in Figure 3, a slip or fall on rock carries a much higher

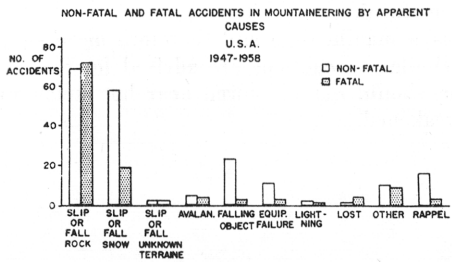

Figure 6

chance of a fatal outcome than a similar event on snow. Being struck by a falling object or an accident occurring during rappelling were the next two most common causes. Neither appeared to carry as great a chance of a fatality as a slip or fall on rock.

The relatively high number of accidents due to falling objects emphasizes the importance of wearing protective headgear. There appears to be much variation in the protection offered by the different types. Certainly they should protect against smaller rocks and if possible against large rocks that have not fallen more than a few feet. This implies some hard outer shell and usually a soft inner lining to absorb the shock of impact without transmitting the energy to the head except in the form of heat. Such headgear can protect the head in the event of a fall. The main problems are comfort to the wearer, clear vision, and security that the head covering will not fall off. Five accidents occurred this year in which the victim was struck on the head by falling rocks, and in other instances protection was offered by a "hard" hat. The committee strongly urges that protective headgear should become a standard item for climbers. The "spelunkers" or cavers, wear "hard" hats regularly.

It is relevant to mention an accident that occurred in a cave. It was a failure of a 9/16 inch manila rope during a rappel into a cave which resulted in a 100 foot fall, and death of the rappeller. The rope had been used bi-weekly for about a year. All the strands broke within an inch of one another under a load of about 200 pounds. There was no indication of abrasion or cut. Analysis of the rope indicated the presence of hydrochloric acid (HCl). After much searching it was decided that the probable source was a bowl cleaning fluid containing 23% HCl, since a can of this material had been stored by another person in the same area where the cavers had stored their gear. In order to demonstrate that the HCl in the cleaning fluid (Vani-Sol) could have weakened the rope, a cloth impregnated with the fluid was wrapped around the rope and left in place for a week. At the end of this time the rope was tested and failed at this point under a 25 pound load. Another untreated area failed at a bowline at 2,000 pounds. This was at 58% of the rated minimum tensile strength of 3,450 pounds, however, a bowline reduces the tensile strength 63%. The 5% difference might be expected after a year of use or possible variations in manufacture. The lesson to be learned is not to store chemicals in the same area as climbing ropes. It is not irrelevant to reemphasize that ropes should be stored in dry areas and should only be used for climbing—not to tow cars, lash on furniture, or for roping of cows or other wild life. Although this was a manila rope and therefore more subject to deterioration than nylon similar precautions are advised for the care of nylon rope. In addition nylon should not be stored near hot steam pipes since it can be melted and weakened.