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ALPINE DISTRESS-SIGNAL

PAPER EMBODYING THE
REPORT OF A SUB-COMMITTEE OF THE ALPINE CLUB
READ BY MR. H. G. WILLINK AND APPROVED BY
A GENERAL MEETING OF THE CLUB
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ALPINE DISTRESS-SIGNAL.

On November 10, 1892, the Alpine Club Committee appointed a sub-committee, consisting of Mr. C. T. Dent, Captain E. D. Law, Mr. F. O. Schuster, and Mr. H. G. Willink, to consider and report upon the possibility and advisability of recommending for adoption by all Alpine Clubs some form of signalling-communication in the mountains in cases of emergency.

On January 12, 1894, the sub-committee sent in their report, which was accepted, and which will be found in the Appendix to this paper.

In considering the question referred to them, there appeared to the sub-committee to be two chief points upon which they had to come to definite conclusions, viz. :—

1. What was to be the *scope of communication*?—*i.e.*, were *full* means of intercourse to be devised, or only a code of messages, or a certain definite message; and if either of the latter what code or message?

2. What actual *method of signalling* should be employed for the purpose?

On the first point, the scope of communication, they decided that the one thing most wanted was that a party should be enabled to summon help in serious emergency. The power of sending other messages might be convenient, but the distress-signal must stand alone and be unmistakable; and any system which might cause misunderstanding must be condemned. And they accordingly confined their express recommendation to the adoption of a universal *distress-signal* alone; though the methods of making the actual signal recommended do, as will be seen, lend themselves without ambiguity to the establishment of more extended intercourse, if individuals or localities should so desire.

On the second point, the best method of making the signal, several axiomatic propositions presented themselves.

An ideal signal should conform to the following conditions, viz. :—

(*a*) It should be extremely simple, so that the sender cannot possibly go wrong in making it, nor the reader in understanding it.

(*b*) It should be unmistakable for anything but a signal of communication.

(*c*) It should be intelligible at great, no less than at small distances.

(*d*) It should be available by night as well as by day, and by means of sound as well as of sight.

(*e*) It should, so far as possible, be independent of atmospheric conditions of light and shade, and colour, and also of perspective.

(*f*) It should be capable of being easily made, and should require the minimum of constant attention or labour.

(*g*) It should be readily improvisable—*i.e.*, it must not of necessity require, though certainly it should not exclude, the use of special apparatus.

If, in addition, it leads up to or can be developed into an alphabetic or other extended code of communication between persons properly qualified, so much the better.

It was clear, at starting, that the above conditions absolutely excluded more than one class of signal which has for other purposes been found practicable. For instance, all signals depending solely upon *colour*, whether of lights or flags, &c., and also all *semaphore* signals, however useful as subsidiaries, cannot in the mountains be applicable under all circumstances. Colour entails apparatus; and it is doubtful whether a coloured lamp (unless burning a specially strong light) would be visible at any great distance at night, or the colour of a flag or other object be distinguishable from far off in a sunset glow, or in a blue haze, or against the light. The use of colour, moreover, as the essential distinction, is inconsistent with the use of the reflected rays of the sun, one of the best means of making signals; and it is difficult to imagine a correlative *audible* signal. The natural suggestion of a flag, to be hoisted and kept flying, besides being open to the objection that climbers are prone to hoist flags as indications of success, and to leave them flying for good (or until the next storm), was ruled out of court on the ground that it would have no parallel luminous or audible signal—a mere steady light being manifestly open to confusion. *Semaphores*, again, except when the arms are human (with or without flags in the hands), also require apparatus,

however simple (especially at night); are not audible; are probably liable to apparent distortion by perspective;[1] and do not of themselves attract attention so well as does a moving or a shining object. If the signaller be himself the semaphore he will be legible at a comparatively short distance; and in any case he may, until attention is attracted, have to stand in position longer than he will like, even if he be well and strong, which he might not be.

No one, in fact, who has not actually tried to converse with persons at a distance can appreciate the difficulties which occur in sending even the simplest signals. The fellow at the other end is always so inconceivably stupid. And in the mountains these difficulties will perhaps be especially great. Indeed, no *perfect* scheme can possibly be devised, for thick clouds or a contrary wind must stifle the most penetrating appeal to eye or ear; and there will often be the further difficulty that the signaller will not know whether his signal is understood, or even observed at all. After much discussion, the sub-committee decided that the foregoing conditions would best be fulfilled by a signal of the following description, viz.:—

(*a*) A regular series of short signs (which may be called 'dots') continued during one minute at the rate of six dots per minute, and repeated in alternate minutes; the precise duration of individual dots being immaterial, provided that each dot is as nearly as possible of the same duration, and that the intervals are regular.

(*b*) The dot may be made by whatever means may be most suitable under the circumstances—*e.g.*, a single wave *to and fro* of a flag or anything held in the hand, also the exposure for a moment of any object; a single flash of light from lamp or looking-glass; a single blast of horn or whistle, or a shout.

Any means may be used to gain attention in the first instance, if necessary—*e.g.*, a bonfire; but, apart from this, the intermittency of the signal is calculated to attract notice.

The signal should be answered by a similar series of dots in alternate minutes, made, however, at the rate of three dots per minute.

As regards the different ways of making the signal, each case will have its own requirements, which must be met by

[1] For instance, a semaphore at the Schwarzsee might be read differently at Zermatt and at the Riffelberg, and none the less so if the signaller were facing one place more than the other.

the signal best adapted to them, whether audible or visible, and whether distinguishable by light, colour, or motion. No hard and fast rules can therefore be laid down, the great merit of the system recommended being its infinite elasticity, inasmuch as almost any single phenomenon, except perhaps a sneeze or an avalanche, can be pressed into the service.

The following suggestions, however, may be found useful:—

(1) *Visual signals* (other than 'light signals').—In waving a flag or other object the sender should squarely face the objective, and should wave his 'dots' as high and wide as possible. Except at short distances, anything so small as a pocket-handkerchief fastened to an axe will be of little use; a shirt or coat would be better. An object hoisted and lowered will make a good dot, but in the case of a flag regard must be had to the wind, with a view to the surface being fully displayed to the receiver. A large flat thing (like a hut door) alternately shown and laid down, or presented faceways and edgeways, might perhaps serve. Where apparatus is available, a collapsing drum, or a kind of Venetian shutter, have been found useful contrivances.

In all cases the object used should contrast with the background as seen by the receiver. This background may be ascertained by the sender if he looks back along a stick carefully pointed at the objective. An opaque object, however pale in colour, will probably show dark, and will certainly not show light, against a light sky or against snow in sun.

(2) *Light signals.*—In signalling by flashes the beam of light, whether from lamp or mirror, should be kept *steadily* directed on the objective, and the dots should be caused by the removal and interposition of some sufficient screen,[1] *e.g.*, the human body. Any two rather pointed objects will serve as sights. They should be set up firmly, and at a convenient height, not less than two feet apart, their tips being in a true line bearing on the objective, and the hind sight being the smaller of the two; and the beam should be kept so directed that the shadow of the tip of the hind sight remains exactly on the tip of the fore sight. They should be adjusted with the utmost possible accuracy, as a slight error is multiplied by divergence, and it is important that they should be so fixed as not to be liable to displacement, whether by melting snow, or a porter wandering in the dark, or any other

[1] This is the principle of the heliostat. Of course, if a heliograph is available, it will be used in the ordinary way.

animal. If there is any prospect of night signalling being necessary, the signaller should not forget that the sights can be much more easily adjusted by day than in failing light. He will therefore beforehand, when circumstances admit (*e.g.*, before leaving a camp to which he intends to return), establish his sights in bearing upon the point, if any, to which an appeal for help may, in case of need, be made. At suitable distances a lamp may be waved, like a flag.

If working by reflected sunlight, constant attention will be found necessary to keep the mirror beam truly directed as the sun moves; if the party comprises two or more persons, one man should devote himself entirely to this. The mirror need not be more than three or four inches in diameter. It should be held very steady, resting on an axe-head or other firm support.

When the sun is at all behind the sender, two mirrors must be used, one facing the sun, the other facing the objective, as before directed; but the inclination of the former mirror alone need be varied to suit the sun, the latter mirror being used to pass on along the sight-tips the beam reflected into it from the former mirror. Care must be taken to keep the *centres* of both mirrors as nearly as possible in their original positions.

(3) With regard to signals by *sound*, perhaps no more can be said than that they will not always in themselves tell the receiver the exact position of the sender. Every effort should therefore be made to supplement them by visual signals.

In all signals regularity of interval is of the utmost importance, both as regards intervals between dots, and as regards the 'minute intervals' between the series.

As to a subsidiary or more extended system of signalling, the sub-committee did not, as already stated, make any express recommendation on this point. But where parties desire to communicate more fully, the Morse code (a compound of short and long signs, or *dots* and *dashes*, the dash being three times as long as the dot[1]) is, it is submitted, much the best, and for the following reasons, viz. :—

(*a*) It can be expressed by the same means as the distress-signal.

[1] In using the Morse code the dots and dashes composing any letter must be given *continuously*, a pause being made between letters, and each word being answered by a single dash. Full instructions will be found in the *Manual of Army Signalling*, which can be bought at Stanford's, price 1*s*.

(*b*) It is not peculiar to any nationality.

(*c*) It has infinite capabilities, comprising the whole alphabet.

(*d*) And yet, by using abbreviations (*e.g.*, single letters), any short private system can be pre-arranged.

On the other hand, though easy to learn and easy to send, it requires much practice to read well. Probably it will be found advisable that all huts, in view of possible sources of help, should be furnished with printed instructions in several languages, and a copy of the Morse code, together with *the best suitable means according to the locality* of making the distress-signal. Proper sights, permanently adjusted, might be set up at such places, and also at convenient spots at the sources of help.[1]

Lastly, the sub-committee are anxious to point out that nothing in their recommendations will prevent individuals from making use, for their own purposes, of any form of signal, such as semaphore, flags, &c., which may be convenient under particular circumstances.

In making their report the sub-committee did not forget that probably in a great majority of cases no signal at all will be practicable. The need will generally arise in bad weather; or at great distances from visible sources of help, if not in lonely spots quite out of sight and hearing; or in cases of injury or exhaustion; or even all these drawbacks may exist together. But if only one life in twenty years may possibly be saved, the experiment will be worth trying; and it is to be hoped that the Alpine Club will lose no time in leading the way in this, as it has done in so many other matters, for the good of mountaineers and travellers. Every guide should be imperatively required to understand the signal and its application.

H. G. W.

March, 1894.

[1] It has been suggested that certain hours should be chosen at which, by preference, signals should be made, and special look-out kept. This, however, appears to be a matter for local arrangement.

APPENDIX.

Report of the Sub-Committee appointed to consider the Question of Signalling on the Mountains.

THE sub-committee have carefully considered the question submitted to them for consideration, and beg to report as follows:—

In their opinion it is desirable—

I. That a single signal, implying distress and want of help, should be approved by the Alpine Club and recommended for adoption generally in all other Alpine and mountaineering clubs or associations.

II. That this signal should be of the simplest character possible, not liable to be mistaken for any other, and that it be suitable for use during the day, night, or in fog.

III. That in their opinion the form of communication best adapted for the purpose is an intermittent signal recurring, or interrupted, at regular intervals of ten seconds—*i.e.*, repeated six times in the minute—during alternate minutes, any means whatever being used to attract attention in the first instance, if necessary.

IV. That the 'answer' (if any) be a similar signal, but at twenty-seconds' interval—*i.e.*, three times a minute.

They submit that the advantages of this form of communication lie in its wide applicability, any method being permissible by which intermittent signals can be made. For instance (without entering into minute details), such signals may be made (*a*) during the day by the movement of any suitable article—such as a flag, or an extemporised flag—or by the alternate exposure and concealment of any conspicuous object, or of a flash of reflected sunlight; (*b*) at night by the similar movement, or the concealment and exposure, of a light; and (*c*) at any time, under favourable circumstances, by the employment of sound on the same principle.

The sub-committee have considered the advisability of employing a different signal to imply safety, or 'all well,' and they are unani-

mously of opinion that this is unnecessary, and would tend to confusion.

The sub-committee are of opinion that if a general consensus of opinion in favour of this proposal is obtained from other Alpine clubs, endeavours should be made to insure its wide adoption, and that all hotels in mountain districts and all huts should be provided with a description of the distress-signal and hints as to the various methods in which it may be employed.

The sub-committee desire to point out that the signal recommended has the further advantage that it may be extended to almost any degree by the employment of the Morse code, without leading to any confusion or possibility of mistake.

The sub-committee further recommend that during the ensuing session an evening should be set apart for the reading of papers on the subject, and a discussion at a general meeting of the Club.

(Signed) C. T. Dent.
H. G. Willink.
Felix O. Schuster.
E. D. Law.

To the President and Committee of the Alpine Club.
January 12, 1894.