$$D = a\left(T + \frac{a}{g} \pm \sqrt{2\frac{a}{g}T + \frac{a^2}{g^2}}\right).$$

The term under the square root has a double sign; but since D=0 when T = 0, it is evident we must consider it negative. Putting for *a* and *g* their numerical values, the expression becomes

$$D = 1130(T + 35 - \sqrt{70T + 1225})$$

If in the equation (*a*) we neglect the term $\frac{gD^2}{2a^2}$ (and we may safely do so in all cases, since for a depth of 1130 feet it only amounts to 16·1), the value of D is expressed in a simpler and more easily applied form; viz.:—

$$D = \frac{a}{2}\left(\frac{T^2}{T + \frac{a}{g}}\right) = 565\frac{T^2}{(T+35)}.$$ *

In constructing the instrument it is obviously unnecessary to follow the dimensions just given so long as the principle is carried out. The tube for the fuze can be obtained from almost any tinman. *Possibly some better kind of fuze might be devised than the one I have described.* As to the marroons, they must be purchased of a firework-maker; they vary in price according to size from 6*d.* to 1*s.* a-piece. Mr. James Pain (Pyrotechnist), 15 Heygate Street, Walworth Road, would be a good person to apply to regarding this portion of the arrangement.

M. LOPPÉ'S PICTURES.

In the world of nature, as in the world of thought, we are not satisfied until the emotions of which we are conscious have been put into a concrete form by the hand of genius.

It must be the wish of all members of the Alpine Club whose love of the mountains is something more than the mere physical enjoyment of exercise in the open air and the moral enjoyment of overcoming obstacles of ice and rock to see the glories of mountain nature translated by art, both for their own sakes, and also for the benefit of the dwellers in the plain, amongst whom are those whom strength does not allow to climb, but whom culture has made most capable of appreciating every form of beauty.

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* Any *formula* for the computation of depth by the descent of a weighted marroon in which the resistance of the air is taken into account, must be one of considerable complexity; and it would involve at least two constants, one having reference to the weight of the whole arrangement, the other to the diameter of the base. I may observe, however, without attempting a discussion of this subject, that in the case of an arrangement 2 inches in diameter and weighing 2 lbs., the air's resistance for depths requiring less than 6 seconds will not (considering the unavoidable roughness of the experiment) seriously affect the result. When the observed interval is longer, say 6 to 8 seconds, I should, in order to insure greater accuracy, subtract ½ of a second from the value of T before inserting it in the above equation.

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But for any artistic expression of the crowning glory of the Alps, we must look to our poets rather than our painters. To the transfigured world of the high mountain-top, where the eye turns from the near snows glowing with unendurable light to range over miles of green and countless shades of blue distance to the saffron hues of the extreme chain, where the mind, as in a starlit southern night, is stirred by the presence of a vast order, which it feels, yet has no sense adequate to comprehend, art can only look up with idle and folded hands. A Turner may, perhaps, some day arise to paint the unpaintable, but the task is for a giant's strength. Until then mountaineers must be content to enjoy alone and in memory only the recollection of those 'golden hours,'* which the world has not known and does not believe in, spent on the top of some 'tower of observance searching space,' some Schreckhorn or Monte Rosa. But the mountains have other beauties. The grey, still dawn in the forests, the glow of sunrise seen from some lofty pasturage, the waves of the ice-sea sparkling in the first morning sunshine, the pure upper snows, the fantastic rock-processions of the topmost ridges, are all subjects within the grasp of earnest and persevering art.

Until lately, however, painters could not be induced to climb. As the forest boundaries were approached they dropped one by one in the rear, or if one hardier than his fellows persevered to the short interval of dreary waste which lies between the rhododendrons and the snow, it was only to turn back more than ever convinced that he had gone beyond the term of beauty, and that the high Alps were unfit subjects for artistic representation. Our artists, as a body, were content to remain as ignorant of the phenomena of the region of eternal ice and snow as a Yarkandee may be of marine effects. In a nature so remote from that of our daily lives, careful study, as well as artistic perception, was required to detect and reproduce the truly picturesque elements. Yet we need not feel surprised that this combination was so long wanting. For art is the child of its century. True mountain painting could only have birth as the outcome of the modern love of the mountains and of the new light thrown by Forbes and Tyndall, and reflected by Emerson, on the 'horrid wastes' of old-world theologians and poets.

Ruskin was among the first to point out that 'it is possible by care and skill to suggest the preciousness of form and intimate the nature of the light and shade' of the upper snows; and he added, 'this has never been attempted.' The latter statement no longer remains true. What had 'never been attempted' the Alpine Club naturally recognised as its proper province. Our members have shown their love for the mountains in other ways besides climbing them; and we are proud to reckon amongst them Mr. E. Whymper, Mr. G. Barnard, Mr. E. Coleman, Mr. Croft, Sir Robert Collier, Mr. Walton, and M. Loppé, those who were the first to feel that a new country was to be gained for art, and to put forth their best powers for its conquest. It would not perhaps be difficult for an unsympathetic critic to search out a weak point in each of these painters. But it is far pleasanter to dwell on

* Three hours is no unusual time to be able to spend on a first-class peak.

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the contrast between the works of men, who have all studied and more or less grasped the true nature of rocks and snow, and the productions which still from time to time disgrace the walls of our exhibitions, the emasculated Matterhorns, topheavy Jungfraus, and tottering Eighers of what we may call the Prealpine School.

The pictures of M. Loppé, lately on view in the Alpine Clubrooms, are the most forcible assertion we have yet seen of the painter's power in the snow-world. M. Loppé, whose studio at Chamonix must be well known to many of our readers, has made a determined effort to express truthfully on canvas the facts of ice and snow, to do for them what Mr. Walton has done for rocks and lofty peaks. He has studied the glacier from its birthplace in the névé region down to its tomb amidst the mud and rockheaps of the terminal moraine. Now he shows it us in full life opposite the Montanvert or under the Gornergrat, with its semi-transparent mottled surfaces, its green caves and keen knifelike edges; now he transports us to the upper snows, and bids us admire the delicate gradations and reflections of their imprisoned light, the deep blue depths of their abysses, the confused ruin of tottering towers and fantastic spires, or the ranges of moated ramparts, each white as the purest marble, yet like marble delicately streaked with pale veins of colour.

The masterpiece of the collection represents a huge gaping rift in the half-formed ice. In the slight stains on the glacier surface, in the frosted white of the sides of the crevasse, in the glorious colour which shines out of its recesses those who have learnt for themselves the secrets of the mountains recognise proofs of the painter's fidelity; while, at the same time, they admire the skill which has succeeded in transferring to canvass so much of the pure transparent brightness of the upper world. As we gaze into these blue depths, we are raised 10,000 feet in an instant, and fancy ourselves within a stone's throw of the Col du Géant or the Petit Plateau of Mont Blanc. Empedocles could never have jumped down a volcano if he had seen M. Loppé's crevasse.

We should like to have lingered longer with M. Loppé amongst the 'séracs,' but we must turn to some of the other subjects contained in his collection. 'Nil pictoribus ardui est' might be the painter's motto, and in the pursuit of his art he has carried his brushes up the rocks of the Sonadon, and close to the tops of the Breithorn and Mont Blanc. In a sketch actually painted on the 'calotte,' within a few hundred feet of the summit, the wandering clouds caught and torn at the edges by wind, and the deep hues of the upper air, are most truthfully represented.

An important finished picture of the same scene—the view looking towards Monte Rosa—has been presented by the painter to the Club. Here high mountains seen from a level are admirably drawn; the 'Grandes Jorasses' still produce the effect of great peaks, and are not diminished, as by a less skilful hand they would have inevitably been, into mere rocks. Perhaps in choosing the moment of sunrise, M. Loppé was overbold; to represent the 'awful rose of dawn' at 15,000 feet, a sight few even of the Alpine Club have seen, but once seen

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never to be forgotten, requires the greatest powers of colour and imagination. This sunrise fails to impress us with sufficient awe, it is such an affair as might be seen on the lower hills; in a small 'Sunset from the Aiguille du Goûté,' M. Loppé has been more entirely successful.

'Mont Blanc from the Breithorn,' and 'Mont Blanc from the Col du Sonadon,' are both reproductions of the same effect. The cold upper glacier sweeps down from our feet, and carries on the eye to an horizon glowing in warm sunrise colour. In both pictures the difficulty of giving sufficient distinctness of detail, and at the same time conveying a sense of the distance of the far-off chain, has been successfully conquered. A third class of landscapes—views of the lower Alps in their winter robes—charms us less. Partly, perhaps, because in the lowlands snow always comes as an intruder, reversing all the relations of light and shade we are accustomed to look upon. Amongst these we must, however, stop to point out 'The Mont Salève, near Geneva,' a charming little sketch of frosty air and sunshine.

We now hasten, in conclusion, to offer our hearty thanks to M. Loppé for the pleasure he has given us. We hope that the appreciation his pictures have met with may induce him often again to brighten the dull gloom of our London springs with the pure radiance of his midsummer snows.

NEW EXPEDITIONS.

WESTERN ALPS.

DAUPHINÉ. VARIATION ON THE COL DES CAVALES, *June* 10.—The Rev. C. Taylor, Thomas Cox, W. M. and R. Pendlebury, and F. Gardiner, with Hans and Peter Baumann, Peter Knübel, and J. M. Lochmatter, crossed the dividing ridge from the upper part of the Glacier des Étançons to a field of névé occupying the north-western angle of the Vallon des Cavales, but cut off from the main part of the glacier by a wall of rocks. After descending these the way from the Col des Cavales was joined. Height of the ridge where crossed estimated at about 12,000 ft. 14¾ hrs., including all halts, from La Bérarde to La Grave.

PEYROU D'AMANT, *June* 13.—Height 2,862 mètres (9,390 ft.). The same party ascended the Peyrou d'Amant by the ridge running out towards La Grave, and descended over the glaciers from the Râteau and Meije. The summit gives an excellent view of those two mountains and their snow-fields. The entire excursion occupied 5¾ hrs.

RÂTEAU, *June* 14.—Height 3,754 mètres (12,316 ft.). The same party left La Grave at 4 A.M., and proceeded at first as if bound for the Brèche de la Meije, but bending to the right as soon as they had passed the ice-fall, gained the crest connecting the Meije and Râteau at a considerable elevation above the Brèche. They had climbed some distance along this ridge when the guides, dreading the weather and the state of the snow, urged a retreat. It would have been quite possible to

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