

no lecture on the same subject.

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## THE AVALANCHES OF THE JUNGFRAU.

TO THE EDITOR OF THE TIMES.

Sir,—Every day during the season hundreds of Swiss travellers cross between Lauterbrunnen and Grindelwald, by way of the Wengern Alp, with the object of seeing the vast precipices of the Jungfrau range, and especially of witnessing the avalanches that rush and roar at frequent intervals down its sides. I beg to assure future tourists that the majesty of these avalanches may be safely witnessed by those who are capable of a short scramble at the distance of a few yards, instead of from the Wengern Alp, which stands a mile from their course, and whence they appear of such insignificant proportions as grievously to disappoint the spectators. This morning, in pursuance of an idea which occurred to me last year, I made an excursion to see how near I could get with safety to the channel down which all the avalanches from the north face of the Jungfrau necessarily fall, and I succeeded beyond my expectations. I have witnessed one of the most astounding of Alpine phenomena with perfect ease, and have examined it with a leisure and a nearness which I believe no mountaineer, however practised, can have accomplished in his ordinary expeditions. The channel I went to directly faces the Jungfrau Hotel, on the Wengern Alp, and may be reached from it in an hour and a half. It is the sole outlet of the Jungfrau glacier (that goes here by the name of the Giessen), and conveys its snow waters and its avalanches to the bottom of the deep valley that separates the Jungfrau range from the Wengern Alp. In some seasons ice falls down it half-hourly; in this peculiarly hot and dry month they are much more rare, but in the course of a long half day I witnessed three magnificent ones at ten yards' distance, besides many occasional peltings. The avalanches are detached from the snowfields above, they then slide, tumble, and roll down a steep slope of perhaps 40 deg., through a descent of 2,000 yards, to the head of the channel of which I have been speaking. Thence they dash down it in two great leaps and numerous minor cascades, amounting in the whole to 1,000 feet of descent, and, hurtling together and rattling as they go, they rage and burst forth at the foot of the channel (by which I took my stand) like a storm of shrapnell. The avalanche here mainly consists of a mass of iceballs about one foot in diameter, and which seem never to exceed a yard; a vast quantity of smaller pieces of rounded ice is also projected, and fills the interstices between the larger balls, as the whole slides along a final slope of another 1,000 feet of descent to the bottom of the valley. After they have burst from the channel their course is steady but rapid; they follow the undulations of the slope like a riband. Occasionally one of the larger balls would break loose and roll, and so get the start of its companions; but the general appearance of the moving mass is that of an orderly mob filling a street and hastening, not hurrying, to the same object. The noise they make is peculiar. I often shut my eyes and tried to conceive what I should have guessed it to be had I heard it unexpectedly. It has the "whish," but not the splash, of water from a broken waterpipe, and it rises and falls like the noises of the sea. The best comparison I can make is to the sound of a rapid tide rushing up many channels. Neither in the fearful rattle of the ice cascade, nor in the sound of the slide, could I trace any resemblance to the roar that is always heard at a distance. Precisely as after lightning, where a harsh, rending sound, composed of innumerable electric crepitations is echoed and reverberated at a distance into prolonged thunder, so do similar sounds made by the ice and acted on by similar influences produce the roar of the avalanche.

I strongly advise tourists to follow my example. They will mostly require a rope to enable their guide to assist them up two short terraces of rather slippery rock, in which a stonemason could scoop a set of steps in half a day. An enterprising Swiss might also avail himself of the natural disposition of the strata, and cut a perfectly secure "covered way" within five yards of the ice fall.

FRANCIS GALTON.

Scheideck Hotel, Aug. 8.