Earthquakes, traffic vibrations, skiers —

What triggers an avalanche?

This series of photographs show the progress of an avalanche released by artillery.

Photographies mettant en évidence la progression d'une avalanche déclenchée par des artilleurs.

"We hear two loud cracks beneath our feet, as if the crevasse has shifted. There is dead silence. It is 1.26 p.m.

"And then it thunders down over us — ton upon ton of snow. Some team members jump or are blown into the crevasse, which is filling with snow. I am knocked to my hands and knees. Everything goes dark as the snow pours over the serac overhead. It rises and hardens around me. I try to flail away for breathing space while coughing the powder from my mouth. I cannot see and can barely breathe.

"It lasts a full minute. Then it is ended, the biggest avalanche I have ever seen.

"The avalanche has ripped up a slope of 1,000 feet (300 m) wide and at least 4,000 feet (1200 m) long. Below us, snow debris is piled 30 feet (9 m) deep. Only later do we learn that an earthquake triggered the slide.

"I try to push myself free of the wet snow and look about. Everyone is there. It seems incredible that no one was swept away.

"We help dig each other out . . . The ice serac deflected the full fury of the avalanche over our heads, at the least several hundred thousand tons of snow, we calculate later."

Christopher S. Wren, a correspondent in The New York Times Moscow Bureau, was a member of the American team of mountain climbers that scaled the 7138 m (23,405-foot) Lenin Peak in the Pamirs last year — a climb beset by earthquakes, blizzards, avalanches, and death.

Avalanches have taken thousands of lives the world over: in the Dolomite Valley of Northern Italy on 13 December, 1916, an estimated 10,000 Austrian and Italian troops were buried in more than 100 avalanches. Bodies were still being found 36 years later; in Huaras, Peru, 13 December, 1941, some 5,000 people perished; at Mount Huscaran, Peru, 20 January, 1962, 3,000 people. Two avalanches in France in 1970, one at Val d'Isère on 10 February, and the other at Saint Gervais, on 16 April, took a total of 114 lives.

The greatest avalanches, though rarely observed, occur in the Himalayas. It has been estimated that 3,500,000 cubic meters (120,000,000 cubic feet) of snow fell in one avalanche alone in the Italian Alps in 1885.

In Canada, the worst avalanche occurred in 1910 in Rogers Pass, British Columbia, when 58 people lost their lives. The heaviest death toll in recent years was in 1965 at the Granduc Mine in northern British Columbia, where 26 people were lost. A heavy avalanche year in 1971-72 claimed 17 lives, and last winter 10 people, including three skiers, were killed in avalanches.

The National Research Council of Canada's Division of Building Research has been investigating the characteristics of avalanches and avalanche defence methods since 1958. During the last 10 years, the need for information concerning avalanches and avalanche defence in the mountains of Western Canada, where the greatest number of avalanches in this country occur, has greatly increased because of the development of new mines, an increase in road and rail traffic, and an expansion of ski areas.

"Our work," says Mr. Peter A. Schaerer of the Division's Geotechnical Section, "is concerned with learning the characteristics of avalanches in order to obtain the information which is required by anyone with an avalanche control problem, for example, those who must locate highways or buildings where avalanches occur, those who build structures strong enough