DR. TALMAGE'S LECTURE.

That the State University is sadly in need of a new lecture hall was clearly demonstrated again Tuesday, when upon the occasion of Dr. Talmage's lecture more than 200 people were unable to get inside the room provided in the laboratory building. The lecture was the first of a series to be given during the winter by members of the University faculty. The course is continued next Tuesday night by Professor Marshall, who lectures on a historical topic.

Dr. Talmage's lecture was on the subject "Ice and Snow; the study of ice as a geological agent; glaciers and a glacial epoch." The lecture was divided into two parts, the first devoted to a general discussion of the topic, with the aid of illustrative specimens and models; and the second to an exhibition of over 50 excellent stereopticon views illustrative of the various phases of ice work and glacial phenomena ancient and recent. The following is a brief synopsis of the address:

The fairy like ice crystals on the window pane, and the feathery snowflake falling to earth, may seem to have little of promise as geological tools, and yet, when massed flake on flake and crystal against crystal they become an agent of almost incalculable power. The freezing of water exhibits the tendency of all liquids when passing into the solid condition to assume the crystalline state. The microscope reveals in the snowflake and the ice fragment a marvelous symmetry of parts. The frost flowers exhibit an arrangement of six parts. Prof. Tyndall has described a snow storm as a shower of frozen flowers all of them six-leaved. In thus solidifying water expands 9.99 per cent, say one-tenth. Freezing water exerts a bursting pressure on its containing walls. This pressure is, at 30 degrees Fahrenheit, 146 atmospheres, corresponding to 138 tons to the square inch. By its expansion in freezing water breaks up the clods of the field and bursts asunder the masses of rock which make up the mountains, preparing them for rapid disintegration. The talus, or pile of debris found at the foot of every cliff in our mountains, is largely the result of ice work.

Ice as a geological agent may be conveniently studied under the following headings: (1) River and lake ice, comprising surface ice and ground ice or anchor ice. (2) Ice on the sea, comprising the production of such by the freezing of sea water either near the shore, this giving rise to the ice foot, or to the freezing of the open sea, producing the ice sheet blocks or floe ice; and next icebergs which are produced by the seaward passage of land ice. (3) Ice on land, comprising glaciers with all their interesting phenomena. The existing glaciers of the Alps, those of the Sierras, and the still more extensive glaciers of Alaska, and the ice sheet of Greenland and of the Antarctic regions may be taken to illustrate glacial phenomena as presented by existing glaciers. The essential conditions for the production of glaciers are: (1) Ample elevation, the source of the glacier must be above the line of perpetual snow. (2) Alterations of temperature. (3) Abundant precipitation. There are many analogies and some differences between glaciers and rivers. Glaciers move downward from their course by a differential motion; their central parts move more rapidly than do the marginal portions; the upper parts more rapidly than the deeper layers. As with rivers, their velocity is increased by the slope and by many other conditions which diminish friction. The formation of veins and fissures in glacier ice may be studied on any large glacier. Debris falling upon the surface and material swept along the bed make up the great moraines which mark the termination of glaciers. We are more particularly interested in the contemplation of glaciers as a geological power; they are most effective eroding and transporting agents. The pressure of a mass of ice but 100 feet thick is fully 40 lbs. to the square inch, and ice with a depth of 1,250 feet exerts a pressure of 500 lbs. to the square inch. Great difficulty is experienced by many in the thought that ice, a characteristically brittle substance, can possibly flow, and many theories have been advanced to explain the downward passage of glacial ice. By a model consisting of brittle pitch in a channel of metal the viscid motion of this material was demonstrated. The viscosity theory advanced by Forbes, the regulation theory put forth by Tyndall, the molecular readjustment theory of Croll, and the successive melting theory by Thomson, may all serve to explain many of the phenomena of glacier movement.

Geologists very generally profess a belief that at one time a period of glacial cold existed in the northern hemisphere. They base their belief on the following facts: (1) The existence of a heterogeneous material called drift, which covers all northern countries. In North America from 38 degrees or 40 degrees northward the land is mantled by drift. (2) The smooth and scored condition of the bed rock underlying the drift. (3) The existence of erratic builders which have been seemingly stranded far from their source. (4) The existence of old moraines. (5) The entire correspondence between such phenomena and similar occurrences now presented in connection with existing glaciers. Many examples of local glaciation are presented in the higher parts of the Rocky Mountains and of the Sierras. There seems to have been two great centers of ice distribution in North America. The first near Hudson Bay sent out its ice floods in all directions; this great ice body has been the Laurentide glacier. The second or western center occurs in the Cordilleran or British Columbia and this ice body has been called the Cordilleran glacier. Local glaciers of considerable size existed in the Uintah and Wasatch mountains and on the higher plateaus of Utah. Well preserved ice deposits are found at the mouth of Little Cottonwood canyon in the Uintahs; moraines of all descriptions abound on the Fish Lake plateau.

Among the possible causes of the Glacial Epoch the following have received special consideration: (1) It is attributed to an elevation of the regions now found to be glaciated. We have conclusive proof of extensive oscillations of the earth's crust during glacial times and great climatic changes would doubtless result. (2) Changes in the direction of ocean currents are urged as a true cause; by such changes the distribution of tropical warmth might have been seriously interfered with. (3) Croll's theory assigns astronomical causes in explanation; the result of a precession of the equinoxes and of secular changes in the shape of the earth's orbit would produce very great variations of temperature. It is probable that both astronomical and geographical conditions have conspired to produce this epoch of long continued winter.

IN THE NORTHWEST.

POCATELLO, Idaho, Dec. 2, 1896.

Returning from western Idaho and eastern Oregon, where I have been in the interests of Utah industries, I took stage at Shoshone and crossed the country to Oakley via the celebrated Falls. While along the Oregon Short-line the weather was mild; but the morning of the 25th ultimo, when the stage started out, we were enveloped in a blizzard. The forty miles' travel that day was anything but pleasant. The Falls, as has been described in a former issue of your valuable paper, was more beautiful than ever in its coat of ice. As the spray arose from the river below, and fell like a rain cloud on the splashing waters and the points of rock in the river, wherer the stream tumbled over the great precipice, it fastened itself in a coat of ice on everything it met and rendered the sight surpassing in its loveliness.

On leaving Rock Creek next morning we faced a driving storm of falling frost, and it was with difficulty we kept from freezing.

At Oakley we found the people enjoying Thanksgiving sociables, and in the evening participated in the dance, conducted by the Young Men's association aided by the Young Ladies, who spread a splendid lunch, which, of course, was on sale to aid their good cause. The turkey sandwiches and the good old pumpkin pies reminded one of the times of yore. While sitting on the stand enjoying the music and observing the dazzling whirl, who should I see enter but L. G. Hardy, Bishop of the Second ward, Salt Lake, who was out in Cassia county on mining business.

Another cold drive of 30 miles and we found ourselves at Albion, but unable to proceed further, as the ferry boat in the Snake river was frozen fast and the condition of the river rendered it entirely unsafe to try to cross in a skiff.

In company with the good people of Albion ward on Sunday I found them a little despondent at the temporary separation from their beloved Bishop, Wm. T. Harper, who parted with his little flock on Thursday and is now en route for his missionary field in Indian Territory.

At 3 p.m. Monday our Salt Lake mining expert and myself were seated comfortably in the stage and set out for Minadoka, the railroad station. By this time the stage could cross on the ice. As we neared the great stream we could observe that it was