gain on descent to the level of 700 metres, to 13°C. (23°.4 F.). The amount of heat lost by the air during its passage across the mountainous region by radiation, and contact with the snowy peaks, cannot be determined. It is, of course, much greater in winter than in summer, and depends also on the speed with which the current of air travels.

Owing to the width of the mountain-barrier, the main result is complicated by local details; regions of considerable precipitation occurring on the western slopes of each important mountain-range, with subsidiary drier regions in the lea. The last of these regions of precipitation is that of the Rocky Mountain range properly so called, in descending from which a further addition of heat is made to the air, which then flows down as a dry and warm current to the east. GEORGE M. DAWSON.

Ottawa, Canada, Dec. 31.

## The Taconic controversy in a nutshell.

The New York geologists encountered a great group of metamorphic, apparently successive and conformable strata, extending from the Hudson River eastward into New England (1836–42).

Emmons claimed they were all older than the Potsdam, and named them all Taconic. His colleagues of the New York survey, and their friends of the Canadian survey, regarded them all later than the Potsdam, and applied to them the terms of the New York system up to the Medina (1842).

Fossils were discovered in some of the eastern belts of this metamorphic series, and announced by Hall and others in 1842, rather indicating the whole series was post-Potsdam.

Emmons re-examined the whole, and called attention to an unconformable overlying of the Hudson River and calciferous upon the older slates of the true Taconic, and distinctly re-asserted the pre-Potsdam age of the Taconic system, from which he figured primordial fossils (1844). He was supported by Billings and Barrande, and by Colonel Jewett of Albany, but as time passed he was ostracized from geological circles.

The authority of Barrande, however, was sufficient to convince the opponents of Emmons on the New York and Canadian surveys, and they expressed a willingness to abandon the use of the conflicting term, 'Hudson River group' (1862).

The Canadian geologists, however, fertile in the invention of devices of stratigraphic nomenclature, renewed the contest by two flank movements, — one the Huronian phalanx, aimed at the lower strata; and the other, the 'Quebec coffin,' aimed at the overlying strata, thus rallying the whole discomfited cohort (1855–61). Emmons died in the midst of this movement.

As time passed, the term 'Hudson River group,' besmirched and hesitating, was re-habilitated by being shifted to new ground, — that of the Lorraine shales (1877).

In Wales, Barrande had discovered the 'primordial zone' in Sedgwick's 'Cambrian;' but, as the Sedgwickian term was then under as strong a ban in England as 'Taconic' was in America, Barrande's term was adopted in England, and also transferred to the equivalent strata in America.

Gradually, in other places outside the Hudson valley, the primordial fauna came to light, the strata taking other Canadian names, — St. John's and Acadian; these terms becoming current in the United States.

Finally the existence and fossiliferous character of a great series of strata, occupying exactly the position, claimed by Emmons, and mapped by him under the term 'Taconic,' lying below the Potsdam sandstone, has been demonstrated, and is admitted by all geologists.

The term 'Quebec' not being approved, and 'Huronian' seeming to collide, the later English term, 'Cambrian,' is applied in America to this very horizon to which Emmons had given the name 'Taconic.'

Some of the opponents of Emmons, re-enforced lately by active, younger men, revive the fossiliferous character of some of the eastern belts as new matter, adding many interesting and valuable details, and begin again to fire at the old fort, long ago abandoned by Emmons, insisting that Emmons is still intrenched there (1872–85).

It seems to me that any fair-minded geologist, finding primordial fossils in the strata mapped by Emmons as Taconic, lying below the Potsdam, would at once admit the strata to be Taconic; just the same as, if he found non-Taconic fossils in an area not claimed as Taconic, except by a mistake in a preliminary definition (corrected by its author), he would at once admit those strata were not in the Taconic, and were not intended to be so described.

The same mistake was made by Emmons at first as by his opponents. None of them imagined they had to deal with two different and unconformable formations. The strata were all either Taconic or Hudson River. Emmons approached them from one side, the primordial, and his opponents from the opposite direction. Each had evidence to support his claim; and, viewed from his own stand-point, each was right. It is unfair to Emmons, and to American geology, to insist that this preliminary mistake should consign to oblivion the great fact that in America, and by an American geologist, was first discovered the primordial zone of geology.

If the Taconic is to 'lose its identity' because a portion of the original described strata prove to be post-Potsdam, what shall become of the Hudson River, by the same reasoning, if it be treated with honesty, when nearly all the strata covered originally by it prove to be pre-Potsdam? If the strata can fairly be divided between the conflicting claims, as the structural geology of the region seems to require, it would be for the honor of American geology to so divide them. It seems, however, that the extreme anti-Emmons partisans will not grant such a division, but insist on the utter destruction of every thing that smacks of Taconic. N. H. WINCHELL.

## Relics from an Indian grave.

On the Conejo plateau in Ventura county, Cal., and about fifteen miles from the coast, a conical hill rises to the height of a hundred feet, with a base of several hundred feet. On the south side of this elevation, and stretching more than half around it, is the remains of an old Indian town. At the top of the hill is a circular depression, indicating the spot where once stood the 'sweat,' or council-house, of the tribe that occupied this site. Near the centre of the crescent-shaped village is the place where the dead were buried. Early last month the writer examined this burial place, which yielded about a hundred and