

would seem well-nigh incredible that the upper currents and the power of suspension of the ashes could have combined in carrying the particles 11,000 miles.

Common cloud-coloring is caused by diffraction from particles of dust or water-droplets. Light of different wave-lengths has a greater or less power of passing through dust, smoke, water-droplets, ice-spicalae, etc. It is stated that the light at the blue end of the spectrum has less power of penetration than at the red end: hence the light is sifted out, as it were; and the blue disappears first, then the orange, and, last of all, the red (Scott's 'Meteorology,' p. 205). Why may it not be possible that the blue, having the greater refrangibility, is refracted to such an extent as to be intercepted by the earth long before the red has disappeared? Taking into account the great abundance of moisture, the appearance of ice-spicalae (which, however, may have been volcanic ashes), and the fact of the appearance being precisely similar to that ordinarily seen upon clouds, there is no necessity of resorting to the at best doubtful theory of the volcanic origin of the phenomenon.

The similarity between the ordinary sunset and this phenomenon was finely illustrated one evening by a magnificent red-cloud sunset, manifestly caused by clouds comparatively near the observer. These clouds, gradually fading away, were followed by the deeper red so prominently noticed recently, and evidently produced by ice-spicalae at a great distance.

G. A. N.

On the evening of Dec. 22 a red glow was noticed upon the clouds which overspread the whole heaven. On the 23d the cloudiness was complete, and even denser than on the previous evening; but the glow tinged the whole visible vault down to the eastern horizon, and continued for at least an hour after sunset, fading first in the east. On the 24th the clouds were slightly broken. Before 5 P.M. (standard time) a yellowish tinge began to be apparent. At 5.10 the color was reddish, and reached the horizon on all sides. At 5.20 the color was a deeper red, with clouds more broken. At 5.30 the clouds were thin, and showed faint but distinct blood-red color on the eastern horizon, though a little brighter in the west. At 5.40 the cloudiness was reduced to a partial thin film, but a dusky redness was still perceptible in all parts of the sky. At 5.55 the sky was everywhere thinly veiled, but a dark ruddy tint could still be faintly seen all around the horizon. At 6.10 the sky was mostly cloudless, though few stars were visible. A dark-red glow could be discerned in all parts of the heavens, and in the west it rose in broad, ill-defined bands from the position of the sun. At 6.20 no clouds, but only stars of first three or four magnitudes were visible. At first no ruddiness was seen, but shortly it became unmistakably apparent. It was a faint dusky red still obscurely barred in the west. This glow lasted two hours and eight minutes after sunset: atmosphere calm; thermometer sinking from 28° to 25° F. The observations possess interest in connection with similar ones recently made in various parts of the world.

ALEXANDER WINCHELL.

Ann Arbor, Dec. 25, 1883.

Plant distribution in Lower California.

I would call attention to the fact, that many Arizonian, New Mexican, and Mexican species of plants, together with more northern species, are found on the narrow strip of tablelands in northern Lower California. Among them I may mention *Quercus Emoryi* and *Q. pungens*, *Astragalus Sonorae*, *Fouquieria splendens*, and many others, with *Geranium*

caespitosum of the Rocky Mountains, *Ivesia Baileyi* of Nevada, *Galium pubens*, *Quercus agrifolia*, the common *Pteris*, *Aquilegia truncata*, and a number of introduced (?) species well known throughout the United States.

CHARLES R. ORCUTT.

San Diego, Cal., Dec. 15.

Kames near Lansing, Mich.

A few years since, I spent one or two days at Mason, some ten miles south of Lansing, Mich. I had hoped to return at some future time, and complete my observations upon some peculiar ridges of sand, gravel, and bowlders in the vicinity of that village; but, as it may be some years before I shall be able to do so, I would like to lay the observations before the readers of *Science*, hoping that some of the Michigan readers may have time to investigate the subject fully.

The surface is here nearly plane. The front moraine of the Saginaw glacier lobe lies some thirty-five miles to the south-south-east, beyond Jackson. These ridges trend towards this moraine from some unknown point north of Mason to another unknown point ten or more miles south-south-east. I was informed that some of these ridges were six and eight miles in length, and are sometimes used as a highway. The drainage is to the northward at present, parallel with the course of the ridges, though I noticed one or two instances where creeks had intersected the ridges instead of being guided by them. The ridges seemed to persist in a northerly course, though with many local exceptions. I noticed one instance in which the main ridge turned nearly at an angle of 100°; but the main course was continued farther north in the heavier ridge, and at the elbow by a much lighter one. The ridges are quite variable in elevation. Perhaps the mean lies between twenty and thirty feet. The slope was not measured, but is, as a rule, too great to permit their being crossed by teams at the natural grade. The component material is all water-worn, and evidently deposited through the agency of water. The bowlders are of all sizes, up to twelve inches. Perhaps forty per cent were sandstone, similar in lithological characters to the subjacent rock strata. The remainder were metamorphic or igneous species, except some limestone pebbles.

Whether these ridges were formed in the longitudinal crevasses and river-channels of the ancient glacier, or not, must be determined by a more careful survey of the region than the writer was able to make in the few days spent at Mason.

L. C. WOOSTER.

Eureka, Kan., Dec. 17, 1883.

Longevity in a fasting spider.

On the fifteenth day of October, 1881, I enclosed a spider in a small paper box. From that day to the seventh day of May, 1882 (204 days), I carefully watched and daily inspected the prisoner, and can positively affirm that he partook of no food or water. The box in which he was confined was as clean and white as white paper could make it, and remained so while he continued to occupy it, except for the appearance of a few dark specks which I suppose to be the droppings of the prisoner. I carefully observed him every day, and sometimes two or three times in a day; and I was unable to detect any emaciation or symptoms of weakness, or even irritability of temper, while he lived. He always appeared as active, and looked as plump and healthy, as he did the day I dropped him into the box, until within three days of his death, when I first observed that when the box was tipped he would fall from his position.

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