

many interesting views of the dinosaur bones, the quarries and the scenery of the region in which they occur.

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DISCUSSION AND CORRESPONDENCE.

THE FALL OF BODIES.

THE report of Professor E. H. Hall on the motion of falling bodies recalls an interesting experiment. It was proposed by Newton in order to obtain a proof of the rotation of the earth. The experiment was made by Robert Hooke in 1680. Hooke dropped a ball 27 feet, and it fell toward the east and south. The most complete experiments have been made in Germany. Benzenberg dropped balls 235 feet, and found a small deviation to the south and a marked deviation to the east. His first sixteen trials gave a deviation to the north, but the last fifteen trials more than balanced this. Two years later Benzenberg repeated his experiments, and found a small deviation to the north. It appears to have been the erroneous investigation of this question by Olbers that led Gauss to examine the theory of this motion. Gauss says that, to his astonishment, he found by theory no deviation to the south. Afterwards Laplace examined this question ('Mec. Cel.' Tome IV.) and found no deviation to the south. The most complete experiment is that of Professor Reich, who dropped balls 488 feet. From 106 trials the deviation to the east was 23.30 mm., and to the south 1.06 mm.

The result appears to be that the deviation to the east is decided, and that to the south or north is so small that it can be ascribed to errors of observation. The probable errors of the results are large. Perhaps good conditions for this experiment can be found in our country.

A. HALL.

February 4, 1903.

MOUNTAIN SPECTRE NEAR BOULDER, COLORADO.

THE term 'mountain spectre' is taken from the Encyclopedia Britannica, where it is noticed under the article 'Halo.' The best-known example is at the Brocken in the Harz Mountains. From the description of the phenomenon as observed at that place, it is in-

ferred that the appearance noted in Colorado was quite as distinct as that at that famous locality. It was observed February 1 from the top of Green Mountain, near Boulder, Colorado. This mountain is a high point in the foothill belt; its summit is 2,500 feet above the plains which it overlooks, or about 7,800 feet above the sea. On the day mentioned, at 4:30 P.M. patches of white cloud were drifting below its summit. Occasional snow flurries visited the plains below. The temperature was apparently below the freezing-point. At the hour of observation the sun, which was not more than twenty degrees above the horizon, was shining clear at the summit. Opposite the sun, a few hundred feet distant, was a mass of white or grayish cloud. Upon this cloud was seen a complete circle of rainbow colors. The diameter of the most pronounced red ring was estimated at nine degrees. Outside of this was a faint blue color, and then a suggestion of red in a still larger circle. Within the nine-degree red ring were blue and violet, the center appearing a dull lavender. In the field within the bright red ring appeared the shadow of the observer, which was so definite as to reproduce all movements of arms and hands. Each observer saw his own shadow and the reproduction of his own movements, and could see nothing of the shadow or movements of his neighbor if standing more than six or eight feet away. The phenomenon was watched about twenty minutes.

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SIGNS OF THE GLACIAL PERIOD IN JAPAN.

IN my visit to Japan a few years ago I failed to find any distinct signs of glacial action, though I penetrated what seemed to be a typical place for extinct glaciers in the mountainous region one hundred miles northwest of Tokyo. But Mr. Yeijiro Ono, of the Bank of Japan, has just sent me a translation from a Japanese paper of some observations in the mountainous district a little farther south than that visited by me, which would seem to indicate that there are some relics of the glacial period in the central highlands