Jr.; 'The Red Sandstone of Diabolo Mountains, Texas,' E. T. Dumble; 'Cretaceous and Later Rocks of Presidio and Brewster Counties,' E. T. Dumble; 'A Preliminary Report on the Austin Chalk Underlying Waco and the Adjoining Territory,' illustrated with half-tone engraving, John K. Prather; *Proceedings* of the Academy for 1901; List of Patrons and Fellows; List of Members; Constitution, in all covering 138 pages.

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Discussion and Correspondence.

Iridescent Clouds.

To the Editor of Science: The letter of Mr. Ward in Science of July 4, concerning iridescent clouds, leads me to record my observations of similar phenomena. From my own observations, covering five years in Princeton, Williamstown, Mass., and Baltimore, and seven years in Boulder and Denver, Colo., I am led to think that iridescent clouds are of very much more frequent occurrence in Colorado than in the Eastern States. And they occur much more frequently near the mountains than at a short distance out on the plains.

Boulder is situated immediately at the base of the eastern foothills of the Rocky Mountains, these foothills being from 1,200 to 3,000 feet higher than the plains, upon the edge of which the town is built. Just above these foothills a stratus cloud sometimes forms, especially in winter, whose lower edge is often bordered with a band of color, frequently very bright and clear. These colored bands occur from ten to twenty minutes after sunset. The cloud usually lies at a distance of 5° or 10° above the horizon and is often almost absolutely horizontal. The colors extend along the lower edge for a distance of 15° to 30°, being about 1° or 2° wide.

At other times I have seen great patches of cirrus clouds which were most beautifully iridescent. One of these I saw at about eleven o'clock which covered a space perhaps 5° or more each way and which was about 15° or 20° east of the sun. It lasted for ten or fifteen minutes, there being very little motion of the clouds on that day. At other times I have seen many small patches of color, mostly bluish-green and pink, appearing simultaneously in light cirrocumulus clouds. These usually occur about the middle of the afternoon. I have on a single occasion observed a similar effect produced by the full moon.

Denver is situated about twenty miles from the foothills. Although I have not kept a record, my observations during the last two years convince me that these cloud colors are seen much less frequently here than in Boulder.

I wish also to speak of a related phenomenon of very much less frequent occurrence. On July 5, I was looking toward a nimbus cloud from which the rain was apparently falling beyond a mesa which lies about five miles east of Boulder. It was between four and five o'clock in the afternoon. There appeared in the cloud a patch of rainbow colors about 10° long by half as wide. The colors were in the order of the rainbow, but the bands were very much broader and quite irregular. The colors lasted for ten or fifteen minutes. The position of the sun precluded the possibility of the colors being produced in the same way as in an ordinary rainbow.

I have but once before observed the same phenomenon. In the spring of 1895, I was teaching in Grand Junction, which is situated in the valley of the Grand River in the western part of the state. To the east of the town at a distance of about thirty miles the Grand Mesa rises to a height of 5,000 or 6,000 feet above the valley. On May 1, I observed a nimbus cloud, from which rain could be seen falling, lying in the eastern end of the valley and so low that the top of Grand Mesa could be seen above it. About half past three I saw in this cloud a strip of color extending north and south about 10° and about 5° wide. The red was above and about 10° or 12° from the earth. (These data are copied from my diary of that date.) The colors were quite as bright as in a brilliant rainbow and included all the colors of the rainbow. As in the former case, the position of the sun made it impossible to explain the production of the colors on the basis of the theory of the rainbow.

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