

guide-book had referred with sublime and picturesque good faith, they failed utterly to materialize.

In one respect New Year's Eve was historical in Albuquerque. Gambling up to that night was not unlawful. We visited some of the gambling halls and saw the roulette wheel and other games in full swing. The places were crowded. But 12 o'clock New Year's Eve all these "joints" were compelled by law to close for the first time in hundreds of years.

New Year's Day was devoted wholly to a trip into the Sandia mountains (near Albuquerque), which rise over 10,000 feet above sea level. The excursion was made under the auspices of the Commercial Club of Albuquerque and the University of New Mexico. Four vans, each drawn by two teams of horses, left the city at seven in the morning. It was quite cold at that hour. After the first mile there is a gentle, gradual rise for ten miles until the foot of the mountains is reached. To one not used to desert country it was puzzling to note that on this gentle ascent the road seemed to be falling towards the mountain, but that always when we looked backwards it also fell away. It was merely one of those deceptive phenomena of the desert and mountain country. The ascent was continued until about one o'clock, through deep canyons and along winding arroyas, when an elevation of between seven thousand five hundred and eight thousand feet above sea level was reached. Here the party had lunch. Within a stone's throw the basal conglomerate of the Carboniferous was splendidly exposed, lying unconformably on quartzite and quartz schist of possibly pre-Cambrian age. The relationships of the pre-Cambrian rocks of the Sandia mountains have not been fully or satisfactorily worked out. We were keenly interested to find among them an old looking greenstone resembling the Keewatin series of Northern Ontario and the Lake Superior regions. This was intruded by granite. Besides the quartzite above mentioned there is a metamorphosed granite gneiss the relationship of which to the other three members was not clear.

After the sun was well up, even at this high altitude, it was warm and balmy. For the Eastern visitor the air was indescribably exhilarating. Here and there in the canyons we passed the adobe, and occasionally in the more open parts we met the solitary sheep-herder, with his herd all bunched together.

The return trip was made by a different route, giving us a chance to drink some natural carbonated mineral waters, and to see again the basal conglomerate of the Carboniferous, this time lying unconformably on the broken down surface of the metamorphosed granite gneiss above mentioned. We reached Albuquerque a little after dusk and the same evening took our sleeper for the West.

Before dawn the following morning (January 2nd) Adamana was reached. Our Pullman remained here for a day to allow a visit to the celebrated Petrified forest of Arizona. Most of the party got well loaded up with specimens of the fossil trees, the colors of which are very beautiful and the original structures well preserved.

We left in the evening for the Grand Canyon of Arizona, which was reached the following morning. For many of us this was the real point of interest on the trip. It would be puerile and uninteresting for a tyro to attempt a description of the canyon. All of us have read about it and will recall its total length of 217 miles. Its width for the fourteen miles we saw is 13 to 15 miles, and depth over a mile. The elevation of the rim is about 7,000 feet above the sea. To the reader these figures probably mean nothing, nor do they to the on-

looker. It is only when one has gone down, down, down on the trail to the bottom of the gorge that he realizes to some extent its depth. For the lower 1,000 feet the Colorado river has cut its way through granites and gneisses for all the world like our vast Laurentian areas in Canada. As seen from Grand View Point the series appears to have been eroded down to a plane. What is known as the Grand Canyon group of sedimentary rocks rests unconformably on this floor. On the gently up-turned edges of the canyon group rest, unconformably, Paleozoic beds, the majority of which are more or less horizontal. The Carboniferous is the surface rock. For those of us who had worked on pre-Cambrian geology in the thickly wooded, monotonous peneplane of Northern Ontario, where unconformities and relationships are with difficulty unravelled beneath their ubiquitous, glacial mantle, it was a source of delight to be able to see from the rim of the canyon such a profound succession of rocks.

But apart from geological considerations was the external beauty and grandeur of the chasm. Some of us were at the brink before daylight to watch the sunrise effects. No one will probably ever catch the coloring on canvas. One evening three of us had been quietly ab-



Mexican adobe in the "old town" of Albuquerque, New Mexico, showing in the left foreground. Dr. Ami, of the Canadian Geological Survey, on the right.

sorbing the scenery in front of the hotel, when four Western gentlemen issued from the door and walked to the side of the canyon. We had already experienced the different effects which a first glance produced, but it was rather startling to be brought back to earth by this expression: "By God, that's the deepest hole I ever see!" It was uttered with a nasal drawl and his earnestness was not lessened by the fact that he had dined not wisely but too well.

Some of the party made the trip down the Bright Angel trail on mules, while others, perhaps more energetic, preferred to walk. The distance to the bottom and back is about thirteen miles. A few of those who rode were novices on either horses or mules, and for them there were moments when thrilling was a tame word to apply.

Saturday evening, January 4th, the party broke up, the majority going home, but a few remained longer at the canyon before taking the train East.

The writer is not a member of the Geological Society of America, but it is with the permission of the secretary, Dr. Hovey, that this article is written.