

Clayton, 1873, p. 88-89

Calif. Acad. Sci., V. 4 (for 1871-1872), 321 p. S.F.

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PROCEEDINGS OF THE CALIFORNIA

in diameter, with an indefinite length, exploding with a fan-like shape of at least ten feet in breadth on an estimate, not unlike the appearance of a sky-rocket exploding. I heard no noise from the explosion."

REGULAR MEETING, DECEMBER 7TH, 1869.

President in the Chair.

J. Taylor and A. W. Bowman were elected resident members.

Donations to the Cabinet: A large collection of shells, radiata and fossil corals, with cones of *Pinus taeda*, from Florida, by R. E. C. Stearns.

Donation to the Library: Catalogue of recent Mollusca, part 4, by S. R. Roberts, Philad., 1869, pam. 8vo., from the author.

Prof. Whitney stated that in the Rocky Mountains of Colorado he had observed only six species of Coniferae.

Dr. Behr mentioned *Eucalyptus marginata* as plentiful in Australia, which he thought might be imported with advantage for use in building wharves, as the logs are not attacked by the teredos. Another tree grows in salt marshes and might be cultivated in such situations here, (*Avicennia tomentosa*?).

Prof. Whitney read a very interesting letter from Baron von Richthofen on his recent explorations in China, where he has been a year and a half. He recognized there the "Taho sandstone;" next, a series of shales 1,200 to 3,000 feet thick, widely distributed; third, a superposition of limestone schists; fourth, a period of volcanic disturbances and outbursts of granite; fifth, an undisturbed stratum of sandstone; sixth, one of limestone, 600 feet thick, full of fossils, some of Devonian appearance; seventh, another limestone formation, followed by sandstone conglomerate, porphyritic tufa, and clays, as observed on the Yang-tze-kiang.

Professor Whitney read a letter from Mr. J. E. Clayton, dated Hamilton, Nevada, October 21st, 1869, and giving a sketch of the geological structure and mode of occurrence of the silver ores in the White Pine District.

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Item 98

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Mr. Clayton gives the following section of the rocks in that region :

	Feet.
Very brittle, chiefly limestone, with <i>Productus</i> , <i>Spirifer</i> , corals and flint nodules.....	1,000
Greenish sandstone.....	60
Black bituminous shales.....	400
Enerinital limestone.....	60
Pink shales and sandstones.....	300
Silver-bearing limestone, with abundant corals and small bivalves.....	1,500

He considers the silver-bearing rocks as probably of Silurian age. In regard to the occurrence of the ore, he writes as follows :

"The ore is found, first, in certain lines of fractured country rock, which I call 'ore-channels,' or zones of metal-bearing country. The ore-channels have been in all cases brecciated or crushed by mechanical movements of the earth's crust, and sometimes extensive faults or vertical displacements are seen along the crushed lines, but not always. In some of the most extensive brecciated beds of limestone no material displacement has occurred; as, for instance, in the great Aurora ore-channel, which is one hundred to two hundred feet wide, and one mass of broken limestone, the angular fragments being of all sizes, from that of minute pieces to large blocks. In the interstices of this mass the quartz and ore have been deposited, the small fragments being completely changed to quartz, the large ones only partially so.

"Second—In layers between the bedding of the limestone in masses of all shapes and sizes, from a few pounds in weight to hundreds of tons, always connecting immediately or remotely with some vertical fissure or brecciated channel of country rock.

"Third—In vertical fissures, cutting the country to unknown depths; but there are no true veins of ore in these fissures; they are filled with silicified breccia of the same general character as that found in the ore-channels.

"Many of the true fissures are filled with banded spar veins; but they are barren and are of a later formation, in many cases cutting through the ore channels and country rock indiscriminately. There have evidently been two periods in the changes made here: First—A partial upheaval, fracturing the limestone beds, but not breaking the more flexible overlying shales, which thus confined the heated waters and gases to the limestone. This was the quartz and ore-period. Second—An upheaval, breaking the whole series of overlying rocks, making new fissures, reopening old ones, and depositing spar."

Prof. Bolander spoke of the recently reported rise of six feet in the waters of Mono Lake, said to be accompanied by a freshening of the waters and the disappearance of the dense clouds of flies, of which the larvæ were formerly so abundant in the lake.

Prof. Whitney stated that the ancient water-marks showed that

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