

1892). It is probable that there were ranges of flexures and monoclinical shoves along the rest of the Sierra to the southward and great upthrust faults also in the Taylorville region.

The maximum thickness of the rock in the Taylorville region is 24,500 feet, of which 17,500 feet are Paleozoic and 7000 feet Mesozoic (Diller). The Sierra Nevada geosyncline of deposition, which began during or before Upper Silurian time, hence reached in this part a depth nearly of 25,000 feet; this was the thickness of the pile of deposits that was upturned and flexed in the crisis of mountain-making at the close of the Jurassic. The heat generated by the movements was sufficient for the rather feeble metamorphism which characterizes the rocks. Facts also appear to prove that the core of dioritic granite, which is the chief rock of the ridge to the south, was an Archæan ridge over and against which the thrust took place; for the stratified rocks, where in contact with it, show in some places in their crystallization or metamorphism the effects of the friction. For an example of such effects, see page 534. This view of the Archæan age of the Sierra core of granite is presented by King in his 40th Parallel Report, 1878.

The Sierra Nevada, when first formed, probably had not half its present height. It has a later history of great geological interest.

The formation of the gold-bearing veins of quartz in the Sierra rocks was a consequence of the upturning. The wrenching of the strata opened the leaves of the slates, and also made great intersecting fissures. The opened spaces and fissures became filled with silica (quartz) which the heated moisture took into solution, and also with such ores as the vapors found in the beds. Some of the auriferous quartz veins have a width of 10 to 40 feet. As the modern Sierra gravels contain gold from the rocks which make the modern Sierra, so the more ancient rocks, of Jurassic and earlier origin, must have held gold from the earlier crystalline rocks of the Sierra; and this gold, with ores of lead, copper, and other metals, the hot vapors gathered into the fissures. It was not the work of superficial waters; for the veins now visible on the Mariposa estate and elsewhere are, owing to denudation, thousands of feet below the original surface; but there is no doubt that superficial waters took part in the work. The metamorphic effects include many rocks in the Coast Range, besides prevailing kinds above mentioned, as stated on page 318; and through Becker's studies the region has become an especially instructive one on the general subject of metamorphism.

The "granite core" of the Sierra constitutes the culminating points in the southern portion of the range — among them Mount Whitney, which has a height of 14,808 feet above sea level; and it is the rock of the famous Yosemite Valley. Whitney states that the slates near the granite are harder than at a distance from it, and contain hornblende; that veins of granite extend into the altered schists. And Diller describes contact phenomena observed by him in the Taylorville region. Moreover, some of the auriferous quartz veins extend into the granite. Evidence of this kind led Whitney, in his California Report, to present the view of the post-Jurassic age of the granite; and several recent investigators of the region hold the same opinion. But intrusions of