

RADIOLES. Unknown.

MATERIAL EXAMINED. Holotype only.

LOCALITY. Dr Edgar H. Bailey (private communication, November 10, 1959), gives the following data:—

“The echinoid was found in a prominent knot of limestone lying at an altitude of 1,000ft at the junction of two major branches of Baldy Ryan Canyon (formerly known as Longwall Canyon) in the SE quarter of the Santa Teresa Hills 7½-minute quadrangle, Santa Clara County, California. This point is 4,800ft S. 69° of Fern Peak.

“Because of structural complexities the detailed stratigraphy of the area cannot be entirely deciphered. The fossil-bearing limestone is exposed as a series of discontinuous outcrops extending in a north-westerly direction through the district for a distance of about 15 miles. In many places the limestone lenses lie stratigraphically a short distance above a distinctively altered tachylytic tuff, suggesting they are parts of a single discontinuous ‘horizon’. The other associated rocks are greywacke, shale, greenstone, and chert, and the entire unit has been assigned to the Franciscan formation on the basis of its lithology.

“Near the echinoid locality *Nerinea* sp. was collected from the limestone. Another exposure of similar limestone lying eight miles north-west of the echinoid-bearing lens yielded the foraminifera described by Cushman and Todd (1948) and by Kupper (1955). The geology of the New Almaden district, which contains the most productive mercury mine in the United States, is described in detail in a report by Bailey and Everhart (in press).”

AGE OF THE FOSSIL CIDARID

In the classification of Cidaroida employed by Mortensen (1928) and adopted by Fell (1954), and Durham and Melville (1957), *Phalacrocidaris* is treated only as a section of *Stereocidaris*. The genus is well represented in the Pacific at present, and ranges back in time so far as the lower Cretaceous. The *Phalacrocidaris* section of the genus is known from the Senonian onwards, and is represented in the North Pacific at present, especially in the waters of southern Japan. In the alternative classification proposed by Lambert and Thiery (1909) the species *merceyi* Cotteau is referred to *Stereocidaris*, and the earliest species in the list of species included in the genus by these authors is of Cenomanian age. As Lambert and Thiery recognize *Phalacrocidaris* Döderlein as a valid independent genus, it appears that *merceyi* ought to have been referred to that genus, not to *Stereocidaris*; but even if this adjustment is made, it makes no difference to the question of the age of the material, for the oldest known species of *Phalacrocidaris* again proves to be Cenomanian. It can therefore be seen that in either of the rival systems of classification the conclusion emerges that the species belongs to a genus unknown from horizons older than Cenomanian, and the species may well be no older than Cenonian, or even younger. If the species were Jurassic it would be by far the oldest known member of its genus, and cogent external evidence would be required before that conclusion could be acceptable. It is inferred, therefore, that the species is probably no older than Cenomanian, and that its closer congener is *S. merceyi* of Senonian age.

The foregoing conclusions were reached on the basis of echinoid evidence alone, and were communicated to Dr Kier, of the Smithsonian Institution. He has since informed me that Dr Imlay, of the United States Geological Survey, has deduced, from different evidence, that the Franciscan is a facies formation which varies in age from Portlandian to Campanian. Thus, the independent sources of evidence lead to consistent results.