**How good was the fossil record? Clues from the Californian Pleistocene by James W. Valentine**

As can be inferred from the title, this article takes a look at the quality of the fossil record by examining the fossil records of bivalve and gastropod families from the Californian Pleistocene. The author did not include extinct species in his considerations. Instead, he only included fossils that could be linked to living genera or species. Using this method, he could see where the gaps are in the fossil record from species with no fossils reported. As would be expected, species that are common in this region today have a fairly abundant fossil record, but some species did not live in areas where fossilization occurs easily, or they have thin shells that are not likely to fossilize. These species occur rarely in the fossil record if at all, but some of the living species have also only been described once. From these data that were collected, the author found that between seventy-five and ninety percent of living bivalves and gastropods were represented in the fossil record. This finding suggests that marine deposits are fairly complete insofar as the representation of organisms with hard shells or skeletonized parts. In that light, any studies regarding organisms of this type can be considered fairly genuine in their results given a nearly complete representation in the fossil record.

One of the things I liked about this article was the quantitative description of the quality of the fossil record. The steps taken were logical and easy to follow. I liked the idea of using living taxa to estimate the accuracy of the fossil record by comparing taxa that are alive and their representation in fossils. I like that he chose to use Pleistocene fauna since a million years seems like a decent amount of time to be able to infer certain types of patterns in an ecological context, such as evolution or response to climate change. Overall, I found the paper interesting, but hardly groundbreaking. It makes a great deal of sense that hard-shelled marine organisms have a fairly complete fossil record, but it is also useful to have a quantitative measure of this.

This was mentioned in the article, but I do not like the narrow nature of this study. This really only affects shallow warm water habitats. We can only infer a nearly complete fossil record for these types of habitats, and that is not even mentioning the types of taxa that were used. Bivalves and gastropods are likely to fossilize because of their hard shells, but there are so many other types of organisms with no such structures. These soft-bodied organisms are significantly underrepresented in the fossil record, and they are rarely found except in special cases called lagerstätte. I know this was not an oversight on the author’s part since it was mentioned, but I think it should be made very clear that these results only pertain to a special set of circumstances. There is also little consideration for terrestrial fauna in this paper. By my best guess, I would assume that the likelihood of being fossilized in a marine environment compared to a terrestrial environment is much higher, especially since most terrestrial fossils are found in association with water.

The only figure in the paper was a map simply to show where the data were collected from in California, and it did exactly that. The table included in the body of the paper was very clear on which species or genera were represented in the fossil record compared to the living ones. A much more detailed version of this table was included in the appendix, and I actually found this table more interesting. It showed which genera were present and what their fossil record was like.