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Reading #6

How good was the fossil record? Clues from the Californian Pleistocene

Author: James W. Valentine, 1989

Summary: The goal of this paper is to assess the completeness of the fossil record using marine benthic fossil record of the California Province. It begins by summarising the findings of three prominent studies which all contribute to the understanding of how newly fossilised skeletons are incorporated into dead assemblages. The paper notes that dead assemblages span many generations and thus are often more significantly diverse than living assemblages. Dead assemblages include fossils of animals which did not live together at the same time and which may have been mixed together through wave or water action. Fossils are not continuously added to dead assemblages but it is a more episodic process. One thing to consider when sampling these fossils is that although the number of rare fossil species is abundant, the chances of them being sampled is very low. In order to do this study the author sampled a living fauna of the classes Gastropoda and Bivalvia within the Californian Province. Next, Pleistocene fauna from the past one million years was sampled. Comparisons of the ecological data gathered for these two faunas were then compared and summarised in a table, and of 536 species sampled, 98 are extinct. The author concludes that the record he has studied has captured the most important species with a very high percentage of all species. He also concludes that as the rock record gets older, many fossils do not survive because of diagenesis and erosion, rather than because of a lack of accumulation.

Why I liked this paper: I think that this paper was very thorough and I also think the author did well in his techniques for the study. I like the background information that is presented about the fossils, like for example their shelf environment and I also enjoyed reading the introduction and learning about what dead assemblages were.

Why I disliked this paper: I think that there were too few diagrams in this paper and that having more would have made it easier to visualise the results and implications of the study. For example the author frequently referenced fossil distributions and log series of the species but he did not provide any diagrams for easy comparison. He referenced several diagrams from other papers but it would have been nice if he had summarised all of their diagrams into one diagram with his own data side by side.

Diagrams: There are only two diagrams in this paper, one which shows a map of the locations of the fossils and another which summarises the living pool of molluscan species. There should be more diagrams, may be for example different shelf environments.