

## **Basin connections, quantitative analysis and climatic cycles**

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A quantitative method for detecting basin connections through geologic time is proposed, based on the amount of shared benthic fauna in relation to the interbasinal distance. The method has been primarily developed for the Tethyan belt and connected areas, but it came out to be valid for every geographic area and for any geologic time. An example for N. America and Recent is given.

A wide census of brachiopod and benthic mollusc species recorded in space and time inside the Tethyan belt, from Permian to Pliocene, was set up; a comparison with current paleogeographic maps allowed to carry out a mathematical elaboration of the number of species shared among the different basins, epoch by epoch, related to basin connection possibility. A mathematical model has been proposed at this regard, with an equation of exponential type. The use of this model confirmed or compelled to correct previous paleogeographic reconstructions. The proportionality coefficients of the equation reflect the geologic and biologic hampers to species diffusion.

The parameters of the exponential equation which links the paleobiologic and paleogeologic factors to species spreading have shown, as a fall out of the research, that the climatic cycle of 26 million years, due to astronomical factors, it is to say to the well known galactovertical movement of the Solar System during its turning around the Milky Way center, is valid as back as about 100 million years. For older times a more complex cycle, with harmonics of an upper order, seems to control the climatic variations. According to some astronomers, the movement of the stars nearest to the Solar System should be the responsible for such a gradual difference from the Permian onward.