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Milankovitch theory - hits and misses (Milutin Milankovitch Medal Lecture)

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Milankovitch Theory has become an important tool in geologic practice and thought, and is sufficiently conspicuous to provide a rewarding target for criticism. The chief problem arising has to do with the prominence of a cycle near 100,000 years, whose origin is not clear. Most practitioners, presumably, would accept a close relationship of that cycle to precession of the equinoxes (that is, cyclic changes in seasonality), along with dynamical properties oft he system that enhance the amplitude of the 100-kyrcycleat the expense of others. In any case, Milankovitch Theory has proved useful, both for age assignments and for stimulating thought about relationships between climate change and sedimentation, as is readily evident from the relevant literature. It would be difficult to replace. Neither does it seem desirable to do so: the chief problem noted in regard of the theory (the 100-kyr problem) is not necessarily a part of the theory, which is concerned with change rather than with condition. The 100-kyr cycle is linked to condition. The problem raised by critics seems to be the time scale of integration of change, a problem not addressed in Milankovitch Theory. A necessity for additional processes and mechanisms not considered in Milankovitch Theory can not be excluded.