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Berggren W A. A Cenozoic time-scale—some implications for regional geology and paleobiogeography. *Lethaia* 5:195-215, 1972.
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A reliable time scale is a *sine qua non* of studies of historical processes in the earth sciences. By integrating data from the fields of planktonic biostratigraphy and isotopic ages, a geochronologic framework is established for the Cenozoic Era (65-0 Ma), which permits improved correlation between marine and terrestrial stratigraphies. [The *SCI®* indicates that this paper has been cited in over 260 publications, making it the most-cited paper in this journal.]

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Geology is a historical philosophy. As such, a chronologic framework is a *sine qua non* of research in the earth sciences. A reliable and accurate geologic time scale is important for the study of rates of historical geologic processes, such as changes in the geometric configuration of continents and ocean basins (familiarly known as "plate tectonics"), in the dynamics of ocean currents, climate changes, changing patterns in the spatial and temporal distributions of plants and animals, and in the tempo and mode of evolutionary change in the animal and plant kingdoms. The reconstruction of the history of the earth involves integration of data from the areas of geostratigraphy (i.e., the physical evidence of geologic data) and geochronology (i.e., the conceptual subdivision of continuous time as measured by the progression in an ordinal series of events).

The desire for precise correlation is one of the main goals of stratigraphic geology. Subdivisions of geologic time, as represented in the sedimentary-rock record, have occupied the talents and tested the ingenuity of geologists for two centuries. The ability to recognize and distinguish smaller and smaller increments of time by biostratigraphic methods is a tribute to increased understanding of evolutionary patterns in fossil organisms, improved instrumentation, and a growing body of informative, descriptive, and interpretative literature.

My own interest in constructing a time scale for the Cenozoic Era (the past 65 million years) grew out of my research interests in using fossil foraminifera as a means of studying the geologic history of ocean basins and continents during that time interval. An additional impetus came from the initiation of the US-sponsored Deep Sea Drilling Project (DSDP) in 1968. This program is devoted to the drilling and coring of ocean floor sediments and crust to delineate the geologic history of the ocean basins through the study of fossils and sediments recovered.

The first relatively reliable isotopically based time scale for the Cenozoic Era was made by Funnell[1] in the early 1960s based on a compilation of stratigraphically controlled isotopic dates. It was important to have an updated version, a reliable time scale that would allow the DSDP's paleontologists to predict the age of the sub-seafloor sediment ahead of the drill-bit. To this end, I set about preparing a comprehensive review of global Cenozoic stratigraphy and correlations,[2] which established the framework and background for a modified and updated Cenozoic time scale. Two updated versions appeared subsequently in 1969, prior to the appearance of the fourth version, cited here in the *Citation Classic* series. With the development of new and refined techniques and methodologies, I have periodically updated parts or all of the Cenozoic time scale. These have appeared in various incarnations[3-6] over the years. The time scale provided the testing ground for verifying the concept of seafloor spreading when the *Glomar Challenger* drilled a series of sites in the South Atlantic in 1969. It also integrated a large amount of data from various sources and provided the first time scale that allowed relatively precise geologic correlation between marine and terrestrial stratigraphies. That my work on Cenozoic geochronology has found widespread application is attested to by the fact that I received the Mary Clark Thompson Gold Medal from the National Academy of Sciences in 1983.

To end this account on a personal and, to a certain extent, humorous note, this paper was originally rejected when submitted to an American journal. Resubmission to the journal *Lethaia* resulted in an immediate and enthusiastic acceptance because the editor at that time was president of the Commission on Stratigraphy of the International Union of Geological Sciences and saw the utility of the paper immediately. The rest is history.

1. **Berggren W A.** Tertiary boundaries and correlations. (Funnell B M & Riedel W R, eds.) *The micropalaeontology of oceans*. Cambridge, England: Cambridge University Press, 1971. p. 693-809.
2. **Berggren W A & Van Couvering J A.** The late Neogene: biostratigraphy, geochronology and paleoclimatology of the last 15 million years in marine and continental sequences. (Whole issue.) *Palaeogeogr. Palaeoclimatol.* 16(1/2), 1974. 216 p. (Cited 250 times.)
3. **Hardenbol J & Berggren W A.** A new Paleogene numerical time scale. (Cohee G V, Glaessner M F & Hedberg H D, eds.) *Contributions to the geologic time scale*. Tulsa, OK: American Association of Petroleum Geologists, 1978. p. 213-34.
4. **Berggren W A, Kent D V, Flynn J J & Van Couvering J A.** Cenozoic geochronology. *Geol. Soc. Amer. Bull.* 96:1407-18, 1985.
5. **Berggren W A, Kent D V & Flynn J J.** Jurassic to Paleogene: part 2. Paleogene geochronology and chronostratigraphy. (Snelling N J, ed.) *The chronology of the geological record*. Oxford: Published for the Geological Society by Blackwell Scientific Publications, 1985. p. 141-95.
6. **Berggren W A, Kent D V & Van Couvering J A.** The Neogene: part 2. Neogene geochronology and chronostratigraphy. (Snelling N J, ed.) *The chronology of the geological record*. Oxford: Published for the Geological Society by Blackwell Scientific Publications, 1985. p. 211-60.