Daily and lunar growth features in fossil corals from Xinjiang and Guangxi: Information about ancient Earth’s rotation and huge impacts. Weijia. Zhang1, 1Department of Yuanpei Experimental Program, School of physics, Peking University, Beijing, China (100871), itaisa@pku.edu.cn

The author studied several groups of well-preserved coral fossils from Xinjiang and Guangxi (groups distributed from 310Ma to 488Ma) last year. Those fossils have three kinds of clear growth patterns: daily growth lines which resulted from diurnal increments of calcium carbonate deposition, lunar month bands controlled by reproductive cycles and annual annulations which reflected alternations in density of internal tissues [1,2,3,4,5,6,7]. The patterns provided important information of ancient astronomic data and ancient climate data for further analysis, such as number of lunar months and number of days contained per year. Furthermore, fossil bivalves from Florida, Guanling and Liaoxi (groups distributed from 1Ma to 260Ma) were also studied as a supplement. Comparing our result with former achievements derived by tidal rhythmites (including Precambrian data), the author noticed a critical at the transition between Precambrian period and Cambrian period, indicating a possible large impact. Such impacts also exist at K-T boundary and P-T boundary.

Fig.1. On epitheca of our coral fossils, such lunar bands always contain 30~31 diurnal ridges. Specimen name and depositary: DZ-30-6, PKU

Fig.2. Enlargements of each part (containing 1~3 lunar bands) on coral fossil DZ-30-16, PKU.

Fig.3. Variations of days per year in 700 Ma since late Precambrian. Red points are derived from this research, while others are cited from former studies [1,2,3,4,7,8,9,10,11,12,13,14,15]. Each critical point implies an impact event.

In order to explain our discovery, modern astronomic theory of the Milky Way Galaxy called ‘Density wave theory’ [16,17] is applied to make attempt in explaining the catastrophes and paleontological records. Coincidentally, each time the solar system travel through the spiral arms corresponds to K-T event [18], P-T event [19,20] and Prec-C event, respectively. Calculations revealed that the spiral arms would impose an influence on Earth and the solar system, which is astronomically slight but biologically giant enough. Energy transfer would occur between the spiral arms’ gravitational field and earth, and was accompanied with impacts.

Fig.4. Solar system’s movement in the Milky Way since late Precambrian.

Illuminated by this discovery, the author did a thorough research on Earth’s circumstantial changes in the transition and the arresting life evolution, and profounded such a hypothesis: In the Late Precambrian, a celestial body impacted Earth. The Lake Acraman im-
pact structure\textsuperscript{21} was favored as the impact site. The author suggested the high temperature of impact\textsuperscript{22} had ended Morinoan glaciation in Australia\textsuperscript{23} and therefore facilitated the communication of biological information. Synchronously, rapid changes of Earth’s environment enkindled the genesis-control system, and released HSP-90 variations\textsuperscript{24}. After the impact, benefiting from the protection of nascent ozone layer\textsuperscript{25} and energy supplement from aerobic respirations\textsuperscript{26,27}, those surviving life burgeoned and generated complex metabolism to acclimatize themselves to the new circumstance.

The author has made a large amount of analyses and numerical simulations in order to verify the reasonableness of this research. Furthermore, we illustrated that this hypothesis fits well with most of important astronomic and geologic discoveries. Detailed sampling suggested that, with merely one possible exception, Edicaran acritarchs appear to occur only after the Acraman impact ejecta layer\textsuperscript{28}.

**References:**