

Temporary exhibition *Great Extinctions – a Geologist at the Scene of the Event* at the Geological Museum of the Polish Geological Institute – National Research Institute

The year 2025 marks the 45th anniversary of the groundbreaking publication by the father and son duo, Luis and Walter Alvarez, and their colleagues, about the collision of a large asteroid with Earth that caused a mass extinction in the Late Cretaceous. This controversial study not only sparked extensive discussion in the scientific world, but also garnered a lot of attention among the general public that rarely takes an interest in the results of basic research. In a short time, it promoted the topic of mass extinctions, which had been on the periphery of geological sciences throughout the 20th century, and changed the way we perceive geological events in the past.

With reference to this anniversary, a new temporary exhibition at the Geological Museum of the Polish Geological Institute – National Research Institute is devoted to the topic of mass extinctions in the Earth's past. The exhibition is entitled *Great Extinctions – a Geologist at the Scene of the Event*. The grand opening was carried out on December 6, 2024 by the Undersecretary of State – Chief National Geologist Mr. Krzysztof Galos and the Director of the Polish Geological Institute – National Research Institute Mr. Krzysztof Szamalek.

Mass extinctions in Earth deep past

The exhibition portrays many years of research results gathered by countless scientists from around the world, who, step by step, uncovered the secrets of mass declines in biodiversity in the Earth's past. It focuses on such phenomena as mass extinctions as a process, discussing topics of species' average lifespan, the extinction rate relative to the background extinction rate, as well as the very definition of a mass extinction. Space is also devoted to familiarizing visitors with the evolutionary history of early life forms on Earth and the first biotic crises, such as the oxygen revolution, also called the oxygen catastrophe or the Great Oxidation Event, that took place in the Paleoproterozoic between 2.46 and 2.06 billion years ago. It is considered by some scientists as the first mass extinction of species in the histo-



Fig. 1. Part of mandible (lower jaw) of the mighty *Tarbousaurus bataar*, the Mongolian cousin of famous *Tyrannosaurus rex*. From the collections of the Institute of Paleobiology of Polish Academy of Sciences. Photo by M. Świło



Fig. 2. An array of fossils, victims of the Late Permian mass extinction that wiped-out ~90% of species from the face of the Earth. From the collections of the Geological Museum of the Polish Geological Institute – National Research Institute. Photo by M. Świło

ry of life on Earth. Another notable event was the Ediacaran extinction, which claimed 74 to 90% of life forms at that time, making room for the diversification of skeletal organisms during the so-called “Cambrian explosion of life”.

Geologist on the trail of the Big Five

The largest part of the exhibition is devoted to the so-called Big Five mass extinctions, i.e. the five largest and most famous biotic crises in the Phanerozoic, over the last 540 million years: the end-Ordovician extinction (~445 million years ago), the end-Devonian extinction (~372.2 million years ago), the extinction at the Permian-Triassic boundary (~252 million years ago; Fig. 1), the end-Triassic extinction (~201.5 million years ago) and the extinction at the Cretaceous-Paleogene boundary (~66 million years ago).

The exhibition presents the timing, duration and nature of each extinction, its scope expressed in the percentage of extinct species and higher taxonomic groups, as well as the most important victims. A special place in the exhibition is held by the description of the complex causes and processes that led to such large and fateful biotic crises.

In addition to the text and graphics, geological specimens are an inseparable part of the exhibition. Every effort has been made to select them so that they best illustrate the world that disappeared as a result of climate and ecological changes and catastrophes. The visitors will be able to see the inhabitants of the ancient great Devonian reefs, large Triassic amphibians and the bones of the last dinosaurs from the Cretaceous (Fig. 2).

Anyone who visits the exhibition cannot pass by the title character of the exhibition, a brave and attentive Mr. Geologist who investigates the scene with a hammer in his hand. The Geologist-Detective, along with his case files, will be waiting for visitors until May 2025.

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