

Dear Friends,

At the very end of 2018 came great news: two discoveries by Russian scientists got on the Science's Breakthrough of the Year list. Interestingly, both were made in evolutionary biology. The first was that the primitive multicellular organisms Dickinsonia that appeared on the Earth long before the Cambrian burst of life are not a dead end of the evolution, as proven by the analysis of organics from fossil prints. The second was the discovery concerning the origin and formation of present-day humans: scientists from the Novosibirsk Institute of Archaeology and Ethnography SB RAS found, in Denisova Cave in Gorny Altai, the bone remains of a half-breed between two ancient people – a Neanderthal and a Denisovan.

The paleogenetic analysis of the tiny bone fragment performed at the laboratory of Prof. Svante Pääbo (Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany), with whom the Novosibirsk scientists have had a long and successful history of cooperation resulted in the first direct evidence of a mixture between these two very different groups of ancient hominins. In this issue of the journal, Prof. A. Derevyanko not only dwells on the details of this discovery, but also summarizes the many years of archaeological research done in Gorny Altai, including the discovery of the previously unknown ancient man, which brought on a new view on the history of present humanity.

Over two thousand years ago, the ancient Roman poet Horatio wrote, "What is hidden under the earth, time will show in broad daylight." If we substitute "time" for "new technologies," these words will perfectly apply to our days. New technologies have made it possible to read the hidden pages of the humanity's evolutionary history.

Most of the amazing discoveries made recently in the area of human origin that have transformed our conception of the Homo sapiens development became possible thanks to paleogenetics. When the ancient DNA hidden in fossil bones was sequenced, Neanderthals came back to our family tree, and Denisovans – a previously unknown group of ancient hominins whose genetic contribution to modern mankind is quite important – were discovered. The story about how ancient DNA was sequenced and how it changed our concept of linear human evolution is told by one of the founders of paleogenetics, Prof. Svante Pääbo and Dr. Vivian Slon,



a young researcher from the department of evolutionary genetics at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

Further examination of the fossil remains from Denisova Cave and of the genes inherited from the Denisovans holds the possibility of new discoveries. Until recently, the only "record" of this hominin was the genome obtained from a few teeth and a fragment of bone. Today, however, judging by the report at the annual American Association of Physical Anthropologists held in March 2019, the fragments of a Denisovan's parietal bone found by Novosibirsk archaeologists in 2016 have been first identified based on mitochondrial DNA. Another revelation announced at the same conference was that some representatives of an ancient Denisovan population successfully mixed with the present-day humans about 30,000 to 15,000 years ago, i.e. on the threshold of historical time! Details of these discoveries have not been published yet.

This issue of the journal contains our traditional rubric intended for the general reader "Expeditions Encyclopedia." The readers, together with the archaeologists, can take part in the archaeological diggings in the Kashmir Valley squeezed by the Himalayan mountain ranges.

*Academician Nikolay L. Dobretsov,
Editor-in-Chief*