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Impact-related microspherules in Late Pleistocene Alaskan and Yukon “muck” deposits signify recurrent episodes of catastrophic emplacement

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Large quantities of microspherules have been found in fine-grained sediments retained within seven out of nine, radiocarbon-dated, Late Pleistocene mammoth (*Mammuthus primigenius*) and bison (*Bison priscus*) skull fragments. The well-preserved fossils were recovered from frozen “muck” deposits (wind-transported, organic-rich silt) that overlie gold-bearing gravels located in stream valley bottoms within the Fairbanks and Klondike mining districts of Alaska, USA, and the Yukon Territory, Canada. In addition, elevated platinum (Pt) abundances were measured in sediment analyzed from three out of four fossil skulls. The high-temperature, melt-quenched and accretionary microspherules, and Pt enrichments, are well-established indicators of extraterrestrial impact events. In view of this new evidence, much of the death, dismemberment, rapid burial, and preservation of megafaunal bones and carcasses within the frozen Beringian mucks, as well as within similar frozen Yedoma deposits of Siberia (e.g., the Berezovka mammoth), are perhaps better explained by the catastrophic effects of cosmic impacts rather than by more commonplace causes of mortality such as illness, accident, advanced age and/or predation. The mucks and their well-preserved but highly disrupted and damaged vertebrate and botanical remains are therefore reinterpreted in part as blast deposits that resulted from several episodes of airbursts and ground/ice impacts within the northern hemisphere during Late Pleistocene time (~46–11 ka B.P.). Such a scenario might be associated with repeated bombardments by cometary debris in Earth-crossing orbits, such as the early Taurid Complex, that was most likely generated from contemporaneous fragmentation of a large short-period (sub-Jovian) comet within the inner Solar System.