

THE PERIGLACIAL EXPANSION OF MARMOTS (MARMOTA) IN MIDDLE EUROPE DURING LATE PLEISTOCENE

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ABSTRACT.—Scattered fossil remains of the rodent genus *Marmota* are known in Eurasia back to the late Pliocene, but are most numerous in the late Pleistocene. Together with mammoths and some tundra and steppe species of animals, the marmot is a constant component of Upper Paleolithic fauna of the Valdai (Würm) glacial epoch. The ecology and habitat preferences of modern marmots indicate that they must have been well adapted to conditions of the periglacial zone of the last glaciation, and this may have been the reason for their wide spread over Eurasia during the Valdai (Würm). The traditional concept of marmots as inhabitants of the post-glacial steppe seems to be incorrect.

Thirteen species of marmots are generally recognized, of which eight inhabit Eurasia (Fig. 1). The steppe marmot, *Marmota bobac*, still preserved in a few steppe regions in the western European part of the USSR, also can be found on the left (east) bank of the Volga River and the southern Urals. Great numbers also dwell in western and central Kazakhstan. The gray or Altai marmot, *Marmota baibacina*, inhabits Central Kazakhstan, the Altai, Tarbagatai, Dzhungar Alatau, and Tien Shan mountains, northwestern Mongolia, and western China. The Mongolian marmot or tarbagan, *Marmota sibirica*, dwells in the Transbaikalian region, Mongolia, and northern China; the Kamchatka or black-capped marmot, *Marmota camtschatica*, inhabits eastern Siberia, Kamchatka, and the mountains of northern Transbaikalia; the long-tailed or red marmot, *Marmota caudata*, lives in the western and southern Tien Shan and the Pamir-Alai, in addition to Kashmir, Afghanistan, and northwestern Pakistan; Menzbir's marmot, *Marmota menzbieri*, inhabits only the mountains of western Tien Shan; the Himalayan marmot, *Marmota himalayana*, lives in the mountains of central Asia, Tibet, western China, and the Himalayas; the Alpine marmot, *Marmota marmota*, now inhabits only the Alps and the Carpathian mountains (Tatras).

Almost all species of marmots, especially those now distributed in Eurasia, are morphologically similar, which seems to indicate their recent origin. Opinion differs on the number of species of marmots; some authors distinguish eight in Eurasia (Ognev, 1947; Gromov, 1963; Gromov *et al.*, 1965). Bazhanov (1947), Bannikov (1954), and Bibikov (1967) recognized six; Kuzyakin (1963), four; Ellerman and Morrison-Scott (1951), three; and Rausch (1953), one. On the other hand, many subspecies are recognized (*M. bobac*, three; *M. baibacina*, five) and the presence of hybrid individuals and even populations where ranges of species meet also indicate a close relationship of the species.

Recent investigations of karyotypes of marmots also confirm the impression of the genetic youth of these animals. Karyologically, Eurasian marmots are homogeneous; six of the seven Palearctic species have $2N = 38$, and only *M.*