

Geologic attractiveness of the Zagros Mountains for early humans

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The Zagros Mountains of Iran, which culminate in Mt. Zard (4548 m), formed along the convergent boundary between the colliding Arabia and Eurasia plates during late Miocene to early Pliocene time. The range consists almost entirely of limestone. Recently, the Zagros Mountains have yielded key evidence of the expansion from Africa of *Homo sapiens*, which originated in East Africa 200,000 to 100,000 years ago. There are two main routes from Africa to Eurasia, a northern route from the Sinai Peninsula to the Levant and a southern route around the Arabian Peninsula. Because recent research in Iran has documented Paleolithic remains from before 50,000 years ago at Arsenjan, northeast of Shiraz, the southern Zagros Mountains have received attention for their role in the southern route of early human migration. Early humans who followed this route onto the Eurasian continent would have confronted the Zagros Mountains immediately. This situation, however, was so fortunate for them that the Zagros Mountains became a starting point for the spread of humans to the rest of the world. Raw material for stone tools was easily available in the form of radiolarite (chert), and the abundant limestone caves served as ready dwellings near the radiolarite outcrops. This limestone-radiolarite association that characterizes the Zagros Mountains provided superb conditions for these ancient people. This association also occurs elsewhere in Western Asia and in the Mediterranean region. The objective of this study was to determine what geological factors in the Zagros Mountains brought benefits to the first humans coming out of Africa. During the Jurassic, the continents of Laurasia and Gondwana were separated by the shallow Neotethys Ocean. Present-day western Asia was located at the innermost part of the Neotethys near the paleo-equator at a favorable location for upwelling currents, resulting in high faunal productivity. Thus, an extensive carbonate platform developed on the Arabian continental margin. After the Arabia plate separated from the Africa plate and collided with the Eurasia plate, the limestone-radiolarite association was folded and uplifted to form the Zagros Mountains. Here came to be a land replete with limestone caves and widespread radiolarite that welcomed ancient *Homo sapiens*.

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