



Reply to discussion of “Dextral transpression in Late Cretaceous continental collision, Sanandaj–Sirjan Zone, western Iran”

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We thank Nazar Numan for his interest in our paper. Most of his discussion is, however, mainly concerned with a brief review of stratigraphic relationships and their inferred structural and tectonic significance in the northwest continuation of the Zagros and Arabian platform in Iraq. While these relationships are relevant to developing a wider understanding of continental collision in the Middle East they have no relevance for much of the content of our paper. We were mainly concerned with an analysis of structures produced during and prior to collision and how transpression has developed wide zones of strike-slip deformation in metamorphic and plutonic rocks in western Iran.

An issue that Numan (2001) has raised that is relevant to our paper is the timing of continental collision in the Sanandaj–Sirjan Zone of western Iran which we noted as Late Cretaceous within the study area in western Iran. In contrast Numan has suggested that in northern Iraq final closure of Neo-Tethys occurred in the Eocene and was followed by continental collision. Some disagreement does exist in the literature over the timing of continental collision between Central Iran and the Afro–Arabian continent along the Zagros Mountains. Stoneley (1981) and Berberian et al. (1982) have argued that in the Late Cretaceous ophiolite and radiolarite allochthons were emplaced on the northeastern Arabian continent and that continental collision did not occur until the Miocene. In contrast, reviews by Berberian and King (1981) and Alavi (1994) noted that ophiolite emplacement and continental collision occurred in the Late Cretaceous in western Iran. This has been followed by continuing convergence in the Cainozoic resulting in folding and thrusting in the Zagros Fold–Thrust Belt since the Miocene (e.g. Alavi, 1994).

It was beyond the scope of our paper to outline all the evidence for Late Cretaceous collision in the Sanandaj–Sirjan Zone of western Iran. Although this is a topic that

we cover in a manuscript presently being prepared (along with R. Sahandi) on the regional geology and tectonic interpretation of the Sanandaj–Sirjan Zone. We noted in our paper (Mohajjel and Fergusson, 2000, p. 1135) that a suite of Late Cretaceous to Palaeocene plutons postdates the major deformation associated with the collisional event in the northwestern part of the Sanandaj–Sirjan Zone. Furthermore, regionally we have recognised a Late Cretaceous suture zone associated with this collision. No evidence exists for either an Eocene or Miocene suture zone in the northwestern Sanandaj–Sirjan Zone of western Iran.

We make the point that variations in the timing of collision may occur along a collision zone due to the presence of re-entrants and promontories in the colliding continents. Hempton (1985) found that the Bitlis Suture, the western continuation of the Zagros Suture in Turkey, formed by continental collision in the Eocene after ophiolite obduction in the Late Cretaceous. In contrast in western Iran ophiolite obduction was synchronous with continental collision as shown by the deformation record of the Sanandaj–Sirjan Zone (see Alavi, 1994). These differences may be real and reflect earlier continental collision in western Iran due to the presence of a promontory compared with younger continental collision further to the west in Turkey.

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