COMPARATIVE PLANETOLOGY: ACHERON FOSSAE - SCANDIA COLLES, MARS: A HIGHLY DEGRADED PENDANT OF THE TEMPE TERRA UPLANDS WITH RESPECT TO THE ALBA PATERA SYSTEM...AND ALBA PATERA AN IMMATURE VENUSIAN CORONA?

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Various authors have investigated the volcanic activities of Alba Patera (1) and have speculated about the possibility that the central axis of the Ceraunius Fossae, Alba Fossae, and Tantalus Fossae together with the very large but low shield volcano Alba Patera (i. e. the Alba Patera - System) indicate a rift-like feature (2) and/or a (fossil?) block-/plate boundary (3). Such an interpretation is supported by the unique set of large linear grabens (Ceraunius Fossae) which trend north - south south of Alba Patera and form north of Alba Patera a giant horsetail structure (Alba Fossae, Tantalus Fossae), and by a more recent paper in which a large plume/dome beneath Alba Patera is proposed (4). Moreover, the relief which is formed by the grabens resembles very much that of the Afar Triangle in Ethiopia, Africa - especially in the area of the Ceraunius Fossae and the southern part of the Alba- and the Tantalus Fossae. An investigation of the relief division of the environs of the whole system provides additional hints for the existence of a (fossil?) embryonic spreading axis along the central axis of the Alba Patera - System.

Appr. 900km e a s t of Alba Patera the Tempe Terra - Uplands set in very abruptly with steep escarpments which stand some 500 - 1 500m high and run subparallel with respect to the central axis of the Alba Patera - System. These escarpments form an abrupt boundary between the low and much younger surface around Alba Patera and the much older surface of the Tempe Terra - Uplands. The subparallel arrangement of that boundary between two major martian units is especially evident with respect to the Acheron Catena and the Phlegeton Catena.

The w e s t e r n set of features with a similar spatial distribution with respect to the Alba Patera - System is represented in part by the eastern boundary of the Acheron Fossae and north of 60° Lat. by the Scandia Colles, a large group of erosional outliers west and northwest of Alba Patera. Whereas the eastern boundary of the Acheron Fossae and the southern part of the Scandia Colles run subparallel with respect to the central axis of the Alba Patera - System at a distance of appr. 900km and 1 300km resp., is the northern part of the Scandia Colles arranged roughly concentrically with respect to the centre of Alba Patera at a distance of appr. 1 800km (Fig. 1).

Taking into consideration that the grabens of the Alba Patera - System form a very rift-like relief and that the escarpments of the neighbouring uplands or their remnants run (sub)parallel to that rift-like system the preliminary interpretation seems to be justified that the central axis of the Alba Patera - System in deed can be interpreted as a further (fossil?) embryonic block-/plate boundary within the area of the TaNoVa - Updoming along which minor spreading has happened - a situation which is similar to that within the Valles Marineris (3,5).

However, the general situation in the investigation area is very much complicated by the giant but very low shield volcano Alba Patera which in general resembles more the relief of an updoming with a diameter of appr. 900km rather than the relief of a typical martian shield volcano. The existence of that volcano has obviously influenced the course of the southern branch of the Alba Fossae and of the Tantalus Fossae so much that they nearly form a circumferential feature with a diameter of appr. 600km. In this context it should be pointed out that similar features of similar dimensions are common on Venus, the venusian coronae (6). After the investigation of the general situation of the Alba Patera - System the preliminary assumption seems to be acceptable that this structure not only indicates an embryonic (fossil?) block-/plate boundary but resembles very much a venusian corona as well, the evolution of which came to a halt in a somewhat immature stadium prior to the collapse and/or subsidence of the central part of Alba Patera. Hence, the investigation of the Alba Patera - System on Mars is a challenge for comparative planetology (Mars - Venus) as well.

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COMPARATIVE PLANETOLOGY: ALBA PATERA, MARS - VENUS (CORONAE)

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