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Western extension of the Kuala Lumpur fault zone

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A prominent zone of lineaments striking 280°–300° through the Kuala Lumpur area (Gobbett, 1964; Ayob, 1968; Shu, 1969) has been recognized by Stauffer (1968, 1969) to represent a series of sinistral strike slip faults. Judging from Gobbett's map the zone may span a width of 15 km while it extends for at least 80 km. Stauffer (1968) sees the 30-km wide fault bundle of the Mersing area as the eastern continuation. Lineaments in both fault zones strike in similar directions but their internal organisations seem different (Fig. 1). Left slip on the Kuala Lumpur fault zone amounts to an aggregate of about 20 km as is indicated by offsets of lithologic boundaries and possibly also by similar displacements of alluvial tin zones (Stauffer, 1969). The Kuala Lumpur fault zone was active after the late Triassic-early Jurassic granite intrusion. Postmagmatic movement is also indicated by strained quartz within the Klang Gates quartz dyke that may be regarded as a late magmatic intrusion into a strand of the Kuala Lumpur fault zone. According to the general geologic history of the Peninsula, tectonic activity ceased by Late Cretaceous or Early Tertiary. Some geologists have suggested that the ?Miocene Batu Arang beds west of Rawang became downwarped on account of tectonic deformation. It seems more probable to me that probably gradual, subsidence of its presumably calcareous basement imparted a basinal structure to the overlying rocks. Tectonic deformation may be expected to develop anticlines as well as synclines. The calcareous rocks may be the Kuala Lumpur Limestone. For the present I assume that fault movement also ended in Early Tertiary.

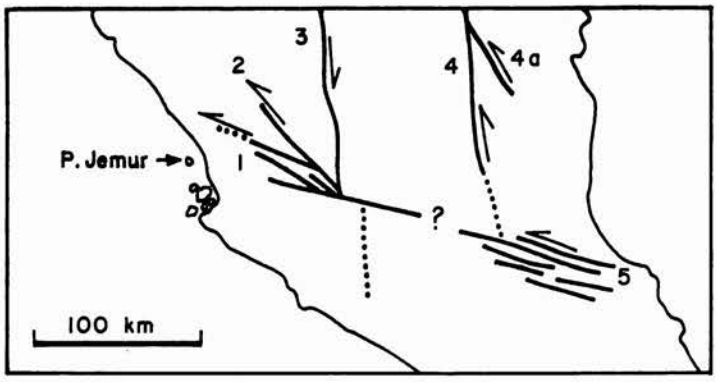

Fig. 1. Location of Pulau Jemur in the Straits of Malacca and as a continuation of the southern at branch of the Kuala Lumpur fault zone. Fault zones within the region are (1) Kuala Lumpur, (2) Bukit Tinggi, (3) Kelau-Karak, (4) Lebir, (4a) Lepar, a subsidiary fault of the Lebir zone, (5) Mersing.

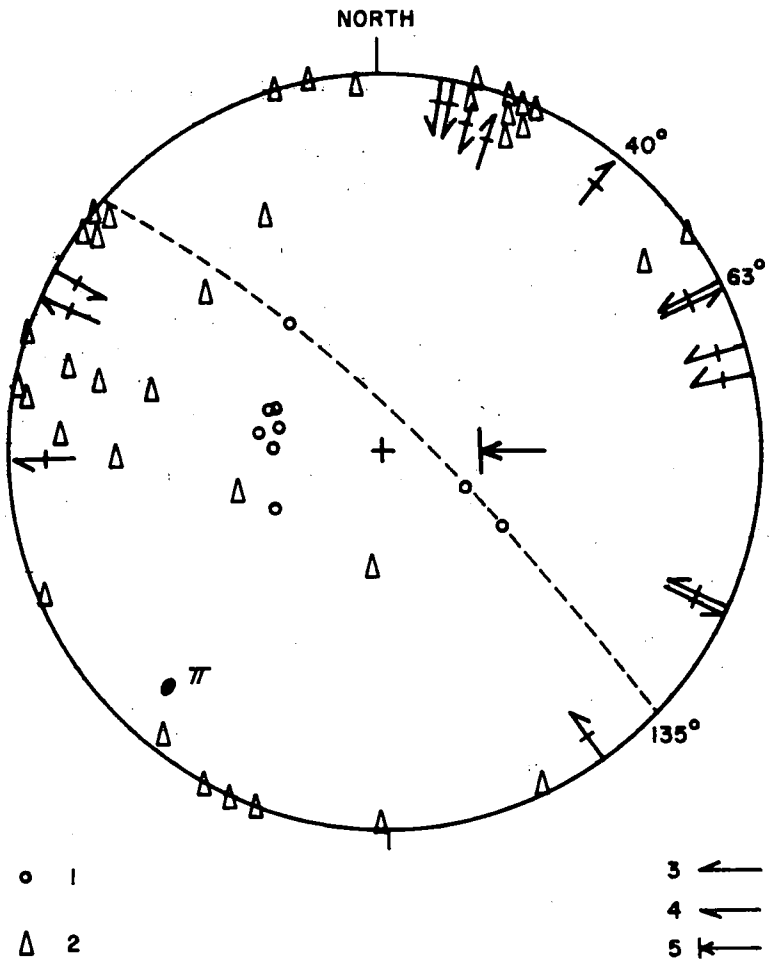

Fig. 2. Lower hemisphere, equal-area projection of structural elements on Pulau Jemur. Key: (1) pole to foliation plane, (2) pole to fault flaser plane, (3) pole of pitch of fault striation having left slip sense, (4) ditto indicating right slip sense, (5) ditto indicating reverse faulting. Short bars across the arrows indicate the average pitch of fault striations. Pi-pole plunging 10 degrees in 225° direction has been constructed based on observed fold limbs; other foliations outside the Pi-girdle probably represent NNE-striking and eastward dipping isoclinal fold limbs.

The majority of fault motions is compatible with a compression direction that acted within the sector 40°–63°. The observed fold indicates compression in 135° direction which may represent a second regional compression or a compression that had been reoriented on account of left slip movement on the major faults striking 115°.

Until now, to the west, the fault zone has only been followed up to Batu Arang. Beyond that locality its trace is lost below the coastal plain. Structural mapping of rocky islets in the Strait of Malacca has revealed that one strand of the Kuala Lumpur fault zone outcrops on Pulau Jemur, approx. 1.5 km west of Jeram village on the mainland (Fig. 1).

In the northern part of Jemur island occurs a flasered, 30-metre wide zone consisting of twisted and boundinaged metatuff lenses in black mylonite. Relatively straight and vertical fault planes cut through the flasers. Small 30-metre wide zone consisting of twisted and boundinaged metatuff lenses in black mylonite. Relatively straight and vertical fault planes cut through the flasers. Small markings on several of the 115°-striking, vertically disposed fault planes indicate left slip motion. The markings include recrystallized steprisers facing the direction whence the opposite fault block come, tectonic prod depressions on the stoss sides of fragments embedded in the fault planes, and spall fractures across the striated planes and opening towards the direction of fault movement (Tjia, 1972).

Sense of fault motion, phyllonite foliation planes, and foliation planes have been plotted on an equal-area projection (Fig. 2). The majority of structures and sense of fault movement are compatible with a regional compression that acted within the sector 40°–63°. A few senses of motion cannot be explained by this compression direction, like for instance those striking west and west-northwest and having right slip movement. These fault motions may have occurred on fractures that were subsidiary to the main faults and thus represent manifestations of reoriented stress fields (Tjia, 1972) or their motions were generated by another compression direction, i.e. a few foliations. Work in progress by the author and students of this university in the Lebir Valley, Kelantan, in the Kuala Dungun area, Trengganu, and near Dingkil, Selangor, shows that multiple deformations with compression acting in various directions were active in the Peninsula.

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