Already the tilted spin axis of Uranus has been attributed to the impact of an $\sim 2M_E$ planetary body on proto-Uranus[6]. Numerical experiments[7] have shown that the properties of the present Neptunian moons and the Pluto–Charon system can be understood in terms of the tidal encounter of Neptune with a 2–5 M_E planetary body.

The idea of a perturbing body (with a dimensional mass/velocity of 5) in the outskirts of the solar system has many attractions. As we have seen, it can explain the tilt of the Uranian spin axis. This perturbing body would take 10–100 years (depending upon its velocity) to move to the Neptunian orbit. If during this time Neptune has already formed its equatorial disc, then the tidal effect of this outgoing can explain why the two Neptunian satellites became irregular and Pluto–Charon heliocentric. And if the body had a mass of $100M_E$ it can account for the missing gas that should otherwise have enriched the outer Jovians.

If the perturber had a very small velocity (and a low mass), it would end up as a satellite of Uranus. This is ruled out because of the extreme regularity of the Uranian satellite system, which precludes a captured satellite. If the perturber had a velocity of about 7 km s^{-1}, it would be bound in the Sun's gravitational potential, and should be detectable as a yet undiscovered planet at a large heliocentric distance.

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BEDDING PLANE FAULT IN THE KALADGI ROCKS, BASIDONI, BELGAUM DISTRICT, KARNATAKA STATE

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DEVELOPMENT of a bedding-plane fault in the quartzarenitic rocks of the Kaladgi Group at Basidoni (16°51′25″N, 75°13′30″E), situated 18 km north-east of Saundatti, is evidenced by the development of a bluish-green pseudotachylyte, covering an area of 4500 m^2. The layer of pseudotachylyte is sandwiched between low-dipping quartzarenites. Striations and grooves trending N 70°E–S 70°W and N 30°W–S 30°E, and shears trending N 35°W–S 35°E (most frequent), N 70°E–S 70°W (intermediate frequency) and N 70°W–S 70°E (least frequent) are associated with the bedding-plane fault.

Several workers[1–5] have studied different parts of the Kaladgi basin, but there is no mention of such a fault by them. Angular unconformity is clearly noticed between the Kaladgi and the underlying Archaean gneisses. Two kilometres north-west of Basidoni, exposures of 80 m-thick pink quartzarenites dipping 4–5° due S 20°E are characterized by the presence of a thin (1 cm) veneer of glassy, bluish-green pseudotachylyte (figure 1). The bedding-plane fault dips gently (2–3°) due south-east. Pseudotachylyte layers are also noticed in the beds of quartzarenites occurring below the one shown in figure 1. In the vicinity of psuedotachylyte the rocks are found to be actively sheared in several directions.

The development of pseudotachylyte in the quartzarenites and the association of striations, grooves and shear planes in the vicinity of psuedotachylyte support the existence of a bedding-plane fault. The striations indicate displacement on the fault plane in two directions, viz. N 70°E–S 70°W and N 30°W–S 30°E. However, considering the higher frequency of striations trending N 70°E–S 70°W, it is suggested that greater/frequent movement might have taken place in this direction. Considering the fact that striations trending N 30°W–S 30°E are obscure, it may be surmised that the movement in that direction occurred at an earlier period and consequently the striations have become obscure.

The development of several parallel layers of pseudotachylyte one below the other probably indicates the presence of several 'parallel bedding-plane faults'.

Figure 1. Field photo showing the development of unusually large-sized bedding fault. Note the development of bluish-green pseudotachylyte, the remnants of which are seen in the form of patches (outlined). Striations in two different directions are also developed, though they are obscured. View looking north-west. Location: 2 km west of Basidoni village.

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REACTION OF DIBENZOYLMETHANE WITH FORMALDEHYDE: A REVISED STRUCTURE FOR THE PRODUCT

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RECENTLY, Joglekar and Samant[1] reported that 1,3-diphenyl-1,3-propanedione and formaldehyde in ethanol in presence of different amines gave 2-benzoyl-1,5-diphenyl-1,5-pentanedione (**1**) through base-catalysed cleavage. Spectroscopic data were interpreted and a suitable mechanism for the formation of **1** has also been proposed. However, a critical examination of the PMR spectroscopic data of **1** points out that (i) the methylene (4-CH_2) adjacent to carbonyl appears at considerably downfield (5.70 ppm), which is unusual for this type of protons[2], and (ii) the absence of a signal corresponding to a methine (2-CH) connected to two benzoyl groups, although such protons were located earlier[3].

A literature survey reveals that the PMR data reported for **1** by Joglekar and Samant agree well with those recorded for 2,4-dibenzoyl-1,5-diphenyl-1,5-pentanedione (**2**)[3,4].

R
|
$PhCOCHCH_2CH(COPh)_2$

1 R=H

2 R=COPh

The mass spectrum of **1** was reported[1] to have a peak at m/z 356, attributed to the molecular ion. It