corresponding to the m-th state, in case the (0-0) transitions are not observable (which is generally the case in solution study). D is the dielectric constant and n the refractive index of the solvent, μ_e and μ_g are the dipole moments of the solute in the electronic excited and ground singlet states respectively. The quantity 'a' is the radius of the solute cavity in the solvent dielectric (as given by Onsagar).

The estimated quantity $(\mu_e - \mu_g)^2/a^3$ in isomeric trifluoromethylbenzonitriles is found to vary in the order para < meta ≈ ortho. Under an assumed value of 'a' about 2A, the estimated values of $(\mu_e - \mu_g)$ are 1·47, 1·69 and 1·68 debye units in para, meta and ortho isomers respectively. Corresponding calculations in case of trifluorotoludines give $(\mu_e - \mu_g)$ as 2·3 and 2·5 debye units in meta and para isomers respectively. It is significant to observe that in case of trifluorotoludines, the change in dipole moment is larger than that in case of trifluoromethylbenzonitriles. In the first case, the substituents are electron withdrawing *vs.* electron donating, whereas in the latter both substituents are electron withdrawing. Secondly in the toludines, the charge transfer states make a contribution to the excited state. Both these factors contribute to the greater dipole moment change in case of amines than in nitriles.

The results obtained by this method show the change in the dipole moment which in turn contribute substantially to the understanding of the nature of the states

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FIRST RECORD OF GOLDEN OOLITES FROM THE BEDESAR FORMATION, JAISALMER BASIN, RAJASTHAN

IN the Jaisalmer basin, Rajasthan, the sequence of rock formations is as summarised in Table I.[2,4,7,8]

TABLE I

Lower to Middle Eocene	Bandha Formation	75 m
Paleocene to Lower Eocene	Khuiala Formation	100 m
Paleocene	Sanu Formation	75 m
	—Unconformity—	
Lower to Middle Cretaceous	Abur Formation	60 m
Lower Cretaceous	Parihar Formation	305 m
	—Unconformity—	
Jurassic	Bedesar Formation	61 m
	Baisakhi Formation	150 m
	Jaisalmer Formation	300 m
	Lathi Formation	360 m
Triassic	Non-calcareous Sandstone and Claystone (Sub-surface)	260 m

The rock formations are correlatable to those in Kutch; Lathi to Patcham, Jaisalmer to Chari, Baisakhi to Katrol, Bedesar to Upper Katrol-Lower Umia, Parihar to Umia, and Abur to Ukra[8]. "Golden Oolite" occurs in the Chari as a few layers "constituting the DIADEMATUS ZONE (*Indo-cephalites diadematus*), which is a calcareous oolite, the grains of which are coated with thin films of ferric oxide giving them a golden colour"[8]. It is quite thick, locally disturbed and often wanting[5]. The Variegated Series of Salt Range and its Trans-Indus continuation also contain thin layers of "Golden Oolite", similar to the Kutch rocks, associated with argillaceous limestone, and rust-coloured sandstones, and formed as a result of the ferruginisation of an oolitic limestone[5]. The Jaisalmer Formation has oolites in its upper part noted at several localities in the Jaisalmer basin[3]. Near Hamira (27° 0″ : 71° 4′ 30″), golden calcarenite of 20 cm thickness has also been recorded, which shows coarse grained limestone with metallic lustre, golden yellow coloured coatings on tiny gastropods upto 2 mm size; these are restricted to the lower part of the Jaisalmer Formation. The "Kuldhar Member" named as the topmost portion of the Jaisalmer Formation has oolite bands[1]. "Golden Oolites" are also found at the same horizon in the Jurassic of Europe. Thus the oolitic zone serves as a marker horizon in the Middle Jurassic strata of Western India and Pakistan.

This note records, for the first time, oolites from the Bedesar Formation. The localities of conspicuous occurrence are the hill ·807 due south of Kumbhar Kotha (26° 44′ 25″ : 70′ 44′ 55″), Chinchaloi Dungar (26° 40′ 45″ : 70° 34′ 40″), east of Malan-ka-Than (Dhanneli) (26° 35′ 50″ : 70° 34′ 30″), 4·5 km ESE of Bida 26° 42′ 30″ : 70° 31′ 35″), and 0·5 km north-west of hill ·731 in the district Jaisalmer. Systematic geological mapping has revealed that these oolites form a persistent horizon and can be traced all over the area in the lower portion of the Bedesar Formation.

South of Kumbhar Kotha, on western side of the hill ·807, bands of yellow and golden yellow oolites, oolitic ironstone, and oolitic marlstone occur in 9 m thick sequence of ferruginous sandstone and ironstone. They are confined mainly to the upper 5 m section. Greyish oolites also occur as a distinct band in the brownish weathered calcareous marlstone in the lower 4 m sequence. This horizon is located in the lowermost portion of the Bedesar Formation. Shallow digging in the area has revealed the occurrence of gypseous bentonitic clay, which is indicative of the occurrence of Baisakhi Formation.

A well-exposed 75 cm thick bed is recorded at the base of 4 m thick sequence, comprising ironstone, calcareous ironstone, ferruginous sandstone, and sandy ironstone, along with bands of hematite and ochreous sandstone, exposed on the eastern side of Chinchaloi Dungar.

The oolites form up to 35% of the quartzose rock and occur in a ferruginous cement (Figs. 1, 2, Plane Polarized Light, ×32). They are confined to the ferruginous,

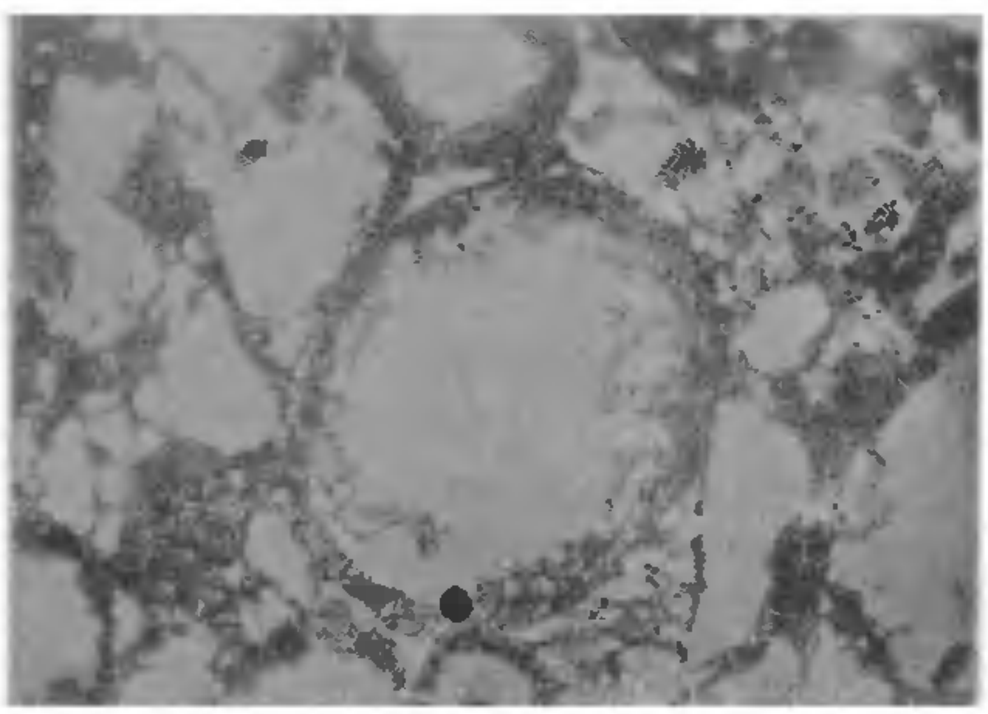

FIG. 1

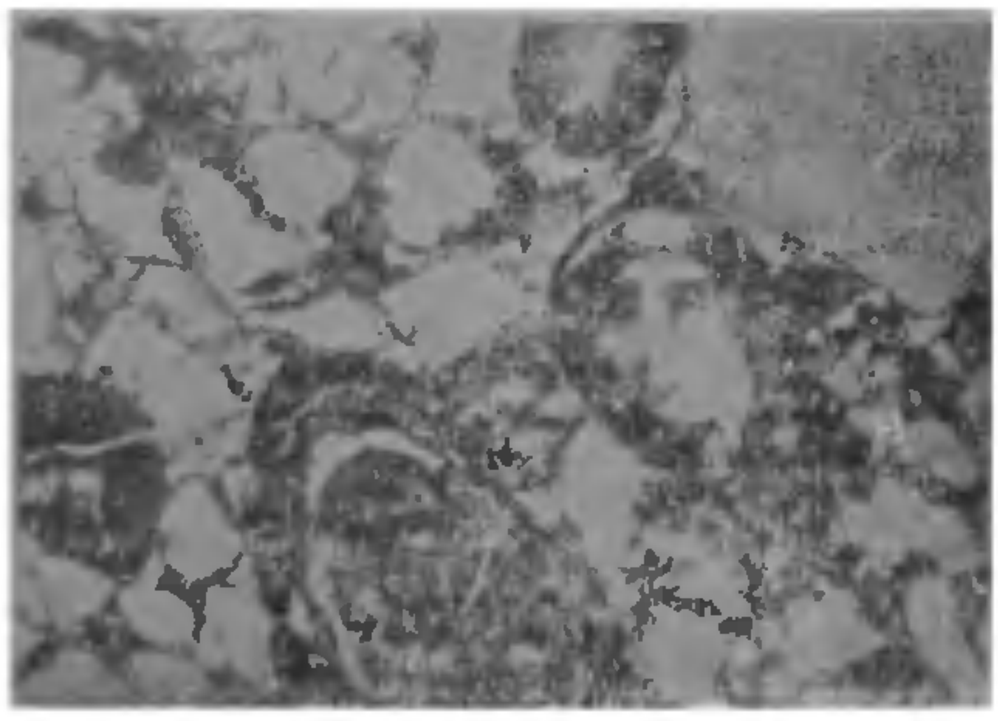

FIG. 2

vitreous, red, brown, and maroon coloured grits and gritty sandstone, interstratified with thin layers of hematite, and hematitic matter. The yellow colour is due to ferric oxide coating on calcareous oolites, showing one concentric layer (Fig. 1) or more (Fig. 2) embedded in a reddish or maroon coloured ferruginuous matrix. The nuclei of oolitisation is quartz and calcite. The rock is likely to be completely overlooked in the field, as has been done by previous workers, unless examined very closely, and traced laterally. The rock formation forms cappings of the Baisakhi Formation, separated as isolated scanty hillocks in the vast desertic terrain. The oolites owe formation evidently due to the intense ferruginisation of the beds.

Western Rajasthan forms part of the shelf in which Mesozoic and Tertiary sedimentation took place, the basin extending from Kutch in the south to the Salt Range, Pakistan, in the north. Oolites have not been reported so far from the beds correlatable to the Bedesar Formation, *i.e.*, Upper Katrol–Lower Umia beds of Kutch, or of equivalent beds in Pakistan. This find, therefore, is of significance in indicating the configurational set-up of the Jaisalmer basin.

The association of oolite horizons with the interbedded sequence of grits, sandstones, and ironstones is indicative of the fact that the shore line was oscillating between near-shore to neritic environments. The oolites were formed in the near-shore environment where high energy conditions were prevalent. Their prevalence also exhibits unstable tectonic condition in the basin.

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