STORE HOUSE OF CURRENT BEDDING IN THE VINDHYAN SANDSTONE UMMAID PALACE HILL, JODHPUR (RAJASTHAN)

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The present communication records the occurrence of various types of current bedding met in the Vindhyan sandstone forming the hill over which stands the historical building, the Ummaid Palace, in the city of Jodhpur in Rajasthan. The area constitutes a part of Vindhyan basin of Western Rajasthan mapped by Heron (1932). The sandstone is strongly current bedded in the area. However, no indication of ripple marks was observed anywhere. Ripple marks are generally formed above a certain minimum current velocity, but are easily destroyed if the velocity increases beyond certain limits. The presence of various types of current bedding perhaps suggests the velocity of the current much above the critical values within which ripple formation could take place.

Current bedding: Depending upon their nature, the various kinds of current bedding present in the area may be grouped and discussed as below:

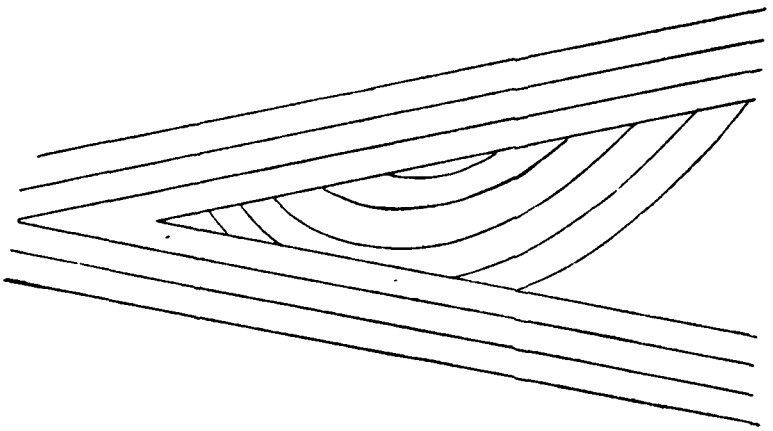

Figure 1. Wedge-trough type of current bedding.

(a) *Tabular current bedding:* The most prevailing type of current bedding present in this area, is the one characterized by more or less parallel top and bottomset beds with foresets having truncated tops and asymptotic bottoms. The foreset has a varying thickness to a maximum of about 12″ and length up to about 3′6″, dips towards SW. It occurs in more or less equigranular coarser sandstone which shows relatively better sorting. The sandstone is composed of grains of coarse to medium size. At times there is concentration of heavy dark coloured minerals along the bedding plane, more so towards the bottom of the foreset. In a few instances streaks of mica rich layers are met which impart easy fissility to the rock.

(b) *Wedge-trough type of current bedding:* (Fig. 1) This type is next to tabular current bedding in preponderance. In this case the topset and bottomset beds form a wedge and meet at an acute angle ranging roughly between 20°–25°. The foreset bed which occupies an intermediate position forms a trough bearing a geometrical

resemblance to a mini-syncline. The maximum thickness of the foreset varies between 18″ to 24″. The trough ranges roughly between 2 ft. to 6 ft. in length. Such a current bedding occurs where sandstone is gritty and composed of more or less well rounded granules ranging from 0.25″ × 0.15″ to even more, These granules in coarse to medium grained sandstone impart a heterogeneous nature in an otherwise relatively homogeneous rock. It is also characterized by the presence of a heavy dark coloured mineral along the bedding plane particularly in the foreset beds. When streaks of mica are present the rock is more fissile. Less frequently highly rounded ferruginous pieces are found to be embedded in the sandstone.

(c) *Lens-shaped current bedding:* (Fig. 2) It is a rare type in which again the topset and bottomset beds meet but at comparatively smaller angle and are separated by a lens-shaped double convex foreset bed of lengths seldom measuring up to 3′ and thickness a couple of inches only. The lens is relatively light-pink in colour. Occasionally fine laminations are also present within the lenticular foreset bed.

(d) *Torrential current bedding:* In very few cases, simple cross straight foreset bed is met. The topset and bottomset beds are more or less parallel but the foreset bed shows a small dip of about 5°–10°, generally 7° with respect to the top or bottomset beds which themselves dip at an angle of about 5°. Such a small foreset dip of 10°–15° is rather uncommon.

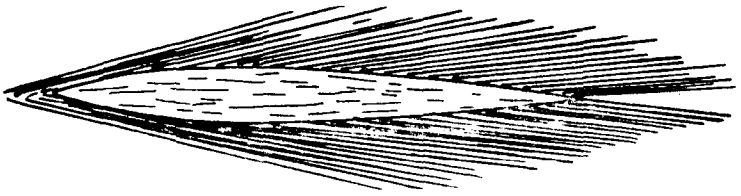

Figure 2. Lens-shaped current bedding

Discussion: The above description reveals that the area exhibits a rich and interesting variety of current bedding and has therefore been aptly designated as a 'store-house of current bedding'.

The different beds of the current beddings are dominantly distinguished by the intensity of colouration (red) of the rock followed by the size of the constituent grains. It is quite an uncommon experience to meet so many varieties of current bedding in the same but small area of hardly half a square mile. It would appear that the conditions of deposition locally varied at these places rather very rapidly. The beds were deposited under shallow water conditions. The occurrence of granules possibly indicates the flood-time deposits which were received in the receptacle where sedimentation of coarse to medium grained sediments was going on. As in the flood time the velocity of the current increases thereby increasing its competence and also the supply of detritals, the gritty sandstone shows a thicker scale of current bedding.

Conclusions: As a result of the above description and discussion, the following conclusions have been drawn:

(a) The Vindhyan sandstone is a shallow water deposit.

(b) The beds show right side up because the tabular type of current bedding shows truncated top and asymptotic bottom.

(c) The conditions of sedimentation have been rapidly changing as is evidenced by the presence of various types of current bedding and their thickness.

(d) The area also received some flood-time sediments of granules etc. which got deposited along with the coarser and finer sediments.

(e) The current bedding is developed at a site where sand was being dropped over the edge of a growing sand bar. This indicates that the site must have been in close proximity of the shore.

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Reference

Heron, A. M., (1932) The Vindhyans of Western Rajputana *Rec. Geol. Surv. India,* Vol. LXV, pp. 457-489.