

## BOOK REVIEWS

Ashok R. Marathe

Geoarchaeology of the Hiran Valley, Saurashtra, India

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The growing dependence of archaeology on the earth and natural sciences is evident from the increasing number of archaeological publications with a multidisciplinary approach. Geoarchaeology, in its widest sense, ranges from the initial location of archaeological sites, through an evaluation of geomorphic and geologic data, the physical and chemical analyses of sediments from present as well as paleoenvironments, a complete analysis of archaeological data and finally to geochronology. A more restricted application of the term involves the contribution of the earth sciences to the interpretation of archaeological contexts. The Saurashtra Peninsula, from this point of view, is in the happy position of having preserved evidence of marine, transitional as well as continental deposits, of environmental changes from the late Tertiary onwards, as well as stratified evidence of Early Man and his cultural adaptations. Ashok Marathe's study of the Quaternary environment and archaeology of the Hiran Valley is important not only because it aims at geoarchaeological reconstruction but also because it documents the first evidence of Lower Palaeolithic artefacts to have been dated in the context of littoral stratigraphy.

The first two chapters introduce the problems and detail the present day environment of Saurashtra. The Hiran Valley was chosen as a 'type area' for concentrated study only after a complete survey of the central, eastern and southern parts of Saurashtra. The book can essentially be divided into two parts, the former involving a study of stratigraphic sequences, fluvial and coastal morphology and the subsequent physical and chemical analysis of sediment

samples from the above environments, while the latter comprises essentially a typological study of the Lower and Middle Palaeolithic artefacts from the area.

The most interesting aspect of the palaeo-environmental study largely because of its controversial nature is the discussion on miliolite. Essentially limestone formations, miliolites occur along the coast as well as further inland. They overlie Trap, Gaj Beds, fluvial gravels and marine clays and are found at heights ranging from a few metres to 130 metres AMSL. The composition of the miliolites varies from calcarenites to micrites and calcareous clays. The controversy centring on the miliolite revolves round the problem of whether it is the product of aeolian or marine processes. Beginning more than a hundred years ago, when miliolite was first reported and until recently, scholars have been divided on the subject and have supported only one or other hypothesis. This may, of course, have been the direct result of the fact that most researchers tended to concentrate on only one aspect of the miliolite and furthermore in a restricted area of observation.

Marathe has shown that the miliolite formations can be classified as marine, fluvio-marine and aeolian. He has further distinguished two phases of formation designated as M-I and M-II. The importance of the recognition of these two phases is: a) that it has been possible to establish a relative chronology of geomorphic events in the area and by tying these sequences to other known or dated sequences elsewhere suggest a timescale for these events; and b) that as an extension of this, the Palaeolithic tools associated with or underlying the miliolite deposits have also been dated.

And yet the picture is by no means completely clear. The chemical analyses (CaO, MgO, Al<sub>2</sub>O<sub>3</sub>, and SiO<sub>2</sub> percentages) showed no marked difference between the inland and coastal miliolite samples. Petrological studies were also not by themselves useful in this context, and even scanning electron microscopic results indicated that samples from well above sea level at Umrethi (84m AMSL) and Bhatchel (130m AMSL) Paradoxically showed subaqueous characters and no aeolian features. Consequently these studies cannot, either by themselves or together be used in support of any particular hypothesis. As someone who has faced similar problems, the reviewer is able to appreciate Marathe's quotation from Karl Butzer describing the present status of pleistocene studies as an "almost insurmountable morass of unintegrated and seemingly contradictory data, an unlimited number of alternate stratigraphic frameworks and a nomenclature so debased as to be worse than useless..."

Aimed at a geoarchaeological reconstruction of Quarternary events, this study does not sufficiently emphasise the nature of man-land relationships either in the Hiran Valley or Saurashtra in general. This may be partly the result of the paucity of archaeological material. The total number

of Lower Palaeolithic artefacts is 19, out of which only 3 from the Umrethi dam site and one from the base of Adi Chadi Wao are stratified. There are about 60 Middle Palaeolithic artefacts—an amorphous collection — out of which more than 40 are scrapers. None of these tools were found in a stratified context. Without the environmental background it would then be very difficult on the basis of the archaeological data alone to make any except the most generalised statement about the prehistoric cultures. The radiometric dates are based on <sup>14</sup>C as well as <sup>230</sup>Th/<sup>234</sup>U assays. With regard to the oyster shells from Badlapur it would have strengthened the case to have obtained some geochemical data on the type of shell material, degree of re-crystallization, if any, etc. The U/Th dates should, as even the dating laboratory maintains, be used with great caution at this stage, as much more work is necessary before we can accept such dates with any degree of precision.

In the Indian subcontinent new fields of research are being opened up and new techniques being applied. Despite its limitations Marathe's study marks an advance in the field of prehistoric archaeology in India and is a worthwhile contribution to the subject.

S. J. Guzder

#### D. M. Wagh

#### 'Agricultural Planning A micro level approach with reference to Maval taluka Pune district' — a report of the I C S S R supported research project

It is rare to find a microlevel study of a taluka like the one presented by D.M. Wagh on agricultural planning of Maval taluka, an area nestled amidst the Sahyadri and straddling athwart to occupy the western fringe of the 'Desh.' The imperative for such a study in the context of contemporary Indian scene, when sustained self-sufficiency in agriculture is proving elusive, is only too obvious to need any justification. What

appears intriguing is the choice of the area having less than 20% of the land under cultivation and squeezed between invading forces of Indian's two major metropolitan centres, Bombay and Poona. Does one expect the study to induce a degree of agricultural development of the taluka or a model of agricultural planning to evolve in such an area?

The report (mimeographed), running