Discussion

The above measurements show that the 3rd molar teeth in our material have full resemblance, in length and width of the crown, with those in authentically identified specimens of *Bos namadicus* Falconer from Nerbada alluvium and Kathiawar. The 2nd and 1st molar are nearly similar except that they are somewhat larger in our material.

It is certain that the piece of mandible with the molar teeth from Susunia is similar to those described for the fossil species *Bos namadicus* Falconer.

The fossil *Bos namadicus* has been reported from India (Pilgrim, 1939) as early as middle Pleistocene from Nerbada alluvium, old alluvium of Penganga and Jamuna River and Billa Sugam cave of Kurnool. The age of the mandible from Susunia discussed here is estimated to be about 20,000 years old. It, therefore, would be the youngest among fossil specimens of this species earlier recorded from other areas in India and incidentally constitutes the first record of this species from Bengal in eastern India. Judging from the fact that one of us (S. Banerjee) has obtained some teeth of this species from Mochpal, Barasat, 24-Parganas District; about 30 Km. east of Calcutta along with partially petrified bones of *Bubalus bavelvicus* Falconer and some early pottery wares, a prehistoric sites ascribed to the Mauryan tradition period (c. 2000 years) indicate that this species survived recently in the eastern India and it seems to have had a fairly wide distribution in the late tertiaries in the Indian peninsula.

Against this context we may have to revise our ideas about the identity of the voluminous bovine remains excavated from the prehistoric sites of the so-called Indus Valley Civilisation at Hareppa, Mohenjodaro, and other areas in India.

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ARTERIOSCLEROSIS ASSOCIATED WITH PULMONARY OSSIFICATION IN ALPINE GOATS

The association of arteriosclerosis with pulmonary ossification is of rare occurrence in goats. However, this association in sheep was observed long ago in Argentina and recently in Punjab in large number of Corriedale sheep. In India a number of cardiovascular investigations have been carried out, but none of these indicated any such association suggesting the rarity of this combination in goats. The present communication deals with the study of 94 Alpine goat carcasses subjected to necropsy and followed by routine histopathology. For detection of calcium salts von Kossa technique was employed.

At necropsy, unusual prominence of aorta was observed in 5 cases. The vessel was hard to cut and opening mineralized plaques were seen scattered over the entire intimal surface of the organ (Fig. 1), however, the extent of mineralization varied with the individual cases. In advanced cases the plaque formation resulted in appreciable narrowing of the lumen. Focal whitish spongy areas in the lungs produced grating sound while cutting, owing to mineral deposition in this organ too. The microscopic examination of aorta revealed focal or diffuse basophilic granular deposits in the tunica media. In extensively calcified regions the presence of osteoid tissue (Fig. 2), along with degenerative changes in the adjacent tissues were noticed. The myocardial muscles also suffered degenerative changes leading to necrosis. In two cases laying down of mineral salts accompanied with fibrous tissue proliferation in lungs resulted in marked thickening of interalveolar septa. Metaplastic leading to well marked areas of ossification characterized by the formation of osteoid cells in

Fig. 1. Gross specimen of aorta showing mineralized plaques over the entire intimal surface.
the severely calcified regions of lungs were also noted (Fig. 3). Calcification also affected the tunica media of some renal arteries. The calcified foci developed blackish coloration on von Kossa’s staining.

Fig. 2. Section of aorta showing severe calcification with few osteoid cells (arrow) in the tunica media. H.E. × 75.

Fig. 3. Section of lung showing calcification and ossification (arrows) replacing considerable portion of pulmonary tissue. H.E. × 75.

In goats, the cases of arteriosclerosis as well as pulmonary ossification in isolation are on record but the information about the association of both the conditions in goats as observed during the present study is lacking in the available literature. In India it seems to be the first report of its kind affecting goats, however arteriosclerosis in sheep accompanied with metaplastic changes leading to ossification in lungs and some other organs has recently been recorded in Punjab4. The etiology of this condition is still obscure but mineral imbalance seems to be the likely possibility.

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STUDIES ON SALIVARY ENZYMES OF RAGNUS IMPORTUNITAS DISTANT (HEMIPTERA: MIRIDAE)

Insects deposit salivary secretion in or on plants when feeding which significantly influence the physiology of the surviving tissues. Some of the secretions result in phytotoxicity including galls in plants. Previous reviews on salivary secretions, particularly that of Hemiptera, were those of Carter1 and Miles2. The mirid, Ragirus importunitas Distant causes serious damage to sunn hemp (Crotalaria juncea L.) resulting in chlorotic leaves, cessation of growth and considerable loss of seeds3. Therefore attempts have been made to identify the enzymes present in the salivary glands of R. importunitas so as to understand the physiology of feeding and the results are presented below.

The salivary glands were dissected from freshly collected adults and nymphs of R. importunitas and the salivary extract was prepared, as per the method of Hori4, by homogenizing the contents in distilled water and centrifuging at 26,000 g for 5 minutes. The clear supernatant was used as the enzyme preparation. One ml of the solution contained extract from 5 to 10 pairs of salivary glands. The enzymes in the salivary glands were detected as per the methods described for each, viz., pectic enzymes5, macerating enzymes6, cellulase7, amylase and protease8, other carbohydrases8, lipase9 and polyphenol oxidase10.

The salivary glands of R. importunitas were found to contain pectic enzymes, macerating enzyme(s), cellulase, amylase, protease and polyphenol oxidase. The pectic enzymes were identified only in the posterior lobe of the principal gland. The enzyme activity was persistent even upto 10 days after dissection. Macerating enzyme capable of digesting potato tissue was evident in the salivary apparatus. Complete maceration of potato disc of 10 mm diameter and 30 μ thick occurred in 5 hr per ml of the enzyme solution containing 10 pairs of salivary