

The Origin of the Pisiform

WHILE studying the bones of an immature female langur (*Semnopithecus entellus*) it was observed that the pisiform had two centres of ossification, viz., a diaphysial centre giving rise to the major part of the bone and an epiphysial centre for its distal end. This observation appeared significant (Fig. 1). A dissection of

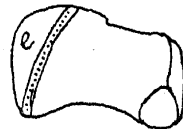


FIG. 1

Pisiform of immature *Semnopithecus entellus*, (left), $\times 2$. Inferior view showing epiphysis, *e*, at distal end.

the wrist of another immature animal and an X-ray photograph (Fig. 2) of an intact limb confirmed the normal presence of an epiphysis for the pisiform in the langur. In an articulated skeleton (of a male adult animal) which the author had previously made, the result of the union of the two constituent parts was seen. The fact that the pisiform bone has in it the elements of a diaphysis and a distal epiphysis has not been recorded previously in this or in any other animal.

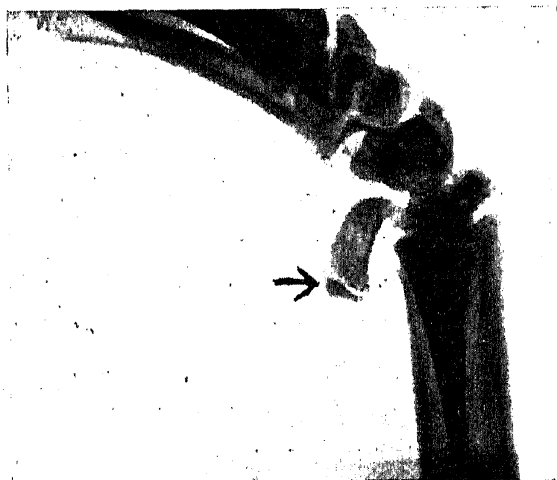


FIG. 2

X-ray photograph of wrist, side view, the arrow pointing to the epiphysis of the pisiform

In the dissected wrist of the langur, the flexor carpi ulnaris muscle was inserted into the epiphysial part of the pisiform whence its prolongations to form the pisohamate and the pisometacarpal ligaments were made out.

The presence of a diaphysis and an epiphysis would lead one to consider the pisiform as a definite skeletal element rather than as a sesamoid bone. According to Keith¹ the M. gastrocnemius in the lower limb corresponds to the M. flexor carpi ulnaris in the upper limb. The insertion of the flexor carpi ulnaris to the epiphysial part of the pisiform is comparable with the insertion of the gastrocnemius to the epiphysial part of the calcaneus. From this it is suggested here, in as much as the primitive carpus and tarsus are similar, that the pisiform appears to be a definite carpal element and that its serial homologue in the tarsus is probably included in the posterior part of the calcaneus.

A fuller discussion on the subject will be published elsewhere.

I wish to thank Dr. P. Kesavaswami, Radiologist, K. G. Hospital, who kindly took the X-ray photograph for me.

A. ANANTHANARAYANA AYER.

Department of Anatomy,
 Andhra Medical College,
 Vizagapatam,
 July 7, 1940.

¹ Keith, Sir A., *Human Embryology and Morphology*, London, 1933, 505.

A Lecture Demonstration of Mixed Solvent Action

It has been observed before that two non-solvents when mixed together may sometimes function as a good solvent for a solute, the case of some forms of nitrocellulose dissolving in a mixture of ether and alcohol forming one of the best examples of this behaviour. Dewaxed shellac is mainly composed of a soft resin, soluble in ether and a hard resin (α -lac) insoluble in it. This α -lac when dry is practically insoluble in acetone, methyl acetate, water and glycol. It has however been observed, that when a mixture of acetone and traces of water, or acetone and glycol, or methyl acetate and water, or methyl acetate and glycol, is

added to dry α -lac, the latter goes quickly into solution. This phenomenon can be utilised as a lecture experiment to illustrate mixed solvent action.

(1) α -lac (hard lac resin) prepared by repeated extraction of the soft resin portion of dewaxed shellac by ether, is dried thoroughly in vacuum at about 42° C. for three hours, after which small quantities (about 0.5 grams) of it are taken in two sets of three test-tubes. To one set is added 5 cc. each of dry acetone, water and aqueous acetone (10 per cent. water) respectively, whilst to the other set is added 5 cc. each of dry methyl acetate, glycol and a 1:1 mixture of methyl acetate and glycol respectively. It will be noticed that the α -lac in contact with the mixed solvents goes into solution in a minute or so at ordinary temperature whilst with the single non-solvents, no such dissolution takes place even on warming.

(2) As the preparation of α -lac from shellac involves a somewhat laborious process for ordinary demonstration experiments, dewaxed shellac which is available in the market could be dried under vacuum as before and experiments conducted with it in the same manner. Experiment with methyl acetate-glycol mixture is easier to demonstrate since the shellac need not be very carefully dried and the sensitivity of the experiment to a small quantity of impurities is far less. The solvents must be dried by the ordinary laboratory methods before using.

H. K. SEN.
S. R. PALIT.

Indian Lac Research Institute,
Namkum, Ranchi,
June 19, 1940.

Detection of Adulteration in Ghee by a Study of its Fluorescence

THE property of ghee (clarified butter-fat), to produce a characteristic fluorescence under the influence of ultra-violet light was utilised independently by Jha¹ and Muthanna and Mukerji² to evolve a method for detecting its

adulteration. The former reported results of a qualitative study covering a number of samples of ghee and its common adulterants. The latter while confirming the qualitative observations, developed a quantitative method for measuring the intensity of the fluorescence so produced. Using a Pulfrich photometer these authors obtained 'standard curves for the common adulterants of ghee'. In these studies fresh samples of clarified butter fat were used.

As pointed out previously in a note,³ there are a number of factors that require consideration in any study purporting to deal with the quality of butterfat, and as long as one is in the dark regarding the identity of the particular substance or substances responsible for the reported fluorescence in ghee, all factors which influence its behaviour such as the season, feed, period of lactation, breed and species peculiarities and others need careful attention. Equally important is the question of the age of the sample. The work so far reported on the subject goes to show that under certain given conditions, the age of the sample exerts considerable influence on the known "butter constants". Added to these are the commercial practices in this country of colouring almost the bulk of the marketed ghee and butter with a variety of artificial colours.

Since reports regarding the typical fluorescence of ghee were encouraging, it was considered of interest to study the limitations, if any, imposed on the method suggested by Muthanna and Mukerji (*loc. cit.*) by the factors mentioned in the foregoing. The present communication is confined to the results of a study of the influence of the age of the sample and the artificial colours. Work is in progress concerning the other factors.

A number of ghee and butter samples which were received in the laboratory for examination were subjected to the fluoremetric analysis, after their regular analysis was finished. Some of these samples were fresh and genuine and the others were old and were stored in the laboratory for the last sixteen months. One sample was nearly nineteen months old.