

ON THE SESAMOID BONES OF THE HAND: A SKIAGRAPHIC CONFIRMATION OF THE WORK DONE BY PFITZNER. By EDWARD FAWCETT, M.B. Edin., *Professor of Anatomy, University College, Bristol.*

"THE sesamoid bones were quite well known to the ancient anatomists; and Soemerring, in his osteology, has given us a good description of them.

"In our time they have been carefully studied by Gillette in 1874; by Aeby in 1875; and by Retterer in 1884. Quite recently—in 1892—their study was revived by Pfitzner, who has published on this subject in the *Morphologische Arbeiten de Schwalbe* a voluminous memoir based on the minute examination of 388 hands and of 385 feet."¹

Through the kindness of Mr Chattock, Professor of Physics in University College, who has shown the greatest possible interest in the subject, I have been able to examine the hands of thirty-eight of my own students and of three of his by means of skiagraphy. The results exceeded in every way my fondest hopes. Not only were sesamoid bones clearly portrayed, but the cancellous tissue of the various bones was depicted in a delightfully clear manner.

Before stating what the actual results arrived at concerning the position and number of the sesamoid bones were, let me quote from Testut's *Anatomy* what is there mentioned with regard to them; and, in doing so, let me at the same time point out that the statements made in the work in question are based on the conclusions arrived at by Pfitzner. Testut² states that the peri-articular sesamoids of the hand are all situated on the palmar face of the joints, *i.e.*, on the side of flexion; that they are met with exclusively in the neighbourhood of the metacarpophalangeal and interphalangeal articulations; that they are very variable in form, volume, and number; that their number varies from two to seven for each hand; that two are constant, *viz.*, those which correspond with the metacarpophalangeal articula-

¹ Testut, vol. i. fascic. i. page 343.

² *Traite d'Anatomie Humaine*, vol. i. fascic. i. page 343 *et seq.*

tion of the thumb; that the others are not so constant, only appearing in certain subjects; that these are in order of frequency those of the metacarpo-phalangeal articulations of the index and the little finger, that of the interphalangeal articulation of the thumb, those of the metacarpo-phalangeal articulations, and the interphalangeal of the other digits.

The *metacarpo-phalangeal sesamoids of the thumb* are two in number—one radial, the other ulnar.

The *interphalangeal sesamoid of the thumb* is situated on the flexor aspect of the interphalangeal joint, in the thickness of the capsular ligament of that joint.

The *metacarpo-phalangeal sesamoids of the index and fifth digit* are placed, as their name indicates, in the neighbourhood of these articulations, and always on the flexor aspect.

Typically, there are two sesamoids for each joint, but this condition is rare: most often one only exists for each, viz., a radial one for the index, and an ulnar for the little finger.

The *metacarpo-phalangeal sesamoids of the medius and ring finger* are relatively very rare; only one is found in each case,—at least in man. Pfitzner in 388 hands has only seen the ulnar of the ring finger and the radial of the middle.

The *sesamoids of the distal interphalangeal joints* are extremely rare. Pfitzner has only observed one situated on the index.

Let us now see how far these results may be confirmed by skiagraphy. As has been said before, 38 hands were examined.

In the *metacarpo-phalangeal articulation of the thumb* two sesamoids were found in every case, and they varied much in size, sometimes being very large.

In the *interphalangeal joint of the thumb* a single sesamoid was present 26 times, that is, in 68½ per cent.

In the *metacarpo-phalangeal joint of the index* a single radial sesamoid was found 21 times in 38 hands—roughly speaking, 55·2 per cent. This sesamoid, when well developed, has its long axis placed in the long axis of the digit, hence it is oval in shape. In one case it was large and circular in outline.

It lies under that part of the head of the metacarpal which is ventral to the notch for the radial lateral ligament of the joint. In one case, however, this sesamoid was placed further forward than usual, and projected for a third of its extent beyond the

head. In all cases it was the radial sesamoid that was seen, not one hand showing the ulnar.

The *distal interphalangeal joint of the index* in no case showed any sign of a sesamoid. (Pfitzner only saw it once in 388 hands.)

The *metacarpophalangeal sesamoid of the little finger* was present in 27 of the 38 hands examined, *i.e.*, in 71 per cent.

In 2 cases there were two sesamoids present in this joint, *viz.*, a large ulnar and a small radial.

When one sesamoid is found, it lies usually under the ulnar half of the head of the metacarpal bone.

In 1 case it projected forwards beyond the head, as also did the indicial sesamoid of the same hand.

It seems, from the specimens I have examined, that the indicial sesamoid is larger than the one of the little finger in the majority of cases: there are, however, exceptions.

No sesamoid was observed in the ring and middle fingers.

It will be seen that these results correspond very closely with those of Pfitzner, and they were much more easily obtained; in fact, the ease with which they were obtained speaks volumes for the industry of Pfitzner, who, of course, had to dissect out these bones. These results only differ when applied to the relative frequency of the interphalangeal sesamoid of the thumb. Pfitzner places this sesamoid behind those of the little finger and the index. In my results, it comes between those of the index and little fingers. Thus, in little finger a sesamoid occurred in 71 per cent., in the index in 55·2 per cent., in the interphalangeal joint of the thumb in 68·5 per cent.

| | | |
|---------------------------|------|-----------|
| Little finger, | 71 | per cent. |
| Thumb (interphalangeal) . | 68·5 | „ |
| Index, | 55·2 | „ |

This arrangement, I venture to think, will be found to be the correct one.

I found it true of first 15 hands I examined, and it was equally true of the next 15.

I confess I do not understand why the little finger should show a sesamoid more frequently than the index, unless it is due to the fact that this finger possesses short special muscles such as are found in the thumb.

I have not found that *age* has any special bearing on the size or number of these bones, for one of the poorest examples occurred in a student aged 40, and one of the best, with the largest sesamoids, in one aged 17.

Then, again, muscular strength seems to have, at all events in the cases I have examined, no practical influence on size or number of sesamoids, certainly not on number, because in that respect the number is as great in females as in males, and in the left hand as in the right; and I have reason to suspect that great muscular strength is not necessarily associated with great size of the sesamoids, because in one case, that of an exceptionally powerful student (muscularly), the sesamoids were small, whereas in a weak student (generally) they were large.

These are points which, however, will bear further examination. It would be absurd to base any definite conclusions as to influence on thirty-eight cases; but one can justly from this number draw some conclusions as to the occurrence of these bones, and I have done so here, because our own text-books say very little about them.

"Quain," for instance, vol. ii. pt. i. p. 105, says:—"A pair of sesamoid bones is placed in the palmar wall of the metacarpo-phalangeal articulation of the thumb; and similar nodules, single or double, are sometimes found in the corresponding joint of one or more of the other fingers, most frequently of the index and little fingers."

"Macalister," p. 159, mentions only the sesamoids of the metacarpo-phalangeal joint of the thumb.¹

"Holden," p. 337, 7th edition, describes two at the metacarpo-phalangeal of the thumb, and says—"We rarely find any in the fingers."

"Wilson"—last edition, edited by Clark—is the only book alluding to the greater frequency in the little finger.

"Morris" says nothing about them under Osteology, but refers to some of them cursorily under Arthrology.

In the thirty-eight hands I have examined I have never found sesamoids in connection with the ring finger nor the medius, nor have I seen the inter-phalangeal of the index. It is evident that they are rare.

¹ Since writing the above, I observe that "Macalister," page 162, says, "always in the thumb, and sometimes on the other fingers, especially on the inside of the little finger, the fibro-cartilage ossifies into a sesamoid bone receiving the insertion of short muscles." This statement is made only of metacarpo-phalangeal joints.

It is obvious that the figures I have given can only be of relative value, because the number examined is small—a tenth of the number examined by Pfitzner; but they suffice to call greater attention to his work than seems to have been given to it, and to the fact that these bones do exist more frequently than is generally supposed; they also demonstrate the value of Skiagraphy in another branch of Medical Science.

In conclusion, let me again express my indebtedness to the kind enthusiastic help given by my colleague Professor Chattock, and his assistant, Mr L. N. Tyack.