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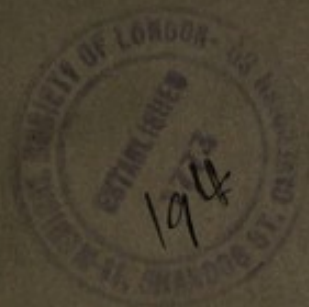
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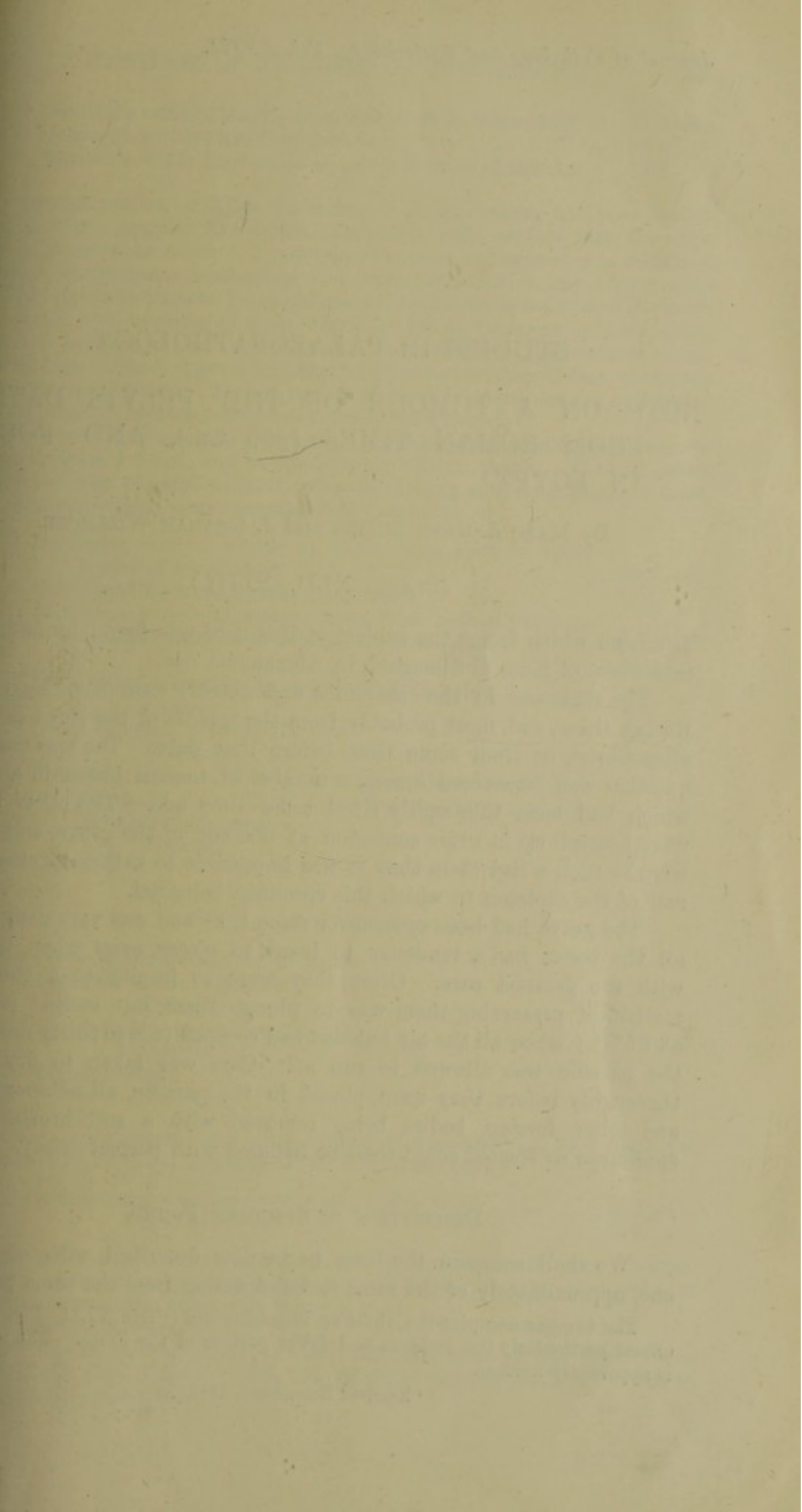
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STUDIES IN PALÆOPATHOLOGY. — NOTE  
ON A TUMOUR OF THE PELVIS DATING  
FROM ROMAN TIMES (250 A.D.), AND  
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## STUDIES IN PALAEOPATHOLOGY.

### NOTE ON A TUMOUR OF THE PELVIS DATING FROM ROMAN TIMES (250 A.D.), AND FOUND IN EGYPT.<sup>1</sup>

By MARC ARMAND RUFFER and J. GRAHAM WILLMORE.

(PLATES XLII.-XLIII.)

THE bone which forms the subject of this note was found by us in the catacombs of Kom el Shougafa, in Alexandria.

The skeletons in the catacombs undoubtedly date from Egyptian Roman times, and, most probably, from the middle of the third century after Christ, or from some time before that date. The specimen in question was discovered among a number of human bones, in a grave which had been thoroughly rifled some time ago. The other bones were heaped up in utter confusion at one end of the grave, and they were in such a bad state that it was impossible to gather together the rest of the skeleton to which this specimen belonged.

The grave had been opened for some time and was very damp, and all the bones had a tendency to break to pieces, even when treated with the greatest care. Often, they were so fragile that the only method of preserving them was to plunge them into melted paraffin at 55° C.; when all the air bubbles had escaped (ten to thirty minutes) the paraffin was allowed to run off. Care was taken to dry the bones thoroughly before they were placed in the paraffin, all adherent soil and other foreign bodies being removed with a soft brush. Specimens so treated could then be handled with perfect safety.

#### DESCRIPTION OF SPECIMEN FOUND.

We shall compare the bone to be now described with a complete one, approximately of the same size and dating from the same period.

The tumour occupies the right os innominatum (Plate XLII. Fig. 1), and affects particularly the ischium and lower portion of the ilium. The os pubis is apparently normal.

<sup>1</sup> Received December 3, 1913.



Maximum vertical length, from iliac crest to tuber ischii .	21.6 cms.
Maximum vertical length of control . . . . .	21.4 „
Maximum width from angle of pelvis to spine of ischium .	12.5 „

Posterior portion of ilium, including articular surface, has been broken away along an irregular line drawn on antero-internal surface, from the angle of great sacro-sciatic notch to a point on iliac crest corresponding to middle of insertion of quadratus lumborum. On postero-external surface a large spike of bone, owing to fracture being obliquely directed from before and outwards to behind and inwards, projects nearly as far as posterior inferior spine. Spine of ischium is also broken away. Thus, the great sacro-sciatic notch, viewed from behind, appears far more nearly complete than it does when seen from interior of pelvis. Broken surface of bone is cancellous and apparently healthy, though perhaps rather more spongy than normal.

Ilium greatly thickened throughout. Crest smooth and rounded, measures at its thickest 1.9 cm., and at its thinnest 1.5 cm. across. Control pelvis shows evidence of osteo-arthritis, with thickening and roughening of crest, yet its corresponding measurements are 1.7 and 0.75 cm.

Maximum vertical length of ilium, from crest to upper border of acetabulum . . . . .	10.0 cms.
Corresponding measurement in control . . . . .	14.4 „
Maximum horizontal measurement, from broken area near superior-posterior to superior-anterior spine . . . . .	12.5 „
Control . . . . .	13.0 „
From anterior-superior to anterior-inferior spine . . . . .	4.0 „
Control . . . . .	2.3 „
Depth of notch between the two . . . . .	0.7 „
Control . . . . .	0.8 „
Thickness of bone, from a point just above acetabulum externally to a little above bony insertion of the psoas parvus internally . . . . .	2.3 „
Control . . . . .	2.1 „

#### *Acetabulum.*

The cavity of the acetabulum is healthy—

Maximum vertical diameter . . . . .	5.7 cms.
Control . . . . .	5.5 „
Maximum horizontal diameter . . . . .	5.2 „
Control . . . . .	5.5 „
Maximum depth . . . . .	2.4 „
Control . . . . .	3.7 „

In the control pelvis there is a good deal of osteo-arthritis, with lipping of the acetabular brim and thinning of the floor of the cavity.

From anterior-superior spine to angle of os pubis . . . . .	15.7 cms.
Control . . . . .	13.5 „

The specimen was sawn across horizontally through middle of acetabulum, from just above the origin of the ischial spine behind to point of junction of horizontal ramus of os pubis with ilium in front.

The obturator foramen is left intact.

The line of section passes through the main mass of the tumour (see Plate XLIII. Figs. 2 and 3). The body of the ischium in particular is seen to be enormously distended.



(a) * The maximum antero-posterior diameter of tumour, as seen on the upper surface of the lower segment, measures . . . . .	7.0 cms.
(b) The maximum transverse diameter . . . . .	5.1 "
Control. . . . .	1.2 "
(c) Maximum vertical length approximately . . . . .	11.0 "
Control identical.	
From centre of the acetabulum transversely across to the inner surface of the pelvis . . . . .	2.5 "
Control. . . . .	0.1 "
From the acetabulum across to the obturator groove, the thinnest part of the tumour, is . . . . .	1.3 "
Control. . . . .	0.3 "

It will thus be seen that the tumour has encroached upon the cavity of the acetabulum, while in the control, in connection with the osteo-arthritis, the seems to have been some rarefying process at work which has unduly thinned the acetabular floor and rendered its cavity deeper than normal.

From a point on the outside just below acetabular margin to a corresponding point on inner surface of body of ischium . . . . .	4.9 cms.
Control. . . . .	2.8 "
From the posterior border of the ischium to most prominent part of anterior margin ( <i>i.e.</i> , about the middle of the posterior border of the obturator foramen) . . . . .	6.0 "
Control. . . . .	3.6 "

The tumour does not appear to involve either the tuberosity or the ramus of ischium. A line drawn from the posterior border of the acetabular notch to the lower border of, and at right angles to, the ramus of the ischium measures only 5.4 cms. as compared with 5.8 cms. in the control; whereas line drawn from the same point—*i.e.*, the acetabular notch—to the nearest part of obturator foramen measures 3 cms., as compared with 1.2 cm. in control.

The obturator foramen is greatly encroached upon; it is crescentic in outline, the two horns pointing backwards and upwards, and backwards and downwards, the enlargement forward of body of ischium being most marked between these horns. The transverse breadth of the foramen at its middle part only 2 cms. as compared with 4.5 cms. in the control; longitudinally, measures 5.5 cms. as compared with 5.3 cms. in the control. Thus, it is evident that the tumour, starting probably in the body of the ischium, has spread forwards so as to encroach on the obturator foramen, and also sideways expanding particularly within the true pelvis. The expansion upwards, therefore, has not been so great, and forwards and downwards it has been still less.

Examined from inside the true pelvis, the bone presents a rounded polished surface, bulging into the pelvic cavity, with seven grooves on it which converge into one large groove passing backwards and outwards under ischial spine. On the inner side, these radiate forwards and spread out fanwise, the uppermost vertically upwards for about 3 cms. in front of the ischial spine; the second

\* Line (a) (7 cms.) is taken from posterior border of body of the ischium to its junction with horizontal ramus of the os pubis. Ramus of pubis is spongy, but while there is a very definite wall between the two, the process seems to have stopped short at this point, *i.e.* the obturator groove.

Line (b) (5.1 cms.) is taken from posterior brim of the acetabulum to the inner surface of the bone just above the origin of the ischial spine.

Line (c) is taken from 1.0 cm. above lower border of ischial tuberosity, which does not appear to be involved, to a point 1.0 cm. above upper border of acetabular brim.



wards the ileo-pectineal line; the third, indistinct, is lost on the bulging surface of the tumour; the fourth, very well defined, deep and narrow (0.5 cm.) passes forwards and slightly upwards and outwards over the body of the tumour and apparently leads directly into the acetabulum. The fifth (1.5 cm. broad in its widest part) is separated from the preceding by a well-marked ridge of bone 0.6 cm. broad, curves upwards and outwards almost parallel to the preceding, and is lost near the posterior margin of the obturator foramen. The sixth, indistinct, runs to the lower angle (or horn) of the obturator foramen. The seventh, well defined, pursues the usual course of the groove for the pubic vessels and nerve. It is probable that all these grooves were formed by enlarged blood vessels.

On section (Plate LXIII. Figs. 2 and 3) the tumour is seen to consist of compact bony tissue with numerous cavities interspersed. One of them, situated near the inner surface, extends from in front of the centre of the acetabulum to near the origin of the ischial spine, and is of considerable size. It measures 2.1 cms. in length, 1 cm. in breadth, and 2 cms. (approximately) in depth. The cavities are in some places smooth and shining, in others they show numerous fine trabeculae which branch and project into the interior and form a delicate honey-comb. These trabeculae are very soft and friable, even after treatment with paraffin.

The cavities above mentioned have no obvious communication with the exterior, and in no way resemble those produced by osteophagous insects, examples of whose work are sometimes to be seen on the surface of certain bones; moreover, they are situated in the midst of hard and massive compact tissue, not in the cancellous tissue.

Microscopically, nothing new was ascertained, chiefly because the sections proved exceedingly unsatisfactory.

#### SUMMARY.

We are here in presence of a tumour which has started in the cancellous tissue of the pelvis. Its growth has caused (1) a very marked expansion of the bone, noticeable chiefly in the body of the ischium and ilium; (2) great deformation of the obturator foramen; and (3) it has encroached to some extent on the acetabulum. Judging from the numerous grooves on the surface, it is very probable that this tumour was highly vascular, and that very soon it would have involved the more superficial parts of the bone, which had remained intact so far.

The exact nature of the tumour must remain uncertain. It is clear, however, that the swelling was not due to any of the infective agents, such as tubercle, syphilis, actinomycosis, etc. From the fact that the larger part of the tumour is solid, secondary carcinoma can so be excluded.

Taking into consideration the fact that the swelling is deeply seated, partly solid and partly cystic, and had evidently been growing fast, we are of opinion that the tumour was most probably an osteosarcoma, of which the bony substance has resisted the effects of time, whereas its soft parts have disappeared.

It is not possible, however, to say whether the tumour was primary or secondary.



## DESCRIPTION OF PLATES XLII.-XLIII.

(The blocks have been prepared from paintings by M. A. COOPER.)

## PLATE XLII.

FIG. 1.—Tumour *in situ*.

## PLATE XLIII.

FIGS. 2 and 3.—Section through the tumour.

(The drawings are exactly natural size.)

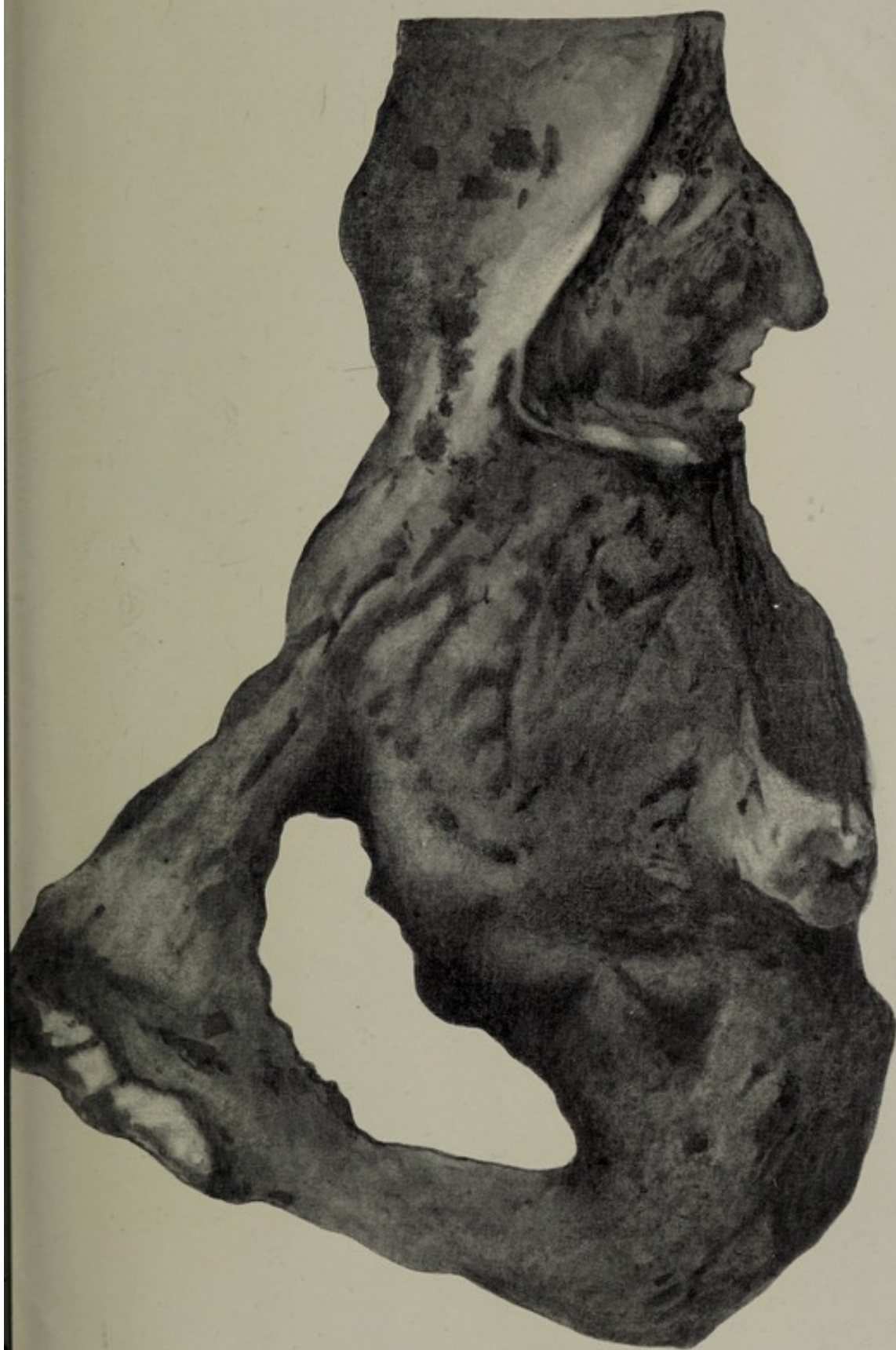


FIG. 1.



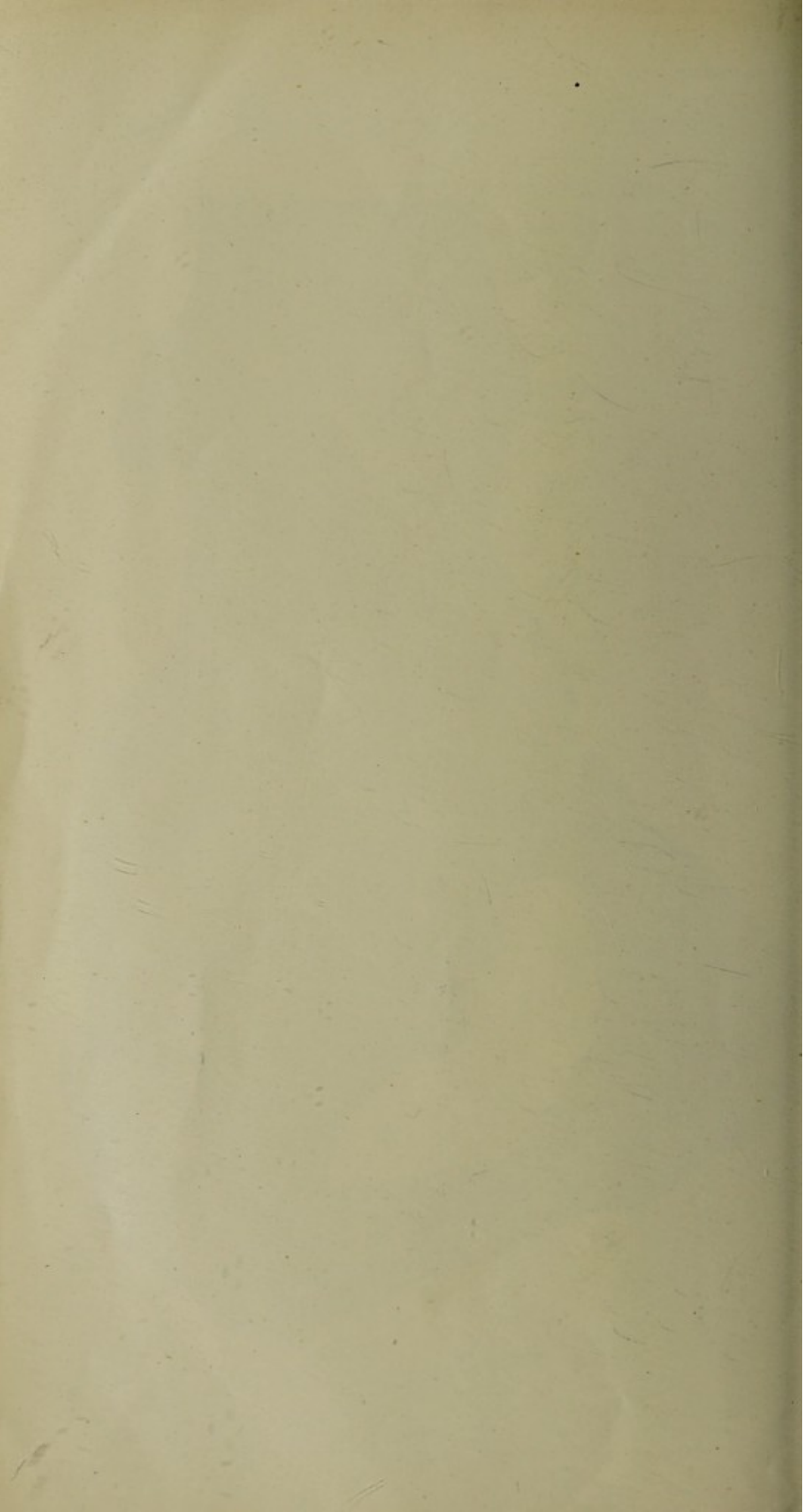




FIG. 3.



FIG. 2.



