General Description.

The overall picture indicates that the tissue is more orientated in this region of the disc. This is due to the fact that on the average the fibres constituting the meniscus are orientated longitudinally. The attachment of the lateral pterygoid muscle to the periosteum of the pterygoid fovea is quite apparent although the disc in this region is only receiving a few muscle fibres in its antero-inferior aspect.

Vascular canals are apparent in the hela of the pes menisci whilst the pars gracilis menisci and the pars posterior menisci are relatively avascular.

Synovial villi are apparent in the inferior joint cavity and sub synovial vascular tissue is prominent at the inferior aspect of the hela of the pes menisci. Prominent synovial villi and sub synovial vascular tissue are apparent in the antero-superior aspect of the joint cavity and superior to the superior stratum of the bilaminar zone. The posterior aspect of the meniscus is demarcated from the parotid gland by a prominent venous plexus which is associated with the bilaminar zone.

The Head of the Condyle.

The head of the condyle is covered by fairly dense fibrous tissue in which can be recognised an inner fibroelastic zone and an outer zone to a large extent fairly fibrous and which contains elongated cells of a fibroblastic nature and cells lying in lacunae, which appear to be chondrocytic in nature.

The outer zone is devoid of elastic fibres, whilst the nner zone contains an elastic fibre component which is more rked in the vicinity of the attachment of the meniscus to condyle. Except at its anterior and posterior portions fibrous covering of the condyle appears to be devoid of vial membrane.

Directly beneath the fibrous covering of the condyle is ne of proliferating chondrocytes and directly beneath this n is a zone of mature flattened cartilage cells. The cells packed fairly close together but they do not have the

orientation typical of the growing end of a long bone. Beneath this zone of mature chondrocyten is a zone of hypertrophic and degenerate chondrocyten. It is apparent that calcification of the cartilage matrix has occurred in this region.

At the diaphyseal portion of this zone invasion of osteogenic mesenchyme is apparent and inferior to this is a zone of bone deposition.

Primary ossification occurs around cores of calcified cartilage, and primary trabeculae consists of large cores of calcified cartilage surrounded by a very fine layer of osseous tissue.

Further towards the diaphyseal end more mature trabeculae can be observed which contain relatively insignificant cartilage cores. In that region where periosteal bone is being laid down, the distinction between primary bone and secondary bone is exceptionally clear. In the primary bone the lacunae are large and irregular. The random and coarse nature of the fibre component can be observed. Whereas the medullary bone consists of regular lacunae, and regular apparently parallel orientation of its fibre component. The periosteum consists of an outer fibrous layer and an inner cellular layer.

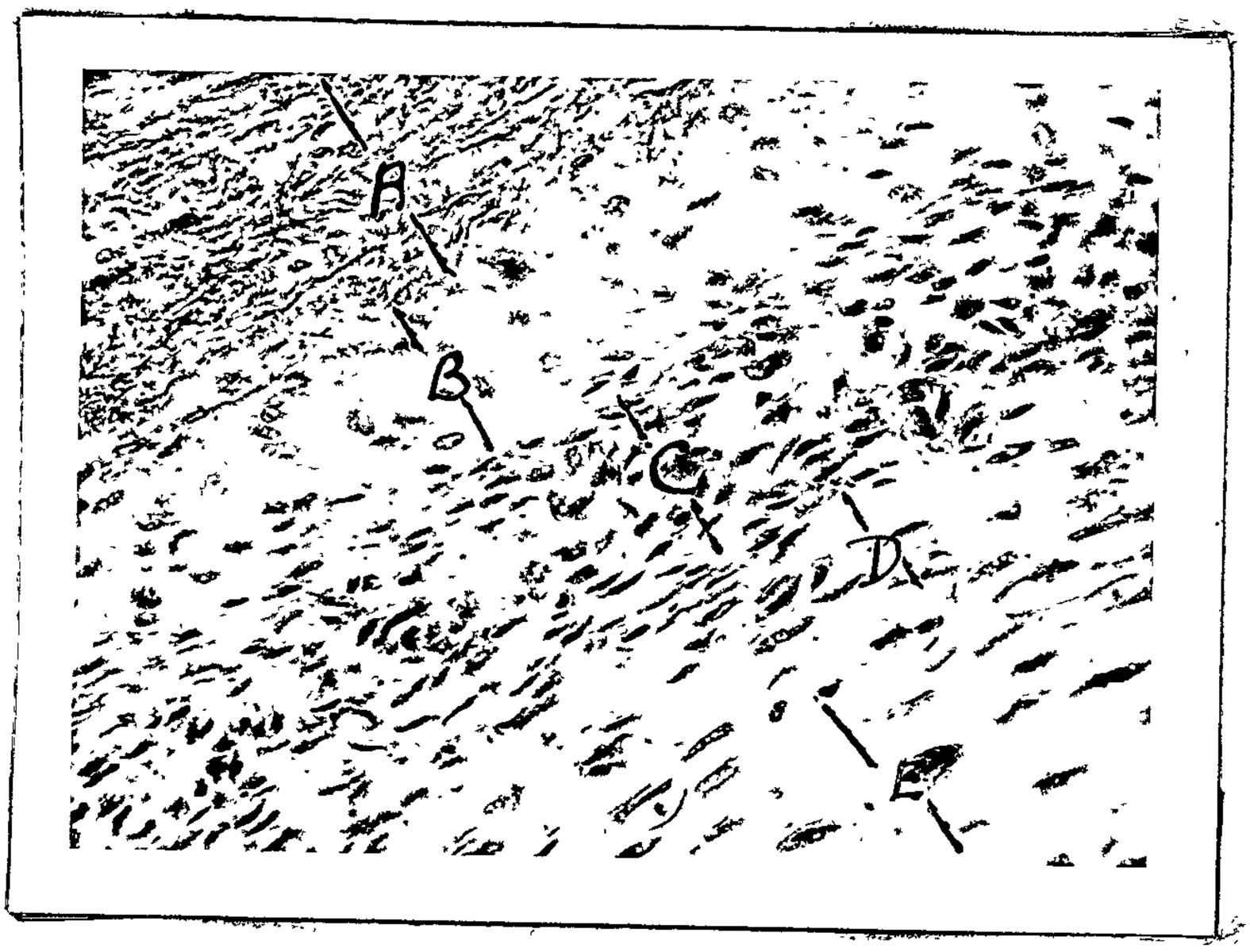

Fig. 48.

Indicates the fibroelastic layer of the condyle, beneath which there is a zone of random chondrocytes in which the collagenous fibres are usually at right angles to the fibres of the fibroelastic layer of the condyle. Below this layer there is a layer which appears to consist of proliferating cartilage cells. Beneath this again is a layer of flattened chondrocytes. (X 540 cf. fig. 8.)

A. Fibroelastic layer.
B. Zone of round chondrocytes.
C. Zone of proliferating chondrocytes.
D. Zone of flattened chondrocytes.
E. Zone of hypertrophic & degenerative chondrocytes.

It may be that the area designated B may correspond to an epiphysis.

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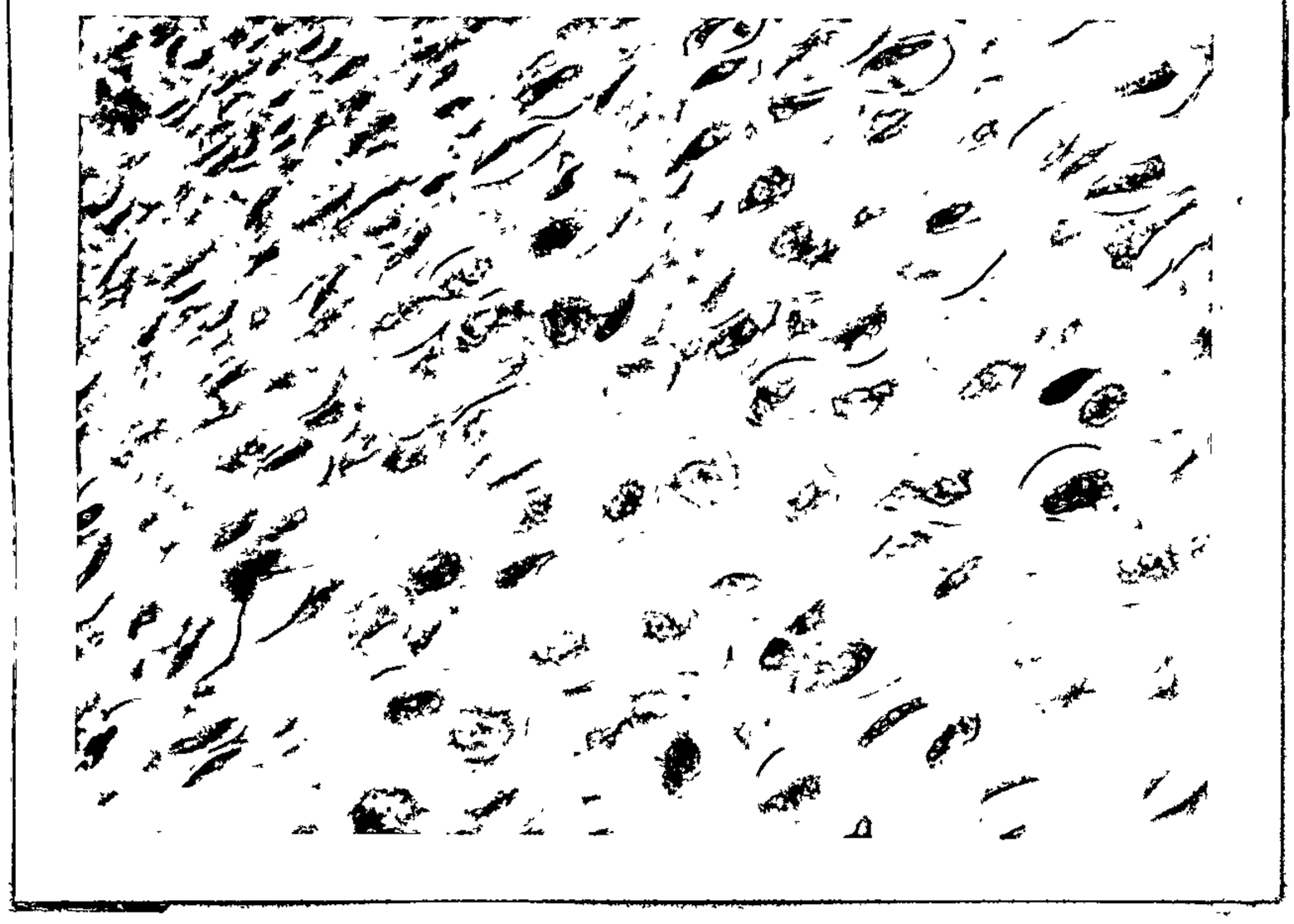

Fig. 49.

The zones of proliferation, maturation and hypertrophy of cartilage cells. (X 900 cf. fig. 47.)

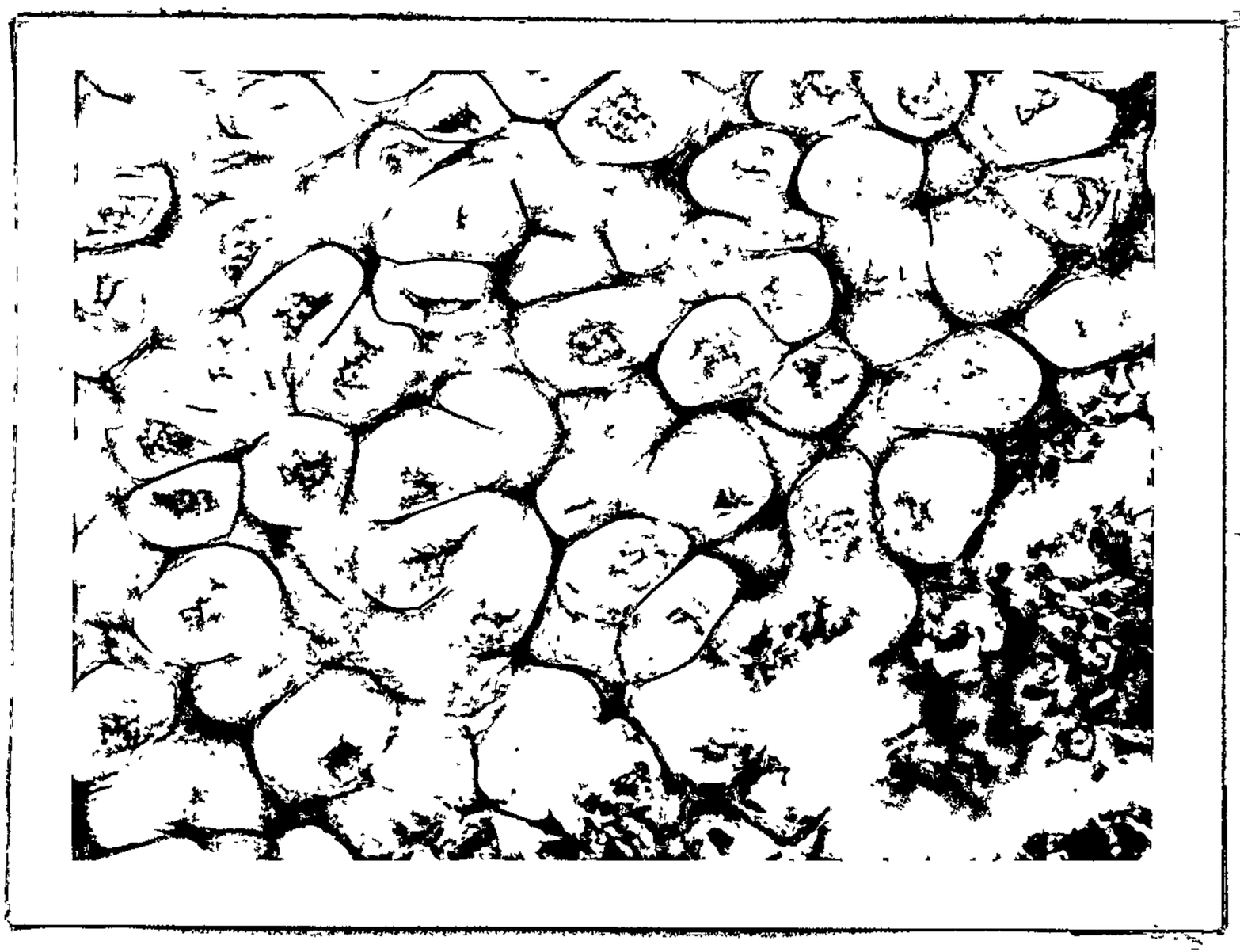

Fig. 50.

nes of degeneration and eruption. (X 900 cf. fig. 47.)

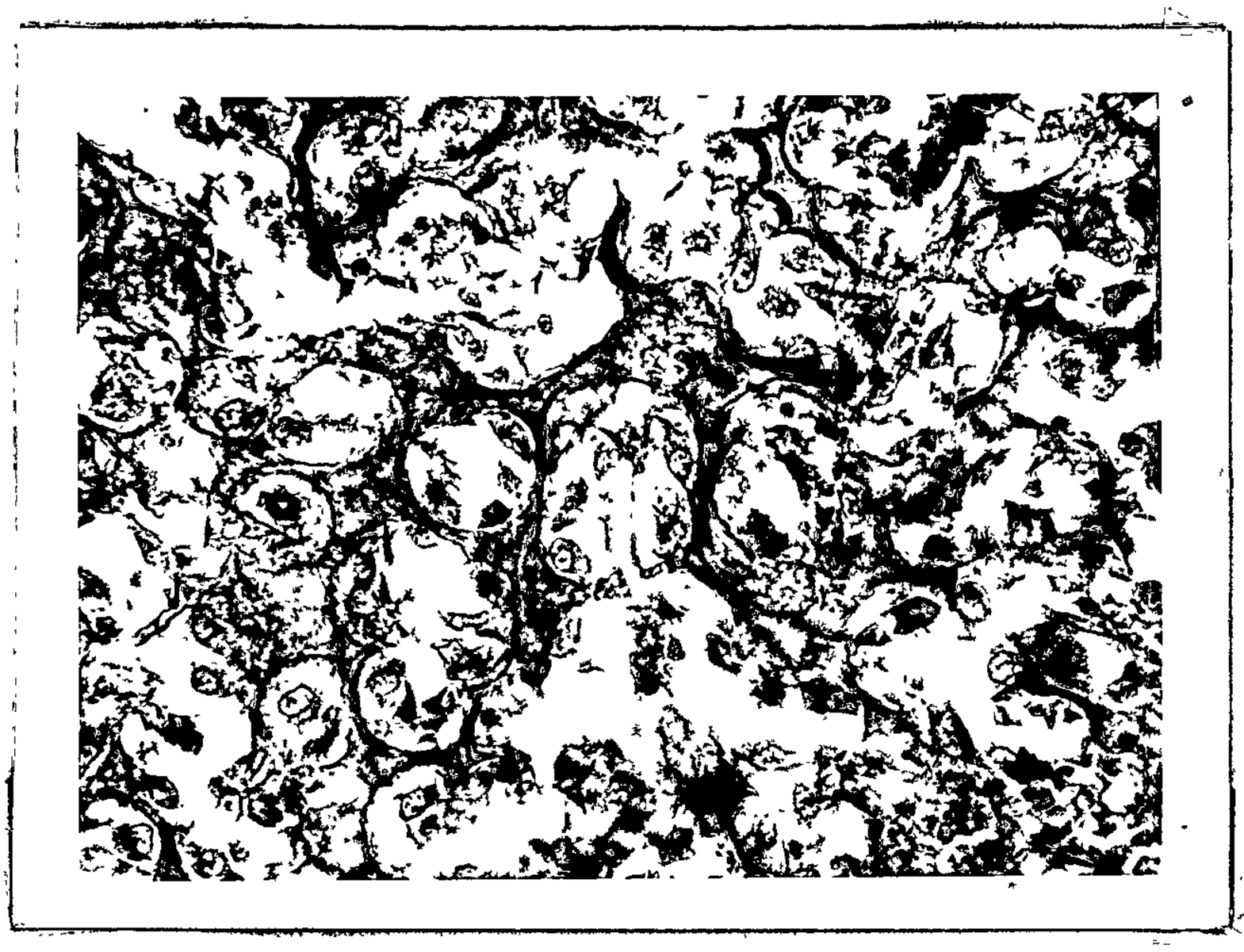

Fig. 51.

Zones of eruption and bone deposition. (X 900 cf. fig. 47.)

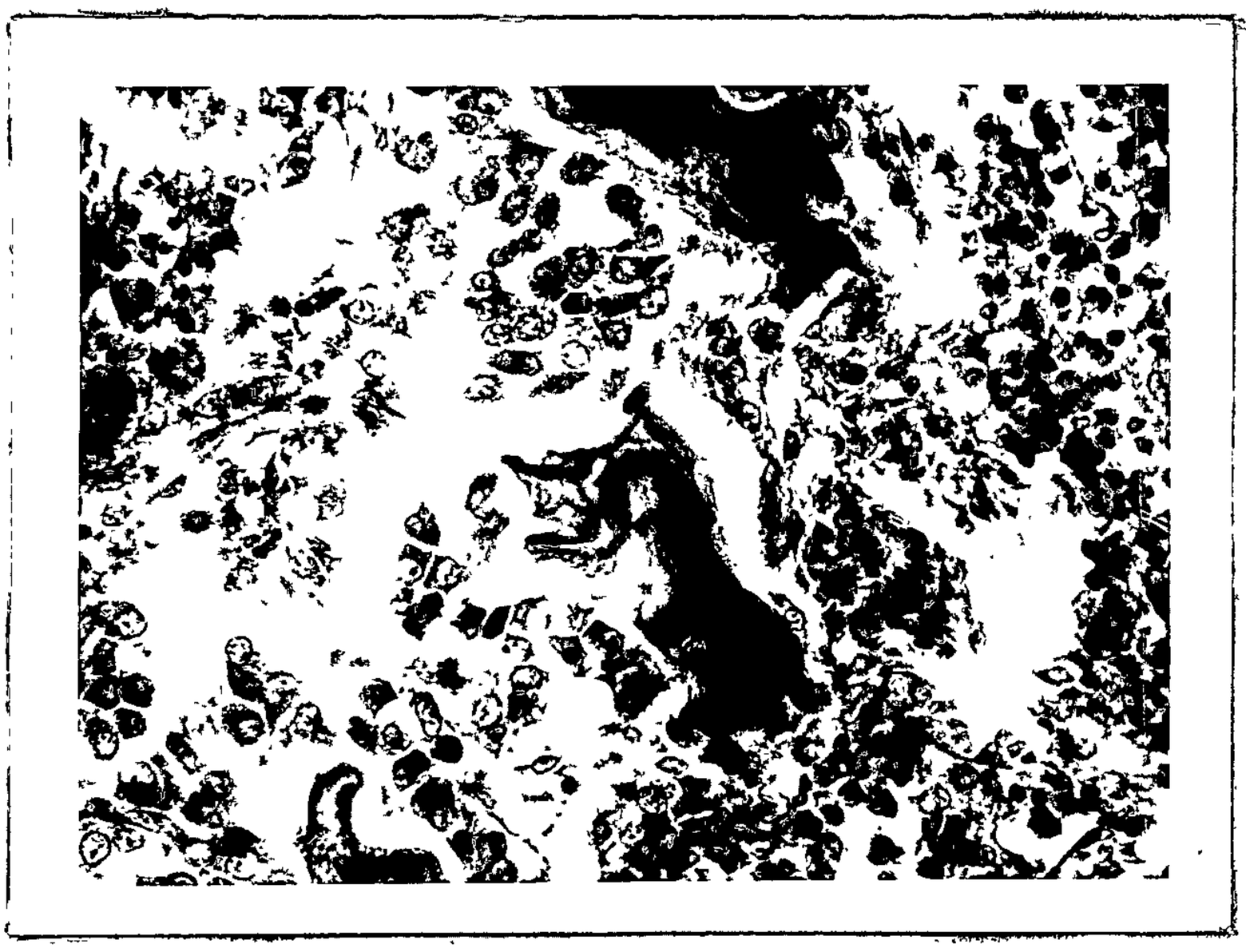

Fig. 52.

rimary endochondral trabeculae and osteoblastic activity.
X 540 cf. fig. 47.)

Fig. 53.

Bone nature trabeculae. (X 540 cf. fig. 47.)

Fig. 54.

nsverse section of muscle fibres of the spheno-mandibular
h are becoming incorporated in the pes anserinus.
270 cf. fig. 47.)

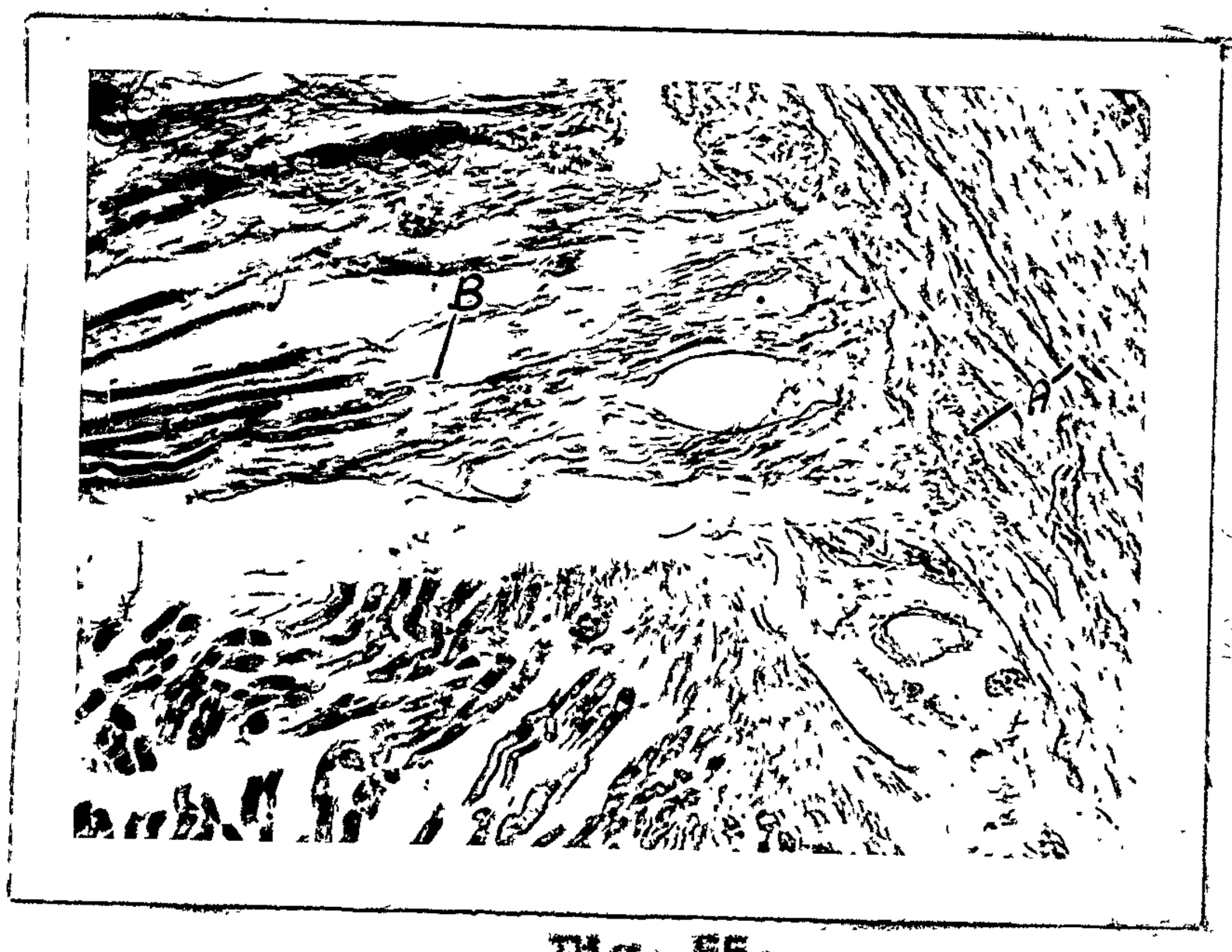

Fig. 55.

Insertion of lateral pterygoid muscle into the periosteum of pterygoid fovea of head of condyle. (X 270 cf. fig. 47.)

A. Outer fibrous layer of periosteum.
B. Musculo-tendinous junction.

****

Pes Menisci. (cf. fig. 47.)

This region receives only a very few fibres of the lateral pterygoid muscle. It consists of collagenous fibres orientated for the most part parallel to each other and its main cellular component is fibroblastic in nature. (fig. 56.)

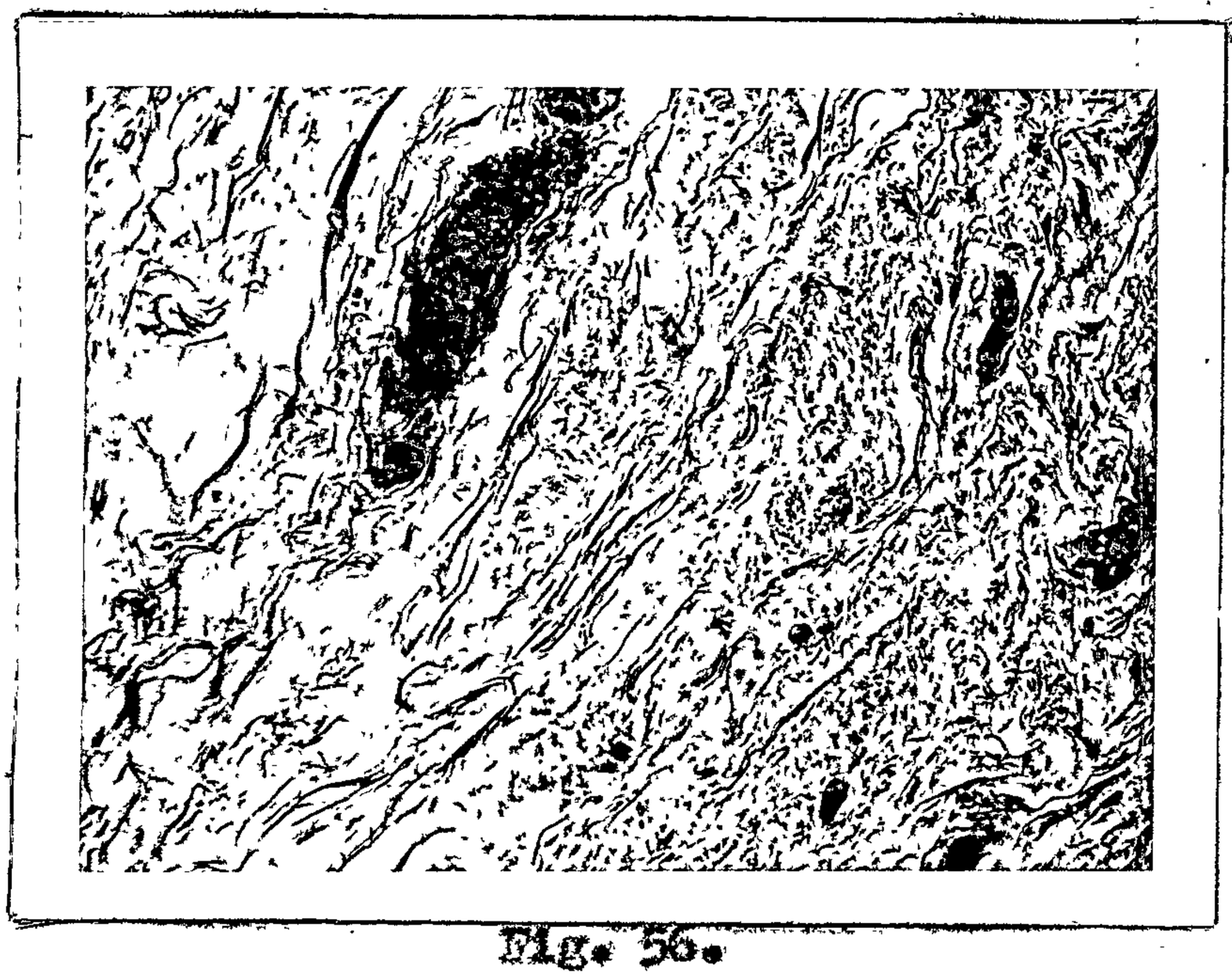

Fig. 56.

...icates structure of the pes menisci, which is fairly ...ular and consists of collagenous and elastic fibres for the ... part orientated parallel to each other. (X 270 cf. Fig. 47.)

****

Hela of the pes meniscl. (cf. fig. 47.)

The collagenous fibres in the hela are for the most part unorientated and a vascular channel is apparent containing a vein which apparently drains the synovial membrane which is inferior to the hela of the pes meniscl. The vein is closely associated with an afferent artery. (fig. 57.)

Inferior to the pes meniscl is a zone consisting of a superficial cell layer of synovial membrane which terminates posteriorly with the substance of the para gracilis meniscl and is continuous anteriorly with a reflection of the synovial membrane which is continuous with the perichondrium of the condyle.

The sub synovial connective tissue is exceedingly vascular and consists of thin walled veins and capillaries. (fig. 57.)

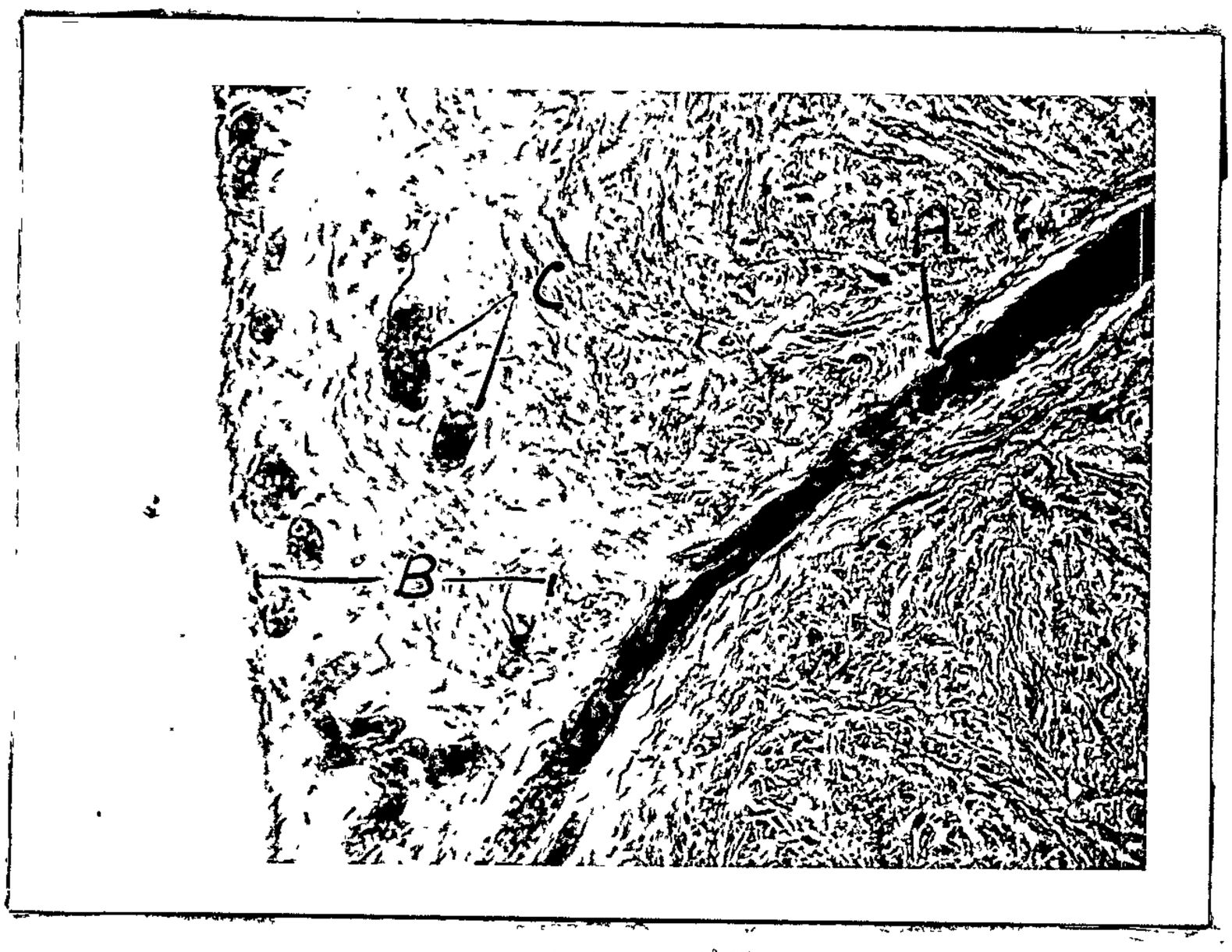

Fig. 57.

n of pes meniscl indicating synovial membrane, vascular
l and unorientated collagenous fibres. (X 80 cf. fig. 47.)

A. Vascular canal.
B. Synovial membrane and sub synovial connective tissue of the areolar type.
C. Thin walled blood vessels packed with erythrocytes.

****

Gracilis Meniscl. (cf. fig. 47.)

Consists of collagenous fibres orientated parallel to
other. Its main cell component at this stage of
lopment appears to be fibroblastic in nature. But here
there cells are seen in definite lacunae and appear to be

chondrocytes.

The infero-superior surface of the pars gracilis menisci is avascular and relatively afibrous and has the appearance of hyaline cartilage and the cells are typical chondrocytes. (Figs. 58, 59, 60.)

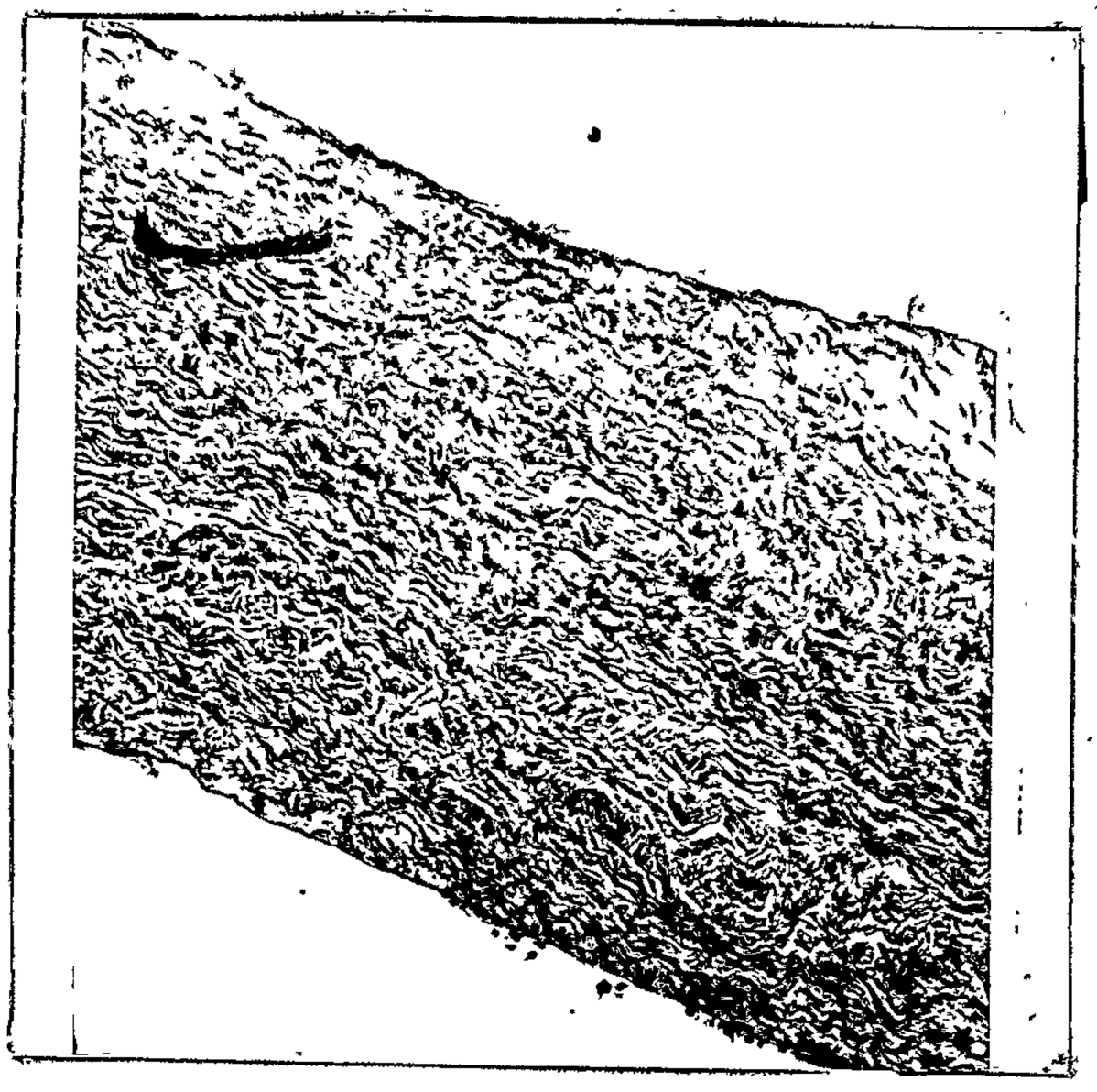

Fig. 58.

Pars gracilis menisci showing relatively well orientated collagenous fibres and the fibrous or chondrocytic nature of the synovial membrane. (X 80 cf. fig. 47.)

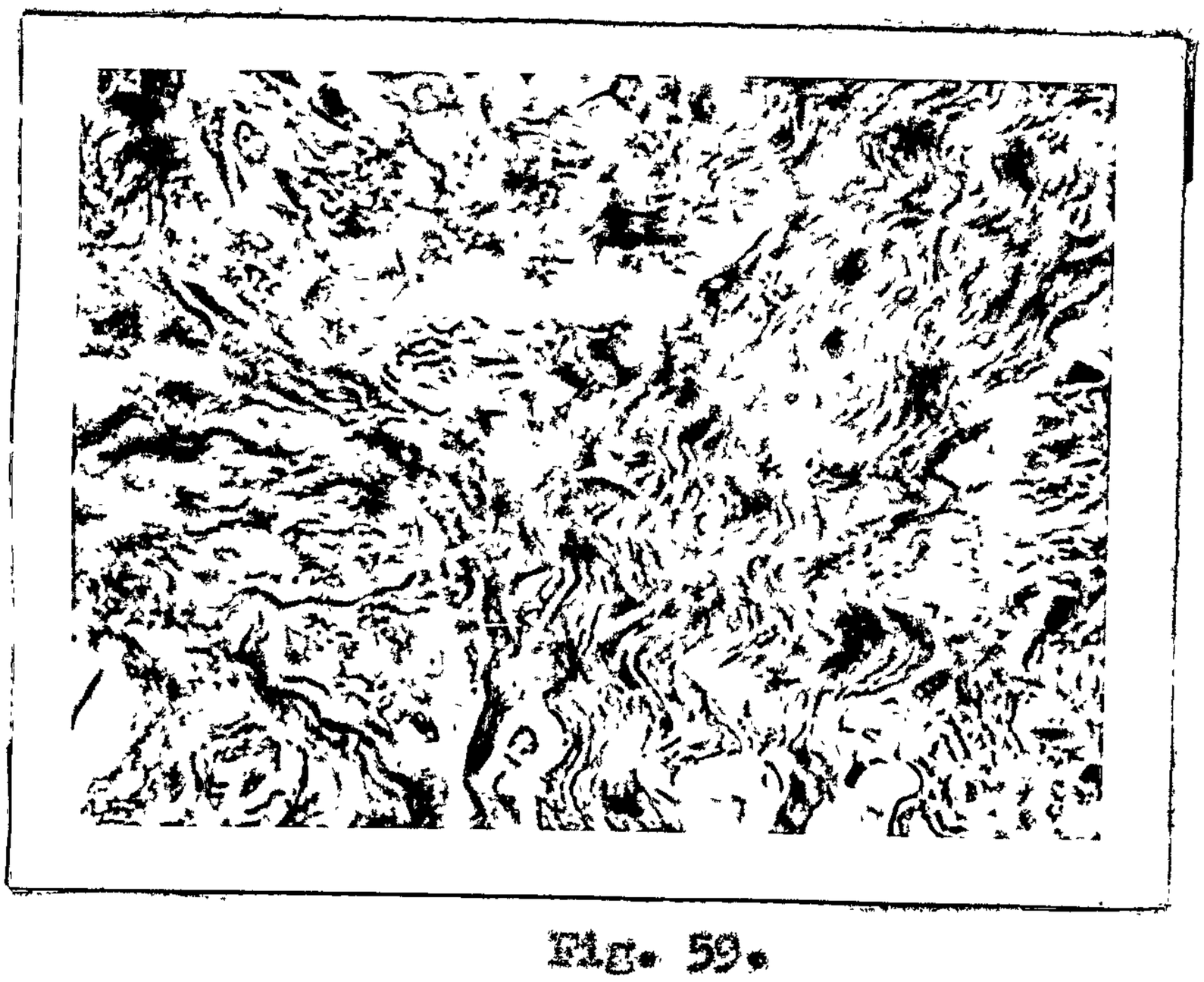

Fig. 59.

ular component of the central part of the pars gracilis
ci. It appears to be essentially fibroblastic in nature.
270 cf. fig. 47.)

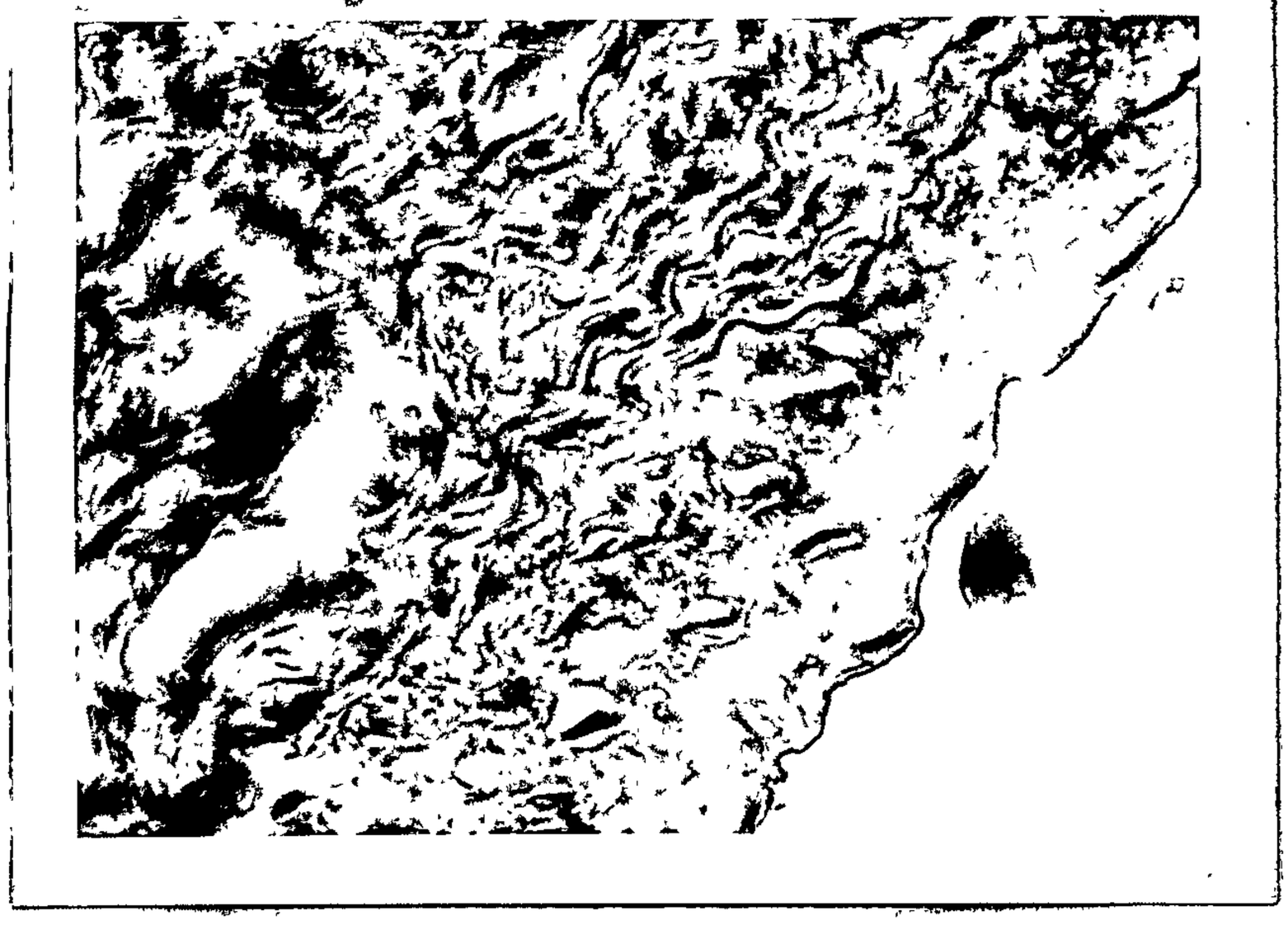

Fig. 60.

Cellular component of the inferior surface of the pars gracilis meniscl. Note the chondrocytes in the sub synovial tissue. (X 540 cf. fig. 47.)

****

Pars Posterior Meniscl. (cf. fig. 47.)

Consists of unorientated collagenous fibres and the cells for the main part have plump nuclei and they are not elongated and appear to be chondrocytic nature. The infero-superior surface is similar to that of the pars gracilis meniscl. (figs. 61, 62.)

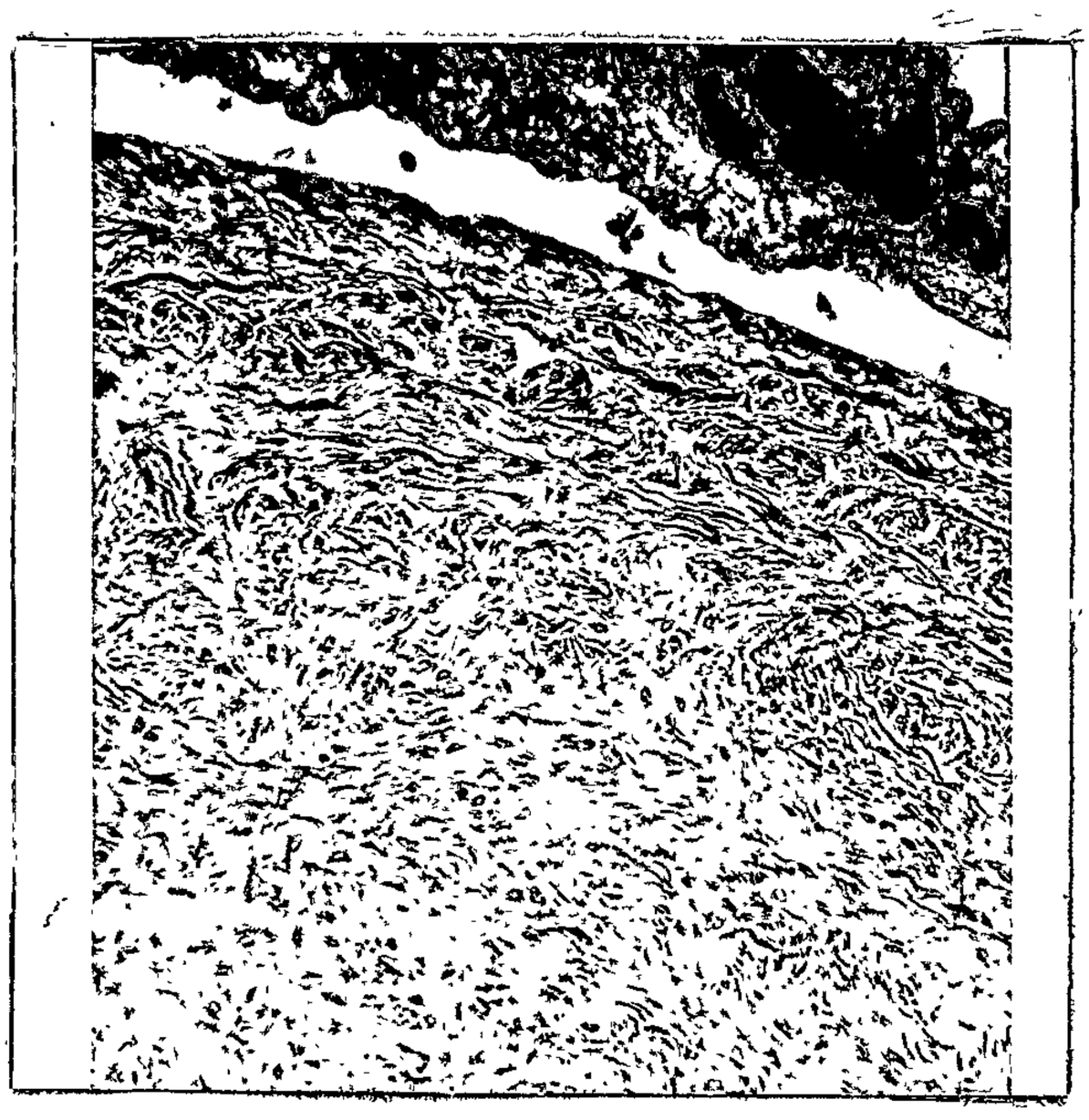

Fig. 61.

Pars posterior menisci and superior joint cavity. Consists of unorientated collagenous fibres and the superior surface consists of flattened fibroblasts and perhaps flattened chondrocytes. Note the synovial villi projecting into the superior joint cavity. (X 270 cf. fig. 47.)

Fig. 62.

ular component in the central part of the pars posterior isci. (X 900 cf. fig. 47.)

A. Undifferentiated mesenchymal cells.
B. Elongated fibroblast.

<u>rior Stratum</u>. (cf. Fig. 47.)

The inferior stratum consists of collagenous fibres ntated for the most part parallel to each other and

contains cells of a fibroblastic and chondrocytic nature.

Below the inferior stratum is a zone of sub synovial connective tissue which is very rich in blood vessels of a capillary nature. Between the blood vessels and an intimate relationship to the joint cavity are chondrocytes and fibroblasts. In this region there is a reflection of the synovial membrane into the inferior joint cavity and villi. It is notable for its rich vascularisation. (fig. 63.) The inferior stratum becomes continuous posteriorly with the fibro-elastic layer of the condyle and a small glomus projects into the joint cavity in this region. (fig. 64.)

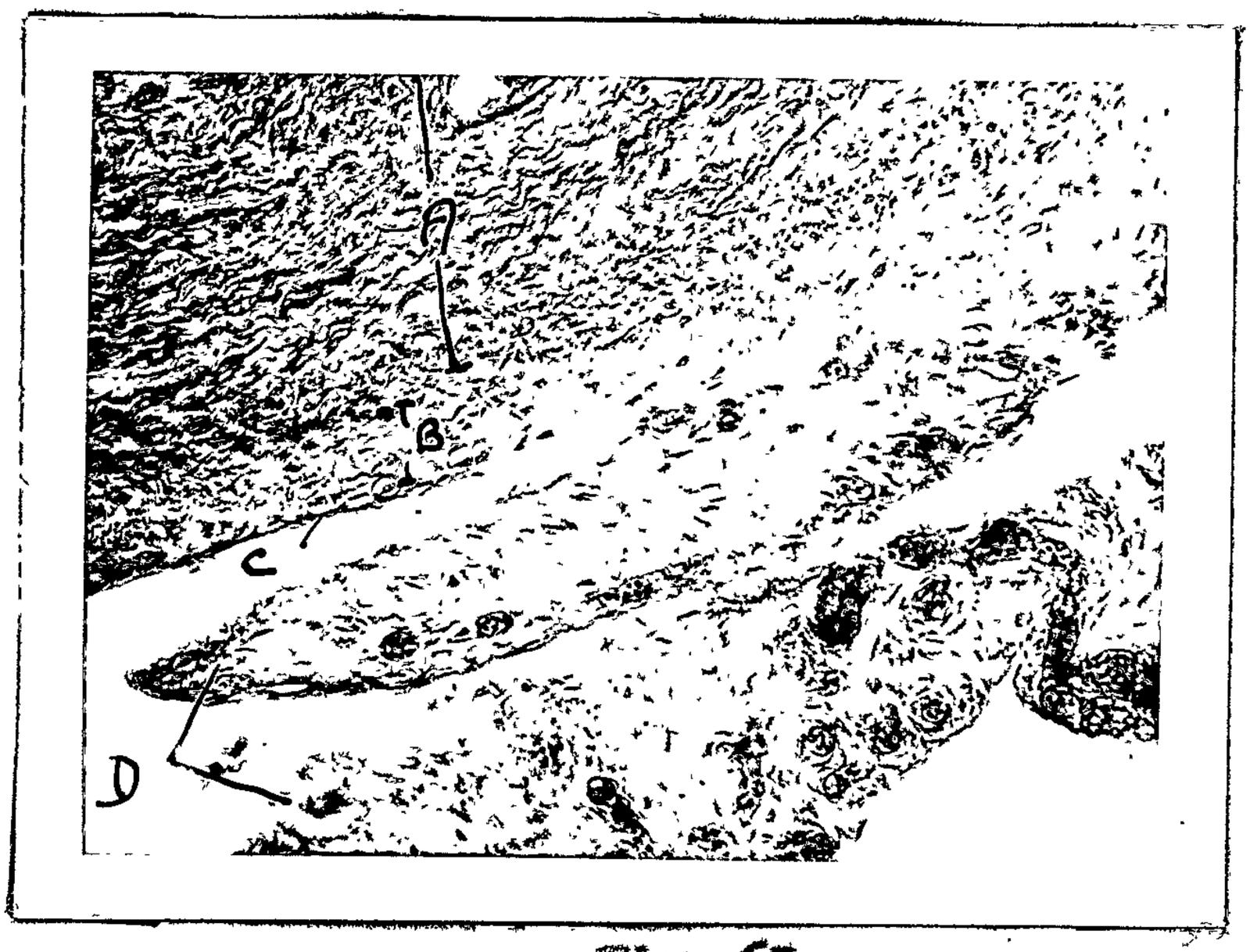

Fig. 63.

nferior stratum showing synovial villi and synovial membrane. te ligamentous nature of this stratum. (X 270 cf. fig. 47.)

A. Inferior stratum.
B. Sub synovial connective tissue.
C. Flattened chondrocytes.
D. Synovial villi.

Fig. 64.

Reflection of synovial membrane at the postero-inferior extremity of the inferior joint cavity. Note the synovial villi. (X 270 cf. fig. 47.)

****

Superior Stratum. (cf. fig. 47.)

Consists of collagenous fibres and few elastic fibres orientated parallel to each other and the cell component is fibroblastic. Above the superior stratum is a zone of sub synovial connective tissue which contains fibroblasts, collagen fibres and thin walled blood vessels. The cells exposed to the synovial fluid are for the most part fibroblastic in nature. (fig. 65.)

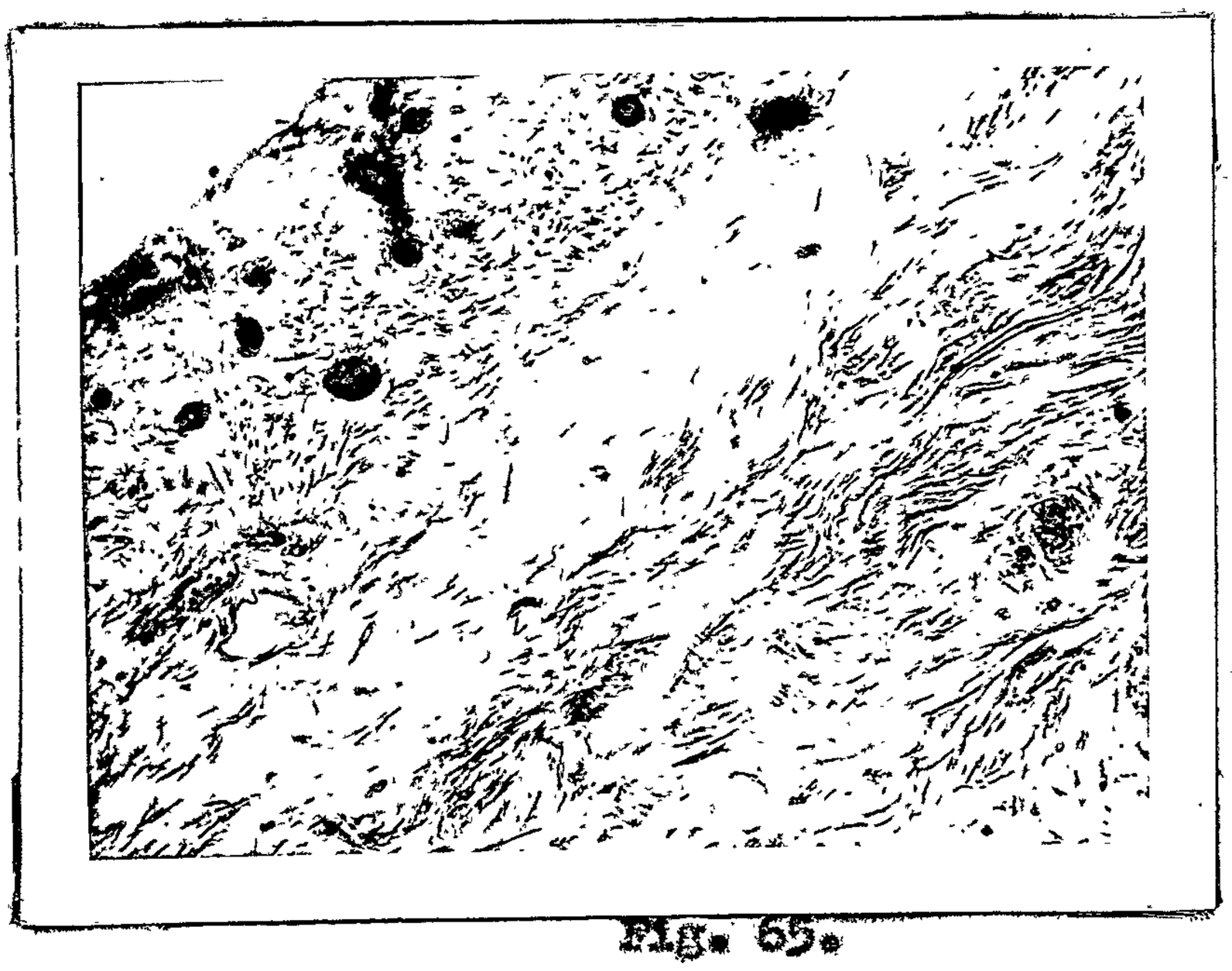

Fig. 65.

erior stratum. Note extensive zone of sub synovial nective tissue. (X 270 cf. fig. 47.)

****

Bilaminar Zone. (cf. fig. 47.)

The bilaminar zone is a relatively small area and consists of loose neuro vascular connective tissue. (fig. 66.)

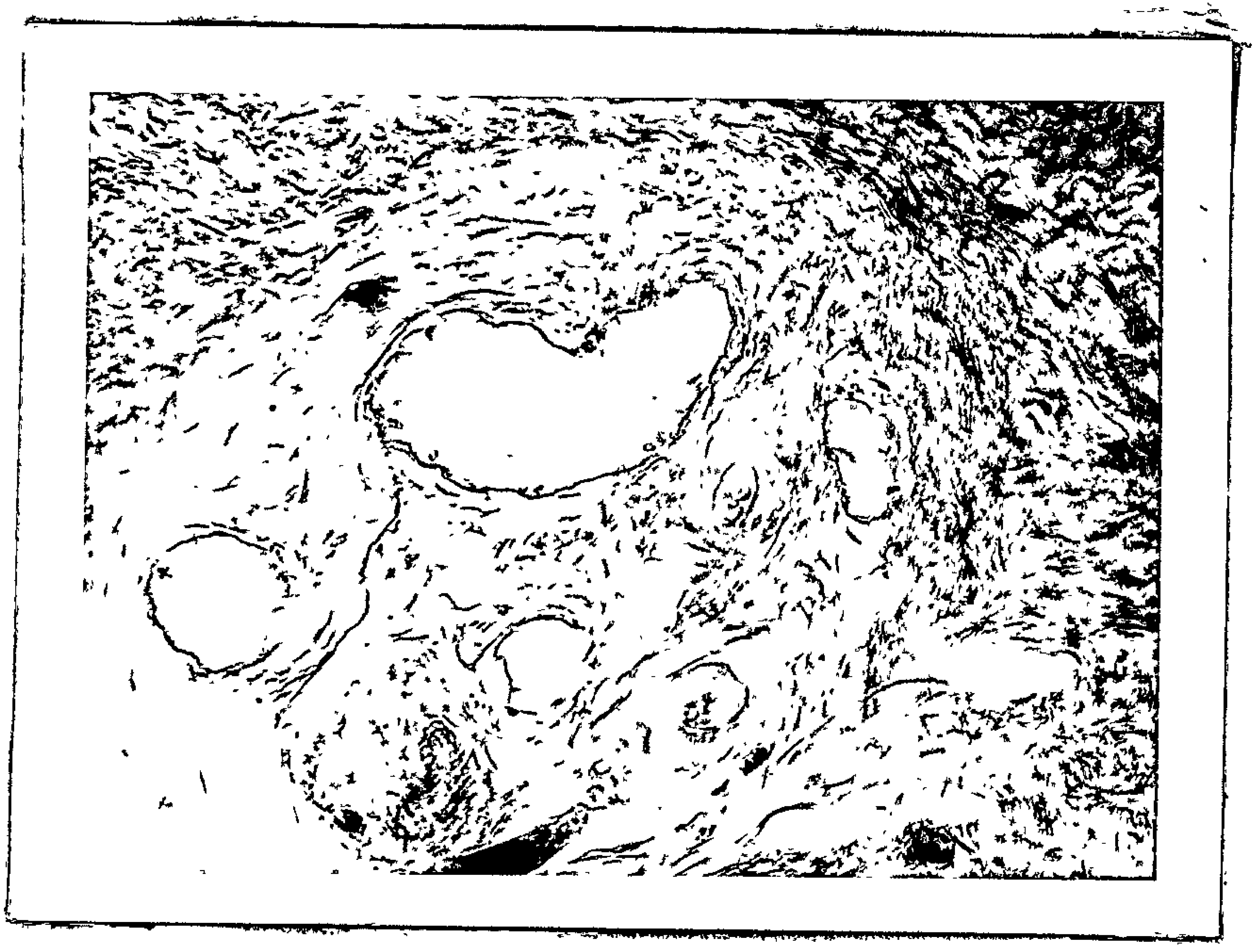

Fig. 66.

Bilaminar Zone (X 270 cf. fig. 47.)

****

Medial third of the Temporomandibular Joint .(cf. fig. 67.)

The specimen consists of, the head of the condyle, the inserting fibres of the lateral pterygoid muscle into the periosteum of the head of the condyle, the inserting fibres of the spheno-meniscus muscle into the pes menisci, the pterygo-condylar area, the temporal bone, and component parts of the disc.

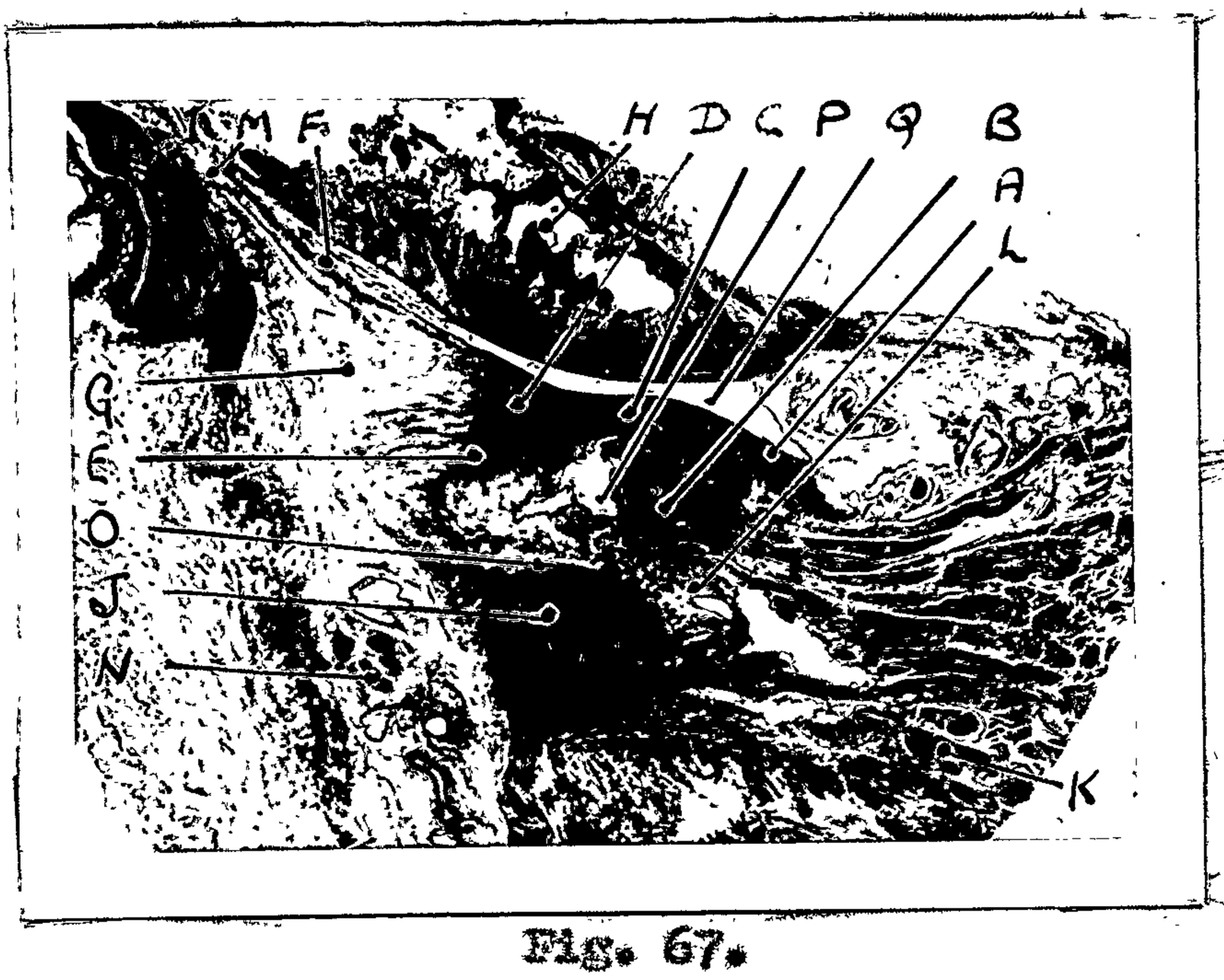

Fig. 67.

Specimen no. 1 - foetus at term.

Sagittal section x 5 medial third temporomandibular joint. This section demonstrates the insertion of the superior stratum through the squamo-tympanic fissure.

A.	Pes Meniscl.
B.	Bela of pes meniscl.
C.	Pars gracilis meniscl.
D.	Pars posterior meniscl.
E.	Inferior Stratum.
F.	Superior stratum.
G.	Bilaminar zone.
H.	Temporal bone.
I.	Tympanic bone.
J.	Condyle.
K.	Lateral pterygoid muscle.
L.	Pterygo-condylar area.
M.	Squamo-tympanic fissure.
N.	Auricular temporal nerve.
O.	Perichondrium.
P.	Inferior joint cavity.
Q.	Superior joint cavity.

****

Head of the Condyle. (cf. fig. 67.)

The head of the condyle has a fibrous covering and the erior portion is associated with the inferior joint cavity the superficial cells are of a chondrocytic nature. They in well defined lacunae. (fig. 68) Immediately beneath is a fibro-elastic layer. The fibres are orientated in ect to curvature of the head of the condyle. Beneath this, e is a layer of proliferating chondrocytes which merge a zone of mature chondrocytes. Beneath this again, rtrophic and degenerative chondrocytes osteogenic

mesenchyme, can be seen invading the calcified cartilage matrix and primary trabeculae are clearly evident.

In the more inferior portion of the head of the condyle secondary trabeculae and haemopoietic tissue can be seen. The overall appearance of the growing condyle is complicated by tongue-like invasions of proliferating and vascular tissue which is clearly associated with the fibrous covering of the head of the condyle. (fig. 69) On each side of these intrusions are layers of cartilage cells similar in appearance and undergoing the same morphosis as described above. (fig. 70) The tongue-like extensions divide the ossifying tissue into semi-circles. The important inference here is the fact that the source of the cartilage cells is clearly the proliferating zone beneath the fibro-elastic layer of the head of the condyle and also that vascularisation, to a certain extent is derived from the same region. A prominent feature of the head of the condyle, in this region of the joint, is the insertion of fibres of the lateral pterygoid muscle into the periosteum covering the periosteal bone. (fig. 71) The elastic component of the condylar head extends around the periosteal bone and forms an elastic and collagenous superficial layer of the periosteum. (fig. 72.)

Beneath the elastic and fibrous layer is the cellular layer of the periosteum which is associated with the growing periosteal bone. The fibres of the lateral pterygoid muscle approximate closely the superficial layer of the periosteum and the method of insertion seems to be largely fibrous.

At this stage of ontogeny, one can not say that the lateral pterygoid muscle has a tendinous insertion in this region. however it has a fibrous insertion into the fibro-elastic layer of the periosteum. (fig. 73)

Symons (20) states that the relation of the lateral pterygoid muscle to the condyle during growth in those muscles with tendinous attachments such as the lateral pterygoid muscles and supra hyoid muscles, the attachment of

the tendinous fibres to the bone must continually undergo a process of breaking down and restoration.

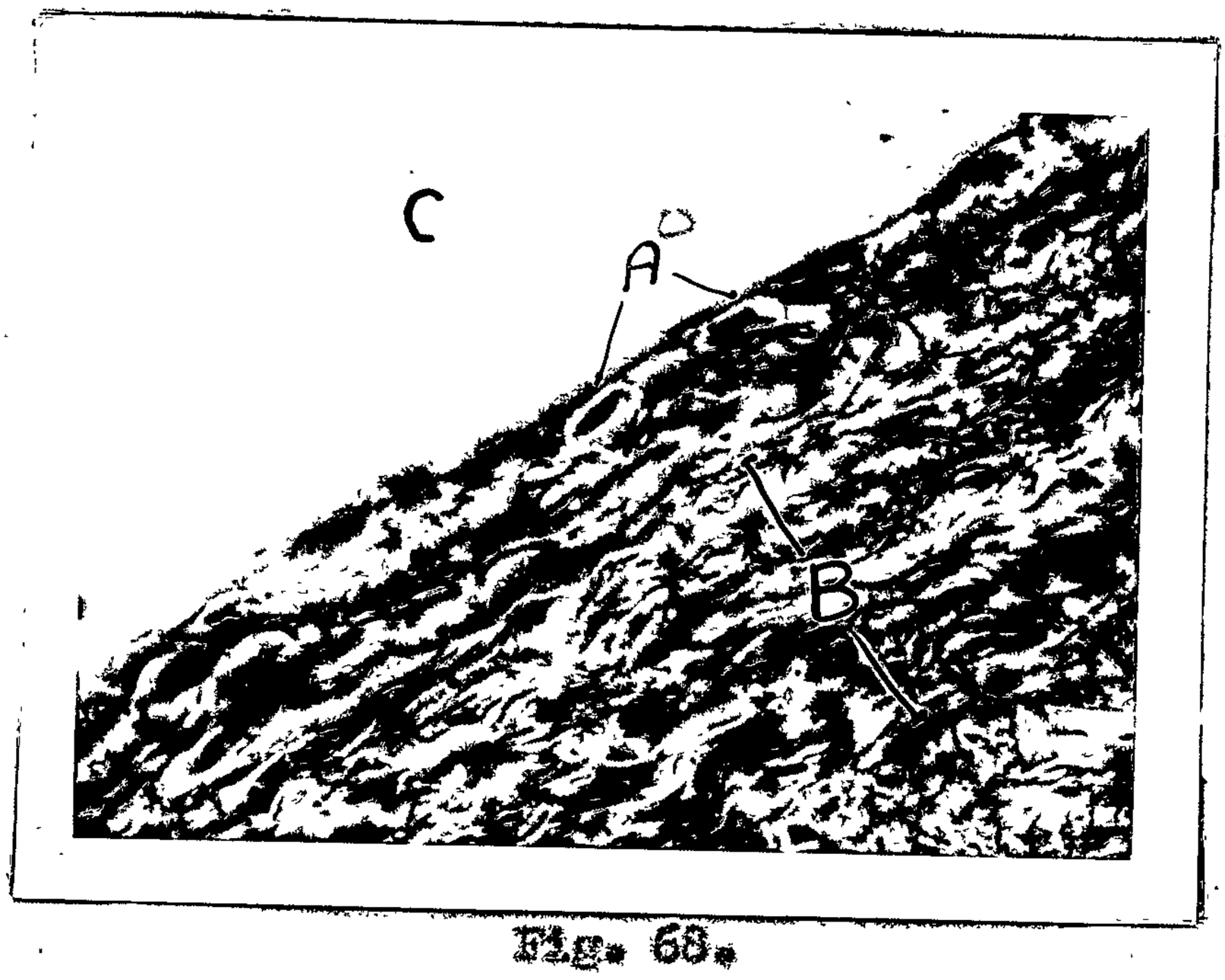

Fig. 68.

Chondrocytes in the most superficial zone of the perichondrium. (X 900 cf. fig. 67.)

A. Chondrocytes.
B. Fibroblastic layer of the perichondrium.
C. Inferior joint cavity.

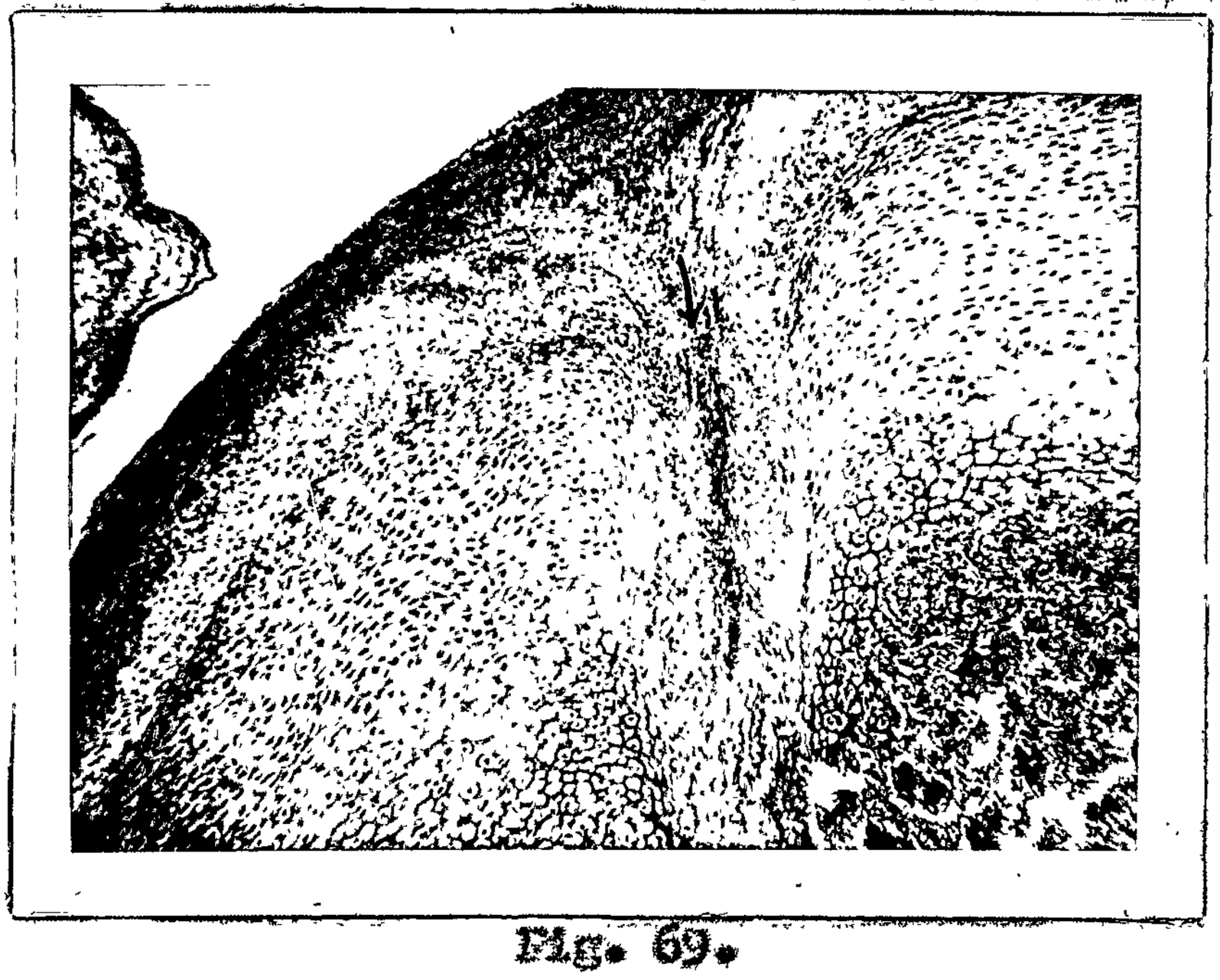

Fig. 69.

gue-like intrusions of proliferating and vascular mesenchyme
n the deeper layer of the perichondrium. (X 80 cf. fig. 67.)
w indicates invagination from the deeper layer of
ichondrium dividing the cartilage of the condyle which is
rgoing ossification into semi-circular compartments.

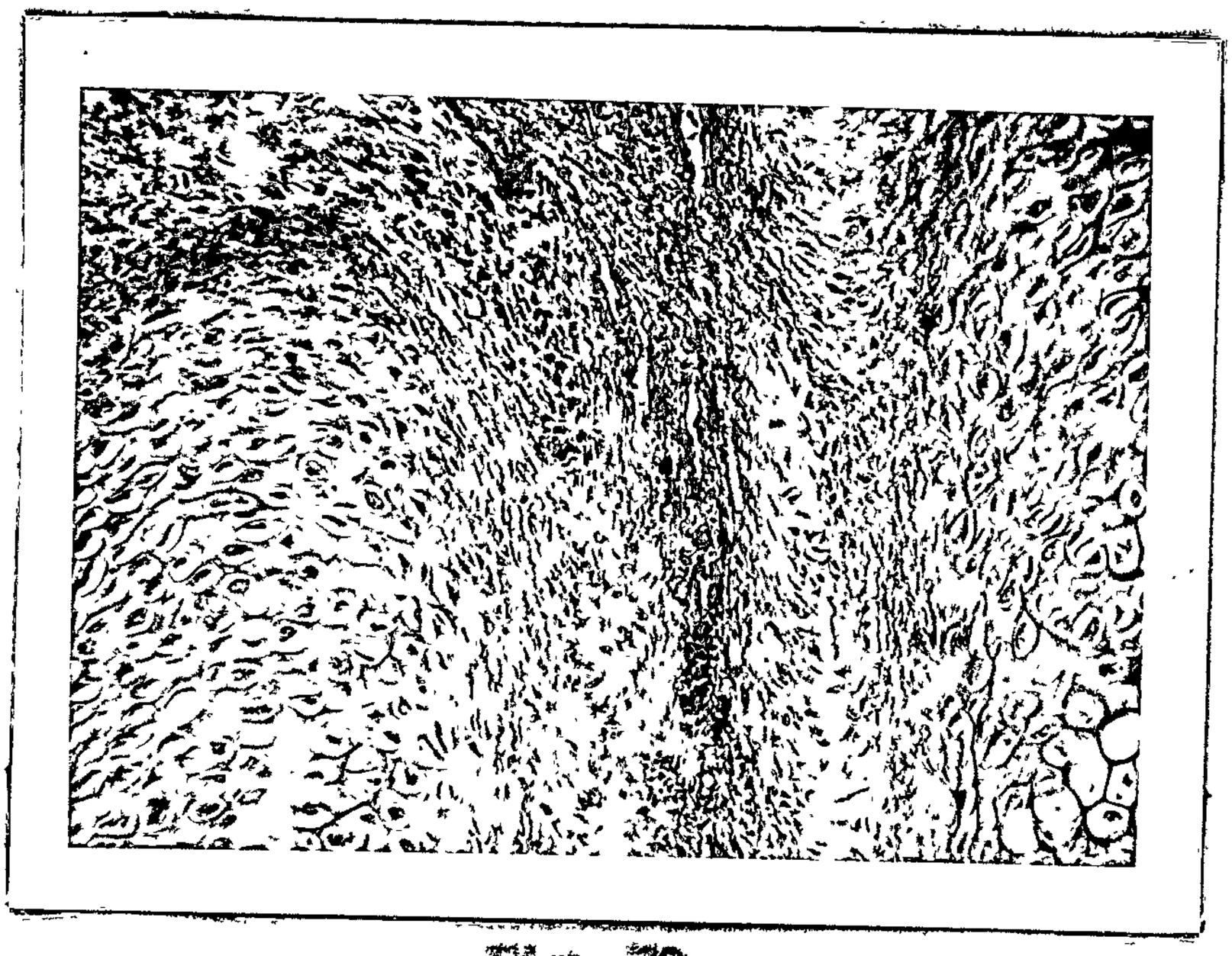

Fig. 70.

Cytomorphosis of cartilage cells laterally and medially to the tongue-like invasions. (X 270 cf. figs. 67 & 69.)

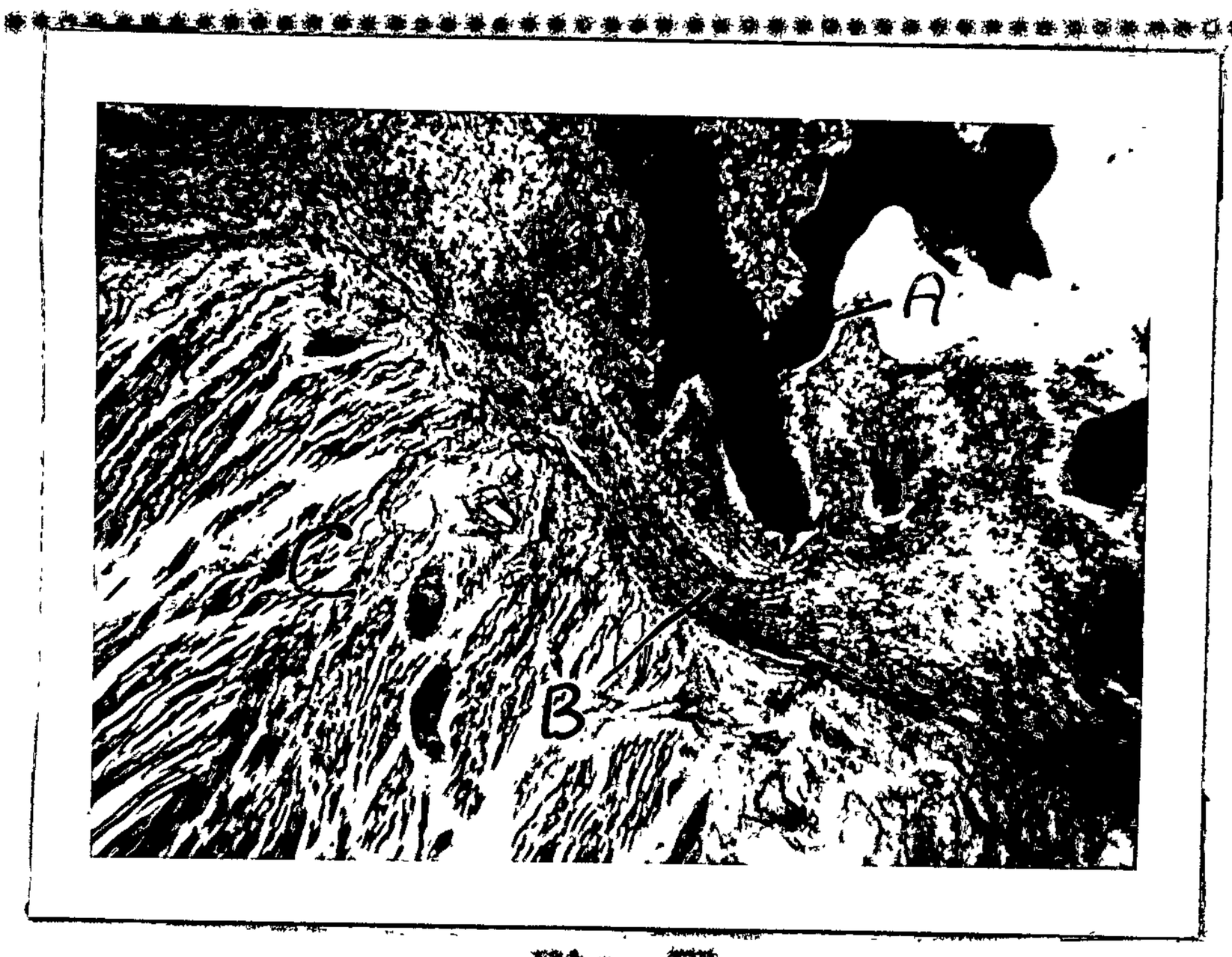

Fig. 71.

ertion of lateral pterygoid muscle into the periosteum the head of the condyle. (X 80 cf. fig. 67.)

A. Periosteal bone.
B. Fibrous layer of the periosteum.
C. Lateral pterygoid muscle.

Fig. 72.

Continuation of fibro-elastic layer of perichondrium into the superficial layer of periosteum. (X 270 cf. fig. 67.)

A. Perichondrium.
B. Periosteum.

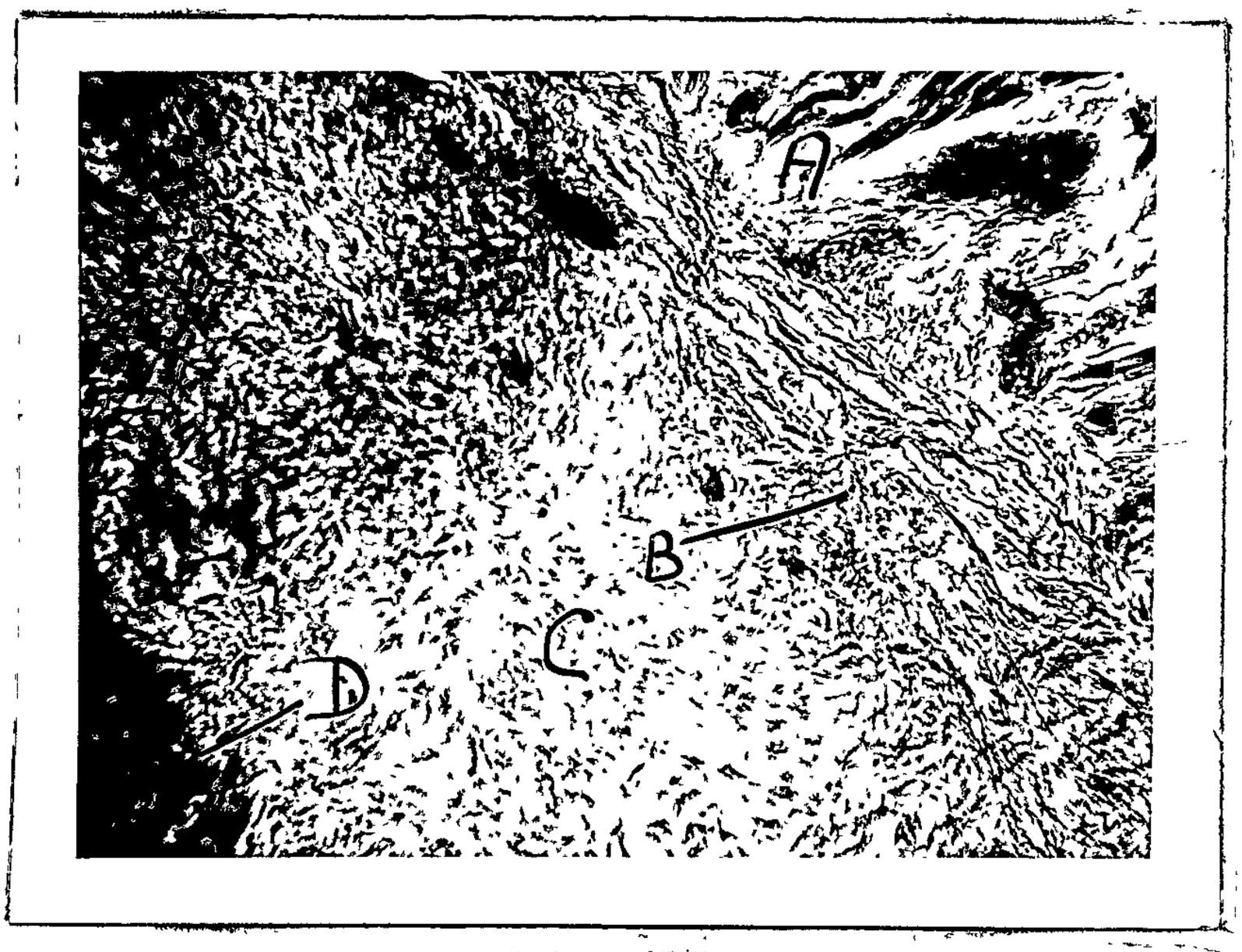

Fig. 73.

ortion of lateral pterygoid muscle into the periosteum of head of the condyle. (X 270 cf. fig. 67.)

A. Lateral pterygoid muscle.
B. Fibrous layer of periosteum.
C. Cellular layer.
D. Periosteal bone.

is probable that this section is tangential.

Sphono-Meniscus Muscle. (cf. fig. 67.)

The superior fibres of the lateral pterygoid muscle which the writer has termed the spheno-meniscus muscle are inserted into the pes menisci. Here again definite tendons cannot be recognised, but the insertion of these fibres into the pes menisci appears to be of a fibrous nature. (Fig.74)

Fig. 74.

Insertion of spheno-meniscus muscle into the pes menisci.
(X 270 cf. fig. 67.)

A. Pes menisci.
B. Spheno-meniscus muscle in transverse section.

s Menisci. (cf. fig. 67.)

The usual morphological characteristics of the pes ci can be defined; i.e., the hala of the pes menisci and foot-like anterior prolongation.

As mentioned above the foot-like extension receives the eno-meniscus muscle. It's component tissue parts are elastic es and collagenous fibres orientated in the main parallel ach other. The cellular components are fibroblasts, eas the hala of the pes menisci consists of a meshwork: collagenous fibres and elastic fibres which are unorientated. g. 75.)

Inferior to the hala of the pes menisci is a well ned and extensive area of sub synovial connective tissue

which is prominent for its vascularity. The layer directly in contact with the synovial fluid consists of cells which are chondrocytes plus other cells fibroblastic in nature. The synovial membrane consists of a layer of cells 1 - 2 cells thick which are both chondrocytic and fibroblastic. Synovial villi project into the antero-inferior joint cavity and there is a reflection of the synovial membrane at the antero-inferior extremity of the inferior joint cavity. (fig. 76.)

The extension of the synovial membrane on the anterior part of the condylar head is marked by a fairly prominent chondrocytic and fibroblastic vascular tissue which lies superficial to the fibro-elastic component of the head of the condyle. (fig. 77.)

Superior to the pes menisci is a sub synovial connective tissue zone which is not so extensive or so prominent as the inferior sub synovial connective tissue zone. It consists of loose connective tissue and very thin walled blood vessels. Some of the cells are clearly chondrocytic in nature, and cells in contact with the synovial fluid, are for the most part chondrocytes. Although here and there are flattened fibroblasts (fig. 78.)

The sub synovial connective tissue of the pes menisci continuous with the sub synovial connective tissue which ers the inferior aspect of the temporal bone and is more ensive on the temporal surface. Here again, synovial villi ject into the antero-superior extension of the superior nt cavity. (fig. 79.)

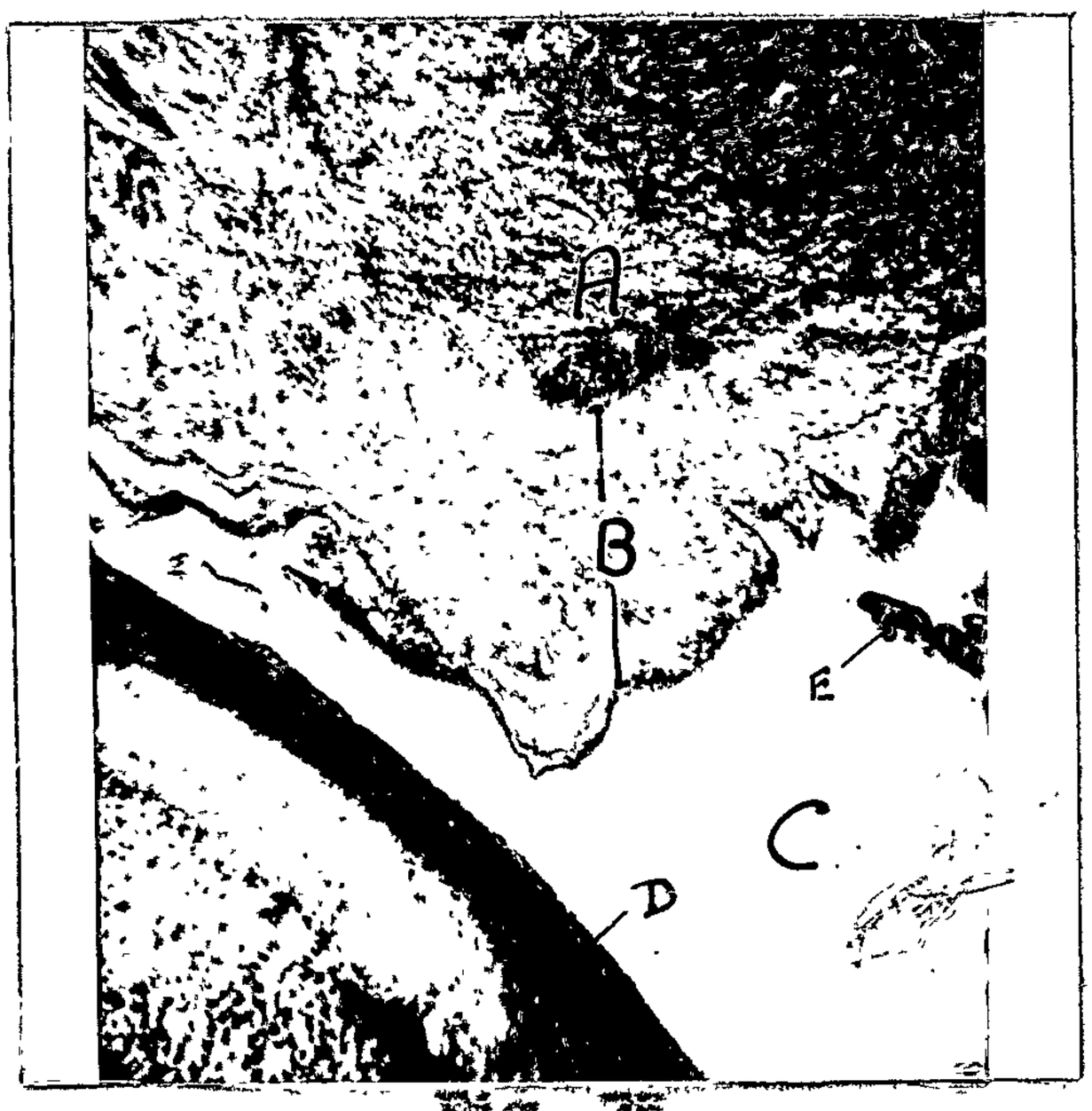

Fig. 75.

Hela of the pes meniscl. (X 80 cf. fig. 67.)

A. Hela of the pes meniscl.
B. Fairly extensive sub synovial connective tissue inferior to hela of pes meniscl.
C. Inferior joint cavity.
D. Perichondrium.
E. Synovial villi.

Fig. 76.

jection of synovial villi into the antero-inferior part of inferior joint cavity. (X 270 cf. fig. 67.)

A. Synovial villi.

Fig. 77.

Synovial membrane superior to the anterior articular surface of the head of the condyle. (X 900 cf. fig. 67.)

A. Synovial membrane. It appears to be fragmented but the surface cells appear to be flattened fibroblasts.

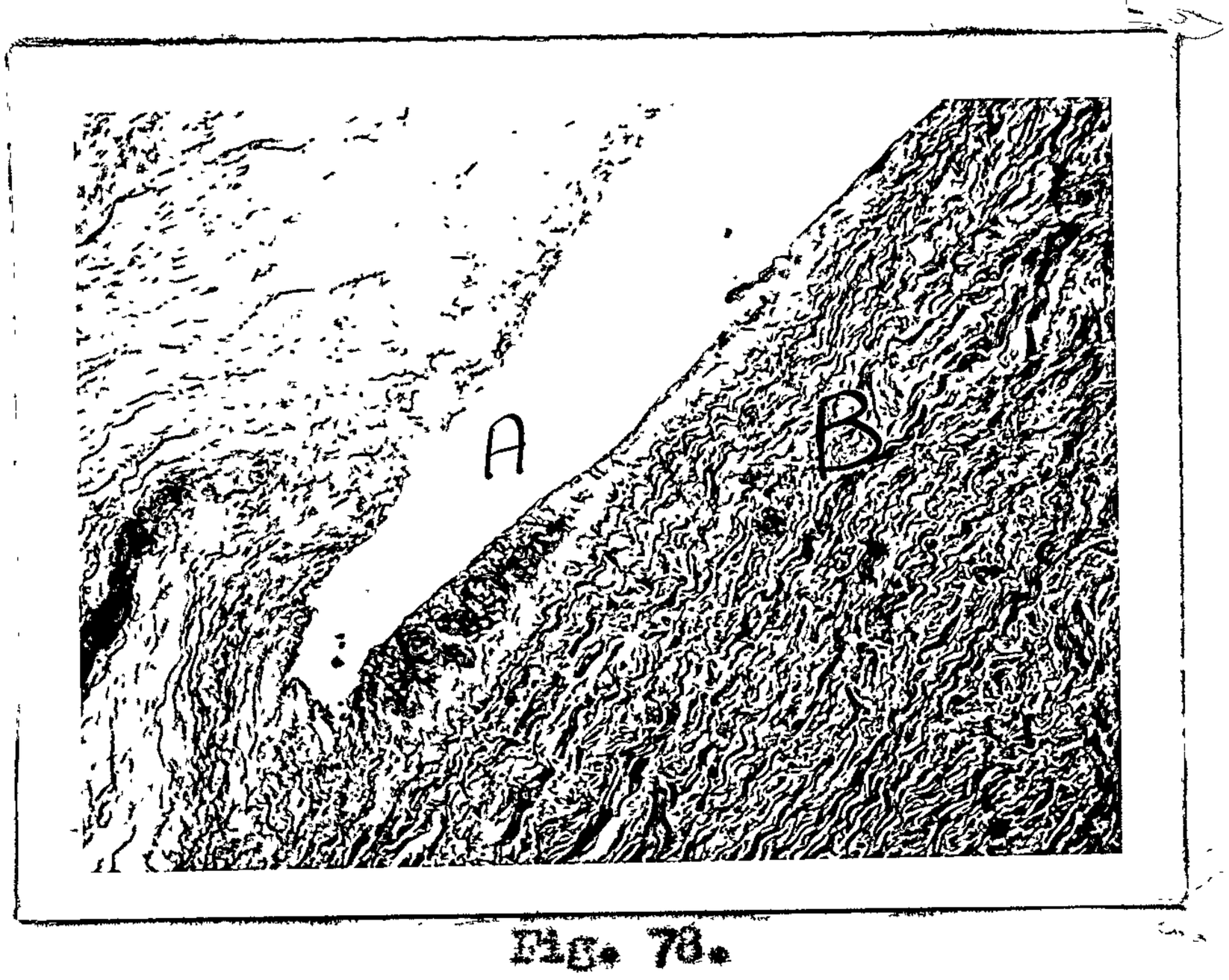

Fig. 78.

ovial membrane superior to the pes menisci. (X 270 cf.fig.67.

e how the sub synovial connective tissue becomes more

ancive as it approaches the antero-superior extremity of

superior joint cavity.

A. Antero-superior joint cavity.
B. Pes menisci.

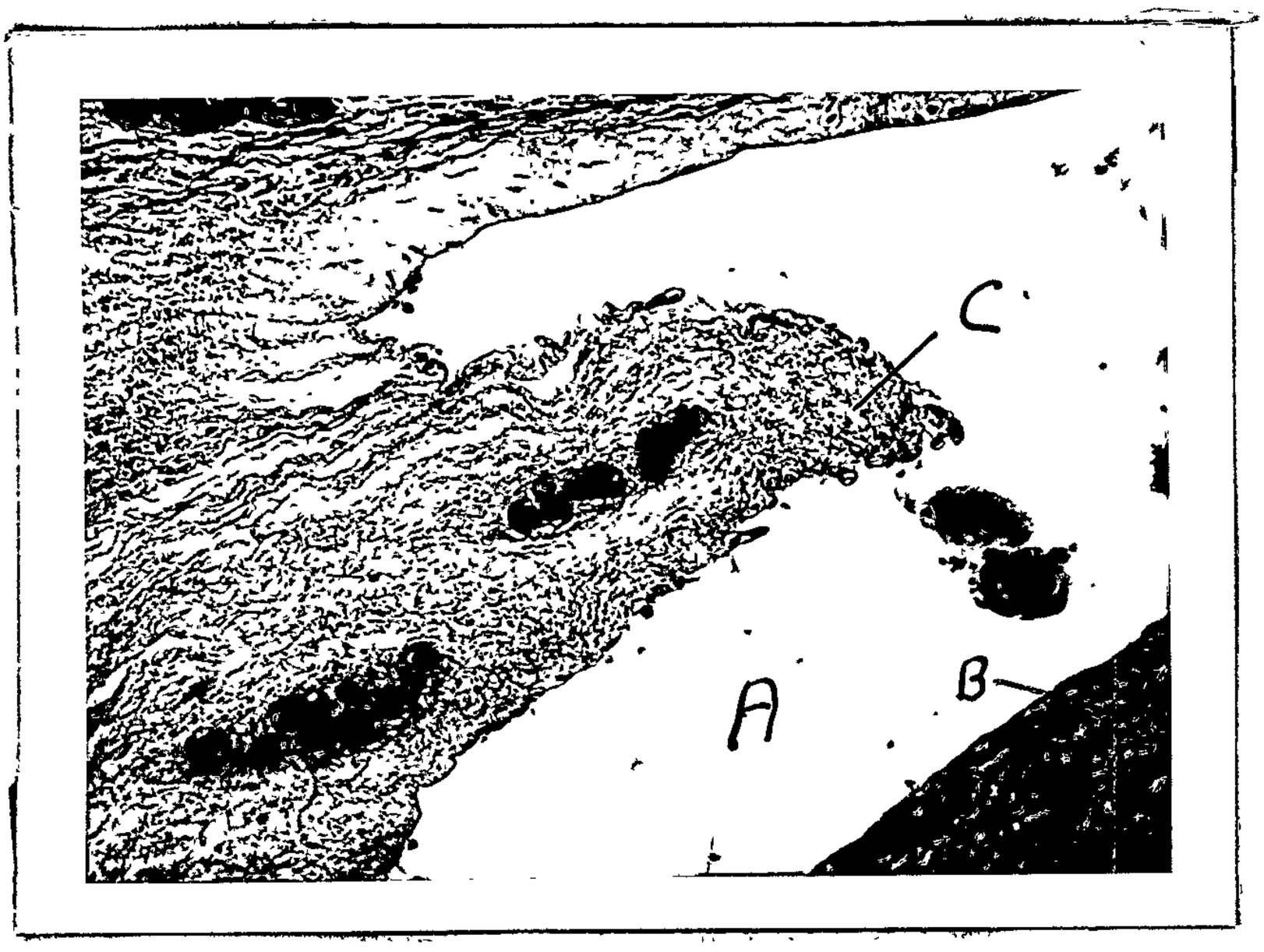

Fig. 79.

Synovial villi projecting into the anterior extremity of the superior joint cavity. (X 270 cf. fig. 67.)

A. Antero-superior joint cavity.
B. Superior surface of pes menisci.
C. Synovial villi.

****

Pars Gracilis Menisci. (cf. fig. 67.)

The pars gracilis menisci in this section is relatively avascular. It consists of elastic and collagenous fibres fairly well orientated which tend to be parallel to each other. The infero-superior surface consists of chondrocytes and fibroblasts which form an avascular layer in contact with the superior and inferior joint cavities. (fig. 80 & 81.)

The main cellular component appears to be chondrocytes, though flattened elongated fibroblasts are also conspicuous. (figs. 80, 81.)

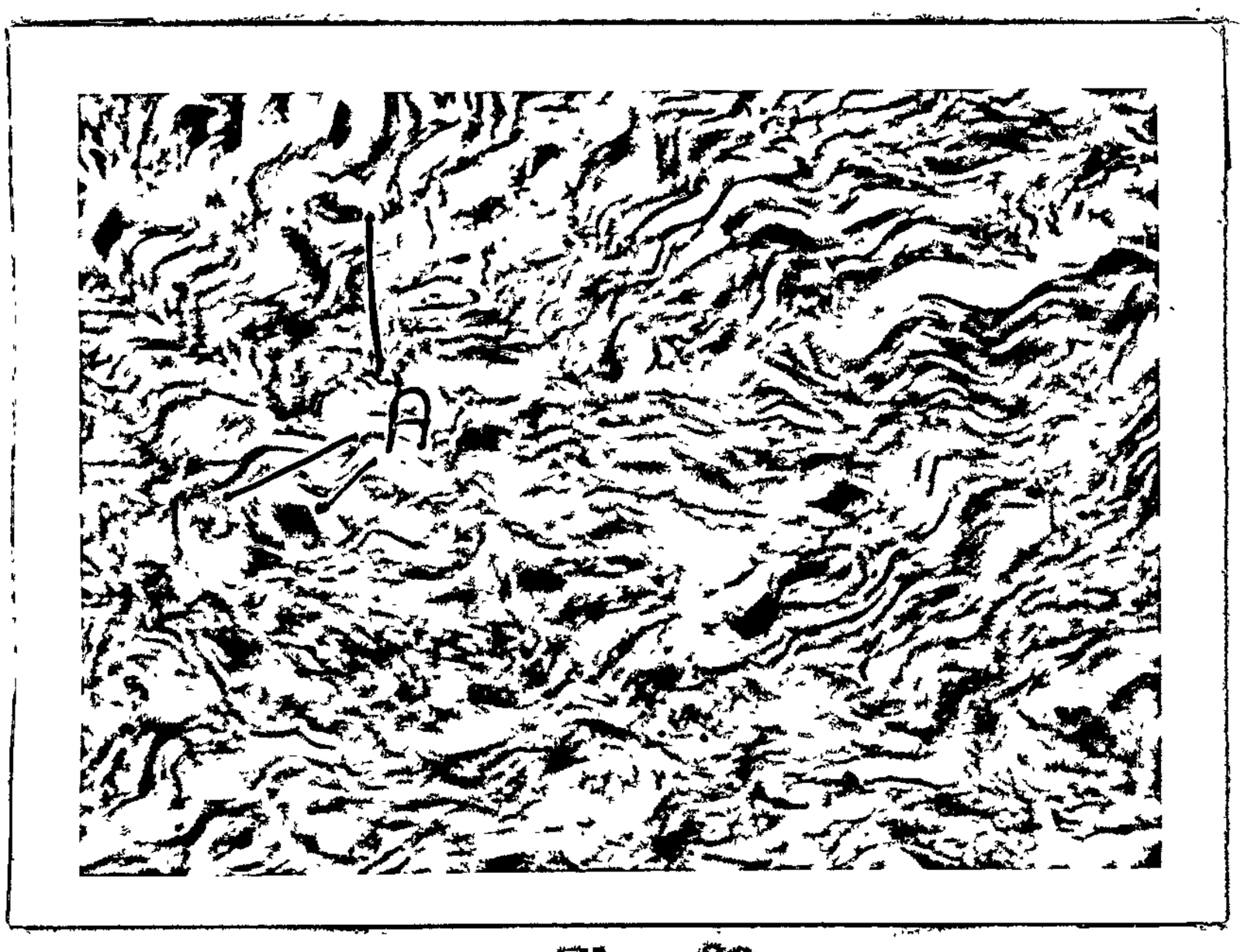

Fig. 80.

Central part of the pars gracilis menisci (X 900 cf. Fig. 67.)
Note how some of the cells in this section resemble chondrocytes.

A. Cells of a chondrocytic nature.

Fig. 81.

ovial surface of the pars gracilis menisci (X 900 cf. Fig.67)
face cells are either flattened fibroblasts or flattened
ndrocytes.

A. Undifferentiated mesenchymal cell.
B. Probably flattened chondrocytes.

Posterior Menisci. (cf. fig. 67)

This section is notable for unorientated collagenous elastic fibres and is fairly avascular. (fig. 82.) The

inferior and superior surfaces are similar to the inferior and superior surfaces of the pars gracilis menisci.

Posteriorly the pars posterior menisci gives rise to inferior and superior strata between which is the bilaminar zone. (fig. 82.)

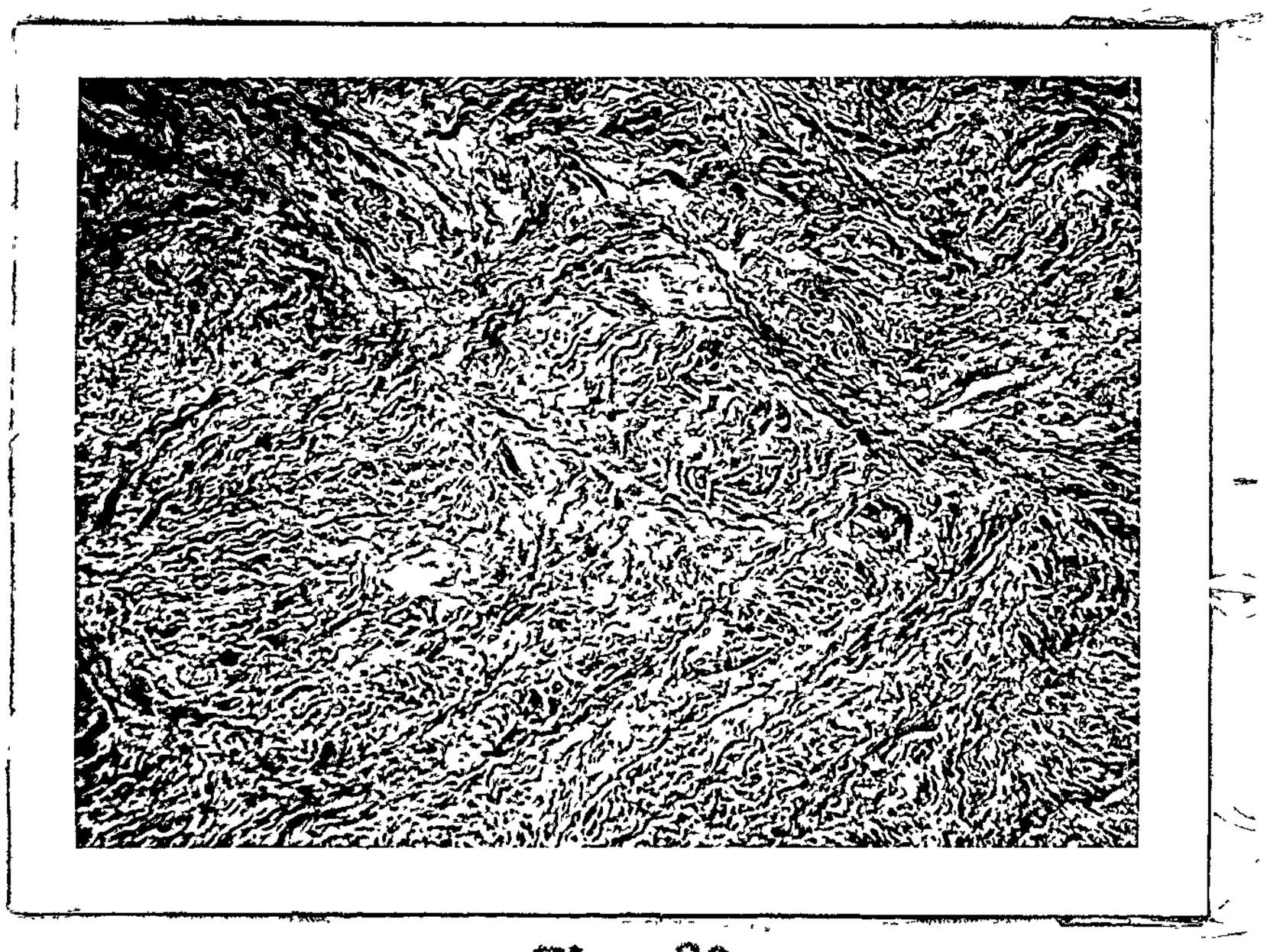

Fig. 82.

Pars posterior menisci demonstrating the usual unorientated collagenous fibre structure. (X 270 cf. fig. 67.)

****

Inferior Stratum. (cf. fig. 67.)

Inferior stratum is attached posteriorly to the posterior ace of the condyle and this section is quite conspicuous the number of chondrocytes. However it has not the roblastic component which has been described in previous tions. (figs. 83, 84.)

In relation to the inferior joint cavity its inferior face consists of cells similar in appearance to those lining surface of the pars gracilis menisci and the pars posterior nisci, i.e. there is no conspicuous sub synovial connective ue. It becomes continuous with the superficial surface the posterior aspect of the fibrous covering of the head of condyle. (fig. 85.)

Fig. 83.

Inferior stratum. Note the ligamentous nature (X 270 cf. Fig. 67.)

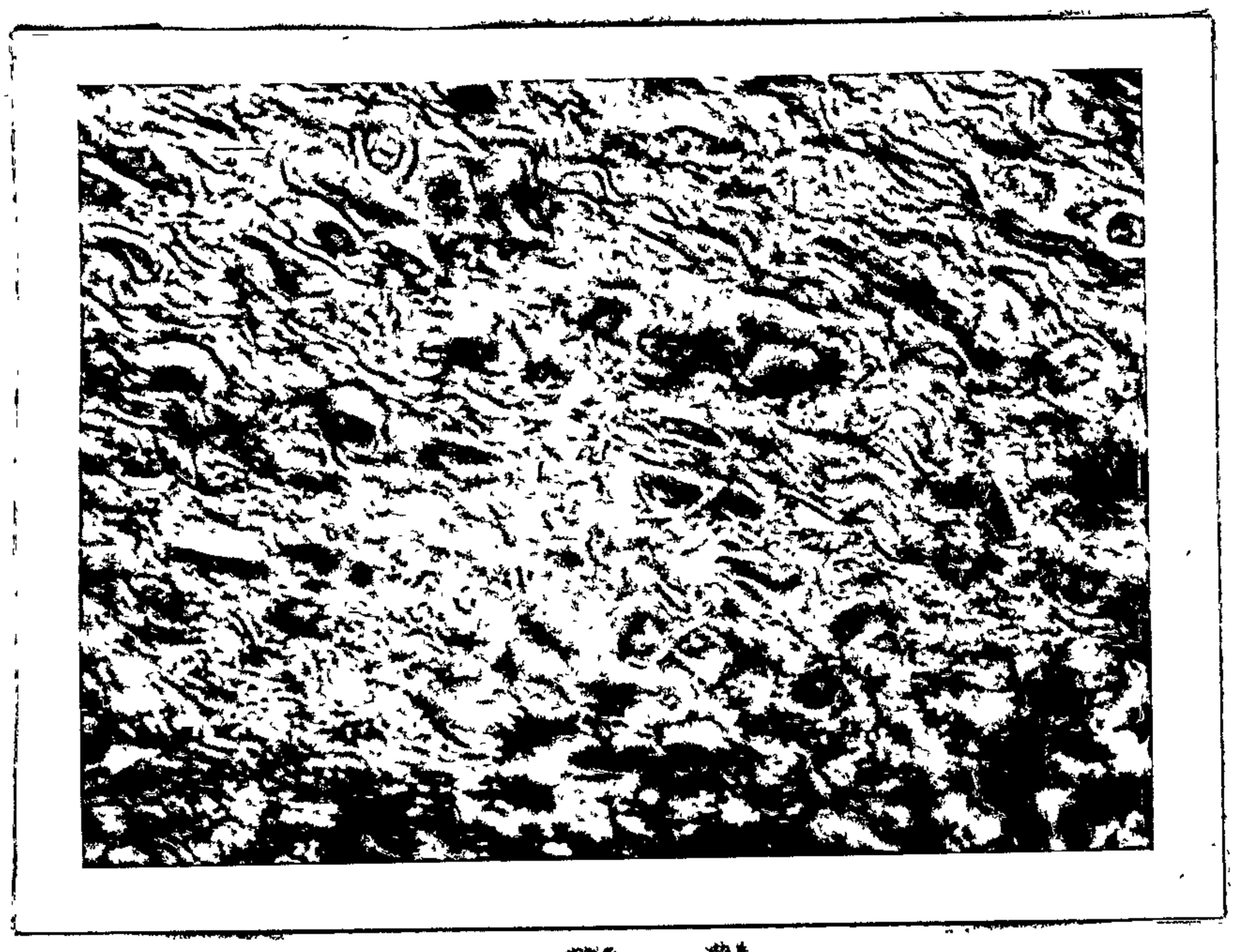

Fig. 84.

.lular component of inferior stratum (X 900 cf. Figs.67 & 83.)
e of the cells are chondrocytic in nature and some are
roblastic. This section was taken as the inferior stratum
reaches its junction with the periosteum of the condyle
the cells probably undergo modification in this area.

Fig. 85.

Attachment of inferior stratum to the posterior aspect of the head of the condyle. (X 270 cf. fig. 67.)

A. Inferior stratum.
B. Periosteum.

****

Superior Stratum. (cf. fig. 67.)

Mainly consists of collagenous fibres extending in the direction of the squamo-tympanic fissure. Superior to it, is a well defined sub synovial connective tissue zone consisting of loose fine collagenous fibres and prominent thin walled blood vessels. (fig. 86)

The synovial membrane in this region consists of a single layer of flattened fibroblasts and is continuous with synovial membrane covering of the inferior surface of the temporal bone. The inferior surface of the temporal bone is quite similar to the superior surface of the head of the condyle. It has essentially the same structure. A similar type of ossification occurring in this region, and similar type of primary and secondary endochondral trabeculae are recognisable.

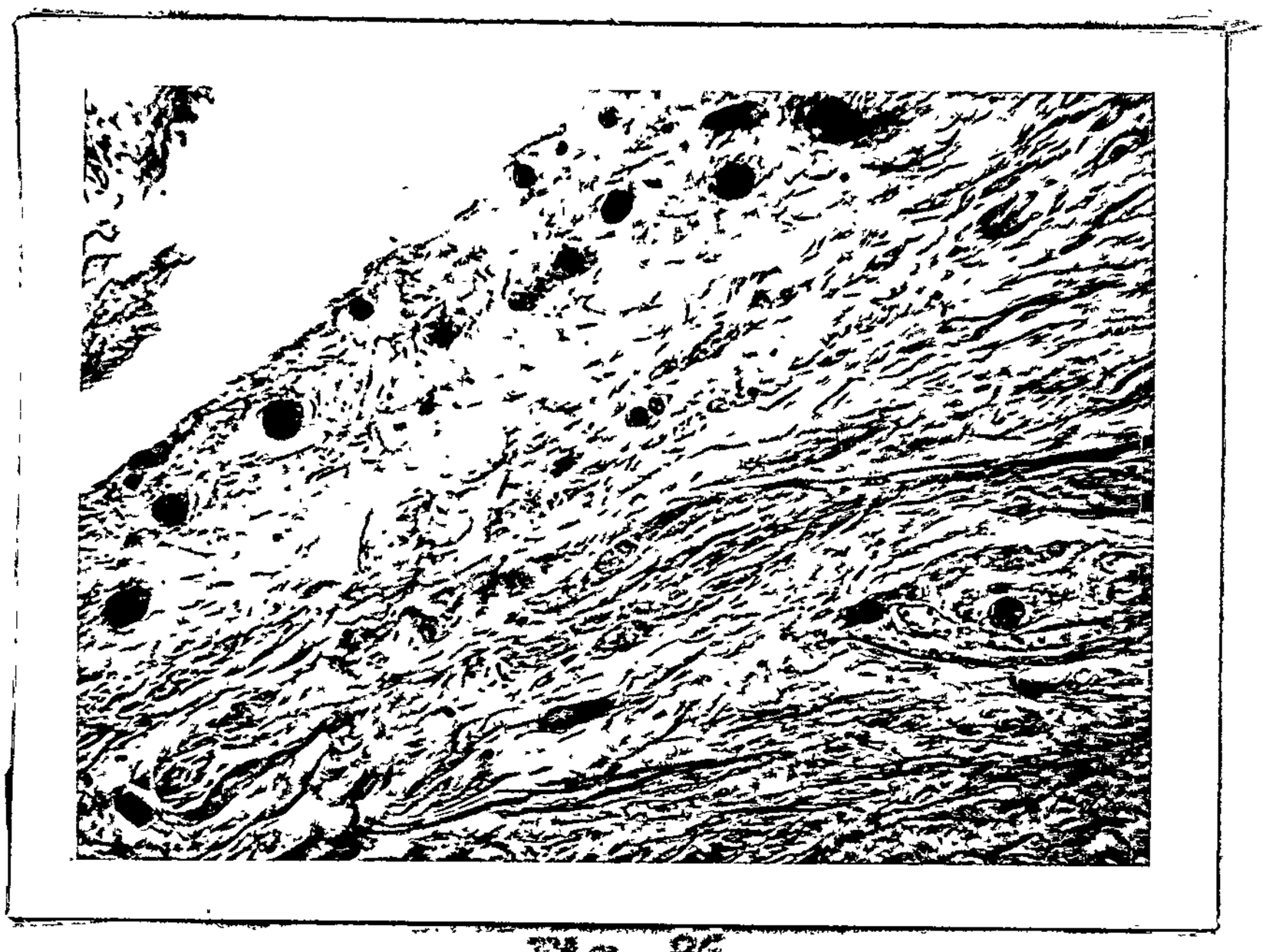

Fig. 86.

Synovial membrane superior to the superior stratum. (X 270 cf. Fig. 67.) Note the extensive zone of vascular sub synovial connective tissue.

Fig. 87.

icular surfaces of the temporal bone. (X 270 cf. Fig. 67.)
o is similar to the articular surfaces of the condyle.

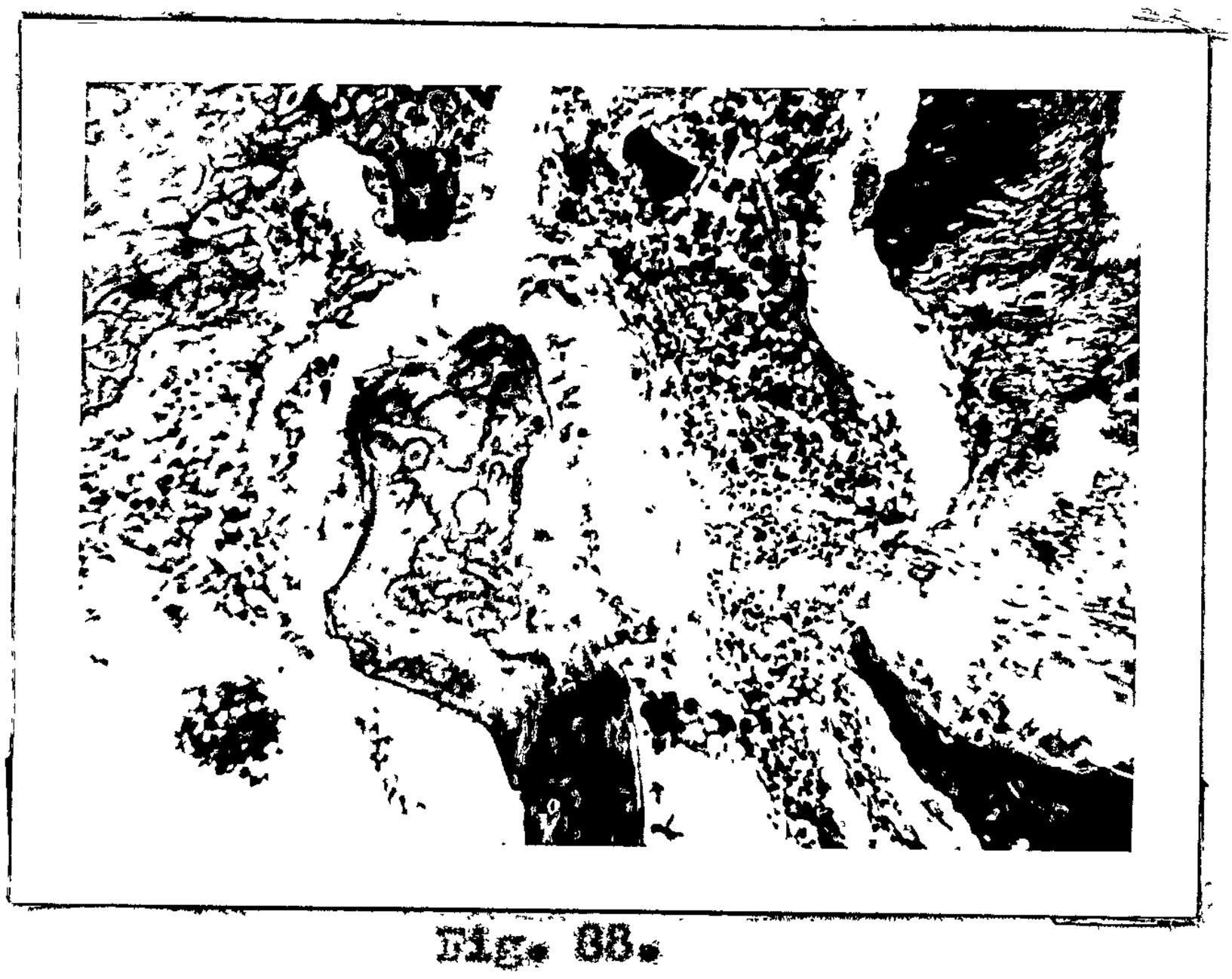

Fig. 88.

Deeper area of the articular surfaces of the temporal bone. (X 270 cf. figs. 67, 87.)

Bilaminar Zone. (cf. fig. 67.)

In this section the bilaminar zone is not clearly demarcated and merges almost imperceptible with the para posterior menisci. However superiorly, it consists of loose euro vascular connective tissue which forms a venous plexus the posterior aspect of the joint. (fig. 89.)

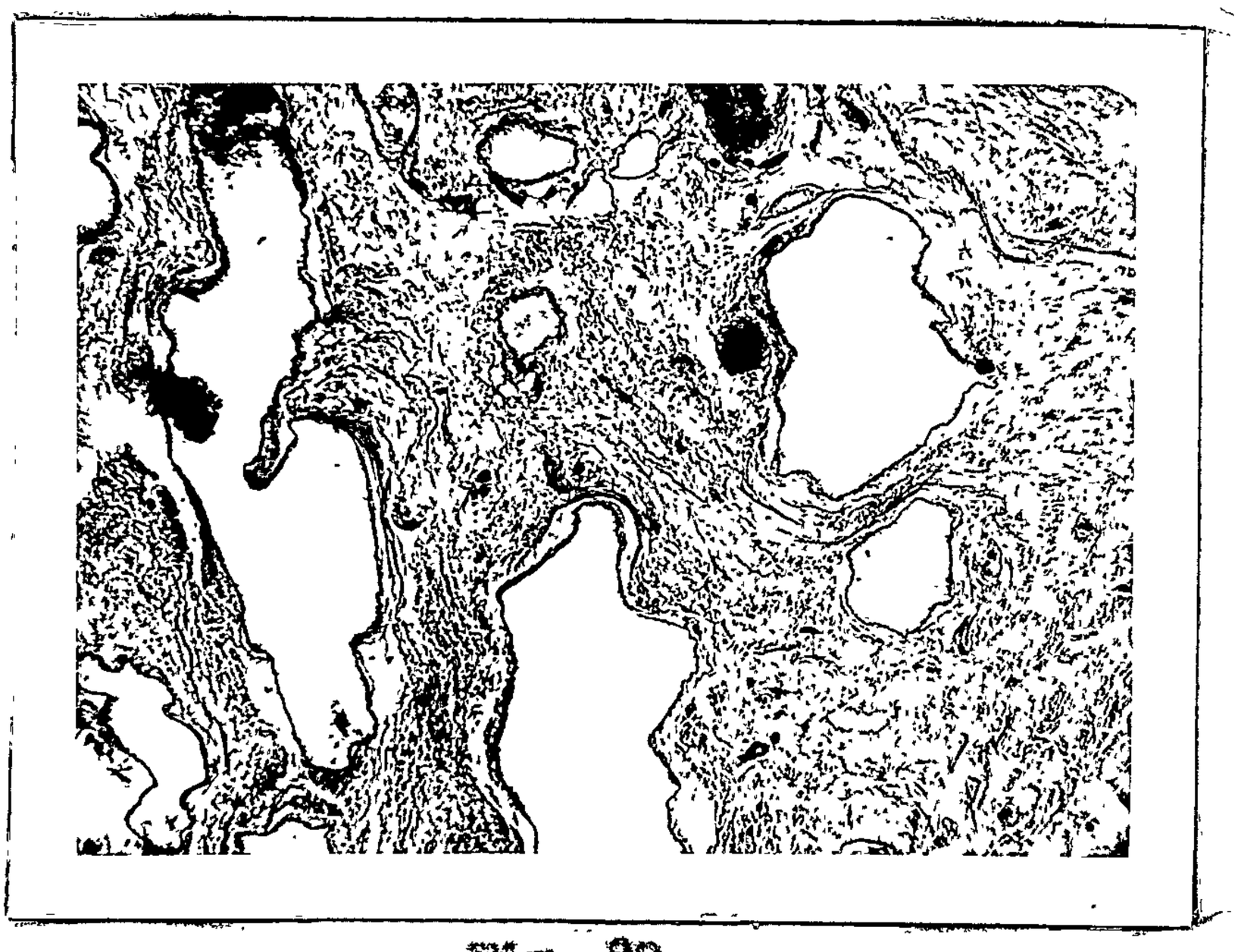

Fig. 89.

aminar zone. (X 80 cf. fig. 67.) Note large thin walled s.

Squamo-Tympanic Fissure. (cf. Fig. 67.)

This fissure is clearly apparent in this section. Its posterior aspect is constituted by the tympanic bone which is covered superficially by a fairly dense fibrous periosteum. The periosteum consists of an outer fibrous layer and an inner cellular layer. (fig. 90.)

The bone is compact in nature and Haversian system are forming in certain regions. In other parts larger Haversian spaces can be seen. (fig. 91.) The anterior aspect is constituted by the temporal bone and the tissue between the squamous bone is very vascular containing numerous tortuous thin walled veins liberally equipped with valves, lymphatic vessels and arteries. (fig. 92.)

Fig. 90.

mpanic aspect of the squamo-tympanic fissure. (X30 cf. fig.67.

A. Tympanic bone.
B. Tissue of the squamo-tympanic fissure.

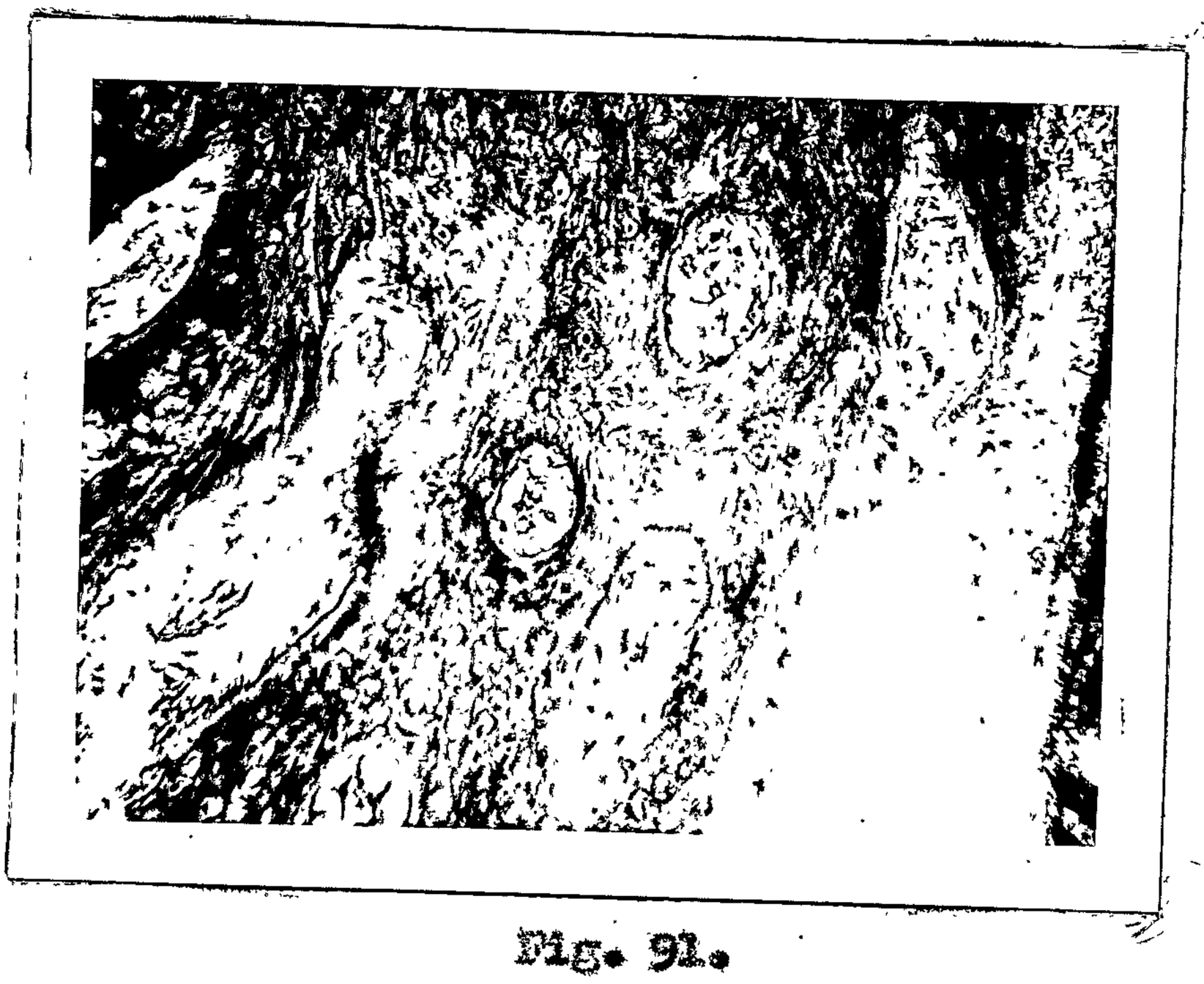

Fig. 91.

Structure of the tympanic bone. (X 270 cf. fig. 67.)

Note: That it has the appearance of a primitive compacta.

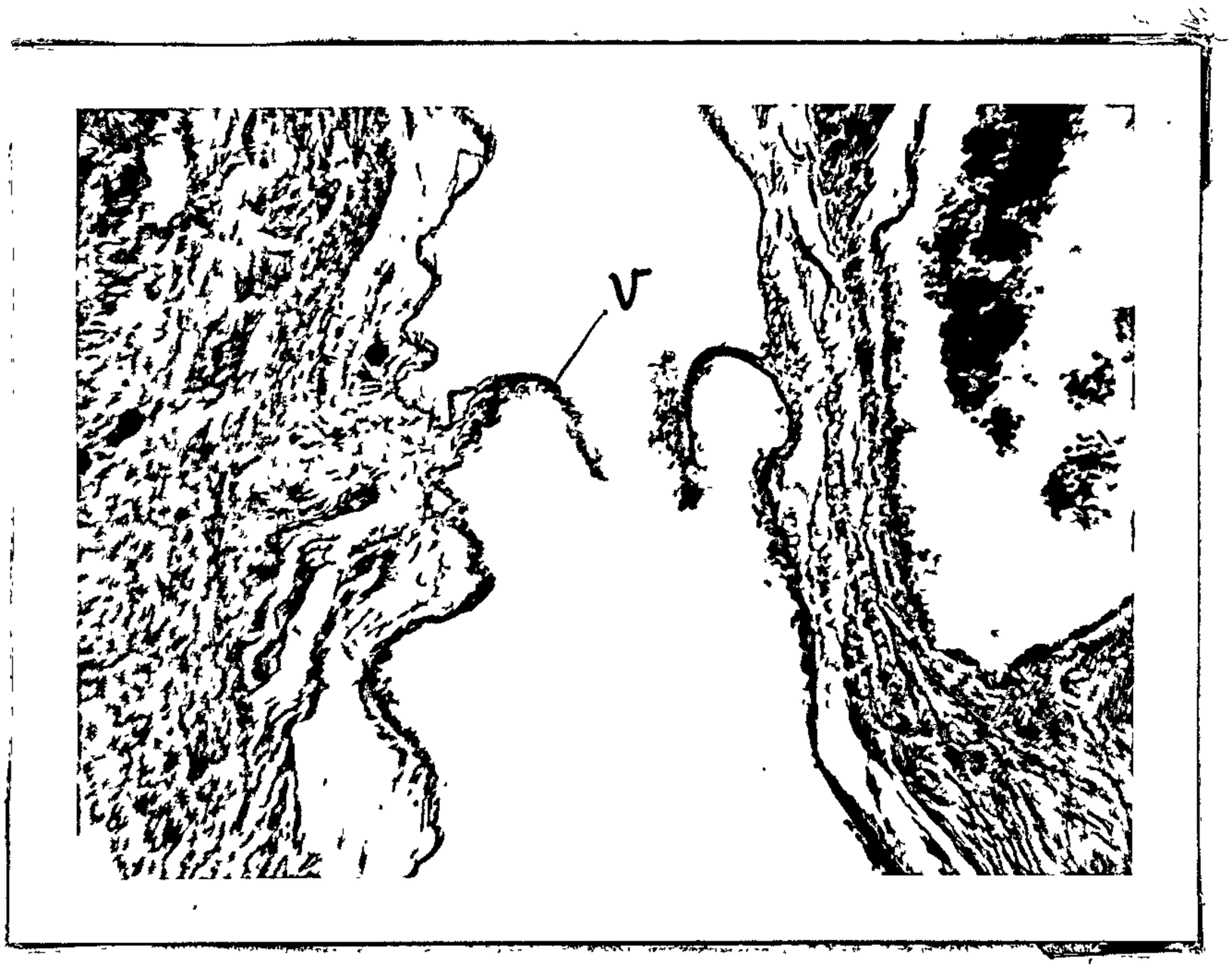

Fig. 92.

scular contents of the squamo-tympanic fissure. (X 270 cf. g. 67.)

ote: The valve ——— V.

<u>ero-Condylar Area</u>. (cf. fig. 67.)

This area is a neuro-vascular area between the sphenoiscus muscle and the lateral pterygoid muscle. In this tion fairly large thin walled veins are apparent with cle of capillary size and arteries, between which there fairly loose connective tissue. It forms a triangular

area whose superior surface is constituted by the fibres of the spheno-meniscus muscle and the helm of the pes meniscl; the inferior surface by the inserting fibres of lateral pterygoid muscle; the base of the triangle is composed or formed by the fibro-elastic layer of the perichondrium of the condylar head. (figs. 93, 94.)

Fig. 93.

erygo-condylar area. (X 270 cf. fig. 67.)

A. Pterygo-condylar area.

Fig. 94.

rygo-condylar area. (X 270 cf. fig. 67.) Showing large n walled vein.

Examination of a Section in the Medial Third where the Superior Stratum becomes continuous with the substance of the squamo-tympanic fissure.

It can be seen that the fibres of the superior stratum become continuous with the substance of the squamo-tympanic fissure. (fig. 95.)

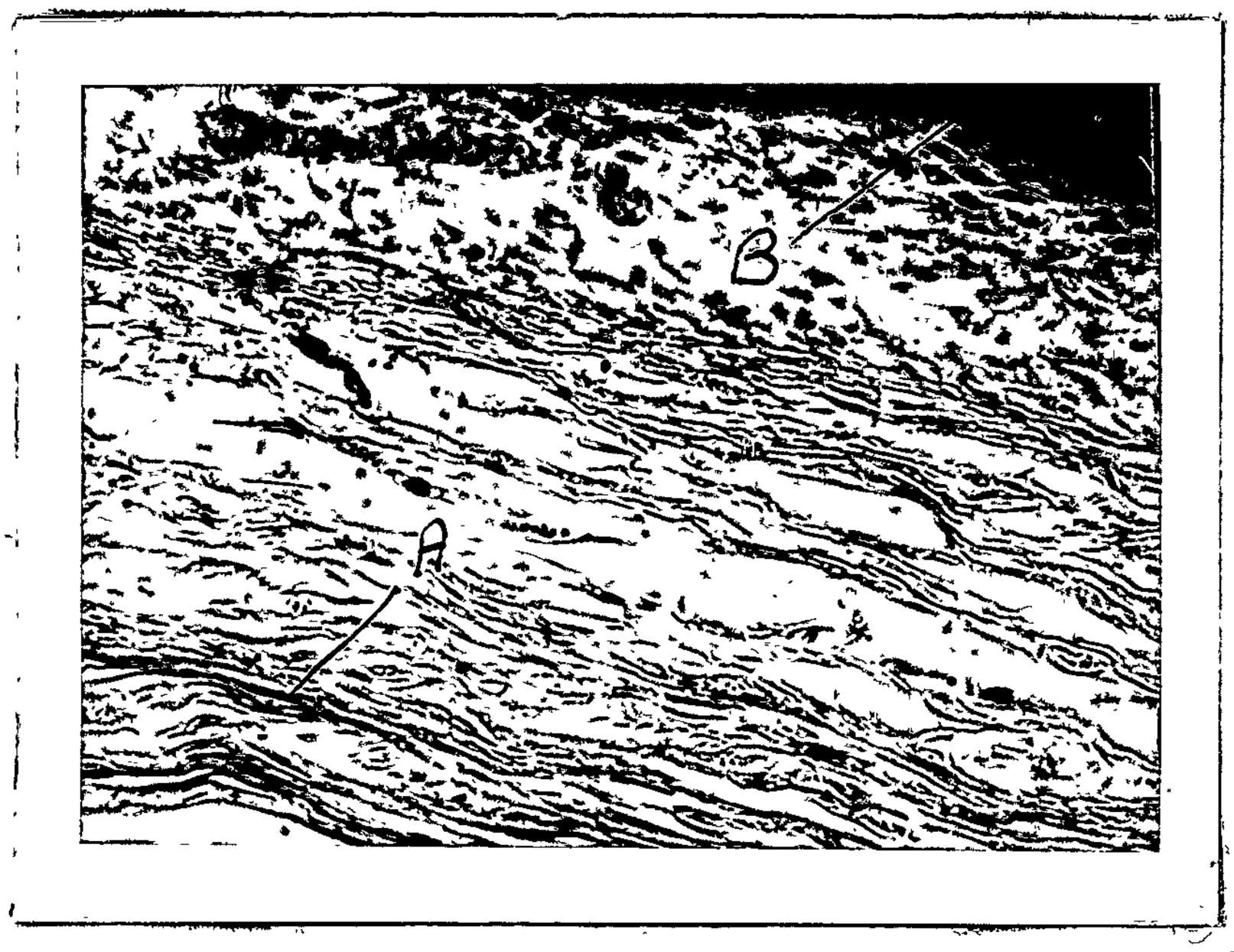

Fig. 95.

showing continuation of fibres of the superior stratum into the substance of the squamo-tympanic fissure. (X 80 cf. Fig. 67).

A. Elastic and collagenous fibres of superior stratum.
B. Temporal bone.

Examination of a section further medially in the medial third of the Temporomandibular Joint. (fig. 96)

The same component structures of the preceding section but more medial. It comprises the medial part of the condyle, the fibro-condylar area, the medial aspect of the inferior joint cavity, the temporal bone and the tympanic bone.

The method of the insertion of the disc through the squamo-tympanic fissure is well demonstrated in this section. (Figs. 96, 97, 98, 99.)

The pars gracilis menisci is reduced in size and the laminar zone is more prominent.

The elastic component of the superior stratum is well demonstrated. Sub synovial vascular connective tissue covers the aspects of the inferior joint cavity. This cavity itself

is markedly reduced in size. There is a prominent pterygo-condylar area containing conspicuous irregular tortuous veins. The pes meniscei is not so prominent and is constituted mainly by the bola which in this section receives the fibres of the sphenо-meniscus muscle. (fig. 100.)

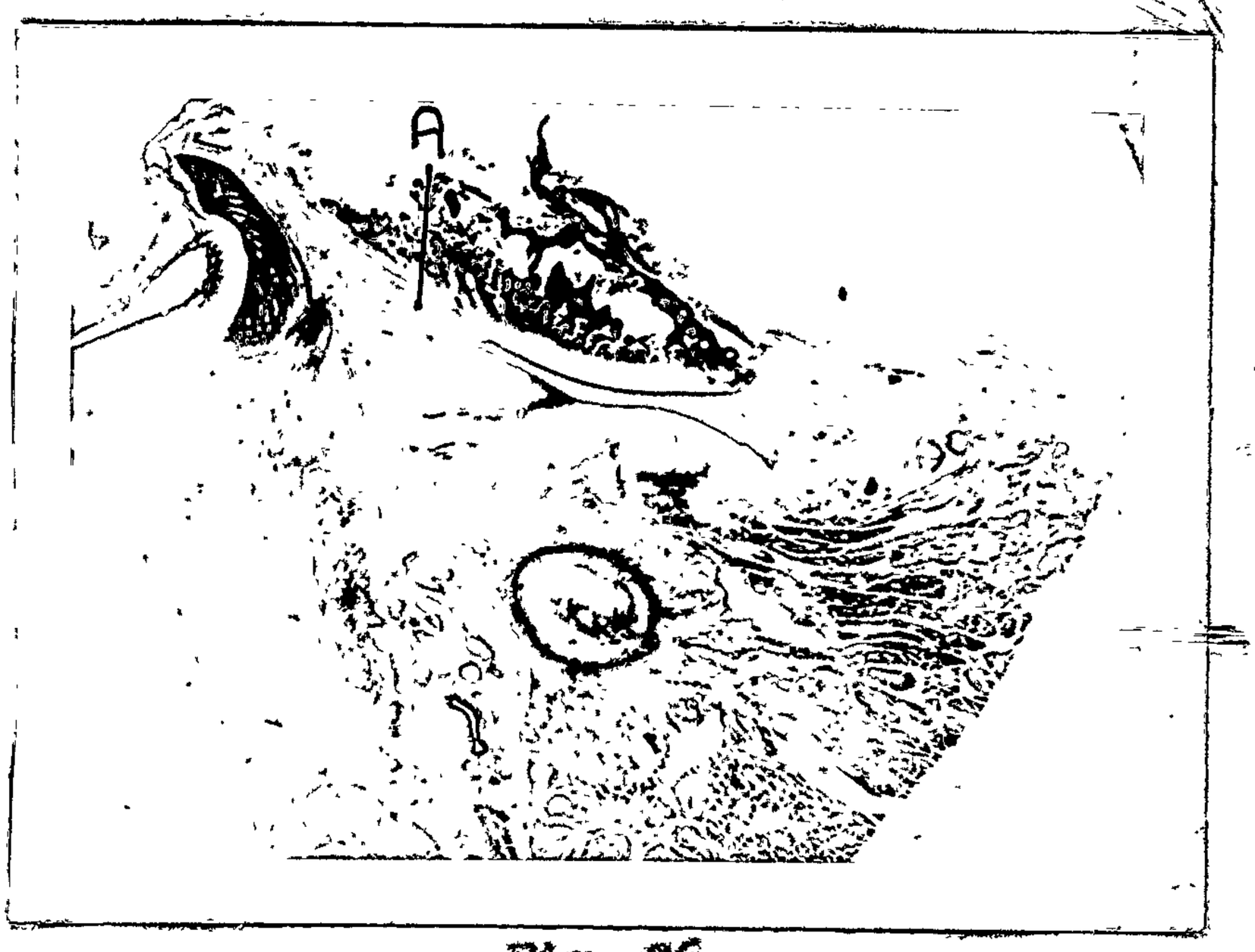

Fig. 96.

more medial sagittal section X 5. Specimen no. 1 - foetus term. (cf. fig. 67) indicating the insertion of the perior stratum through the squamo-tympanic fissure.

A. Fibres of superior stratum extending into the substance of the squamo-tympanic fissure.

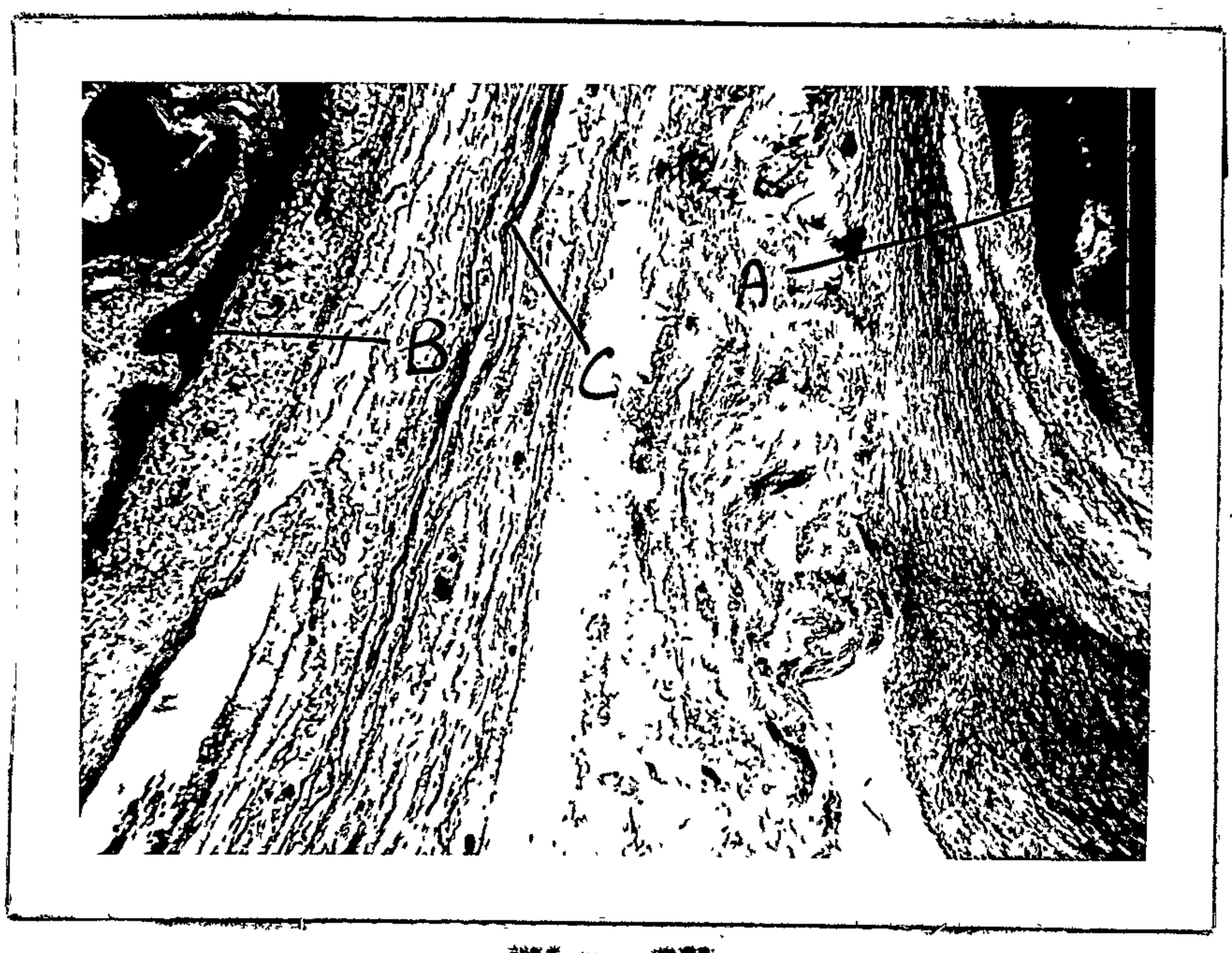

Fig. 97.

Indicates elastic fibres of the superior stratum extending through the squamo-tympanic fissure. (X 270 cf. fig. 96)

A. Tympanic bone.
B. Temporal bone.
C. Elastic and collagenous fibres.

Fig. 98.

...e detail of fig. 97 from the temporal aspect. (X 270 figs. ... 97.)

Fig. 99.

Showing a more definite fibrous layer of periosteum and more compact nature of tympanic bone when compared with temporal bone. (X 270 cf. figs. 96, 97, 98.)

Fig. 100.

lial aspect of the pterygo-condylar area. (X 270 cf. fig. 96.)

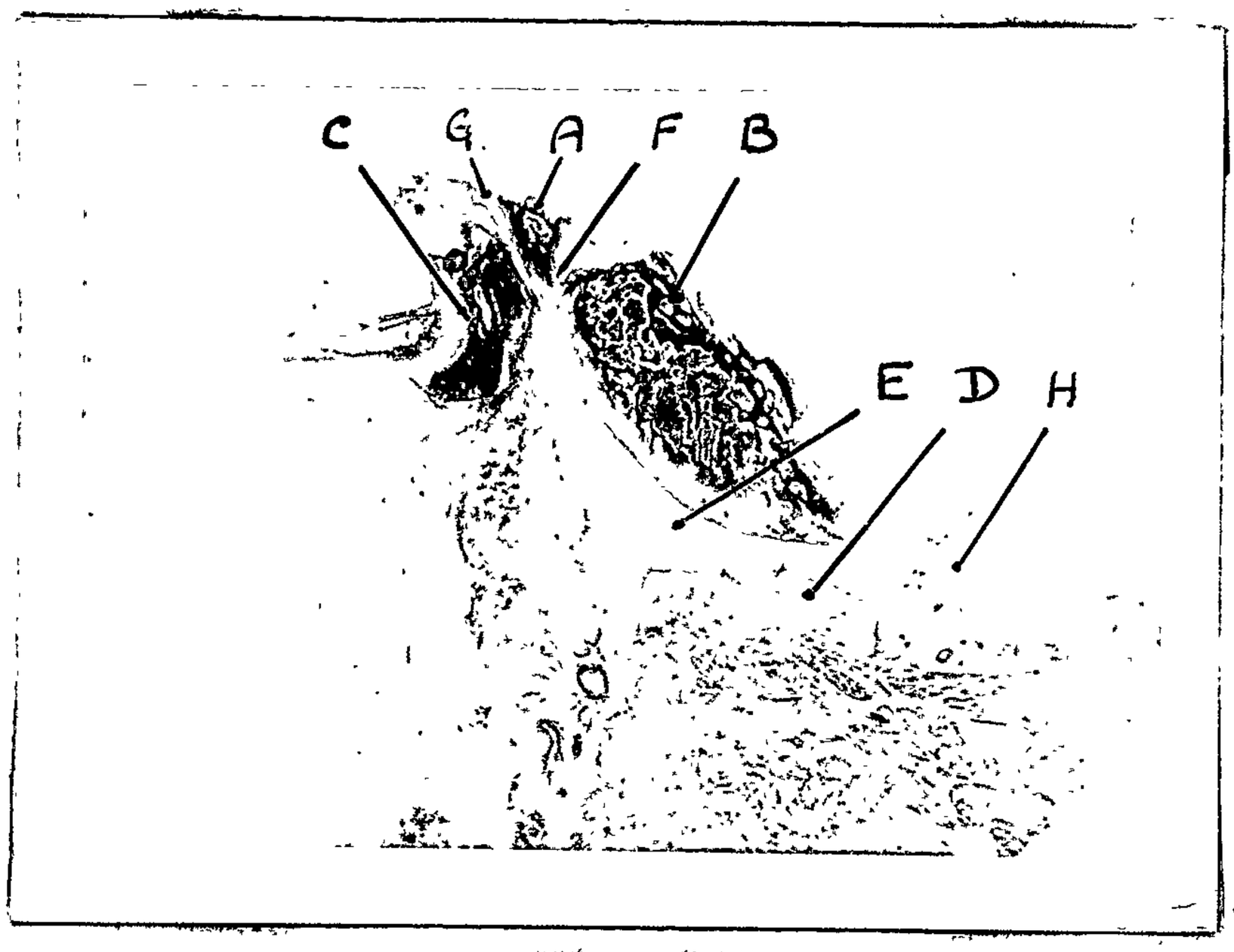

Fig. 101.

Sagittal section X 5 at the medial extremity of the Temporomandibular Joint. Specimen no. 1 - foetus at term. (cf. figs. 67, 97.) Showing the squamo-tympanic fissure as it divides into the petro-squamous fissure anteriorly, and petro-tympanic fissure posteriorly.

A. Downward projection of petrous temporal bone.
B. Temporal bone.
C. Tympanic bone.
D. Medial projection of temporomandibular meniscus.
E. Superior joint cavity.
F. Petro-squamous fissure.
G. Petro-tympanic fissure.
H. Antero-medial capsule.

****

<u>amination at the Medial Extremity of the Medial Third</u>
<u>mporomandibular Joint.</u> (cf. fig. 101.)

The conspicuous feature of this section is the downward tension of the petrous temporal bone so that two fissures e formed. An anterior, the petro-squamous fissure-posterior, e petro-tympanic fissure. The inferior joint cavity has disappeared (fig. 105) and the superior joint cavity is still early in evidence (fig. 106).

The component parts of the disc can no longer be cognised, only a medial extension of the disc proper which sists of unorientated collagenous fibres can be seen, ng which there are a few fine elastic fibres. The main l component is fibroblasts.

The surface related to the superior joint cavity consists

of highly vascular sub synovial connective tissue. The cells constituting the synovial membranes are elongated fibroblasts, although there are a few cells of a chondrocytic nature.

The tympanic bone and the temporal bone are of a compact nature. The squamous temporal bone has a thin peripheral layer of compacta and its main structure is cancellous. The fibres of the superior stratum in this section are seen to be clearly attached to the periosteum of tympanic bone, petrous bone and temporal bone. Thus the disc has a fairly firm medial attachment. (figs. 102, 103, 104, 105, 106.)

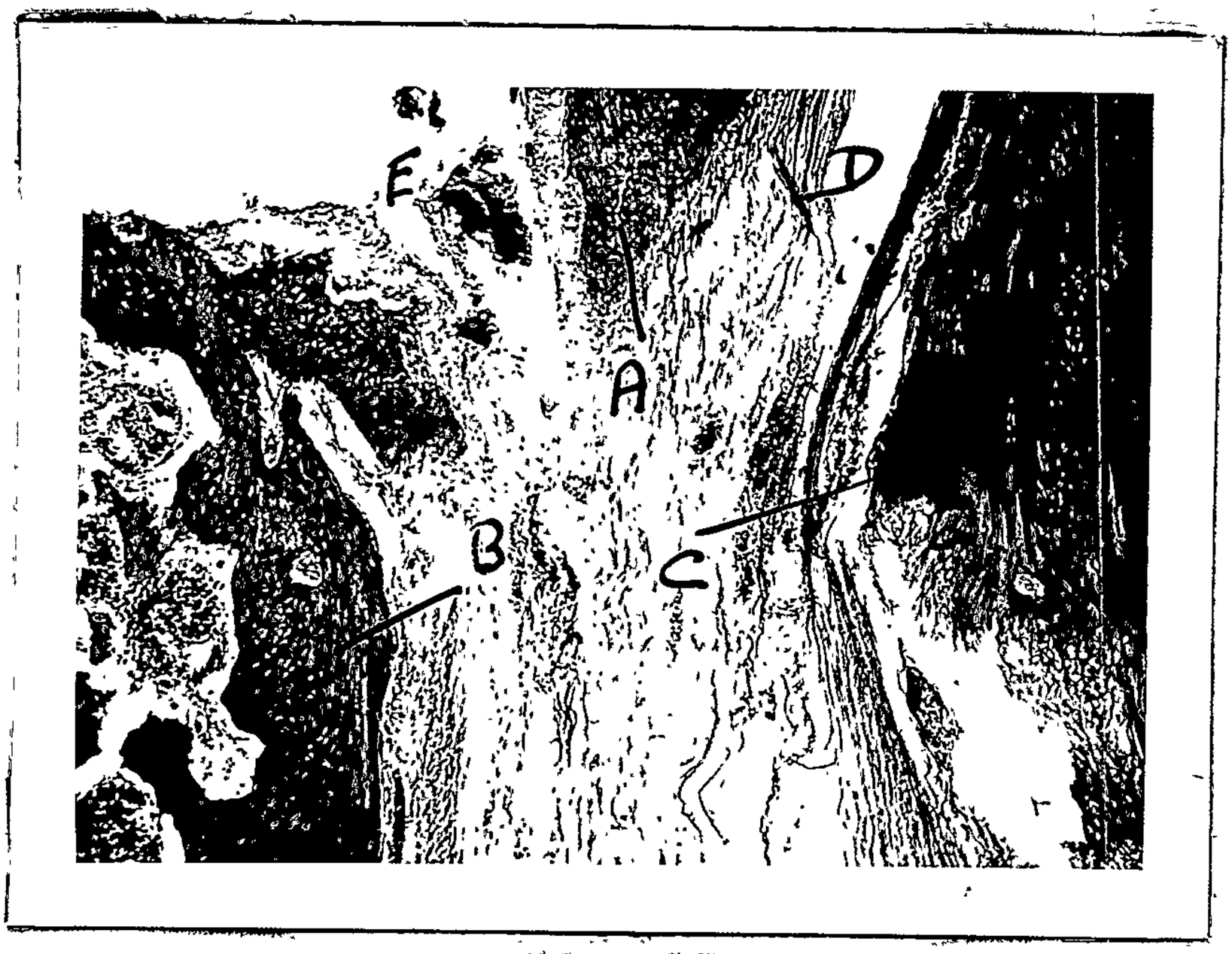

Fig. 102.

owing the petro-squamous and the petro-tympanic fissures. X 80 cf. fig. 101.)

A. Petrous temporal bone.
B. Squamous temporal bone.
C. Tympanic bone.
D. Petro-tympanic fissure.
E. Petro-squamous fissure.

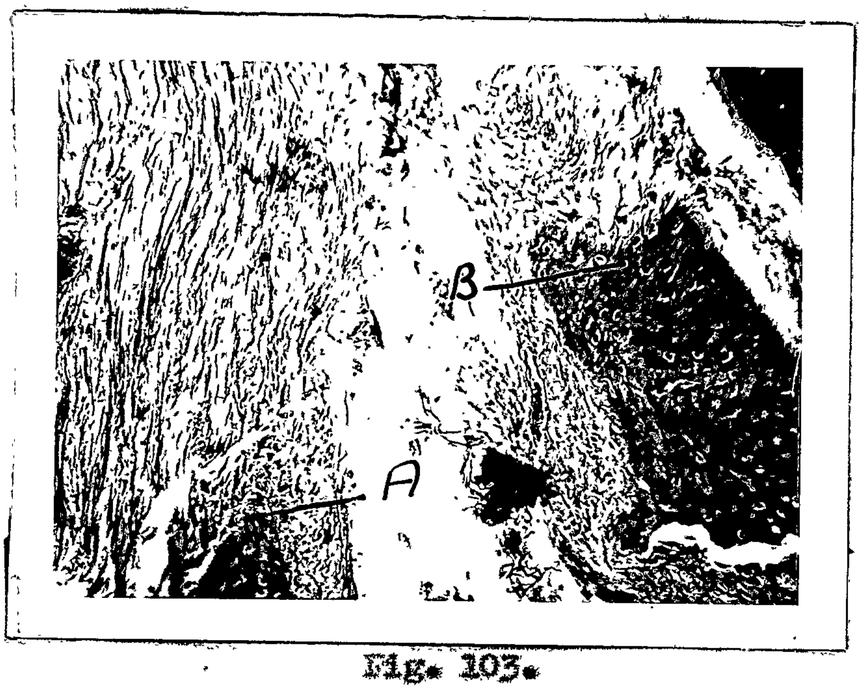

Fig. 103.

Petro-squamous fissure. (X 270 cf. figs. 101, 102.)

A. Petrous temporal bone.
B. Squamous temporal bone.

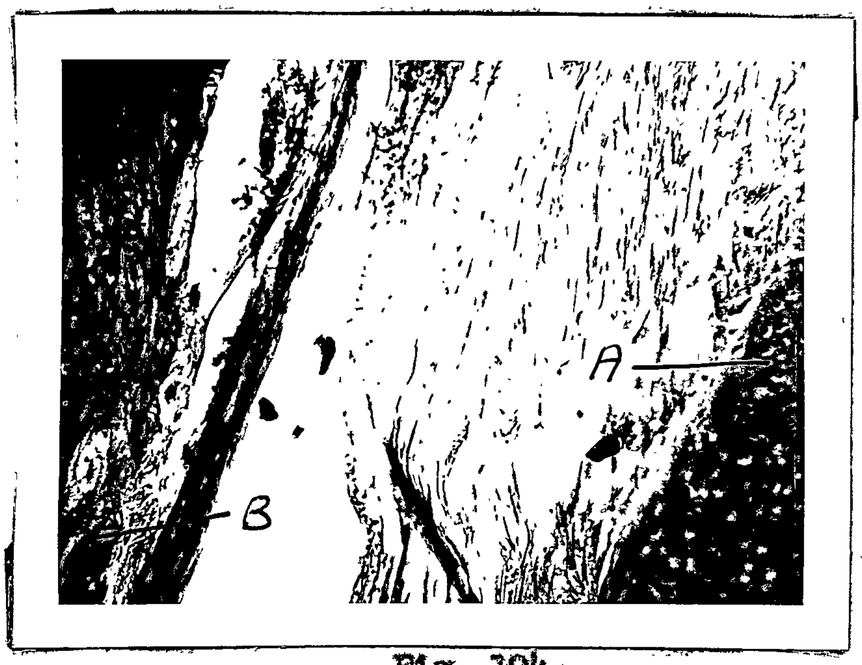

Fig. 104.

ro-squamous fissure. (X 270 cf. figs. 101, 102, 103.)

A. Petrous temporal bone.
B. Tympanic bone.

e: That collagenous fibres extending from meniscus
ear to be more intimately associated with the periosteum
petrous temporal bone rather than tympanic bone or squamous
poral bone.

Fig. 105.

Demonstrating the medial projection of the temporomandibular meniscus and no inferior joint cavity. (X 80 cf. fig. 101.)

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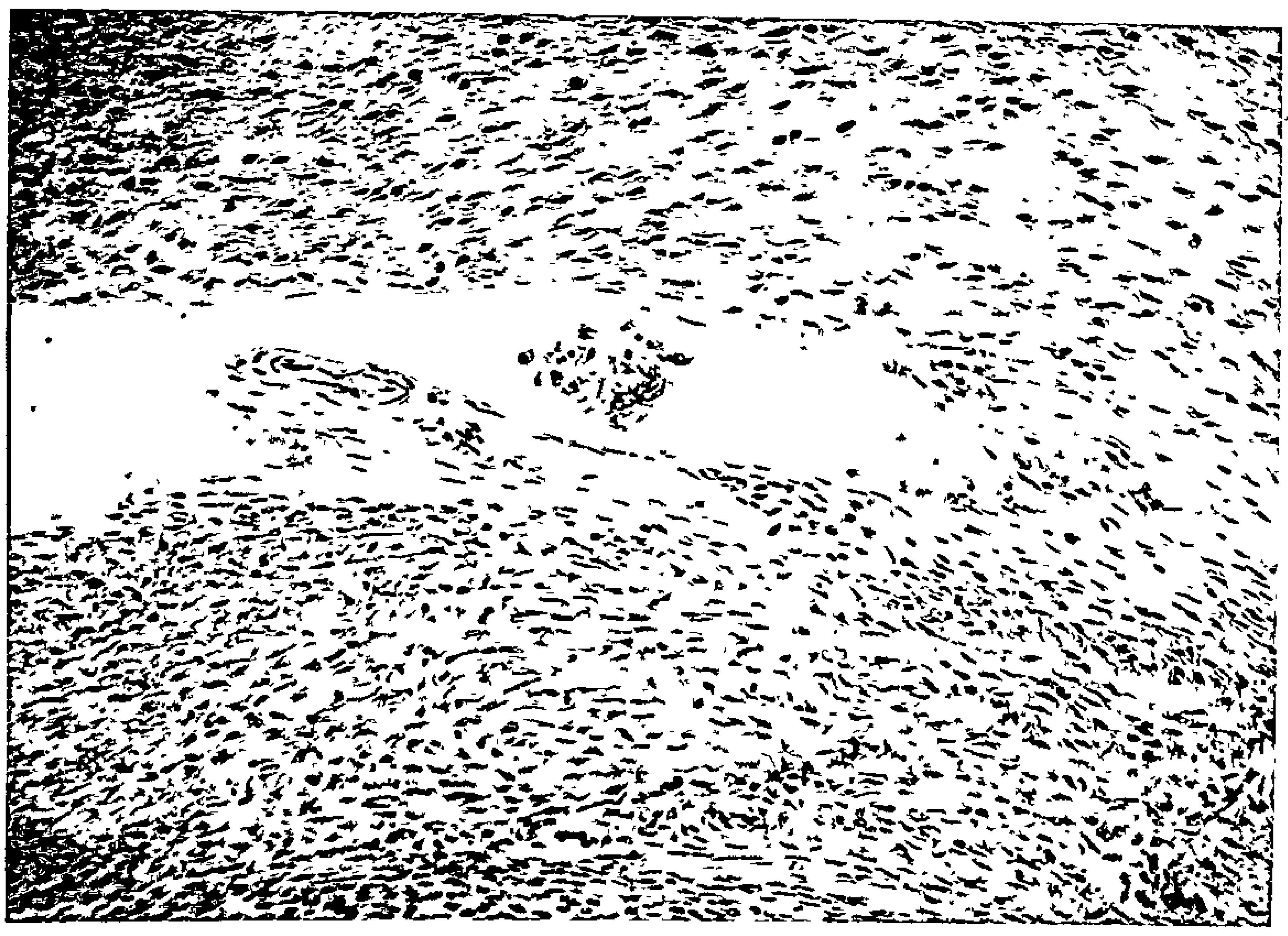

Fig. 106.

dial projection of the meniscus into the superior joint vity. (X 270 cf. fig. 101, & 105.)

****

nu Vasculosis Menisci. (cf. fig. 4.)

This vascular canal is observed in approximately the ddle of the meniscus and runs from the apex of the bilaminar ne to the sub synovial connective tissue inferior to the ferior stratum. Whilst the other parts of the meniscus have te a demonstrable blood supply the blood vessels in this t of the disc (i.e. the genu) appear to be rather cialised and it supplies the sub synovial blood vessels at

the anterior and inferior parts of the posterior inferior joint cavity for quite a distance both laterally and medially.

The joint cavity in this region is conspicuous for the number of villi which are very vascular. The canal at its superior portion consists of an artery and a thin walled vein. Approximately at the middle third of the canal an arterio-venous-anastomoses occurs. (fig. 107.)

The arterio-venous-anastomoses is more in the nature of an arterio-venous bridge and is a thoroughfare channel through which the blood passes when the tissue is at rest. This thoroughfare channel receives also capillary venules and drains into a large thin walled vein. (fig. 108.) Peripheral to the arterio-venous bridge a capillary system can be observed. (fig. 109.)

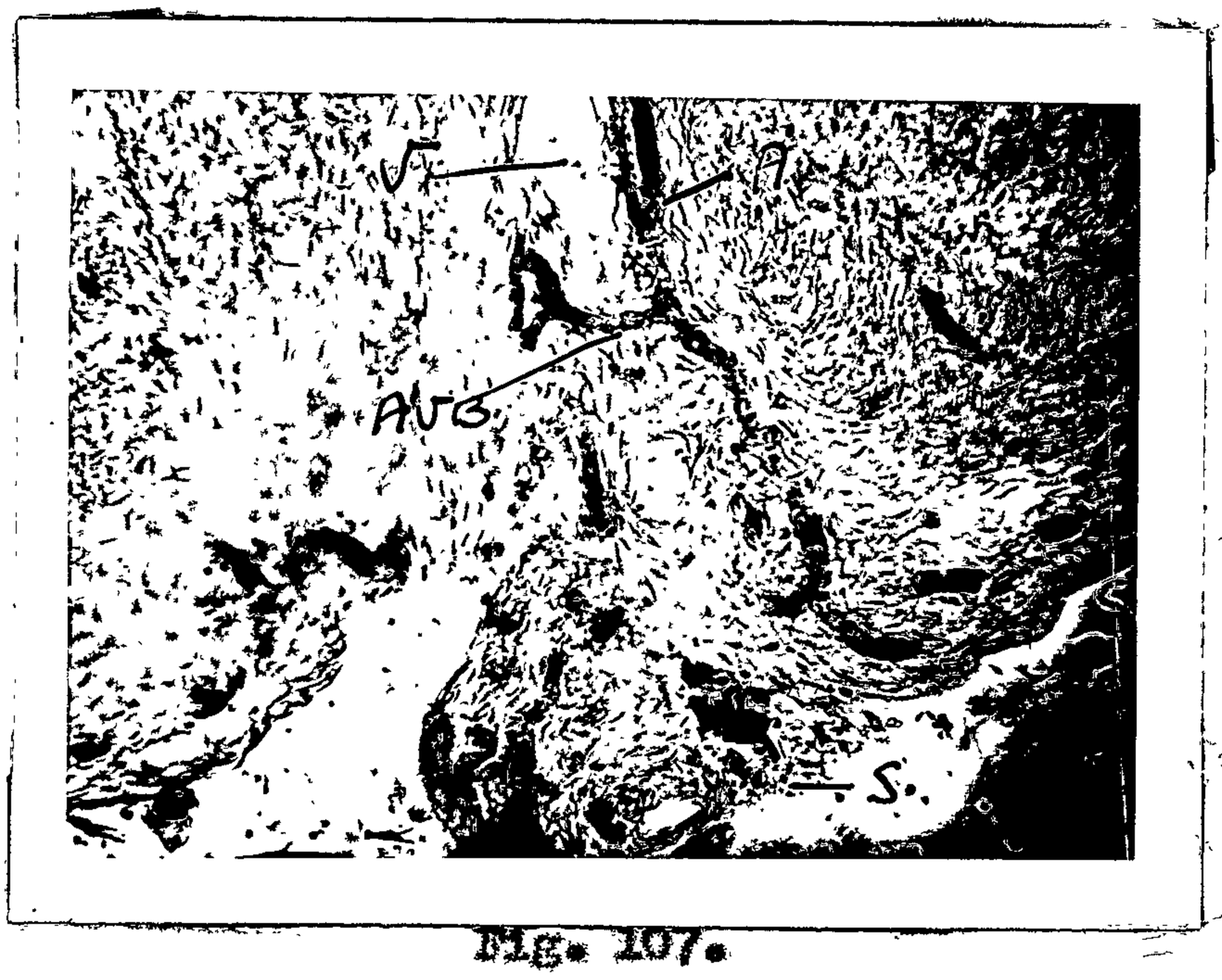

Fig. 107.

arterio-venous bridge in the genu vasculosis menisci.
X 80 cf. fig. 4.)

A. Artery.
V. Vein.
A-VB Arterio-venous bridge.
S. Synovial villi.

****

Fig. 108.

Venous end of the arterio-venous bridge shown in Fig. 107.

(X 900 cf. figs. 4, 107.)

V. Vein.
T. Terminal end of arterio-venous bridge.
C. Capillary venules.

Note: That the bridge is full of erythrocytes.

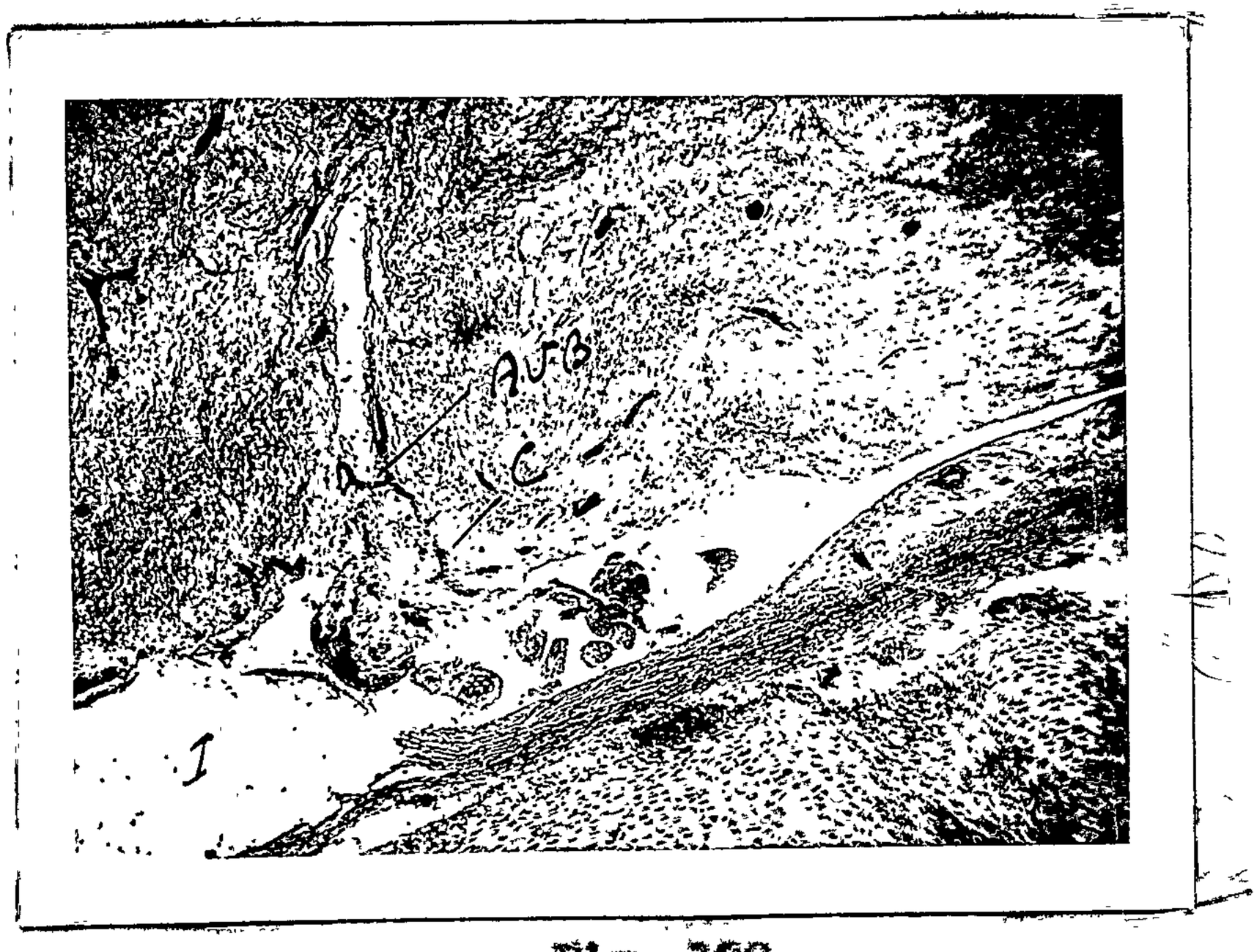

Fig. 109.

Capillary system peripheral to the arterio-venous bridge in

Fig. 107. (X 90 cf. figs. 4, 107, 108.)

C. Capillary system.
I. Inferior joint cavity.
A-V-B. Arterio-venous bridge.

<u>MARY</u>.

The component parts of the disc can be clearly

distinguished through all the sections and it is similar in

structure throughout its width. It possesses a constant appearance in that the pes meniscl and the pars gracilis menisci contain relatively well orientated collagenous fibres throughout which there is a sparse number of elastic fibres.

The pars posterior menisci on the average contains unorientated collagenous fibres and sparse elastic fibres.

The superior stratum has for the most part orientated collagenous fibres which extend in the direction of the squamo-tympanic fissure and passes into the substance of this fissure. It only exhibits a firm attachment in the vicinity of the petro-squamous and the petro-tympanic fissures.

The inferior stratum is not clearly recognised medially and does not possess the ligamentous appearance of the more lateral sections. Posteriorly the auricular temporal nerve and the maxillary artery can be noted whilst anteriorly the relationship of the masseteric nerve can be observed. The synovial membrane is conspicuous for its highly vaseular sub synovial connective tissue in the regions of the pes menisci. and the strata of the bilaminar zone. However, this sub synovial connective tissue is deficient in the vicinity of the pars gracilis menisci and the pars posterior menisci. The synovial membrane, which is the cellular layer in contact with synovial fluid, is fairly regular and consists of chondrocytes and fibroblasts.

The pterygo-condylar area is only evident in the middle and medial parts of the disc and is not apparent laterally.

The cellular component of the meniscus is mainly of a fibroblastic nature in the pes menisci and the bulk of the pes menisci, and in the superior and inferior strata. However the pars posterior menisci and the pars gracilis menisci is of a chondrocytic nature. The ossification of the head the condyle is characterised by the intrusions of the brous covering of the head of the condyle which form a characteristic appearance of semi-circles of ossifying tissue. tympanic plate is notable for the compact nature of the whereas the temporal bone and the condyle have only a

thin layer of primitive cortical compacta.

The blood vessels in the sub synovial connective tissue are mainly thin walled and specialised blood vessels were observed in the genu vasculosis menisci. The bilaminar zone and the pterygo-condylar area contain thin walled tortuous veins which constitute a venous plexus and it is probable the function of this venous plexus is to return blood back to the heart in the various movements of the joint. In the bilaminar zone the approximation of the strata in closure of the mouth would tend to pump the blood back to the heart whilst the contraction of the pterygoid muscle in opening of the mouth would tend to pump the blood in the venous plexus of the pterygo-condylar area back to the heart.

CHAPTER 3.

THE STRUCTURE OF THE TEMPOROMANDIBULAR MENISCUS AT 19 MONTHS OF AGE. SPECIMEN No. 2.

The method of describing the temporomandibular meniscus of this specimen will be similar to that used in describing the temporomandibular meniscus of Specimen no. 1 in Chapter 2. Special attention will be paid to the dominant cell component of the various parts of the disc.

(1) Lateral third of the temporomandibular meniscus. (fig. 110)

(a) Fibrous covering of the head of the condyle.

In this specimen the perichondrium of the head of the condyle has been well preserved (fig. 111) and in certain areas, the cartilage cells concerned in the growth of the condyle are apparent. The superficial layer of the perichondrium of the condylar head is rather more cellular than the layer immediately beneath it. Only very fine elastic fibres can be seen. (fig. 112.)

Immediately beneath the fibrous covering of the condylar head there is a zone of proliferating cartilage cells, and beneath this again is a layer of flattened elongated chondrocytes. (fig. 113.)