THE REGIONS OF THE HUMAN BODY
OSTEOLOGY

ARTHROLOGY

TOLDT
Drs. Christiaan de Veneden & Smelal.
TRANSLATOR'S PREFACE

The science of human anatomy is purely descriptive in its methods, the field it covers is not very extensive, and its boundaries are sharply limited; it is, therefore, one of the few sciences in which something closely verging on finality and completeness has been attained. Even, however, if no new anatomical data are likely to be forthcoming, there is yet scope for originality in the method of presentation of those data of which the science now consists; and originality of this kind Professor Toldt's "Atlas of Human Anatomy" exhibits in a high degree. In the many admirable manuals of human anatomy now extant in English, the illustrations, even when numerous, as they are often, and when good, as they are occasionally, form a mere supplement—usually a very imperfect supplement—to the text. Atlases of anatomy, and useful atlases, also exist in English, but all are quite fragmentary. Some, like the well-known and valuable, but somewhat antiquated, "Illustrations of Dissections," consist of a series of pictures of selected regions carefully prepared on the cadaver; these are models for the imitation of the student in his own dissecting work, but are not of much value for private study. Others, like Bellamy's English edition of Braune's atlas of frozen sections of the human body, present a small number of anatomical facts from a striking and unfamiliar point of view. But among English works, an accurate pictorial representation of all the data of human anatomy, carefully drawn to scale from actual specimens, and arranged suitably for systematic study, has hitherto been lacking.

Whilst a true knowledge of anatomy, a knowledge that will through life supply the needs of the physician and the surgeon in their practical work, can be obtained only in the dissecting-room, the student's labours with scalpel and forceps must be preceded and supplemented by systematic private study. Now, for this purpose, the textual descriptive treatise is not alone sufficient; or, if sufficient, it is so at an excessive expenditure of time and labour. Both in his work preparatory to dissection and in his revision of his anatomical knowledge subsequent to dissection, the energy of the student will be enormously economized if he has at hand a graphic representation of every structure named and described in his systematic treatise. An increased use of the visual or graphic method, both in the acquirement and in the revivification of knowledge, is a feature of the age in all educational departments; but this English translation of Professor Toldt's work is, as far as the English-speaking races are concerned, the first adequate application of the method to the study of human anatomy.

In speaking of the finality and completeness of anatomical science, one exception must be made, and this exception relates to anatomical terminology, which, though nearly completed, has not yet attained finality. Had there been a universal anatomical nomenclature—a nomenclature, that is, adopted by, or even fully intelligible to, anatomists of all nationalities—an English edition of this work would have been superfluous. Anatomy, however, like all other sciences, has suffered from the dispersion of tongues that ensued on the Renascence, when the good and the evil of medievalism became inextricably confounded, and were cast away together, and the inestimable gift of a language common to the learned of all lands was lost for ever. The German-speaking peoples have a fairly complete and fairly pure Latin anatomical nomenclature, needing, however, to be eked out here and there by the vernacular; whilst in England, as in France, a strange and bastard dialect, half Latin and half vernacular, has come into use. Uncouth jargon as it is, being current and familiar, it is not likely in England and America ever to be replaced by the more consistent terminology in use in the anatomical schools of Germany and Austria; I have, however, in this English edition of the "Atlas of Anatomy" retained the terminology of the original side by side with the English translation, distinguishing between the two by a difference of type.

In some cases, in the nomenclature used by the author, terms are met with which have no counterpart in English anatomical terminology: either because the author regards as normal a structure which English anatomists regard as a variety; or, and far more commonly, because the structure in question, though normal, is unimportant, and English anatomists have therefore neglected to name it. Sometimes, in such cases, I have given a literal English translation of the Latin name used by the author; sometimes, however, a paraphrase has been required to explain what the structure is, or to account for the absence of an English name, and this paraphrase, when lengthy, has been printed as a foot-note. In all such cases, an asterisk is prefixed both to the Latin name and to its English equivalent, to indicate to the reader that there is something unusual in the terms employed.

I must further point out that in a few instances the author's nomenclature actually conflicts with that commonly used in England, so that the literal translation of the author's name for a certain structure is applied in England to a structure totally different. For instance, what the author calls canalis pharyngoalatimus is in England called the posterior palatine or palatomaxillary canal, while the pharygoalatine canal of English anatomists is called by the author canalis pharyngens. But for this warning, beginners might imagine such divergencies to be due to carelessness on the part of the translator or to errors of the press.

A further difficulty has arisen from the fact that English anatomical nomenclature is itself not yet finally settled, nor even wholly consistent. Not merely is the same structure often known by several names; but, which is worse, the same
name is sometimes applied to two different structures. Reform is therefore needed, but it is not the part of a translator to undertake it, and I have perforce been content to follow the authorities. My seating authority has been the tenth edition of Quain's "Elements of Anatomy," but I have also had Macalister's "Text-book of Human Anatomy" in constant requisition. From these works I have, when more than one name is used to denote any structure, taken all those in common use, the order in which the alternative names have been printed showing most often the relative frequency of employment; in a few cases, however, where a name less commonly used has appeared to me distinctly preferable for any reason to an alternative name more commonly used, I have given the less usual but preferable name the precedence. To this small extent only have I been influenced by my own views in the matter of anatomical terminology; and, with the exception of those names which for the reason already furnished are preceded by an asterisk, all the terms in the English nomenclature are in use by one or more of the leading English authorities.

As regards the terminology employed in the United States of America, the contributions of the scientific investigators of that country to anatomy have, owing to the early perfection of this branch of study, been far less extensive than in the case of the other sciences ancillary to medicine; and the science of anatomy was for the most part taken bodily over, text-books, terminology, and all complete. A few differences, however, exist, and I have therefore collated my manuscript with that useful little work, Young's "Synopsis of Human Anatomy," and any divergent terms in use in America only have been inserted in my translation, and distinguished by the addition of the letters "U.S."

A considerable number of the references to the figures will be found to be in the English nomenclature only. These are either cases in which the English and the International descriptive terms were identical, and the printing of both was therefore superfluous; or else cases in which in the original the reference was wholly in German. Measurements given in the original in centimetres have in all cases been reduced to inches. In illustrations of fetal parts the age of the foetus is given in months from the date of fertilization of the ovum. On the Continent, however, the period of utero-gestation is usually reckoned as ten "months" of four weeks each; not, as with us, as nine calendar months. To avoid mistake, I have in all such cases after the word "month" or "months" added in parentheses the words "months of four weeks each."

I cannot dismiss mention of the works of reference I have employed without alluding to the German-English "Dictionary of Medical Terms," by Treves and Lang—a book invaluable to all those engaged in the translation of German medical works.

Since this Atlas is intended for the use of beginners, as well as for that of advanced students of human anatomy and of practitioners of medicine, I may fitly conclude this preface with a few words on the general principle of anatomical nomenclature. For descriptive purposes the body is regarded as being in the upright posture, with the arms extended by the sides, and the hands fully supinated, so that the palms look forward. With this attitude kept in mind, the meaning of the terms superior and inferior, anterior and posterior, external and internal, is obvious. Sometimes, however, descriptive terms of another kind are used, to remove the confusion liable to arise from the adoption by man of an attitude different from that of all the other vertebrata, and to homologize the nomenclature of human with that of comparative anatomy. Thus, cephalic and caudal in comparative anatomy correspond respectively with superior and inferior in human anatomy; ventral and dorsal, with anterior and posterior. Dividing the body into right and left halves by a vertical median plane, which cuts the surface of the body at the median line, medial or mesial and lateral correspond respectively with internal and external in denoting position respectively nearer to, or more remote from, the median plane. Other terms in frequent use are superficial and deep, central and peripheral, proximal and distal; these are self-explanatory.

In some cases descriptive terms applied to portions of certain structures denote the relation of those portions to other structures, as when we speak of the vertebral and the sternal extremities of the ribs, or the acromial and the sternal extremities of the clavicle. Terms of similar import are radial and ulnar applied to structures of the forearm; tibial and fibular (or peroneal) of the leg; palmar and dorsal of the hand; plantar and dorsal of the foot; flexor and extensor of any of the extremities. It is to be noted that internal and external are sometimes used in a sense different from that previously explained, being employed to denote the interior and exterior positions respectively, either in relation to the general axis of the body or to the axis of one of its cavities. In this sense, for instance, we may speak of the internal and the external tables of the cranial vault, or of the internal and the external oblique muscles of the abdomen; but it is, as a rule, better to use the words inner and outer to denote this relation, and to reserve internal and external for position in respect to the median plane.

Finally we have to explain the terms used to denote certain directions, more especially the direction of certain sections: these are horizontal and vertical, requiring no definition; sagittal, denoting a dorso-ventral direction either in or parallel to the median plane; and frontal or coronal, which are synonymous terms, denoting direction in a transverse vertical plane.

The definition of many of the terms used in descriptive anatomy, such as condyle and tuberosity, process and tubercle, sinus and cavity, ligament, tendon, and aponeurosis, would be superfluous, since the student will best gain an accurate notion of their meaning by an examination of the structures to which they are respectively applied.

M. EDEN PAUL

Alderney, August, 1903.
REGIONES
CORPORIS HUMANI
THE REGIONS
OF THE HUMAN BODY
Fig. 1.—Anterior Surface of the Body.

Regions of the Human Body.
THE REGIONS OF THE HUMAN BODY

FIG. 1a.—ANTERIOR SURFACE OF THE BODY.

Regiones Corporis Humani.
Fig. 2.—Posterior Surface of the Body.

Regions of the Human Body.
THE REGIONS OF THE HUMAN BODY

Fig. 2a.—Posterior Surface of the Body.

Regiones Corporis Humani.
THE REGIONS OF THE HUMAN BODY

Regions of the Head and Neck.

1 Known also as the infracavicular triangle or infracavicular fossa, and sometimes called Monvenheimer's space.

Fig. 3.—Head and Neck.
Fig. 3a.—Head and Neck.
THE REGIONS OF THE HUMAN BODY

Fig. 4.—Male Perineal Region.

Fig. 5.—Female Perineal Region.

Perineal Region.
Regio Perinealis.
THE STRUCTURE OF THE BONES
THE STRUCTURE OF THE BONES

**Fig. 6.**—Portion of a Cross-Section through the Compact Tissue of a Long Bone.

**Fig. 7.**—Portion of a Longitudinal Section through the Compact Tissue of a Long Bone.

Microscopical Structure of Bone.
THE STRUCTURE OF THE BONES

Fig. 8.—Diagram of the Structure of Bone.

Fig. 9.—Part of the Middle Segment of the Femur from which the Periosteum has been Partially Removed.

The medullary canal (cavum medullare) has been opened, and the bone-marrow (medulla ossis) is seen.

Periosteum and Bone-Marrow (Medulla Ossium).
Fig. 10.—Proximal Portion in Frontal Section.

Fig. 11.—Distal Portion in Sagittal Section.

Humerus—Arm-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa—Long bones.
Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa—Long bones,
Femur—Thigh-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa—Long bones.
External tubercle of the spine of the tibia
Tuberculum intercondylöideum laterale
Internal tubercle of the spine of the tibia
Tuberculum intercondylöideum mediale

External tuberosity
Condylus lateralis

Internal tuberosity
Condylus medialis

Tibia—Shin-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa—Long bones.
Vertebrae: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa brevia—Short bones.
Fig. 23.—Os Cuneiforme III., the External Cuneiform Bone.

Fig. 24.—Talus, the Astragalus, in Sagittal Section.

Fig. 25.—Calcaneum, the Os Calcis, in Sagittal Section.

Ossa tarsi—Tarsal bones: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa brevia—Short bones.
**Fig. 26.**—**N**utrient **F**oramen and **N**utrient **C**anal of the **R**ight **T**ibia. **S**een from **B**ehind.

By sawing away a portion of the shaft the whole length of the nutrient canal has been opened up.

*Nutrient Foramen and Nutrient Canal of a Long Bone.*
**Fig. 27.—Outer Surface of Left Ilium.**

By the removal of the outer compact layer and the cancellous tissue of a portion of the bone, the nutrient canals have been displayed. The bristles projecting towards the right above and below show that the nutrient canals into which they have been inserted open on the inner surface of the bone—that turned away from the observer.

**Fig. 28.—Os Parietale, Parietal Bone, prepared to show the Diploë and the Compact Inner Table. Seen from without.**

Substantia compacta, substantia spongiosa, et canales nutricii—Compact tissue, cancellous tissue, and nutrient canals.

Ossa plana—Flat bones.
THE STRUCTURE OF THE BONES

Fig. 29 and 30.—Two Stages in the Intracartilaginous Ossification of Long Bones, as shown by Longitudinal Sections of the Phalanges of a Human Fetus.

Fig. 31 and 32.—Two Stages in the Intracartilaginous Ossification of the Epiphysis of a Long Bone, as shown by Longitudinal Sections of the Distal Portions of Metacarpal Bones.

Development of the Bones.
**Fig. 33.** Intracartilaginous Ossification of a Short Bone.
A section of the cuboid bone of a new-born child.

**Fig. 34.** Intramembranous Ossification of the Bones of the Cranial Vault.
Upper half of the parietal bone of a human foetus in the eleventh week of intra-uterine life.

Development of the Bones.
Fig. 35.—Anterior Aspect.

Fig. 36.—Viewed from the Left Side, the Arm having been removed.

Skeleton humanum—The human skeleton.
SKELETON TRUNCI
THE AXIAL SKELETON
Fig. 37.—The Vertebral Column as a Whole. Classification and Nomenclature of the Vertebrae.

Columna vertebralis—The spinal column.
FIG. 38.—SEEN FROM THE LEFT SIDE.

FIG. 39.—SEEN FROM ABOVE.

FIG. 40.—SEEN FROM BEFORE.

FIG. 41.—SEEN FROM BEHIND.

Vertebræ: Vertebra thoracalis VI.—Sixth dorsal vertebra.
Vertebrae: Vertebra cervicalis V.—Fifth cervical vertebra.
Vertebrae: Vertebra lumbalis II.—Second lumbar vertebra.
Fig. 49.—Vertebra Thoracalis I.—First Dorsal Vertebra. Seen from Before.

Fig. 50.—Vertebra Thoracalis XI.—Eleventh Dorsal Vertebra. Seen from the Left Side.

Fig. 51.—Vertebra Thoracalis XII.—Twelfth Dorsal Vertebra. Seen from the Left Side.

Fig. 52.—Vertebra Lumbalis V.—Fifth Lumbar Vertebra. Seen from the Left Side.

Vertebrae: Transitional forms of the dorsal and lumbar vertebrae.
**Fig. 53.** — **The Atlas, or First Cervical Vertebra. Seen from Above.**

**Fig. 54.** — **Epistropheus, the Axis, or Second Cervical Vertebra. Seen from Before.**

**Fig. 55.** — **Vertebra Cervicalis VII. — Seventh Cervical Vertebra. Seen from Above.**

Vertebrae: The atypical cervical vertebrae.
Os sacrum—The sacrum.
**Fig. 58.—Male Sacrum (Facies Dorsalis—Dorsal Surface). Seen from Behind.**

**Fig. 59.—Transverse Section through the Sacrum at the Level of the First Set of Sacral Foramina.**

Os sacrum—The sacrum.
**Fig. 60.**—Sacrum and Coccyx. Seen from the Left Side.

**Fig. 61.**—Sacrum and Coccyx in Sagittal Section through the Median Line.

**Fig. 62.**—Coccyx seen from Before.

**Fig. 63.**—Coccyx seen from Behind.

Os sacrum et os coccygis—Sacrum and coccyx.
**THE AXIAL SKELETON**

**Fig. 64.—Unilateral Assimilation and Commencing Ankylosis of the Fifth Lumbar Vertebra with the Sacrum. Seen from Before.**

From a boy seventeen years of age. Epiphyses on the bodies of the sacral vertebra, and along the lateral margins of the sacrum.

**Fig. 65.—Ankylosis of the Sacrum with the Coccyx. Seen from Behind.**

From a man forty years of age.
THE AXIAL SKELETON

**Fig. 66.** Diagram showing the Relations of the Protovertebræ to the Vertebrae. (From von Ebner.)

**Fig. 67.** Primitive Cartilages of the Vertebral Bodies. From a sagittal section through the vertebral column of a human fetus in the tenth week. (Length of fetus, 2½ inches.)

**Fig. 68.** Centres of Ossification of the Bodies of the Vertebrae. From a sagittal section through the vertebral column of a human fetus in the fourth month (months of four weeks each). (Length of fetus, 4½ inches.)

**Development of the Vertebrae.**
Development of the Vertebrae: The centres of ossification in the sacrum and coccyx of a child at the age of two months.
THE AXIAL SKELETON

Fig. 79.—The Thorax seen from Before.

The Thorax.
Fig. 80.—The Thorax seen from Behind.

The Thorax.
Fig. 81.—The Twelve Pairs of Ribs.

Ossa costallae—The ribs.
Fig. 82.—The Twelve Ribs of the Right Side in their Natural Position. Seen from the Right.

Costæ—The ribs.
Fig. 83.—First (Right) Rib. Seen from Above.

Fig. 84.—Second (Right) Rib. Seen from Above.

Fig. 85.—Fourth (Right) Rib. Seen from Behind.

Fig. 86.—Seventh (Right) Rib. Seen from Within.

Fig. 87.—Twelfth (Right) Rib. Seen from Within.

Costae—The ribs.
THE AXIAL SKELETON

The Clavicular notch (Incisura clavicularis) is a part of the manubrium (presternum). The Interclavicular notch (Incisura jugularis) is a feature of the sternum. The Sternal synchondrosis (manubrio-gladiolal articulation) is a point of articulation. The Processus xiphoideus is the parts of the xiphoid process (metasternum, xiphistemum).

\[\text{Clavicular notch (Incisura clavicularis)}\]
\[\text{Interclavicular notch (Incisura jugularis)}\]
\[\text{Manubrium (presternum)}\]
\[\text{Sternal synchondrosis (manubrio-gladiolal articulation)}\]
\[\text{Synchondrosis sternalis}\]
\[\text{Articular facet for a rib (Incisura costalis)}\]
\[\text{The body of the sternum or gladiolus (mesosternum)}\]
\[\text{Articular facet for a rib (Incisura costalis)}\]
\[\text{Ensiform or xiphoid process (mesosternum, xiphistemum)}\]
\[\text{Processus xiphoideus}\]
\[\text{Suprasternal bones (Ossa suprasternalia)}\]
\[\text{Clavicular notch (Incisura clavicularis)}\]
\[\text{The manubrium (presternum)}\]
\[\text{The body of the sternum or gladiolus (mesosternum)}\]
\[\text{Articular facets for the ribs (Incisurae costales)}\]
\[\text{Body of the sternum or gladiolus (mesosternum)}\]
\[\text{Articular facets for the ribs (Incisurae costales)}\]
\[\text{Ensiform or xiphoid process (Processus xiphoideus)}\]

In certain pathological conditions the angle between the manubrium and the body of the sternum becomes less obtuse, and therefore more prominent. It is then known as angulus Ludovici, or Ludwig's angle. — Te.

Fig. 88.—The Sternum seen from Before.

Fig. 89.—The Sternum seen from the Left Side.

Fig. 90.—The Upper Portion of the Sternum with the Suprasternal Bones (a rare variety). Seen from Before.

Sternum—The breast-bone.
Development of the Ribs and the Sternum.
The Axial Skeleton

The homologous skeletal parts of the segments of the body.
CRANIUM ET OSSA CRANII

THE SKULL

AND THE BONES OF THE SKULL
Frontomaxillary suture
Sutura frontomaxillaris

Coronal or frontoparietal suture
Sutura coronalis

Squamous suture
Sutura squamosa

Sphenoparietal suture
Sutura sphenoparietalis

Sphenosquamous suture
Sutura sphenosquamosa

Frontomalar suture
Sutura zygomaticofrontalis

Zygomatic arch
Arcus zygomaticus

Temporalomalar suture
Sutura zygomaticotemporalis

Malomaxillary suture
Sutura zygomaticomaxillaris

The maxilla, or upper jaw-bone
(Superior maxillary bone)

Intermaxillary suture
Sutura intermaxillaris

The mandible, or lower jaw-bone
(Inferior maxillary bone)

The vertex

Frontal eminence
Tuber frontale

Glabella

Superciliary ridge
Arcus superciliaris

Temporal crest
Linea temporalis

Nasofrontal suture
Sutura nasofrontalis

Internasal suture
Sutura internasalis

Nasomaxillary suture
Sutura nasomaxillaris

Anterior nasal aperture
Apertura pyriformis

Bony septum of the nose
Septum nasi osseum

Anterior nasal spine
Spina nasalis anterior

Fig. 102.—The Skull seen from Before: Norma Frontalis.

Cranium—The skull.
THE SKULL AND THE BONES OF THE SKULL

Fig. 103.—The skull seen from the left side: Norma lateralis.

Cranium—The skull.
THE SKULL AND THE BONES OF THE SKULL

Anterior nasal aperture
Apertura pyriformis

Premaxillary suture
Sutura incisiva

Supra-orbital margin
Margo supra-orbitalis

Brow of teeth
Limbus dentalis

Pterygoid process
Processus pterygoideus

Pterygopalatine or pterygopharyngeal canal
Canalis pharyngeus

Basipharyngeal canal
Canalis basipharyngeus

Foramen lacerum medium
Foramen lacerum

PetrospHENoidal fissure
Fissura sphenopetrosa

Petrobasilar fissure
Fissura petro-occipitalis

Jugular foramen (foramen lacerum posterius)
Foramen jugulare

Occipital condyle
Condylus occipitalis

Inferior curved line
Linea nuchae inferior

Nuchal plane
Pla num nuchae

External occipital protuberance
Protuberantia occipitalis externa

Occipitomastoid suture
Sutura occipitomastoidea

Foramen magnum
Foramen occipitale magnum

External occipital crest
Crista occipitalis externa

Foramen lacerum—Petrosphenoidal fissure
Fissura sphenopetrosa

Foramen lacerum—Petrosphenoidal fissure
Fissura sphenopetrosa

Canalis basipharyngeus: This term is not often used by English anatomists, nor even is the canal itself mentioned by Quain. Macalister, however, in his description of the vomer, writes (p. 233): "In the region of its sphenoidal articulation there are three canals transmitting small vessels in the young skull, which usually become obliterated with advancing age; these are—one median vomerine canal between the vomer and the root of the rostrum, and a lateral on each side between the extremity of the ala vomeris and the vaginal process. These run parallel to, and may communicate with, the pterygopharyngeal [pterygopalatine] canal in the vaginal process." The two lateral canals here mentioned are those called by Toldt "canalis basipharyngei."—Tr.

Fig. 104.—External Aspect of the Base of the Skull: Basis Cranii Externa.

Cranium—The skull.
Crista frontalis

Crista galli

Sutura spheno-ethmoidalis

Impressiones digitatae

Juga cerebralia

Anterior cranial fossa
Fossa cranii anterior

Middle cranial fossa
Fossa cranii media

Spheno-ethmoidal suture
Sutura spheno-ethmoidalis

Foramen caecum

Frontal crest

Crista frontalis

Coronal or frontoparietal suture
Sutura coronalis

Sphenoidal limbus
Limbus sphenoidalis

Sphenosquamous suture
Sutura sphenosquamosa

Petrosphenoidal suture
Fissura sphenopetrosa

Occipitophenoidal synchondrosis
Synchondrosis sphenoparietalis

Petrosbasilar fissure
Fissura petro-occipitalis

Parietomastoid suture
Sutura parietomastoidea

Sigmoid sulcus
Sulcus sigmoideus

Posterior cranial fossa
Fossa cranii posterior

Internal occipital crest
Crista occipitialis interna

Internal occipital protuberance
Protuberantia occipitalis interna

Occipitomastoid suture
Sutura occipitomastoidea

Lateral sulcus
Sulcus transversus

Fig. 105.—INTERNAL ASPECT OF THE BASE OF THE SKULL—BASIS CRANII INTERNA: FOSSÆ CRANII ANTERIOR, MEDIA, ET POSTERIOR—THE ANTERIOR, MIDDLE, AND POSTERIOR CRANIAL FOSSÆ. SEEN FROM ABOVE.
Fig. 106.—Calvaria—The skullcap, or roof of the skull. Inner aspect.

Cranium—The skull.
Fig. 107.—Vascular Canals of the Diploë of the Roof of the Skull, shown by Removal of the Outer Table of Compact Bone from the Frontal Bone and the Parietal Bone: Canales Diploici (Brescheti). Seen from the Left Side.
Fig. 108.—The Separate Bones of which the Cranium Cerebrale or Cranium Proper consists.

Ossa cranii cerebralis—Bones of the cranium proper.
Ossa faciei—Bones of the face.
Fig. 110.—Anterior (Internal) Aspect of the Occipital Bone.
Os occipitale—The occipital bone.
Fig. 112.—The Occipital Bone seen from Below (External Basal Surface).

Fig. 113.—The Occipital Bone seen from Above (Internal Basal Surface).

Os occipitale—The occipital bone.
The human occipital bone consists of four elements, which are still separate at birth, being united by intervening cartilage; these are, the basilar portion (basilar process), the two condylar portions, and the tabular portion. In comparative anatomy these are known respectively as basi-occipital, exoccipital, and supra-occipital. The basi-occipital and the exoccipital ossify from four nuclei, an upper pair and a lower. These soon unite, but leave for some time fissures running in along the superior curved line. Not uncommonly this fissure persists on one or both sides through life, and in rare cases there is a persistent suture running right across and dividing the tabular portion of the occipital bone into two pairs (Sutura mendosa; see Figs. 111 and 114). Of these two pairs, the lower, which belongs to the base of the skull and ossifies in cartilage, is the proper supra-occipital element, homologous with the supra-occipital bone of other vertebrates; whilst the upper, which belongs to the vertex of the skull and ossifies in membrane, represents the interparietal bone of many animals. This part alone is entitled to the name squama occipitalis, a term, however, little used by English anatomists. The occasional persistence of the suture between the interparietal and supra-occipital elements of the occipital bone is of surgical importance, since, in cases of injury to the back of the head, it is, if present, liable to be mistaken for fracture.—Tr.
FIG. 116.—THE SPHENOID BONE SEEN FROM BEFORE.

Os sphenoidale—The sphenoid bone.

1 Spine for the attachment of the lower head of the external rectus muscle of the eyeball.
2 See note to p. 48.
3 See note to p. 59.
4 As mentioned in the Preface, the canal called by English anatomists palatomaxillary or posterior palatine canal is by Toldt called pterygopalatine canal. The inner grooved portion of the sphenomaxillary surface, which he here calls the pterygopalatine groove, leads down into that canal, but does not form a part of it, since it lies between the palate bone and the superior maxillary bone.—Tu.
FIG. 118.—THE SPHENOID BONE SEEN FROM ABOVE (CEREBRAL ASPECT).

FIG. 119.—THE SPHENOID BONE SEEN FROM BELOW (EXTERNAL ASPECT).

Os sphenoidale—The sphenoid bone.
THE SKULL AND THE BONES OF THE SKULL

**Fig. 120.**—The Sphenoid Bone seen from the Left Side (Temporozygomatic Surface).\(^1\)

**Fig. 121.**—The Sphenoidal Sinuses in Median Sagittal Section, the Greater Part of the Sphenoidal Septum having been removed. Seen from the Left Side.

**Fig. 122.**—The Sphenoidal Sinuses, exposed from above by the removal of the Inner Lamella of Compact Bone.

The right sinus is opened from above; the left is unopened.

Os sphenoidale—The sphenoid bone.

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\(^1\) See note on p. 59.

\(^2\) English anatomists—use the terms pituitary fossa and sella turcica as synonyms; Toldt, more accurately, distinguishes between them, meaning by pituitary fossa (Fossa hypophyseos) the deep pit on the upper surface of the body of the sphenoid bone which lodges the pituitary body or hypophysis cerebri, and by sella turcica the saddle-shaped surface which forms the floor of that fossa.—Tt.
Body of the sphenoid bone (presphenoid portion)—Corpus ossis sphenoidalis (pars anterior)
Internal pterygoid plate—Lamina medialis processus pterygoidei
Vaginal process—Processus vaginalis
Foramen rotundum—Foramen rotundum

Cerebral surface of the great wing
Facies cerebralis alae magnae

Spinous process—Spina angularis
Interphenoidal synchondrosis
Synchondrosis intersphenoidalis

Small wing (orbitosphenoid)
Ala parva

Olivary eminence—Tuberculum sellae
Pituitary fossa
Fossa hypophyseos

Great wing (alisphenoid)
Ala magna

Foramen ovale
Foramen ovale

Body of the sphenoid bone (postsphenoid portion, or basisphenoid)—Corpus ossis sphenoidalis (pars posterior)

Olfactory eminence
Tuberculum olfactorium

Superior wall of the sphenoidal sinus
Facies suprasphenoidalis

External wall of the sphenoidal sinus
Facies extracapsularis

In the Second Year of Life.

In the Sixth Year of Life.

In the Eighth Year of Life.

Sphenoidal foramen
Apertura sinus sphenoidalis

Pterygoid process
Processus pterygoideus

Great wing
Ala magna

Small wing
Ala parva

Sphenoidal turbinate bone
(inferior surface)
Concha sphenoidalis

Sphenoidal rostrum—Rostrum sphenoidale

Primitiv sphenoidal rostrum
Rostrum sphenoidale primitivum

Sphenoidal foramen
Apertura sinus sphenoidalis

Development of the Sphenoid Bone.
Fig. 127.—The Left Temporal Bone Seen from the Outer Side (Temporal Surface).

Fig. 128.—The Left Temporal Bone Seen from Below (External Basal Surface).

Os temporale—The temporal bone.
THE SKULL AND THE BONES OF THE SKULL

Fig. 129.—The Left Temporal Bone seen from Within (Cerebral Surface).

Fig. 130.—The Left Temporal Bone seen from Above (Internal Basal Surface).

Os temporale—The temporal bone.
FIG. 131.—The Left Temporal Bone Seen from Before.

The petrosquamous sulcus (along which a sound has been passed) is in this specimen partly bridged over by bone; anteriorly it communicates with the outer surface of the bone by means of a spurious jugular foramen—foramen jugulare spurium (Variety).

Os temporale—The temporal bone.
Fig. 133.—Vertical Section through the Petrous Portion of the Left Temporal Bone and through the Anterior Part of the Squamous Portion. (Nomenclature of the Surface and Borders of the Petrous Portion.)

Fig. 134.—Aqueductus Fallopíi, or Canal for the Facial Nerve, shown from Beneath by the Removal of a Wedge-shaped Piece from the Petrous Portion of the Left Temporal Bone.

The canaliculus tympanicus, for the tympanic branch of the glossopharyngeal nerve (Jacobson's nerve), is also opened up throughout its whole length. A sound has been passed through the canaliculus for the auricular branch of the pneumogastric nerve (nerve of Arnold). In the Continental nomenclature this canaliculus is known as the canaliculus mastoides.

Os temporale—Temporal bone.
Fig. 135.—Vertical Section through the Left Temporal Bone in a Plane parallel with the Superior Border of the Petrous Portion, and passing through the Middle of the External Auditory Meatus, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

Fig. 136. Vertical Section through the Left Temporal Bone in a Plane parallel with the Superior Border of the Petrous Portion, the Section passing along the Posterior Wall of the External Auditory Meatus, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

Os temporale—Temporal bone.
Deficiency in the tympanic wall of the aqueduct of Fallopian (variety)

Fenestra ovalis—Fenestra vestibuli
Fenestra rotunda—Fenestra cochleae
Promontory—Promontorium
Hiatus Fallopii—Hiatus canalis facialis
Canal for the tensor tympani muscle
Semicanalis m. tens. tympani
Septum of the musculotubal canal
(cochleariform process)
Septum canalis musculotubarii
Groove for the Gasserian ganglion...
Impressio trigemini
Carotid canal—Canalis caroticus
Osseous canal for the Eustachian tube
Semicanalis tubae auditivae
Caroticotympanic canaliculi
Canaliculi caroticotympanici
Tympanic cells
Cellulae tympanicae
Canaliculus for the chorda tympani nerve
(iter chordis posterius)_
Canaliculus chordae tympani

Prominence of the external semicircular canal
Prominentia canalis semicircularis lateralis
Entrances to mastoid antrum—Aditus ad antrum tympanicum
Ponticulus prominens—Ponticulus promontorii
Mastoid antrum—Antrum tympanicum
Tympanic sinus—Sinus tympani

Sinus posterior
Sinus posterior
Mastoid cells
Cellulae mastoideae

Mastoid process
Processus mastoideus

Fig. 137.—Vertical Section through the Left Temporal Bone, crossing obliquely the Superior Border of the Petrous Portion, and passing through the Anterior Portion of the Mastoid Process, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts (especially the Mastoid Antrum and the Mastoid Cells).

Geniculum of the aqueduct of Fallopian
Geniculum canalis facialis
Hiatus Fallopii
Hiatus canalis facialis
Apex of the petrous portion
Apex pyramidalis
Carotid canal—Canalis caroticus
Caroticotympanic canaliculi
Canaliculi caroticotympanici

Fig. 138.—Vertical Section through the Left Temporal Bone, crossing obliquely the Superior Border of the Petrous Portion, and passing through the Posterior Portion of the Mastoid Process, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

A bristle has been passed through the canaliculi tympanici (the canal for Jacobson's nerve—the tympanic branch of the glossopharyngeal nerve) into the tympanum, and, after traversing this cavity, leaves it by the canaliculi that opens into the groove for the small superficial petrosal nerve.

Os temporale—Temporal bone.
Fig. 139.—The Bony Labyrinth, Labyrinthus Osseus, shown in the Left Petrous Portion. Seen obliquely from in Front and Below. The Osseous Semicircular Canals and also the Canal of the Cochlea have been partly opened. The Relations between the Aqueduct of Fallopius and the Osseous Labyrinth are clearly shown.

Fig. 140.—The Internal Auditory Meatus, Meatus Acusticus Internus, exposed from Above by the Removal of a Right-angled Wedge from the Petrous Portion of the Left Temporal Bone, displaying the Fundus of the Internal Auditory Meatus, or Reniform Fossa, divided by the Transverse Crest, or Crista Falciformis, into Superior and Inferior fossæ. Seen from Behind and Above.

Os temporale—Temporal bone.
**Fig. 141.**—Portions of the Osseous Labyrinth and the Tympanum, shown in the Left Temporal Bone by a Vertical Section through the Petrous Portion in the Plane of the Superior Semicircular Canal. Seen obliquely from in Front and Within.

The fenestra ovalis is divided vertically.

**Fig. 142.**—Portions of the Osseous Labyrinth and the Tympanum, shown in the Left Temporal Bone by a Horizontal Section through the Petrous Portion along the Internal and the External Auditory Meatus. Seen from Above.

Os temporale—Temporal bone
THE SKULL AND THE BONES OF THE SKULL

Squamous Portion of Temporal Bone—Squama Temporalis.

Tympanic Ring—Annulus Tympanicus.

Petrous Portion of Temporal Bone—Pars Petrosa (Pyramis).

Fig. 143.—Seen from Without.

The Three Parts of the Left Temporal Bone from an Eight-Months Fetus (Months of Four Weeks Each).

Body-length, 15½ inches.

Fig. 144.—Seen from Within.

The Three Parts of the Left Temporal Bone from an Eight-Months Fetus (Months of Four Weeks Each).

Body-length, 15½ inches.

Development of the Temporal Bones.

Fig. 145.—The Squamous Portion of the Temporal Bone and the Tympanic Ring united. Seen from Within.

From a fetus at term (body-length, 19 inches).

Fig. 146.—The Three Portions of the Left Temporal Bone united. Seen from Without and Below.

From a new-born male infant (body-length, 21 inches).
THE SKULL AND THE BONES OF THE SKULL

Fig. 147.—The Left Temporal Bone of a Boy at the Age of Eight Months: Formation of the Tympanic Plate and of the External Auditory Meatus. Seen obliquely from Without and Below.

Fig. 148.—The Left Temporal Bone of a Girl at the Age of Three Years: Formation of the Tympanic Plate and of the External Auditory Meatus. Seen obliquely from Without and Below.

Development of the Temporal Bones.
Fig. 149.—The Left Parietal Bone seen from Without. External Surface: Facies Parietalis.

Os parietale—Parietal bone.
Os parietales—Parietal bone.

Fig. 150.—The Right Parietal Bone seen from Without. Internal Surface: Facies Cerebralis.
Os frontale—Frontal bone.
Os frontale—Frontal bone.
THE SKULL AND THE BONES OF THE SKULL

Fig. 153.—The Frontal Bone seen from Below.

Fig. 154.—The Frontal Sinuses, Sinus Frontales, shown by the Removal of the External Table and the Diploë, and partly opened up. Seen from Before and Below.

Os frontale—Frontal bone.
Fig. 155.—The Two Halves of the Frontal Bone from a Human Fetus in the Eighth Month (Months of Four Weeks Each). Seen from Before.

Body-length of fetus 15 inches.

Fig. 156.—The Frontal Bone of a Girl aged Seven Years in which the Frontal Sinuses have been exposed. Seen obliquely from Before and from the Right Side.

Development of the Frontal Bones.
**Fig. 157.** The Ethmoid Bone seen from the Left Side.

**Fig. 158.** The Ethmoid Bone seen from Above.

**Fig. 159.** The Left Half of the Ethmoid Bone seen from Within. Superior and Middle Turbinate Bones.

**Fig. 160.** The Left Half of the Ethmoid Bone seen from Within.
The anterior portion of the middle turbinate bone of the nose has been removed. The free border of the removed portion is indicated by a dotted line.

**Fig. 161.** The Ethmoid Bone seen from Behind and Below. Vertical Plate of the Ethmoid as Upper Part of the Bony Septum of the Nose.

**Fig. 162.** An Ethmoid Bone the Left Lateral Mass of which has been removed.
The entire surface of the vertical plate is exposed.

Os ethmoidale—Ethmoid bone.
THE SKULL AND THE BONES OF THE SKULL

Os Lacrimale: Lachrymal Bone of the Left Side.

Os Nasale: Nasal Bone of the Left Side.

Vomer—The Vomer.

Bones of the Nasal Region.
THE SKULL AND THE BONES OF THE SKULL

Fig. 171.—Left Superior Maxillary Bone: External Surface.

Fig. 172.—Left Superior Maxillary Bone: Internal Surface. View into the Maxillary Sinus, or Antrum of Highmore.

Maxilla—Superior maxilla.

1 Eminences corresponding in position to the fangs of the teeth
FIG. 173.—THE LEFT SUPERIOR MAXILLARY BONE. EXTERNAL SURFACE.
The dental canals are exposed by partial removal of the superficial plate of bone, and their course is shown by means of bristles passed through them.

FIG. 174.—THE LEFT SUPERIOR MAXILLARY BONE. INTERNAL SURFACE.
The foremost and the hindmost of the dental canals have been exposed by the removal of the superficial plate of bone. By means of bristles passed through the canals the situation of the respective dental foramina is indicated. Most of the inner wall of the antrum of Highmore has been cut away.

Maxilla—Superior maxillary bone.
THE SKULL AND THE BONES OF THE SKULL

**Fig. 175.** The Left Superior Maxillary Bone. Seen from Below.

**Fig. 176.** Seen from the Inner Side.

**Fig. 177.** Seen from Below.

The Left Superior Maxillary Bone of a Fetus at the End of the Sixth Month (Months of Four Weeks Each).

Body-length, 12 inches.

**Fig. 178.** Seen from the Inner Side.

**Fig. 179.** Seen from Below.

The Left Superior Maxillary Bone of a Boy Born at Full Term.

Body-length, 21 inches.

Maxilla—Superior maxillary bone.
FIG. 180.—INNER SURFACE.  
FIG. 181.—SEEN FROM BEHIND.  
FIG. 182.—OUTER SURFACE.  

FIG. 183.—INNER SURFACE.  
FIG. 184.—SEEN FROM BEHIND.  
FIG. 185.—OUTER SURFACE.  
THE LEFT PALATE-BONE OF A BOY BORN AT FULL TERM.  
Body-length, 21 inches.

FIG. 186.—SEEN FROM BEFORE.  
OS ZYGOMATICUM—MALAR BONE (OF THE LEFT SIDE).  
Supplementary Bones of the Upper Jaw.
**THE SKULL AND THE BONES OF THE SKULL**

**Fig. 188.**—The Inferior Maxillary Bone seen from the Left Side.

**Fig. 189.**—The Inferior Maxillary Bone seen from Above.

Mandibula—The inferior maxillary bone, lower jaw, or mandible,
The angle of the jaw, writes Quain, "...is more or less rounded off." The specimen from which Fig. 190 was drawn has, however, an abnormal projection at each angle, to which in the German nomenclature the name processus angularis (var.) is given. This variety is not described by Quain or by Macalister. - Tr.
THE SKULL AND THE BONES OF THE SKULL

Fig. 192.—The Inferior Maxillary Bone seen from the Left Side.
The mandibular or inferior dental canal has been exposed by the removal of a portion of the superficial plate of bone.

Coronoid process
Processus coronoides

Alveolar process (buccal lamina)
Pars alveolaris (lamina buccalis)

Head of condyle
Capitulum

Ramus—Ramus

Body—Corpus

Fig. 193.—The Left Half of the Inferior Maxillary Bone of a Human Embryo at the End of the Fifth Month (Months of Four Weeks Each).
Body-length, 7½ inches.

Coronoid process
Processus coronoides

Alveolar process (lingual lamina)
Pars alveolaris (lamina lingualis)

Lingula

Body—Corpus

Fig. 194.—The Left Half of the Inferior Maxillary Bone of a Human Embryo in the Middle of the Eighth Month (Months of Four Weeks Each).
Body-length, 15 inches.

Mental foramen
Foramen mentale

Alveolus or socket of canine tooth

Mental ossicles
Ossicula mentalia

Mental fossa
Foveola mentalis

Mental protuberance
Procerubantia mentalis

Fig. 195.—Mental Region of a New-born Boy. The lateral halves of the inferior maxillary bone have not yet united; between them are the mental ossicles. Seen from Before.

Mental tubercle
Tuberculum mentale

Fig. 196.—The fully developed mental protuberance, in a child aged Six and a Half Months. The mental ossicles have united with each other and with the lateral halves of the inferior maxillary bone.

Mandibula—The inferior maxillary bone, lower jaw, or mandible.
Senile defects in the lachrymal bone

Body of the maxilla
Corpus maxillae

Ramus of the mandible
Ramus mandibulae

Body of the mandible
Corpus mandibulae

Base of the mandible
Basis mandibulae

Fig. 197.—Facial Portion of the Skull of a Woman aged Eighty-Four Years, showing Atrophy of the Alveolar Processes of the Superior and Inferior Maxillary Bones (Nutcracker Face).

Great cornu
Cornu majus

Small cornu
Cornu minus

Body
Corpus

Fig. 198.—Seen from Above.

Fig. 199.—Seen from Below.

Os Hyoideum—The Hyoid Bone.

Fig. 200.—The Hyoid Bone of a Boy, still-born at Full Term.

Body-length, 21 inches.

Senile atrophy of the jaws: Os hyoideum—the hyoid bone.
Fig. 201.—Skull divided into an Anterior and a Posterior Portion by a Frontal Section passing through the Mastoid Processes. The First Cervical Vertebra has also been divided by the Section, and left attached to the Skull.

View of the Anterior Portion of the Cranial Cavity. The Anterior and Middle Cranial Fossae, as well as the Anterior Portion of the Posterior Cranial Fossa, seen from behind. On the Right Side is a Paramastoid Process articulating with the Atlas.

Cavum cranii cerebralis—Cranial cavity.
**Fig. 202.**—Skull divided into an Anterior and a Posterior Portion by a Frontal Section passing through the Mastoid Processes and the Basilar Portion of the Occipital Bone. View of the Posterior Portion of the Cranial Cavity. The Division of the Longitudinal Sulcus into Right Lateral and Left Lateral Sulcus is shown. The Lateral Sulcus passes on either Side into the Sigmoid Sulcus, which terminates in the Jugular Foramen.

Cavum cranii cerebralis—Cranial cavity.
**Fig. 203.**—The External Wall of the Nasal Cavity with the Turbinate Bones and the Nasal Meatus: Median Sagittal Section. Left Side.

**Fig. 204.**—The External Wall of the Nasal Cavity: Median Sagittal Section. Left Side.

The middle turbinate bone of the nose has been cut away.

Cavum nasi—Nasal cavity.


Cavum nasi—Nasal cavity.
THE SKULL AND THE BONES OF THE SKULL

Fig. 207.—By Means of a nearly Horizontal Section passing through the Centre of the Entrance to the Orbit, the Upper Parts of the Nasal Fossæ and of the Orbits are displayed. Seen from Below.

Posteriorly the section passes through the body of the sphenoid bone and the root of the pterygoid process, opening up the Vidian canal through its whole length. A bristle has been passed into the sphenoidal canaliculus¹ from the Vidian canal. The lateral masses of the ethmoid bone (ethmoidal labyrinths) are divided in the horizontal plane.

I am indebted to Professor Toldt for the following account of the *Sphenoidal canaliculus, which is accurately described neither by Quain nor by Macalister: "It begins in the scaphoid fossa and divides as it ascends into two branches, the inner of which opens into the Vidian canal, while the outer opens on the cerebral surface of the great wing of the sphenoid bone, between the lingula of the sphenoid bone and the foramen ovale." The outer branch is termed by English anatomists the foramen of Vesalius, and transmits an emissary vein; the inner branch gives passage to the sphenoidal branch of the otic ganglion, by means of which this ganglion communicates with the Vidian nerve.—Tr.

Cavum nasi et orbita—The nasal fossæ and the orbits.
FIG. 208.—By Means of a Nearly Horizontal Section in a Plane a Little Above That of the Inferior Walls of the Orbits, the Lower Portions of the Nasal Fossae and of the Orbits have been Exposed. Seen from Above.

Posteriorly the section passes through the sphenoidal sinuses, in this specimen exceptionally capacious. The upper orifices of the *sphenoidal canaliculus (see note to p. 92) are indicated by bristles.

Cavum nasi et orbita—Nasal cavity and orbits.
Fig. 209.—By Means of a Section passing through the most Anterior Portions of Both Zygomatic Arches, the Nasal Cavity and the Orbits are divided towards their Posterior Extremities in the Frontal Plane.

The anterior portion of the skull thus divided is figured from behind. The three turbinate bones of the nose and the three nasal meatus, as well as the bony septum of the nose, are seen in frontal section. The maxillary sinuses are also opened up, and the communication of these sinuses with the general cavity of the nose is to be seen above the uncinate process.

Cavum nasi et orbita—Nasal cavity and orbits.
Fig. 210.—By Means of a Section passing vertically through the posterior portions of both lachrymal bones, the anterior portion of the nasal cavity and of the orbits is displayed in frontal section. Seen from behind.

From the right side of the anterior portion of the skull thus divided, a layer of bone a quarter of an inch in thickness has been removed by a section in a plane parallel with the first section, so as to open up the canal of the nasal duct, canalis nasolacrimalis, in its entire length. The sounds passed into the two frontal sinuses indicate the orifices of these sinuses in the nasal fossa. A third sound has been passed through the left canal of the nasal duct from the orbit into the nasal cavity.

Cavum nasi et orbita—Nasal cavity and orbits.
**Fig. 211.—Anterior Portion of the Skull, separated from the Posterior Portion by a Frontal Section passing through the Two External Auditory Meatus.**

The view from behind shows the posterior nares with the posterior border of the bony septum of the nose, the bony framework of the oral cavity, and the zygomatic fossae; further, in frontal section, the tympanic cavities, with portions of the bony labyrinths and the internal auditory meatus.

_Cranium viscerale—Facial portion of the skull._
Fig. 212.—The Hard Palate, Palatum Durum, with the Alveolar Process of the Superior Maxillary Bone, removed by a section passing horizontally through both Superior Maxillary Bones above the Floor of the Nasal Fossa. Seen from Below.

Fig. 213.—The Floor (Inferior Wall) of the Nasal Fossa with the Maxillary Sinuses lying on Either Side, shown by Means of a Horizontal Section through the Superior Maxillary Bones. Seen from Above.

Cranium viscerale—Facial portion of the skull.
Fig. 214.—**Internal Portion of the Left Orbit, shown by the Removal of the External Wall.** Seen from the Left Side.

Fig. 215.—**External Portion of the Left Orbit, shown by the Removal of the Internal Wall of the Orbit and of a Portion of the Superior Maxillary Bone in a Longitudinally Hemisected Skull.**

Orbita—The orbits.
The skull and the bones of the skull

Uncinate process of the ethmoid bone
Processus uncinatus ossis ethmoidalis

Inferior wall of the orbit
Pariés inferior orbitae

Infra-orbital foramen
Foramen infra-orbitale

Lesser wing—Ala parva

Orbital plate of the frontal bone
Pars orbitalis ossis frontalis

Orbital plate, os planum, or lamina papyracea, of the ethmoid bone
Lamina papyracea

Optic foramen
Foramen opticum

Sphenoid bone
Processus orbitalis ossis ethmoidalis

Palato-ethmoidal suture
Sutura palato-ethmoidalis

Orbital process of the palate bone
Processus orbitalis ossis palatini

Orbital surface of the superior maxillary bone—Facies orbitalis maxillae
Sphenopalatine foramen
Foramen sphenopalatinum

Infra-orbital groove—Sulcus infra-orbitale

Sphenomaxillary fossa
Fossa pterygopalatina

Vertical plate of the palate bone
Pars perpendicularis ossis palatini

Posterior palatine or palatomaxillary canal—Canalis pterygopalatinus

Posterior dental canal
Foramen alveolare (posterius)

Zygomatic surface of the superior maxillary bone—Facies infratemporalis maxillae

Orifice of the maxillary sinus
Hiatus maxillaris

Orbital process of the palate bone
Processus orbitalis ossis palatini

Sphenomaxillary fossa
Fossa pterygopalatina

Maxillary process of the inferior turbinate bone
Processus maxillaris conchae nasalis

Maxillary sinus, or antrum of Highmore
Corpus maxillae

Alveolar process

Fig. 216.—The left maxillary sinus, or antrum of Highmore, shown by the removal of the external wall of the body of the superior maxillary bone and the malar bone. Seen from the left side.

Fig. 217.—The left sphenomaxillary fossa, shown by removal of the malar bone, the temporal bone, and the great wing of the sphenoid bone. Seen from the left side.

A sound has been passed through the Vidian canal, and another through the *sphenoidal canaliculus* (exceptionally large in this specimen).

Sinus maxillaris—Maxillary sinus, or antrum of Highmore.—Fossa pterygopalatina—Sphenomaxillary fossa.

See note to p. 92.
**Fig. 218.—A Large Wormian Bone in the Uppermost Part of the Lambdoid Suture.**

**Fig. 219.—Transverse Subdivision of the Squama Occipitalis. Several Wormian Bones in the Lambdoid Suture.**

1 See note to p. 57.

Ossa suturarum—Wormian bones.
The Principal Measurements of the Skull.

Translator's Note.—The above measurements do not fully correspond with those used by English craniologists. For this reason a purely literal translation of the German terms has been given.
Fig. 223.—Human Embryo, Four Weeks old.

The umbilical vesicle has been opened.

Fig. 224.—The Left Half of the Skull of a Human Fetus at the End of the Fourth Month (Months of Four Weeks Each). Seen from Within. The Cartilaginous Portion of the Primordial Cranium (Chondrocranium) is coloured Blue.

Body-length, 4½ inches.

Development of the Skull.
Fig. 225.—The Squamous Portion of the Temporal Bone, the Tympanic Membrane with the Malleus, the Incus, and Meckel's Cartilage, from a Human Fetus in the First Half of the Fifth Month (Months of Four Weeks Each). Seen from Within.

Body-length, 5½ inches.

Fig. 226.—The Skull of a Human Fetus in the Middle of the Fifth Month (Months of Four Weeks Each). Seen from the Left Side and Below.

Body length, 6½ inches. The cartilaginous bars of the visceral arches are displayed, and these, together with the cartilaginous portion of the primordial cranium, are coloured blue. Part of the cartilage of the left side of the interior maxilla has been removed in order to lay bare a portion of Meckel's cartilage which lies beneath it.

Fig. 227.—The Dried Skull of a Human Fetus in the Middle of the Fourth Month (Months of Four Weeks Each). Body-length, 3½ inches.

Fig. 228.—The Dried Skull of a Human Fetus at the End of the Sixth Month (Months of Four Weeks Each). Body-length, 11½ inches.

Development of the Skull.
Fig. 229.—**The Dried Skull of an Infant born at Full Term. Seen from the Left Side.**

Body-length, 20½ inches. In the anterolateral fontanelle there remains part of the membranous portion of the primordial cranium (membrane of the fontanelle); in the posterolateral fontanelle there remains part of the cartilaginous portion of the primordial cranium.

Fig. 230.—**The Dried Skull of an Infant born at Full Term. Seen from Above.**

Body-length, 20½ inches. In the anterior and in the posterior fontanelle there remain parts of the membranous portion of the primordial cranium.

1 See note to p. 57.

**Development of the Skull,**
SKELETON EXTREMITATUM, SUPERIORIS ET INFERIORIS

THE SKELETON OF THE UPPER AND LOWER EXTREMITIES
(THE APPENDICULAR SKELETON)
FIG 231.—THE SKELETON OF THE UPPER EXTREMITY.

Skeleton extremitatis superioris—The skeleton of the upper extremity.
The innominate or hip bone
Os coxae

The pelvic girdle
Cingulum extremitatis inferioris

The femur, or thigh-bone
Femur

The patella, rotula, knee-cap, or knee-pan
Patella

The tibia, or shin-bone
Tibia

The fibula, or peroneal bone
Fibula

The interosseous space of the leg
Spatium interosseum cruris

The bones of the leg
Ossa cruris

The tarsus
Tarsus

The first metatarsal bone (the metatarsal bone of the great toe)
Os metatarsale primum (hallucis)

The phalanges of the toes
Phalanges digitorum pedis

The phalanges of the great toe
Phalanges hallucis

Fig. 232.—The Skeleton of the Lower Extremity.

Skeleton extremitatis inferioris—The skeleton of the lower extremity.
The Skeleton of the Upper Extremity

The scapula
Scapula

The glenoid fossa
Cavitas glenoidalis

The acromion
Acromion

The first rib
Costa I.

The manubrium
Manubrium sterni

The clavicle
Clavicula

The sternoclavicular joint
Articulatio sternoclavicularis

Fig. 233.—The Shoulder-Girdle and its Relation to the Thorax. Seen from Above.

The clavicle
Clavicula

The first rib
Costa I.

The scapula (posterior surface, or dorsum)
Scapula (facies dorsalis)

The acromion
Acromion

The eighth intercostal space
Spatium intercostale VIII.

The twelfth dorsal vertebra
Vertebra thoracalis XII.

Fig. 234.—The Shoulder-Girdle and its Relation to the Thorax. Seen from Behind.

Cingulum extremitatis superioris—The shoulder-girdle.
THE SKELETON OF THE UPPER EXTREMITY

Acromial or scapular extremity
Extremitas acromialis

Acromial facet
Facies articularis acromialis

Trapezoid line (or ridge)
Tuberositas coracoidea

Nutrient foramen
Foramen nutricium

Conoid tubercle

Costal tuberosity, or rhomboid impression
Tuberositas costalis

Sternal facet
Facies articularis sternalis

Costal tuberosity, or rhomboid impression
Tuberositas costalis

Epiphysial disc
Synchondrosis epiphyseos

Clavicula—The clavicule.

FIG. 235.—THE RIGHT CLAVICLE SEEN FROM ABOVE.

FIG. 23.—THE RIGHT CLAVICLE SEEN FROM BELOW.

FIG. 237.—STERNAL EXTREMIT Y OF THE RIGHT CLAVICLE OF A FEMALE AGED TWENTY YEARS, WITH A STERNAL EPIPHYSIS. SEEN FROM BEFORE.
THE SKELETON OF THE UPPER EXTREMITY

Fig. 238.—The Right Scapula seen from Before.

Fig. 239.—The Right Scapula seen from Behind.

Fig. 240.—The Right Scapula seen from the Outer or Axillary Aspect.

Scapula—The shoulder-blade.
THE SKELETON OF THE UPPER EXTREMITY

The Centre of ossification for the coracoid process is indicated.

The Centre of ossification for the uppermost portion of the glenoid fossa (Subcoracoid bone) is shown.

Cartilaginous acromion is marked.

Primary osseous portion of the scapula is illustrated.

Rudimentary cartilage is indicated.

Secondary epiphysis at the tip of the coracoid process is shown.

Subcoracoid bone Os infracoracoideum is marked.

Acromial epiphysis is indicated.

Secondary epiphysis on the base of the coracoid process is illustrated.

Osseous portions of the acromion are shown.

Epiphysis of the lower portion of the glenoid fossa is marked.

Cartilage at the inferior angle and along the vertebral border is indicated.

Epiphysis at the inferior angle is shown.

Development of the Scapula.

Fig. 241.—In the Fifth Month of Intra-uterine Life (Months of Four Weeks Each).

Fig. 242.—In the Second Year of Life.

Fig. 243.—In the Fifteenth Year of Life.

Fig. 244.—In the Seventeenth Year of Life.

Fig. 245.—In the Nineteenth Year of Life.
Humerus—The humerus.
THE SKELETON OF THE UPPER EXTREMITY

THE CENTRES OF OSSIFICATION OF THE PROXIMAL EXTREMITY OF THE HUMERUS.

Fig. 250.—From a Girl aged Four Months.

Fig. 252.—From a Boy aged Three Years (Horizontal section.)

Fig. 251.—From a Boy aged Two Years.

Fig. 253.—From a Boy aged Thirteen Years.

FIG. 254.—From a Girl aged Nineteen Years.

THE COMMON EPİPHYSIS OF THE PROXIMAL EXTREMITY OF THE HUMERUS.

Fig. 255.—From a Boy aged Two and a Half Years.

Fig. 256.—From a Boy aged Thirteen Years.

Fig. 257.—From a Boy aged Seventeen Years.

THE EPİPHYES OF THE DISTAL EXTREMITY OF THE HUMERUS.

Development of the Humerus.
THE SKELETON OF THE UPPER EXTREMITY

Coronoid process
Processus coronoides

Small sigmoid cavity
Incisura radialis

Tuberosity of the ulna
Tuberositas ulnae

Nutrient foramen
Foramen nutricium

External or interosseous border
Crista interossea

Anterior surface
Facies volaris

Articular circumference
Circumferentia articularis

Styloid process
Processus styloideus

Olecranon
Olecranon

Great sigmoid cavity
Incisura semilunaris

Olecranon
Olecranon

Great sigmoid cavity
Incisura semilunaris

Coronoid process
Processus coronoides

Small sigmoid cavity
Incisura radialis

Tuberosity of the ulna
Tuberositas ulnae

Supinator ridge
Crista m. supinatoris

Ulna

Radius

Anterior border
Margo volaris

Internal surface
Facies medialis

Posterior border
Margo dorsalis

Posterior surface
Facies dorsalis

Interosseous borders
Crista interossea

Anterior surface
Facies volaris

Anterior surface
Facies volaris

Anterior border
Margo volaris

Internal surface
Facies medialis

Posterior border
Margo dorsalis

Posterior surface
Facies dorsalis

Ulna

Radius

Fig. 258.—Anterior Aspect.

The Ulna of the Right Side.

Fig. 259.—Posterior Aspect.

Fig. 260.—External Aspect.

Fig. 261.—Transverse (Horizontal) Section through the Middle of the Ulna and the Radius, with the Interosseous Membrane, in Supination.

Ossa antibrachii—The bones of the forearm.
THE SKELETON OF THE UPPER EXTREMITY

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Fig. 262.—Anterior Aspect. Fig. 263.—Posterior Aspect. Fig. 264.—Internal Aspect.

The Radius of the Right Side.

The proximal and distal extremities of the bones of the right forearm seen from above and below.

Ossa antibrachii—The bones of the forearm.
THE SKELETON OF THE UPPER EXTREMITY

The Bones of the Forearm in Supination and Pronation.

**Fig. 267.**—The Bones of the Right Forearm, in Supination.

**Fig. 268.**—The Bones of the Right Forearm, in Pronation.
THE SKELETON OF THE UPPER EXTREMITY

Fig. 269.—From a Boy aged Thirteen Years.

The Development of the Epiphysis of the Proximal Extremity of the Ulna.

Centres of ossification in the olecranon

Tuberosity of the ulna

Fig. 270.—From a Boy aged Seventeen Years.

Double epiphysis of the olecranon in the act of uniting with the shaft

Centres of ossification in the head of the ulna

Fig. 271.—From a Girl aged Six Years.

The Development of the Epiphysis of the Distal Extremity of the Ulna.

Epiphysis of the head of the ulna in the act of uniting with the shaft

Centre of ossification in the head of the radius

Fig. 272.—From a Young Man aged Nineteen Years.

The Development of the Epiphysis of the Proximal Extremity of the Radius.

Epiphysis of the head of the radius in the act of uniting with the shaft

Tuberosity of the radius

Fig. 273.—From a Boy aged Five Years.

The Development of the Epiphysis of the Distal Extremity of the Radius.

Tuberositas radii

Fig. 274.—From a Boy aged Seventeen Years.

Distal epiphysis of the radius in the act of uniting with the shaft

Centre of ossification in the distal extremity of the radius

Fig. 275.—From a Girl aged Two Years.

The Development of the Epiphysis of the Distal Extremity of the Radius.

Fig. 276.—From a Young Man aged Nineteen Years.

Development of the Bones of the Forearm.
FIG. 277.—PALMAR ASPECT OF THE SKELETON OF THE RIGHT HAND (FACES VOLARIS).

Skeleton manus—The skeleton of the hand.
THE SKELETON OF THE UPPER EXTREMITY

Fig. 278.—Dorsal Aspect of the Bones of the Right Hand seen from the Dorsal Side (Facies Dorsalis).

Skeleton manus—The skeleton of the hand.
THE SKELETON OF THE UPPER EXTREMITY

Fig. 279.—Distal Aspect.
Os Naviculare Manus—The Right Scaphoid Bone.

Fig. 280.—Posterior Aspect.

Fig. 281.—Radial Aspect.
Os Lunatum—The Right Lunar (or Semilunar) Bone.

Fig. 282.—Ulnar Aspect.

Fig. 283.—Radial Aspect.
Os Triquetrum—The Right Pyramidal or Cuneiform Bone.

Fig. 284.—Palmar Aspect.

Fig. 285.—Palmar Aspect.
Os Pisiforme—The Right Pisiform Bone.

Fig. 286.—Posterior Aspect.

Fig. 287. The Posterior Aspect of the Right Carpus, containing an Os Centrale.

Osca carpi—The bones of the carpus: first, superior, or proximal row.
THE SKELETON OF THE UPPER EXTREMITY

Articular facet for the second metacarpal bone

Ossa-carpi—The bones of the carpus: second, inferior, or distal row.

Os Multangulum Majus—The Right Trapeziun.

Fig. 288.—Distal Aspect.

Os Multangulum Minus—The Right Trapezoid Bone.

Fig. 290.—Ulnar Aspect.

Os Capitatum—The Right Os Magnum or Capitate Bone.

Fig. 292.—Radial Aspect.

Os Hamatum—The Right Unciform Bone.

Fig. 294.—Distal Aspect.
Articular facets for the third metacarpal bone
Articular facet for the fourth metacarpal bone
Articular facet for the second metacarpal bone
Articular facet for the trapezium
Base, or carpal extremity
Shaft, or body
Metacarpal bone of the thumb
Fifth metacarpal bone
Os metacarpale V.
Depressions for the attachment of the lateral ligaments
Saddle-shaped articular facet for the trapezium
Metacarpal bone of the thumb
Os metacarpale pollicis

**Fig. 296.**—Radial Aspect of the Five Metacarpal Bones of the Right Hand.

Articular facets for the fourth metacarpal bone
Articular facet for the os magnum or capitate bone
Articular facet for the third metacarpal bone
Saddle-shaped articular facet for the trapezium
Metacarpal bone of the thumb
Os metacarpale pollicis

**Fig. 297.**—Ulnar Aspect of the Five Metacarpal Bones of the Right Hand.

**Fig. 298.**—Radial Aspect of the Bones of the Right Index Finger (Margo Radialis Digitii Secundi).

The Metacarpal Bones of the Hand and the Phalanges of the Fingers.
THE SKELETON OF THE UPPER EXTREMITY

CENTRES OF OSSIFICATION OF THE CARpus (SECTIONS PARALLEL TO THE POSTERIOR SURFACE).

Fig. 299.—In the Second Year of Life.

Fig. 300.—In the Seventh Year of Life.

Fig. 301.—Middle Finger in the Second Year of Life.

Fig. 302.—Middle Finger in the Seventh Year of Life.

Fig. 303.—Epiphyses of the Bones of the Middle Finger in the Act of uniting with the Shafts: Seventeenth Year of Life.

Fig. 304.—Bones of the Thumb in the Fourth Year of Life.

Fig. 305.—Metacarpal Bone of the Thumb in the Eighteenth Year of Life.

Development of the Bones of the Hand.
Fig. 306.—Pelvis Muliebris—The Female Pelvis. Anterior Aspect.

The formation of the pelvis out of the sacrum and coccyx and the two innominate bones. The iliac portions of the innominate bones with the base of the sacrum constitute the upper or false pelvis; the pubic and ischiatic portions of the innominate bones with the sacrum and the coccyx constitute the lower or true pelvis; the boundary between the false and the true pelvis corresponds with the upper aperture or entrance of the true pelvis, the line separating the two being known as the brim or inlet of the true pelvis. Regarded as the means of attachment of the lower limb to the trunk, the pelvis is the cingulum extremitatis inferioris, or pelvic girdle.
Fig. 307.—Pelvis Virilis—The Male Pelvis. Anterior Aspect.

The upper or false and the lower or true pelvis, pelvis major and pelvis minor. The brim of the true pelvis is divided into a sacral, an iliac, and a pubic portion.

Cingulum extremitatis inferioris—Pelvic girdle.
Fig. 308.—Pelvis Virilis—The Male Pelvis. Posterior Aspect.

The pelvic outlet, apertura pelvis (minoris) inferior, in the bony pelvis appears to be bounded on either side by the lower borders of the pubis and the ischium and the greater and lesser sciatic notches, incisure ischiadicae maior et minor, and behind by the projecting part of the sacrum and by the coccyx. But inasmuch as on either side there are two strong ligaments arising from the sacrum and coccyx, the great and the small sacrosciatic ligaments, ligamenta sacrotuberosum et sacrospinosum, which stretch across the two sciatic notches, and thus enlarge the posterior and lateral walls of the true pelvis, by this means the sciatic notches are filled in, and the outlet of the pelvis is notably diminished in size.
Fig. 309.—The Median-Sagittal or Antero-Posterior Diameters of the True Pelvis.

Fig. 310.—The Diameters of the Pelvic Inlet (Apertura Pelvis Superior).

The Principal Diameters of the True Pelvis.
The ilium forms the upper part of the os innominatum. The slightly concave inner surface of the upper and anterior part of the ilium, known as the iliac fossa, is directed towards the observer; behind the fossa is the auricular surface for articulation with the sacrum; and behind the auricular surface is the internal rough surface of the *tuberosity of the ilium*. The upper border of the ilium is the iliac crest, the anterior extremity of which forms the anterior superior iliac spine, the posterior extremity, the posterior superior iliac spine. From the anterior border of the ilium projects the anterior inferior iliac spine, from the posterior border, the posterior inferior iliac spine. The superior or ascending and the inferior or descending rami of the pubis and the superior and inferior rami of the ischium, surrounding the obturator foramen, are all seen from the internal or pelvic aspect. The surface of the pubic symphysis, by means of which the two pubic bones articulate, forms the internal limiting surface of the os pubis.

**Os coxæ**—Hip-bone or innominate bone.
Fig. 312.—The Right Hip-Bone, Outer Side. Posterior Aspect.

The outer surface of the ilium is seen, divided by the three gluteal lines into areas from which the three gluteal muscles respectively arise. The spine of the ischium projects backwards from the posterior border of the hip-bone; above this spine is the iliosciatic or great sciatic notch, below it is the small sciatic notch. The lowest portion of the bone is formed by the backwardly projecting tuberosity of the ischium. The acetabulum is viewed obliquely from behind.
**Body of the pubis**: The use of this term by English anatomists is a variable one. Macalister, whose terminology here, as usual, is in conformity with that of Continental anatomists, writes: "The pubis consists of a body which forms a little less than one-fifth of the acetabulum..." Quain, on the other hand, writes: "The flat portion between the rami of the pubis is the body"; and Young, in his "Synopsis of Human Anatomy" (U.S.), follows Quain's usage. The Continental application of the term has, however, the advantage in the point of consistency, the body being then, in the case of each of the three elements of the hip-bone, the thickened portion taking part in the formation of the acetabulum, of which the body of the pubis constitutes about one-fifth, the body of the ilium nearly two-fifths, and the body of the ischium the remainder.—Ts.

**Fig. 313.—The Right Hip-Bone, Outer Side. Seen from the Right.**

For this illustration the hip-bone has been so placed that a direct view of the interior of the acetabulum is obtained; this consists of two portions, the rough, nearly circular fossa of the acetabulum, and the horse-shoe shaped articular surface (facies lunata—covered in the recent state with cartilage); opposite the fossa of the acetabulum, the rim bounding the depression is interrupted by the cotyloid notch (incisura acetabuli). The three bones which, separate at first, subsequently unite to form the hip-bone, all take part in the formation of the acetabulum (see note ¹ above).
The Skeleton of the Lower Extremity

Fig. 314.—In the Fifth Month of Fetal Life (Months of Four Weeks Each).

Fig. 315.—In the Sixth Month of Fetal Life (Months of Four Weeks Each).

Fig. 316.—In the Fourth Year of Life.

Fig. 317.—In the Fourteenth Year of Life.

Fig. 318.—In the Seventeenth Year of Life.

Development of the Hip-Bone.
Fig. 319.—The Right Femur, Anterior Aspect.

Fig. 320.—The Right Femur, Posterior Aspect.

Femur—The femur, or thigh-bone.
THE SKELETON OF THE LOWER EXTREMITY

Fig. 321.—The Right Femur, Internal Aspect.

Fig. 322.—The Upper Portion of the Right Femur; Third Trochanter (var.) Seen from Behind.

Fig. 323.—Transverse Section through the Middle of the Shaft of the Right Femur.
Fig. 324.—Horizontal Section through the Proximal Extremity of the Right Femur, above the Small Trochanter, to show the Calcar Femorale.

Fig. 325.—Distal Extremity of the Right Femur. Seen from the Outer Side.

Fig. 326.—Distal Articular Extremity of the Right Femur. Seen from Below.

Femur—The femur.
Cartilage of the proximal epiphysis

Diaphysis

Center of ossification for the epiphysis of the head of the femur

Center of ossification for the distal epiphysis

Fig. 327.—From a Boy still-born at Full Term.
Body-length, 21 inches.

The Centres of Ossification of the Proximal and Distal Epiphyses.

Epiphysis of the head of the femur

Epiphysis of the great trochanter

Diaphysis

Calcar femorale

Gluteal ridge

Tuberositas glutaea

Fig. 328.—From a Boy aged Nine and a Half Months.

The Epiphyses of the Proximal Extremity.

Epiphysis of the small trochanter

Diaphysis

Fig. 329.—From a Girl aged Seven Years.

The Epiphysis of the Distal Extremity from a Girl aged Fifteen Years.

Diaphysis

Fig. 330.—From a Girl aged Fifteen Years.

Development of the Femur.
THE SKELETON OF THE LOWER EXTREMITY

Anterior border of proximal articular surface
*Margo infraglenoidalis
External tuberosity
Condylus lateralis
Tuberosity of the tibia
Tuberositas tibiae

Spine of the tibia
Eminentia intercondyloidea

Internal tuberosity
Condylus medialis

External tuberosity
Condylus lateralis

Articular surface for the head of the fibula
Facies articularis fibularis

Popliteal or oblique line
Linea poplitea

Nutrient foramen
Foramen nutricium

Shaft or body of the tibia (posterior surface)
Corpus tibiae (facies posterior)

External border, or interosseous ridge
Crista interossea

Internal border
Margo medialis

Crista anterior

Internal surface
Facies medialis

Internal malleolus
Malleolus medialis

Groove for tibialis posticus
Sulcus malleolaris

**Fig. 333.—Anterior Aspect.**

THE RIGHT TIBIA.

**Fig. 334.—Posterior Aspect.**

Internal malleolus
Malleolus medialis

Incisura fibularis

Shaft or body of the tibia
Corpus tibiae (facies posterior)

External border, or interosseous ridge
Crista interossea

**Fig. 335.—Anterior Surface.**

THE RIGHT PATELLA.

**Fig. 336.—Posterior Surface.**

Ossa cruris—The bones of the leg: the patella, rotula, or knee-pan.
**THE SKELETON OF THE LOWER EXTREMITY**

**Fig. 338.**—*Facies Articularis Superior Tibiae—The Proximal Articular Surface of the Right Tibia.*

Note to Fig. 338.—*Anterior and Posterior Intercondylar Fossa.*—These terms are used neither by Quain nor by Macalister. The latter speaks of the hollows in question as *depressions for the crucial ligaments.*—Tr.

**Fig. 339.**—The Distal Articular Surfaces of the Bones of the Right Leg.

**Fig. 337.**—Right Tibia seen from the Outer Side.

Ossa cruris—Bones of the leg.
**THE SKELETON OF THE LOWER EXTREMITY**

**Styloid process of the fibula**
- Apex capituli fibulae

**Head of the fibula**
- Capitulum fibulae

**External border**
- Crista lateralis

**Shaft or body of the fibula (external surface)**
- Corpus fibulae (facies lateralis)

**Anterior border**
- Crista anterior

**External malleolus**
- Malleolus lateralis

**Articular surface of the external malleolus**
- Facies articularis malleoli (lateralis)

**Groove for the tendons of the peroneus longus and peroneus brevis muscles**

**Articular surface of the head**
- Facies articularis capituli

**Internal border**
- Crista medialis

**Shaft or body of the fibula**
- Corpus fibulae

**Posterior surface**
- Facies posterior

**Fossa of the external lateral ligament of the ankle-joint**

**Fig. 340.**—**EXTERNAL ASPECT.**

**The Right Fibula or Peroneal Bone.**

**Fig. 341.**—**INTERNAL ASPECT.**

**Fig. 342.**—**TRANSVERSE SECTION THROUGH THE MIDDLE OF THE BONES OF THE RIGHT LEG, WITH THE INTEROSSEOUS MEMBRANE.**

**Osse cruris—Bones of the leg.**
Centre of ossification for the proximal epiphysis of the tibia

Centre of ossification for the distal epiphysis of the tibia

Centre of ossification for the proximal epiphysis of the tibia

Centre of ossification for the distal epiphyses of the tibia and fibula

Centre of ossification for the proximal epiphysis of the fibula

Distal epiphysis of the fibula

Proximal epiphysis of the tibia

Tubercle of the tibia

Tuberositas tibiae

Distal epiphyses of the tibia and fibula

Fig. 343.—From a Boy still-born at Full Term.
   Body length, 21 inches.

Fig. 344.—From a Boy aged Nine and a Half Months.

Fig. 345.—From a Boy aged One and a Half Years.

Fig. 346.—Proximal and Distal Portions of the Fibula of a Girl aged Four and a Half Years.

Fig. 347.—Proximal Portion of the Tibia of a Girl aged Fifteen Years. Sagittal Section.

Fig. 348.—The Distal Portions of the Bones of the Leg of a Girl aged Fifteen Years. Frontal Section.

Development of the Bones of the Leg.
Fig. 349.—Bones of the Right Foot seen from the Outer Side: Facies Dorsalis Pedis et Margo Lateralis Pedis.

Fig. 350.—The Bones of the Right Foot seen from the Inner Side: Margo Medialis Pedis.

Skeleton pedis—Bones of the foot.
Fig. 351.—The Bones of the Right Foot seen from the Plantar Side: Facies Plantaris Pedis.
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Fig. 352.—The Bones of the Right Foot seen from the Dorsal Side (arranged in Two Longitudinal Rows).

Skeleton pedis—Bones of the foot.
THE SKELETON OF THE LOWER EXTREMITY

Fig. 353.—Seen obliquely from Within and Before.

The Right Calcaneum or Os Calcis.

Fig. 354.—Seen obliquely from Without and Behind.

Fig. 355.—Seen from Below.

The Right Astragalus.

Fig. 356.—Seen from Behind.

Fig. 357.—The Right Astragalus. With an Os Trigonum (var.). Seen from Below.

Os trarsi—Bones of the tarsus.
**THE SKELETON OF THE LOWER EXTREMITY**

**Fig. 358.**—Anterior Aspect.
**Fig. 359.**—Posterior Aspect.

Os Naviculare Pedis—The Right Navicular or Scaphoid Bone of the Foot.

**Fig. 360.**—External Aspect.
**Fig. 361.**—Anterior Aspect.

Os Cuneiforme I.—The Right Internal Cuneiform Bone.

**Fig. 362.**—Os Cuneiforme II.—The Right Middle Cuneiform Bone.
**Fig. 363.**—Os Cuneiforme III.—The Right External Cuneiform Bone.

**Fig. 364.**—Inner Aspect.
**Fig. 365.**—Seen obliquely from Without and Behind.

Os Cuboideum—The Right Cuboid Bone.

Ossa tarsi—Bones of the tarsus.
Tuberosity of the fifth metatarsal bone
Tuberositas ossis metatarsalis V.

Articular facet for the third metacarpal bone
Articular facet for the cuboid bone

Articular facet for the external cuneiform bone
Articular facets for the second metatarsal bone

Articular facet for the middle cuneiform bone
Articular facet for the internal cuneiform bone

Base
Basis

Shaft
Corpus

Depressions for the attachment of the lateral ligaments

Fig. 367.—The Metatarsal Bones of the Right Foot seen from the Inner Side.

Tuberosity of the first metatarsal bone
Tuberositas ossis metatarsalis I.

Articular facet for the fourth metatarsal bone
Articular facet for the external cuneiform bone

Articular facets for the third metatarsal bone

Depressions for the attachment of the lateral ligaments

Fig. 368.—The Metatarsal Bones of the Right Foot seen from the Outer Side.

Grooves for the sesamoid bones

Ungual process
Tuberositas unguicularis

Fig. 369.—Plantar Aspect of the Head of the Metatarsal Bone of the Great Toe (Capitulum Ossis Metatarsalis Hallucis).

Fig. 370.—The Phalanges of the Second Toe seen from the Inner Side (Margo Medialis Digitii Secundi Pedis).

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Development of the Bones of the Foot.
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REGIONS OF THE HUMAN BODY

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INDEX

TO THE OSTEOLY

Certain names in this Index have an asterisk (*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft.

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AN ATLAS
OF
HUMAN ANATOMY
FOR STUDENTS AND PHYSICIANS
BY
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ASSISTED BY
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Adapted to English and American and International Terminology
BY
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THE ARTICULATIONS IN GENERAL
THE ARTICULATIONS IN GENERAL

FIG. 378.—SUTURA SERRATA—SERRATED OR DENTATED SUTURE.

FIG. 379.—SUTURA SQUAMOSA—SQUAMOUS OR SCALY SUTURE.

FIG. 380.—HARMONIA—HARMONIC SUTURE.

Synarthrosis, or Continuous Articulation.
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**Fig. 382.** — **Symphysis.** (The Pubic Symphysis; Frontal Section, Posterior Portion.)

**Fig. 383.** — **Gomphosis.**

Synarthrosis, or Continuous Articulation.
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Fig. 384.—Extension. Posterior Aspect.

Diarthrosis (Metacarpo-phalangeal Articulation).—Ginglymus, or Hinge Joint (Articulations of the Fingers).

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Fig. 386.—Articulatio Cochlearis, Cochleoid or Screw Ginglymus. (Superior Articular Surface of the Left Astragalus, seen from Behind, showing the Screw Form of the Ankle-Joint.

Diarthrosis, or Discontinuous Articulation—Articulatio simplex, simple joint.
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- Lateral ligament (Lig. collaterale)
- Capsule of the joint (Capsula articularis)
- Axis of adduction and abduction
- Centre of the head (axis of flexion of the metacarpo-phalangeal articulation)
- Second metacarpal bone (Os metacarpale II).

**Fig. 388.—Condylarthrosis, or Condyloid Joint.** (Right occipito-atlantal articulation; seen from the outer side.)

The outer half of the lateral mass of the atlas has been removed by a sagittal section passing through the joint.

- Anteroposterior axis (axis of adduction and abduction)
- Radio-ulnar axis (axis of flexion and extension)
- Trapezium (Os multangulum majus)
- Superior articular surface of the atlas (Fovea articularis superior atlantis)
- Lateral mass of the atlas (Massa lateralis atlantis)
- Basilar portion of the occipital bone (Pars basilaris ossis occipitalis)
- Capsule of the joint (Capsula articularis)
- Occipital condyle (Condylus occipitalis)

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Diarthrosis, or Discontinuous Articulation—Articulatio simplex, simple joint.
Diarthrosis, or Discontinuous Articulation—Articulatio simplex, simple joint; articulatio sphaeroidae, ball-and-socket joint.
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The arrows show the dorsal emergence of the axes of the wrist joint and of the transverse carpal articulation respectively.

Fig. 393.—Articulatio Trochoidea, Trochoid or Pivot Joint.—Ginglymus, Hinge Joint. (Palmar Aspect of the Elbow-Joint.)

The radial half of the capitellum of the humerus has been removed by a sagittal section passing through its centre of curvature.

Diarthrosis, or Discontinuous Articulation.
Amphiarthrosis, arthrodis or gliding joint—Articulatio composita, compound joint.
THE ARTICULATIONS IN GENERAL

**Fig. 394.**—**Syndesmosis. Interarticular Fibrocartilage. (The Sternoclavicular Articulation, Anterior Aspect.)**

The right articulation is divided through the middle by a frontal section; in the left, the front portion of the capsule has been removed, and the clavicle has been drawn backwards.

**Fig. 395.**—**Syndesmoses Scapulae, Proper Ligaments of the Scapula; seen from Above.**

Syndesmosis, fibrous or gamentous union—Discus articularis, interarticular fibrocartilage.
JUNCTURÆ OSSIUM TRUNCI
THE ARTICULATIONS OF THE TRUNK
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Ligamenta columnae vertebralis—The ligaments of the vertebral column.
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columnae vertebrales—The ligaments of the vertebral column.
THE ARTICULATIONS OF THE TRUNK

Fig. 398.—Fibrocartilagines intervertebrales, intervertebral discs. Ligamenta Flava, or subflava. Ligamenta Interspinalia, interspinous ligaments. Ligamentum Supraspinale, supraspinous ligament. (Median section through the twelfth dorsal and the first lumbar vertebra, left half.)
Fig. 399.—Ligamenta Flava, Ligamenta Subflava. Articulationes Intervertebrales, Intervertebral Articulations. Of these Latter the Right are unopened, the Left opened. (The Archs of the First Four Dorsal Vertebrae, separated from the Bodies by a Frontal Section. Seen from Before.)

Ligamenta columnae vertebralis—The ligaments of the vertebral column.
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Anterior occipito-atlantal ligament
Membrana atlanto-occipitalis anterior

First cervical vertebra
Vertebra cervicalis I.

First dorsal vertebra
Vertebra thoracalis I.

Tendon of origin of the
longus colli muscle

Divided anterior costocentral
or stellate ligaments

Eleventh rib
Costa XI.

Posterior or internal intercostal
aponeurosis
Lig. intercostale internum

Costal portion of the diaphragm
Pars costalis diaphragmatis

Crura or pillars of the diaphragm
Fascia lumbodorsalis

Lumbar fascia
Fascia lumbalis

Transversalis muscle
Musculus transversus abdominis

Iliolumbar ligament
Lig. iliolumbae

Great sacrosciatic foramen
Foramen ischiadicum majus

Anterior or small sacrosciatic ligament
Lig. sacrospinosum

Small sacrosciatic foramen
Foramen ischiadicum minus

Posterior or great sacrosciatic ligament
Lig. sacrotuberous

Anterior common ligament
Lig. longitudinale anterius

Anterior superior costotransverse
ligament
Lig. costotransversarium anterius

First lumbar vertebra
Vertebra lumbalis I.

Lumbar fascia
Lig. lumbocostale

Lumbar fascia
Lig. iliolumbae

Iliolumbar ligament
Lig. iliolumbae

Surface of the section through the
innominate bone

Fig. 400.—Ligamentum Longitudinale Anterius, the Anterior Common Ligament. Ligamentum Lumbocostale, Lumbocostal Ligament. (The Ventral Aspect of the Vertebral Column, the Anterior Half of the Base of the Skull and the Anterior Half of the Pelvis having been removed.)

Ligamenta columnae vertebralis—The ligaments of the vertebral column.
**Fig. 401.—Intervertebral Discs, Interspinous Ligaments, Supraspinous Ligament, Ligamentum Nuchae, Spinal Canal; Intervertebral Foramina. Vertical Axis of the Vertebral Column. (Median Section through the Vertebral Column.)**

Macalister calls this ligament *ligamentum latum axiale*, the broad axial ligament.—Tr.

Ligamenta columnae vertebrales—the ligaments of the vertebral column.
Ligamenta columnae vertebralis—The ligaments of the vertebral column.
Fig. 404.—Lumbar and Sacral Portions of the Posterior Common Ligament, and the Connexions of this Ligament with the Spinal Dura Mater and with the Deep Posterior Sacrococcygeal Ligament. (The Sacrum and the Lumbar Portion of the Vertebral Column with the Spinal Canal laid open from Behind.)

The sacral portion of the dura mater has been drawn to the left side.

Ligamenta columnae vertebralis—The ligaments of the vertebral column.
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Fourth sacral vertebra
Vertebra sacralis IV.

Anterior or small sacrosacral ligament
Lig. sacrospinosum

Anterior sacroccygeal ligament
Lig. sacroccygeum anterius

Fig. 405.—The Ligaments connecting the Anterior Surfaces of the Sacrum and Coccyx: the Anterior and the Lateral Sacroccygeal Ligaments.

Fourth anterior sacral foramen
Foramen sacrale anterius IV.

Sacroccygeal symphysis
Symphysis sacrococcygea

Lateral coccygeal ligament
Lig. coccygeum laterale

Apertures in the posterior sponges of the levatores ani muscle for the passage of the middle sacral vessels

Prolongations of the anterior sacroccygeal ligament into the tendons of the pubococcygeal portions of the levatores ani muscles

*Articular sacral crests
*Crista sacrales articulares

*Median sacral crest
*Crista sacralis media

Lateral sacroccygeal ligament
Lig. sacroccygeum laterale

Interarticular sacroccygeal ligament
Lig. sacroccygeum articulare

Superficial posterior sacroccygeal ligament
Lig. sacroccygeum posterus superficiale

Deep posterior sacroccygeal ligament
Lig. sacroccygeum posterus profundum

Fig. 406.—The Ligaments connecting the Posterior Surfaces of the Sacrum and Coccyx: the Superficial and Deep Posterior Sacroccygeal Ligaments, and the Interarticular and Lateral Sacroccygeal Ligaments.

The Coccyx with the Two Last Sacral Vertebrae.

Ligamenta columnae vertebralis—The ligaments of the vertebral column.
Fig. 407.—Ligamentum Nuchæ. (The Cervical Portion of the Vertebral Column and the Posterior Portion of the Cranium; seen from the Right Side.)

Ligamenta columnae vertebralis—The ligaments of the vertebral column.
Fig. 408.—Articulationes Capitulorum et Costotransversarìæ, the Costocentral and Costotransverse Articulations: Ligamentum Capituli Costæ Interarticulare, the Interarticular Costocentral Ligament; Ligamentum Colli Costæ et Ligamentum Tuberculi Costæ, the Middle and Posterior Costotransverse Ligaments. (The Seventh Dorsal Vertebra with the Vertebral Extremities of the Seventh Pair of Ribs; seen from Above.)

On the left side the costocentral and costotransverse articulations have been opened by a horizontal section through the rib and the vertebral body; on the right side the section passes through the intervertebral disc on a plane just above the attachment of the interarticular costocentral ligament to the ridge between the two articular facets on the vertebral extremity of the rib.

Articulationes costovertebrales—Costovertebral articulations.
Fig. 409.—Costocentral and Costotransverse Articulations: Anterior Costocentral or Stellate Ligament; Interarticular Costocentral Ligament; Anterior Superior Costotransverse Ligament; and Costotransverse Foramina. Posterior or Internal Intercostal Aponeuroses. (The Third to the Seventh Dorsal Vertebrae with the Vertebral Extremities of the Third to the Seventh Right Ribs; seen from the Right and from Before.)

The third, fourth, and fifth costocentral articulations are unopened; the sixth and the seventh have been opened from before. In the sixth articulation, by the partial removal of the bodies of the fifth and sixth dorsal vertebrae, the upper and lower surfaces of the intervertebral disc have been exposed, and the attachment of the disc to the ridge between the two articular facets on the head of the rib has been demonstrated.

Articulationes costovertebrales—Costovertebral articulations.
Fig. 410.—The Ligaments connecting the Dorsal Vertebrae with the Ribs posteriorly: Posterior and Posterior Superior Costotransverse Ligaments; Intertransverse Ligaments; Posterior or Internal Intercostal Aponeuroses; Supraspinous Ligament. (Sixth to Tenth Dorsal Vertebrae with the Vertebral Extremities of the Sixth to Tenth Ribs.)

Articulationes costovertebrales—Costovertebral articulations.
THE ARTICULATIONS OF THE TRUNK

Fig. 411.—Third, Fourth, and Fifth Cervical Vertebrae seen from the Right Side.

Fig. 412.—Third, Fourth, and Fifth Dorsal Vertebrae seen from the Right Side.

Fig. 413.—Second, Third, and Fourth Lumbar Vertebrae seen from the Right and from Behind.

The Direction of the Articular Surfaces and the Connexions of the Capsules of the Joints of the Articular Processes in the Cervical, Dorsal, and Lumbar Vertebrae respectively.
THE ARTICULATIONS OF THE TRUNK

Fig. 414.—*Membrane of the Sternum. Anterior Chondrosternal Ligaments, Costo-xiphoid Ligaments, and Anterior or External Intercostal Aponeuroses. The Relation of these Latter to the External Intercostal Muscles and to the Pectoralis Minor Muscle. (Anterior Wall of the Thorax seen from Before.)

Articulationes sternocostales—Chondrosternal articulations.
Articulationes sternocostales—Chondrosternal articulations.
Fig. 416.—CHONDROSTERNAL ARTICULATIONS. INTERCHONDRALE ARTICULATIONS. INTERARTICULAR SYNCHONDROSIS. STERNOCLAVICULAR ARTICULATION. (POSTERIOR HALF OF A FRONTAL SECTION THROUGH THE STERNUM, THE CARTILAGES OF THE RIBS, AND THE STERNAL EXTREMITIES OF THE CLAVICLES.)

Articulationes sternocostales—Chondrosternal articulations.
ARTICULATIONES ET LIGAMENTA CAPITIS

THE ARTICULATIONS AND LIGAMENTS OF THE HEAD
Fig. 417.—Posterior Occipito-axial Ligament. Occipito-Atlantal and Atlanto-axial Synovial Joints. (The Three Uppermost Cervical Vertebrae and the Occipital Bone seen from Behind.)

By a frontal section behind the occipital condyles, the squamous portion of the occipital bone and the neural arches have been removed. The dura mater has been cut transversely in the basilar groove, and turned upwards.

Fig. 418.—Transverse Ligament of the Atlas. (The Atlas seen from Above.)

Articulationes atlanto-occipitalis et atlanto-epistrophica—Occipito-Atlantal and Atlanto-axial articulations.
Fig. 419.—Cruciform Ligament of the Atlas; Lateral or Alar Odontoid or Check Ligaments Occipito-atlantal and Atlanto-axial Synovial Joints, the Right closed, the Left open.

The cranial dura mater and the posterior or long occipito-axial ligament1 have been cut transversely in the basilar groove and turned upwards.

1 See note to p. 177.

Accessory occipito-axial ligament. This ligament is not mentioned by the author, though it is well shown in Fig. 419. The accessory ligament is a bundle of fibres strengthening the capsule of the occipito-atlantal joint at its postero-internal angle. It runs downwards and inwards from the back of the occipital condyle to the body of the axis near the base of the odontoid process.—Tu.

Fig. 420.—Lateral or Alar Odontoid or Check Ligaments. Middle Odontoid Ligament or Suspensory Ligament of the Axis.

The transverse ligament of the atlas has been divided in the middle and the parts have been turned outwards; the dura mater and the posterior or long occipito-axial ligament have been entirely removed.

The Atlas and the Axis with the Anterior Portion of the Occipital Bone seen from Behind, a Section having been made similar to that in the Preparation shown in Fig. 414.

Articulationes atlanto-occipitalis et atlanto-epistrophica—Occipito-atlantal and atlanto-axial articulations.
THE ARTICULATIONS AND LIGAMENTS OF THE HEAD

Fig. 421.—Occipito-atlantal and atlanto-axial articulations in frontal section. Lateral or alar odontoid or check ligaments and middle odontoid ligament or suspensory ligament of the axis.

The section passes through the middle of the posterior condylar foramina; and divides the summit of the antero-posterior curve of the occipital condyles.

Fig. 422.—Articulations and ligaments of the odontoid process. Stratiform arrangement of the cruciform ligament of the atlas, the posterior or long occipito-axial ligament, and the dura mater. Spheno-occipital synchondrosis. (Median section through the posterior portion of the base of the cranium and the three uppermost cervical vertebrae.)

Articulationes atlanto-occipitalis et atlanto-epistrophea—Occipito-atlantal and atlanto-axial articulations.
Fig. 423.—Antep or Occipito-atlantal Ligament and Petrobasilar Synchondrosis. (The Atlas with the Posterior Portion of the Base of the Skull, seen from Before.)

Fig. 424.—Posterior Occipito-atlantal Ligament. (The Atlas with the Occipital Bone, seen from Behind.)

Articulatio atlanto-occipitalis—Occipito-atlantal articulation.
Fig. 425.—Articulatio Mandibularis, Temporomandibularis or Temporomaxillary Articulation: Ligamenta Temporomandibulare et Stylomandibulare, External Lateral and Stylo-mandibular or Stylomaxillary Ligaments. Ligamentum Stylohyoideum, Stylohyoid Ligament. (Right Temporomandibular or Temporomaxillary Articulation, seen from the Outer Side.)

Articulatio mandibularis—Temporomandibular or temporomaxillary articulation.
Articulatio mandibularis—Temporomandibular or temporomaxillary articulation.
**Fig. 427.**—Articulatio Mandibularis, Temporomandibular or Temporomaxillary Articulation: Discus Articularis, Interarticular Disc or Meniscus, and Ligamentum Stylomandibulare, Stylomandibular or Stylomaxillary Ligament. Relations of the Superior Head of the External Pterygoid Muscle to the Anterior Wall of the Capsular Ligament and to the Interarticular Disc or Meniscus. (Right Temporomandibular or Temporomaxillary Articulation, divided in a Plane nearly approaching the Sagittal; the Internal Portion being figured.)

The section runs somewhat obliquely forwards and inwards.

**Fig. 428.**—Fibrocartilago Basalis; Fibrocartilage of the Foramen Lacerum Medium: Synchondroses Sphenopetrosa, Petro-occipitalis, et Spheno-occipitalis; Petrosphoenoidal, Petrobasilar, and Occipitosphenoidal Synchondroses: Ligamentum Pterygospinosum; Pterygospinosus Ligament. (The Middle Portion of the Base of the Skull, seen from Below.)

Articulatio mandibularis, temporomandibular or temporomaxillary articulation—Synchondroses et ligamenta baseos crani, synchondroses and ligaments of the base of the skull.
JUNCTURÆ OSSIUM EXTREMITATUM, SUPERIORIS ET INFERIORIS

THE ARTICULATIONS OF THE SUPERIOR AND INFERIOR EXTREMITIES
THE ARTICULATIONS OF THE UPPER LIMB

Fig. 429.—Articulatio Sternoclavicularis, Sternoclavicular Articulation: Capsula Articularis, Capsule of the Joint; Discus Articularis, Interarticular Fibrocartilage; Ligamenta Interclaviculare et Costoclavicular, Interclavicular and Costoclavicular or Rhomboid Ligaments.

The left sternoclavicular articulation has been opened by the removal of the anterior wall of the capsular ligament.

Fig. 430.—Articulatio Sternoclavicularis, Sternoclavicular Articulation: Discus et Capsula Articularis, Interarticular Fibrocartilage and Capsular Ligament; Cavum Articulare, Synovial Cavity or Cavities; Ligamenta Interclaviculare et Costoclavicular, Interclavicular and Costoclavicular or Rhomboid Ligaments.

The right sternoclavicular articulation has been divided by a frontal section; in the left, the capsule has been removed and the clavicle has been drawn backwards.

Sternoclavicular Articulation, seen from Before.

Articulationes et ligamenta cinguli extremitatis superioris—Articulations and ligaments of the shoulder-girdle.
Fig. 431.—Ligamenta acromioclavicularis et coracoclavicularis, superior acromioclavicularis ligament and coracoclavicularis ligament (conoid portion); ligamenta coraco-acromiale et transversum scapule superius, coraco-acromialis and suprascapularis ligaments. (The right scapula with the acromial half of the clavicle and the shoulder-joint, seen from above.)

Articulationes et ligamenta cinguli extremitatis superioris—Articulations and ligaments of the shoulder-girdle.
The acromion has been sawn off, and the coracoid extremity of the coraco-acromial ligament has been turned upwards.

Articulatio humeri—Shoulder-joint.
**THE ARTICULATIONS OF THE UPPER LIMB**

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Fig. 433.—Articulatio Humeri, Shoulder-Joint: Labrum Glenoidale, Glenoid Ligament; Relations of the Tendon of the Long Head of the Biceps Muscle and of the Epiphysial Disc to the Synovial Cavity of the Articulation. (The Right Shoulder-Joint in Frontal Section; Posterior Half.)

Fig. 434.—Articulatio Acromioclavicularis, Acromioclavicular Joint: Discus Articularis, Interarticular Fibrocartilage; Ligamentum Acromioclavicularare, Superior Acromioclavicular Ligament. (The Right Acromioclavicular Articulation in Frontal Section; Posterior Portion.)

Articulatio humeri—Shoulder-joint. Articulatio acromioclavicularis—Acromioclavicular articulation.
THE ARTICULATIONS OF THE UPPER LIMB

Fig. 435.—Articulationes Humeri et Acromioclavicularis, the Shoulder-Joint and the Sternoclavicular Articulation: Bursa Musculi Subscapularis et Bursa Subdeltoidae, Bursa of the Subscapularis Muscle and Subdeltoid or Subacromial Bursa; Vagina Muscosa Intertubercularis, Synovial Sheath of the Bicipital Groove; Ligamenta Coracoclavicularis, Coraco-acromialis, et Transversum Scapulae Superioris; the Coracoclavicular (Conoid and Trapezoid), Coraco-acromial, and Coracoscapular or Suprascapular Ligament. (Right Shoulder-Joint, Injected with Tallow; the Acromial Extremity of the Clavicle has been drawn upwards. Seen from Before.)

Articulatio humeri—Shoulder-joint.
After tallow had been injected into the joint and allowed to harden, the capsular ligament and the surrounding scapular muscles were divided by a circular incision midway between their attachments to the scapula and the humerus. A strip of the capsule, however, being left undivided, where the tendon of the long head of the biceps muscle passes through the joint. The humerus with the distal half of the capsule has been turned upwards.

Articulatio humeri—Shoulder-joint.
THE ARTICULATIONS OF THE UPPER LIMB

Fig. 437.—Articulatio Cubiti, Elbow-Joint: Capsula Articularis, Capsule of the Joint; Ligamenta Collateralia, Lateral Ligaments; Ligamentum Annulare Radii, Annular or Orbicular Ligament of the Radius; *Recessus Sacciformis (see note, above). (Right Elbow-Joint, unopened; Anterior or Palmar Aspect.)

The *recessus sacciformis has been injected with tallow.

Articulatio cubiti—Elbow-joint.
Fig. 438.—Articulatio Cubiti, Elbow-Joint; Attachment of the Capsule to the Anterior Surfaces of the Humerus and the Ulna (Anterior Ligament); Ligamenta Collateralia, Lateral Ligaments; Ligamentum Annulare Radii, Annular or Orbicular Ligament of the Radius. (Right Elbow-Joint; Anterior or Palmar Aspect.)

The capsule has been divided above and below, close to its attachment to the bones, and between the lateral ligaments (i.e., the greater portion of the anterior ligament has been removed); the cut ends of the anterior ligament have been folded back against the bones. The recessus sacciformis—see note on previous page—has been removed.

Articulatio cubiti—Elbow-joint.
Fig. 439.—Articulatio Cubiti, Elbow-Joint: Capsula Articularis, Capsule of the Joint; Ligamentum Collaterale Ulnare, Internal Lateral Ligament. (Right Elbow-Joint; Postero-internal Aspect.)

Articulatio cubiti—Elbow-joint.
THE ARTICULATIONS OF THE UPPER LIMB

The humerus
Humerus

Olecranon fossa
Fossa olecrani

Capsule of the elbow-joint (posterior ligament)
Capsula articularis

Internal condyle
Epicondylus medialis

Olecranon
Olecranon

Capsule of the elbow-joint (posterior ligament)
Capsula articularis

External condyle
Epicondylus lateralis

Capsule of the elbow-joint
Capsula articularis

External lateral ligament
Lig. collaterale radiale

Annular or orbicular ligament of the radius
Lig. annulare radii

*Recessus sacciformis

Neck of the radius
Collum radii

Tuberosity of the radius
Tuberositas radii

The ulna
Ulna

1 See note to p. 204.

Fig. 440.—Articulatio Cubiti, Elbow-Joint: Capsula Articularis, Capsule of the Joint; Ligamentum Collaterale Radiale, External Lateral Ligament; Ligamentum Annulare Radii, Annular or Orbicular Ligament of the Radius; *Recessus Sacciformis. (Right Elbow-Joint; Postero-External Aspect.)

The *recessus sacciformis has been injected with tallow.

Articulatio cubiti—Elbow-joint.
Fig. 441.—Articulatio Humero-ulnaris, Humero-ulnar Articulation. (Sagittal Section of the Right Elbow-Joint; the Radial Half is figured.)

The section passes through the trochlea and the great sigmoid cavity of the ulna, in a plane vertical to the axis of the trochlea.

Articulatio cubiti—Elbow-joint.
Articulations of the Bones of the Forearm.
Fig. 443.—The Posterior or Dorsal Ligaments of the Wrist and Hand: Ligamenta Collateralia Carpi, Lateral Ligaments of the Wrist and the Carpus; Superficial Posterior or Dorsal Ligaments of Carpus and Metacarpus. The Capsules and the Lateral Ligaments of the Metacarpo-phalangeal and Interphalangeal Articulations.

In the articulations of the index finger the posterior wall of the capsule has been divided transversely across the middle of the joint, and the ends have been turned upwards and downwards; in the articulations of the thumb and the middle finger the capsule has been divided only between the lateral ligaments, leaving these intact; in the articulations of the ring and little fingers the capsule has not been opened.

Articulationes manus et digitorum—Articulations of the hand and fingers.
The radius

Anterior or palmar ligament of the wrist-joint
Lig. radiocarpum volare

Tendon of the flexor carpi radialis muscle

Anterior annular ligament of the wrist
Lig. carpi transversum

Ridge or tuberosity of the trapezium
Capsule of the carpometacarpal joint of the thumb
Capsula articulationis carpi-tacarpae pollicis

Tendon of the flexor carpi radialis muscle

Anterior or palmar proximal intermetacarpal ligament
Lig. basium volare

Sesamoid bones
Os sesamoideae

Interphalangeal articulation of the thumb
Articulatio pollicis

Anterior or palmar metacarpo-phalangeal ligaments
Ligg. accessoria volaria

Proximal interphalangeal articulation of the index finger
Articulatio proximalis digiti II.

Lateral ligaments
Ligg. collateralia

Distal interphalangeal articulation of the index finger
Articulatio distalis digiti II.

Capsule of the distal interphalangeal articulation of the middle finger
Capsula articulationis distalis digiti III.

1 These are fibrous plates rather than ligaments properly so called, and, being thickened into fibrocartilage at each side along their attachments to the lateral metacarpophalangeal ligaments, they are grooved on the palmar surfaces for the flexor tendons. Macalister calls them \textit{glenoid} ligaments. It is in the lateral fibrocartilaginous portions of these plates that the sesamoid bones of the metacarpophalangeal joint of the thumb, and occasionally of some of the other fingers, are developed.—TW.

Capsule of the metacarpo-phalangeal articulation of the little finger
Capsula articulationis metacarpo-phalangee digitii V.

Sesamoid bone
Os sesamoideum

Transverse metacarpal ligament
(Anterior or palmar distal intermetacarpal ligaments)
Ligg. capitulorum transversa

Internal lateral ligaments of the interphalangeal articulations of the little finger
Ligg. collateralia ulnaria articulationum digitii V.

Fig. 444.—The Anterior or Palmar Ligaments of the Wrist and Hand: the Superficial Ligaments of the Carpus and the Metacarpus; the Capsules and Ligaments of the Metacarpo-phalangeal and the Interphalangeal Articulations. Ligamentum Carpi Transversum, Anterior Annular Ligament of the Wrist; Canalis Carpi, Canal of the Carpus beneath the Anterior Annular Ligament (for the Transmission of the Flexor Tendons). Relations of the Tendons of the Flexor Carpi Ulnaris and Flexor Carpi Radialis Muscle to the Anterior or Palmar Carpall and Metacarpal Ligaments. Ligamenta Accessoria Volaria, Anterior or Palmar Metacarpo-phalangeal Ligaments; Ligamenta Capitulorum Transversa, Transverse Metacarpal Ligament (Anterior or Palmar Distal Intermetacarpal Ligaments). Ossa Sesamoidea, Sesamoid Bones.

In the interphalangeal articulations of the index finger the anterior portions of the capsules between the lateral ligaments have been entirely cut away; in those of the middle finger the capsules have been divided transversely across the middle of the joint and the divided halves of the anterior ligament turned upwards and downwards; in the interphalangeal articulation of the thumb, the anterior portion of the capsule has been divided along its attachment to the distal phalanx and the lateral ligaments, and, together with the sesamoid bones embedded in it on each side, has been turned upwards; in the remaining joints the capsule has been left intact.

Articulationes manus et digitorum—Articulations of the hand and fingers.
The ulna

Capsule of the inferior radio-ulnar articulation
Capsula articularis radio-ulnaris distalis

Lunar or semilunar bone
Os lunatum

Internal lateral ligament of the wrist-joint—Lig. collateralis carpi ulnare
Platform bone—Os pisiforme

Tendon of the flexor carpi ulnaris muscle
Pis-uncinate ligament
Lig. pisohamateum
Pisometacarpal ligament
Lig. pisometacarpum
Hook of the unciform bone
Hamulus ossis hamati

Os magnum or capitate bone
Os capitatum

Radiations of the tendons of the flexor carpi ulnaris and the flexor carpi ulnaris muscles to the base of the third metacarpal bone

Palmar or radiate ligament of the carpus
Lig. carpi radiatum

Fig. 445.—The Anterior or Palmar Ligaments of the Right Carpus, shown by the removal of the Anterior Annular Ligament of the Wrist: Ligamentum Radiocarpeum Volare, Anterior or Palmar Ligament of the Wrist-Joint; Ligamentum Carpi Radiatum, Anterior or Radiate Ligament of the Carpus.

Fig. 446.—The Anterior or Palmar Ligaments of the Intercarpal (Transverse Carpal) and Carpometacarpal Articulations, after the Anterior Annular Ligament of the Wrist and the Tendons of the Flexor Carpi Radialis and Flexor Carpi Ulnaris have been entirely removed.

Articulatio manus—Articulations of the hand.
Fig. 447.—The Short Posterior or Dorsal Ligaments of the Transverse Carpal Articulation, and of the Carpometacarpal and Intermetacarpal Articulations. (The Right Carpus with the Distal Extremities of the Bones of the Forearm and the Proximal Extremities of the Metacarpal Bones.)

The distal radio-ulnar articulation and the radiocarpal and transverse carpal articulations have been opened by the removal of the posterior ligaments, and the bones of the forearm have been drawn a little upwards and away from the carpus.

Articulatio manus—Articulations of the hand.
The articular pouch of the synovial membrane of the distal radio-ulnar articulation.

Recessus sacroformis articulationis radio-ulnaris distalis

Triangular fibrocartilage

Discus articularis

Lunar, or semilunar, bone—Os lunatum

Intersseous interosseous intercarpal ligament (Lig. interosseum)

Internal lateral ligament of the wrist joint

Lig. collateralis carpi ulnare

Pyramidal or coniform bone—Os triquetrum

Capsule of the transverse carpal articulation

Capsula articulatio manus

Unciform bone—Os hamatum

Carpometacarpal articulations of the ring and little fingers

Intersseous carpometacarpal ligament (Lig. interosseum)

Intermetacarpal articulations

Articulatio intermetacarpeae

Intersseous intermetacarpal ligaments

Lig. basiun interossea

Metacarpo-phalangeal articulation of the little finger

Articulatio metacarpo-phalangae digitii V.

Lateral ligaments

Lig. collateralis

Proximal interphalangeal articulation of the little finger

Articulatio proximalis digitii V.

Lateral ligaments

Lig. collateralis

Distal interphalangeal articulation of the little finger

Articulatio distalis digitii V.

Lateral ligaments

Lig. collateralis

The radiocarpal articulation or wrist joint

Articulatio radiocarpea

Intersseous intercarpal ligament (3)

Scaphoid bone—Os naviculare

External lateral ligament of the wrist joint

Transverse carpal articulation

Articulatio intercarpea

Trapezioid bone—Os multangulare minus

Carpometacarpal articulation of the thumb

Intersseous intercarpal ligament

Articulatio metacarpo-phalangea palmaris

Sesamoid bone

Os sesamoideum

Interphalangeal articulation of the thumb

Articulatio pollicis

Articulationes manus et digitorum—Articulations of the hand and fingers.

Fig. 449.—Articulatio Radio-ulnaris Distalis, Distal Radio-ulnar Articulation. Articulatio Manus, Articulations of the Hand: Articulatioes Radiocarpea et Intercarpea, Radiocarpal Articulation or Wrist-Joint and Transverse Carpal Articulation. Articulatioes Carpometacarpeae, Carpometacarpal Articulations; Articulatioes Intermetacarpeae, Intermetacarpal Articulations. Articulatioes Metacarpo-phalangeae, Metacarpo-phalangeal Articulations; Articulatioes Digitorum Manus, Interphalangeal Articulations of the Fingers. (The Skeleton of the Right Hand with the Distal Extremities of the Bones of the Forearm; Posterior or Dorsal Aspect.)

The articulations are all opened by a section in the frontal plane; and whereas in the fingers this plane passes through the joints from side to side, dividing the lateral ligaments; in the thumb, owing to the op position of this member, the plane of section passes through the joints in a dorsopalmar direction, and divides the dorsal and palmar ligaments.
Fig. 450.—The Articulations of the Hand, seen in Sagittal or Dorsopalmar Section, showing their Relations to the Epiphyseal Discs. (The Radial Portion of the Divided Right Hand of a Youth aged Seventeen Years.)

The section traverses the distal extremity of the radius, the carpus, and the metacarpal bone an phalanges of the middle finger.

Articulationes manus et digitorum—Articulations of the hand and fingers.
Fig. 451.—Articulatio Sacro-iliaca, Sacro-iliac Articulation: Ligamenta Sacro-iliaca Anteriora, Anterior Sacro-iliac Ligament; Ligamentum Iliolumbale, Iliolumbar Ligament. Ligamenta Sacrospinosum et Sacrotuberosum, Small or Anterior and Great or Posterior Sacrosciatic Ligaments. Foramina Ischiadica Majus et Minus, Great and Small Sacrosciatic Foramina. (The Pelvis with the Fourth and Fifth Lumbar Vertebrae, in Frontal Section; Posterior Half, seen from Before.)

The ligaments of the right sacro-iliac articulation are intact; those of the left articulation have been removed.

Articulationes et ligamenta cinguli extrematis interioris—Articulations and ligaments of the pelvic girdle.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 452.—Ligamenta Sacrotuberosum et Sacrospinosum, Posterior or Great and Anterior or Small Sacrosciatic Ligaments; Foramina Ischiadica, Sacrosciatic Foramina. Membrana Obturatoria, Obturator Membrane or Ligament; Canalis Obturatorius, Obturator Canal. Articulatio Sacro-iliaca, Sacro-iliac Articulation. (The Right Half of a Pelvis divided in the Median Plane; seen from the Inner Side.)

Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.
Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.
Fourth lumbar vertebra  
Vertebra lumbalis IV.

Posterior sacro-iliac ligament (superficial layer)²  
Ligg. sacro-iliaca interossea

Long or oblique (posterior) sacro-iliac ligament  
Lig. sacro-iliacum posterius longum

Anterior or small sacrosciatic ligament  
Lig. sacrospinosum

Posterior or great sacrosciatic ligament  
Lig. sacrotuberosum

Fig. 454.—Deep Posterior Ligaments of the Sacro-iliac Articulation: Ligamenta Sacroiliaca Interossea, Posterior Sacro-iliac Ligaments; Ligamentum Sacro-iliacum Posterius Breve, Posterior (Short) Sacro-iliac Ligament. (The Right Half of a Pelvis divided in the Median Plane; Postero-internal Aspect.)

The upper portion of the posterior or great sacrosciatic ligament has been removed; the long or oblique (posterior) sacro-iliac ligament has been divided transversely in the middle, and the ends have been turned upwards and downwards.

Fig. 455.—Horizontal Section through the Sacro-iliac Articulation; Upper Surface of Lower Segment: Superficial and Deep Layers of the Posterior Sacro-iliac Ligament.

The section was made in a plane at right angles to the long axis of the pelvis, and passes through the middle of the body of the first sacral vertebra.

¹ This forms part of the posterior sacro-iliac ligament of English anatomists. See note on p. 218.—Tr. ² See note on p. 218.

Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.

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Fig. 456.—*Symphysis Ossium Pubis, Pubic Symphysis*: *Ligamentum Publicus Superior, Superior Pubic Ligament; Ligamentum Arcuatum Pubis, Inferior Pubic or Subpubic Ligament; Ligamentum Transversum Pelvis, Transverse Ligament of the Pelvis. The Origin of the Tendons of the Rectus Abdominis Muscles from the Pubis, and the Relation of These Tendons to the Pubic Symphysis. (The Anterior Aspect of the Pubic Symphysis.)

The lower extremities of the rectus abdominis muscles have been pulled a little apart.

Fig. 457.—*Horizontal Section through the Pubic Symphysis of a Nulliparous Woman Aged Twenty-One Years; Upper Surface of Lower Segment: Lamina Fibrocartilaginea Interpubica, Interpubic Disc; Fissure in the Interpubic Disc. Re-inforcement of the Interpubic Articulation by the Interlacing on its Anterior Surface of the Fibres of the Tendons of Origin of the Rectus Abdominis Muscles and the Tendons of Insertion of the External Oblique Muscles.*

The plane of section lies in the upper half of the symphysis.

*Symphysis ossium pubis—Pubic symphysis.*
THE ARTICULATIONS OF THE LOWER LIMB

Superior pubic ligament—Lig. pubicum superius

Public ligament of Astley Cooper, or Cooper’s ligament

Superior or ascending ramus of the pubis
Ramus superior ossis pubis

*ioaterior prominence of the interpubic disc
"Torus pubicus

Foramen for the passage of the dorsal vein of the penis

Inferior or descending ramus of the pubis
Ramus inferior ossis pubis

Obturator fascia
Fascia obturatoria

Transverse ligament of the pelvis
Lig. transversum pelvis

1 The slight posterior prominence of the interpubic disc has not received any name from English anatomists. A few transverse fibres connect the pubic bones in this region, forming the *posterior pubic ligament*, which is not mentioned by Toldt.—Tr.

2 See note 2 on p. 220.

**Fig. 458.—Symphysis Ossium Pubis, Pubic Symphysis: Torus Pubicus, Posterior Prominence of the Interpubic Disc; Ligamentum Transversum Pelvis, Transverse Ligament of the Pelvis (see note 2 above), with the Venous Foramina; Connexions of the Transverse Ligament of the Pelvis with the Obturator Fascia. (The Pubic Symphysis seen from Behind.)**

**Fig. 459.—Symphysis Ossium Pubis, Pubic Symphysis: Lamina Fibrocartilaginea Interpubica, Interpubic Disc; Ligamentum Pubicum Superius, Superior Pubic Ligament; Ligamentum Arcuatum Pubis, Inferior Pubic or Subpubic Ligament. (The Pubic Symphysis in Frontal Section; Anterior Surface of Posterior Segment.)**

Symphysis ossium pubis—Pubic symphysis.
Fig. 460.—Articulatio Coxeæ, the Hip-Joint: Ligamentum Ilioëmorałe, Ilioëmoral Ligament, or Y Ligament of Bigelow; Ligamentum Pubocapsulare, Pubofemoral Ligament, and its Relations to the Obturator Membrane. (The Right Hip-Joint, seen from Before.)

Articulatio coxeæ—The hip-joint.
**Fig. 461.—Articulatio Coxa, the Hip-Joint:** Capsula Articularis, Capsular Ligament; Zona Orbicularis, the Circularly Disposed Fibres of the Capsular Ligament, forming a Band round the Neck of the Femur, which is most distinct Behind and Below. Relation of the Epiphysial Disc of the Head of the Femur to the Hip-Joint. (The Right Hip-Joint in Frontal Section; Anterior Surface of Posterior Segment.)

The section passes through the middle of the cotyloid notch and of the fossa of the interarticular ligament.
Fig. 462.—Articulatio Coxae, the Hip-Joint; Ligamentum Teres Femoris, Interarticular or Round Ligament of the Hip-Joint; Labrum Glenoidale, Cotyloid Ligament; Capsula Articularis, Capsular Ligament of the Hip-Joint; Reflection of the Synovial Membrane of the Hip-Joint from the Inner Surface of the Capsular Ligament on to the Neck of the Femur; Zona Orbicularis, Circular Band of the Capsular Ligament Round the Neck of the Femur. (The Right Hip-Joint seen from Before.)

The anterior wall of the capsular ligament has been removed, except for a narrow band at its distal attachment, which has been turned outwards. The head of the femur has been slightly withdrawn from its socket in a downward and outward direction.

1 Perhaps most frequently known in England by its Latin name, ligamentum teres.
2 Also frequently known in England by its Latin name, zona orbicularis.
The interarticular or round ligament has been divided close to its attachment to the head of the femur.

Articulatio coxae—The hip-joint.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 464.—Articulatio Coxae. The Hip-Joint: Capsula Articularis, the Capsular Ligament; Zona Orbicularis (see p. 223), and its Relations to the Pubofemoral and Ischiocapsular Ligaments. Membrana Obturatoria et Canalis Obturatorius, Obturator Membrane or Ligament and Obturator Canal. (The Postero-internal Side of the Right Hip-Joint seen from Below.)

The articular cavity has been injected with tallow.

Articulatio coxae—The hip-joint.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 465.—Articulatio coxa, the Hip-Joint: Zona Orbicularis (see p. 223), and Its Relations to the Iliofemoral, Pubofemoral, and Ischiocapsular Ligaments; the Thin Portions of the Capsule, and the Communication between the Synovial Cavity and the Bursa beneath the Tendon of the Iliopsoas Muscle; the Acetabulum, with the Transverse Ligament of the Acetabulum, and the Interarticular or Round Ligament.

After the capsule of the right hip-joint had been prepared from without, the joint was fully flexed; the capsule was then divided by a section in the direction of a line passing from the middle of the upper border of the great trochanter to the inner border of the iliopectineal eminence; the ilium was cut away except for that portion of the bone which contributes to the formation of the acetabulum, and the neck of the femur was sawed across just internal to the distal attachment of the capsule; the interarticular ligament was divided close to the head of the femur, and this latter, together with the intracapsular portion of the neck, was removed; the acetabulum and the remaining proximal portion of the femur were divided in two by a continuation of the section already made through the upper wall of the capsule; the two halves of the acetabulum and the head and neck of the femur were then opened out till the cut surfaces met at a very obtuse angle; so that the capsule and the cotyloid ligament were fully exposed from within. The synovial membrane was dissected off, and the inner surface of the capsule cleaned from fat and cellular tissue.

Articulatio coxae—The hip-joint.
The articulations of the lower limb

The femur

Subcrureus muscle
M. articularis genu

Bursa beneath the suprapatellar tendon
Bursa suprapatellaris

Tendon of the rectus femoris muscle
Sehne des M. rectus femoris

Vastus internus muscle
M. vastus medialis

External lateral patellar ligament
Retinaculum patellae laterale

Capsular ligament
Capsula articularis

External lateral ligament of the knee-joint
Lig. collateralis fibulare

Anterior superior tibiofibular ligament
Ligg. capituli fibulae

The fibula
Fibula

Interosseous membrane, or ligament, of the leg
Membrana interossea cruris

The synovial cavity has been injected with tallow.

Articulatio genu—The knee-joint.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 467.—Articulatio Genu, the Knee-Joint: Ligamenta Collateralia, Lateral Ligaments of the Knee-Joint; Ligamenta Cruciata, Crucial Ligaments; Ligamentum Patellae, Patellar Ligament, or Infrapatellar Tendon. Articulatio Tibiofibularis, Superior Tibiofibular Articulation: Ligamenta Capituli Fibulae, Anterior Superior Tibiofibular Ligament. (The Right Knee-Joint seen from Before and Without.)

The capsular ligament has been removed from the front of the joint between the two lateral ligaments, and the patellar ligament has been turned downwards.

Articulatio genu—The knee-joint.
Fig. 468.—Articulatio Genu, the Knee-Joint: Capsula Articularis, Capsular Ligament, and the Relations of the Subcrureus Muscle to this Ligament; Bursa Suprapatellaris, the Bursa beneath the Suprapatellar Tendon. Ligamentum Collaterale Tibiae, Internal Lateral Ligament of the Knee-Joint; Ligamentum Patellae et Retinaculum Patelle Mediale, Patellar Ligament, or Infrapatellar Tendon, and Internal Lateral Patellar Ligament. Relations of the Epiphysial Discs to the Articulation.

The same preparation as that of Fig. 466, seen from within.

Articulatio genu—The knee-joint.
Fig. 460.—Articulatio Genu, the Knee-Joint: Capsula Articularis, Capsular Ligament; Bursa Suprapatellaris, and the Relations of the Quadriceps Extensor Cruris Muscle to the Same. Ligamentum Collaterale Fibulare, External Lateral Ligament of the Knee-Joint. Ligamentum Patellæ et Retinaculum Patellæ Laterale, Patellar Ligament, or Infrapatellar Tendon, and External Lateral Patellar Ligament; the Relations of the Latter to the Plantaris Muscle and to the Outer Head of the Gastrocnemius Muscle. Bursa Infrapatellaris Profunda, Bursa beneath the Patellar Ligament, Articulatio Tibiofibularis, Superior Tibiofibular Articulation. Ligamenta Capituli Fibulae, Anterior Superior Tibiofibular Ligament. Relations of the Epiphyseal Discs to Both the Joints.

The same preparation as that of Figs. 466 and 468, seen from the outer side. The synovial cavity of the knee-joint has been opened behind the external lateral ligament of the knee-joint, and the bursa beneath the patellar ligament has also been opened.

Articulatio genu—The knee-joint.
Fig. 470.—Articulatio Genu, the Knee-Joint: Capsula Articularis, Capsular Ligament; Ligamentum Popliteum Obliquum, Posterior Ligament of the Knee-Joint; Relations of this Ligament to the Tendon of the Semimembranosus Muscle and to the Outer Head of the Gastrocnemius Muscle; Ligamentum Popliteum Arcutum et Retinaculum Ligamenti Arcuti, Arcuate Portion of the Posterior External Lateral Ligament (Macalister), and Short External Lateral Ligament (Quain), or Direct Portion of the Posterior External Lateral Ligament (Macalister). Bursa Musculi Gastrocnemii Medialis, Bursa between the Tendon of the Semimembranosus Muscle and the Tendon of the Inner Head of the Gastrocnemius Muscle, Communicating with the Knee-Joint and Having a Common Cavity with the Bursa between the Tendon of the Semimembranosus Muscle and the Knee-Joint. Bursa Musculi Poplitae, Synovial Sheath of the Tendon of the Popliteus Muscle. (The Right Knee-Joint, seen from Behind.)

Articulatio genu—The knee-joint.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 471.—Articulatio Genu, the Knee-Joint: Ligamenta Cruciata, Crucial Ligaments, and Ligamentum Menisci Lateralis, Posterior or Ascending Band of the External Semilunar Fibrocartilage (Ellis) or Ligament of Wrisberg (Macalister), (Variety'). Communication of the Synovial Sheath of the Tendon of the Popliteus Muscle with the Synovial Cavities of the Knee-Joint and of the Superior Tibiofibular Articulation. (The Right Knee-Joint, seen from Behind.)

The posterior portion of the capsular ligament, between the external and internal lateral ligaments, has been removed, except for a strip left above close to the femoral attachment, which has been turned upwards; the synovial sheath of the tendon of the popliteus muscle has been opened at its inner side, and its posterior wall has been turned outwards with the tendon and the proximal portion of the popliteus muscle.

Though this band is called a variety by Toldt, it is, in fact, usually present, but its situation varies; inasmuch as it passes, sometimes behind (as here), and sometimes before, and sometimes as a double band behind and before, the posterior or internal crucial ligament, its strength and thickness varies much, but it is seldom entirely wanting.—Tr.

Articulatio genu—The knee-joint.
Articulatio genu—The knee-joint.

The joint was first injected, and the injected material allowed to solidify; the capsule of the joint was then prepared from without, the quadriceps extensor cruris muscle being left intact; subsequently the joint was opened by a section passing through the quadriceps muscle and the upper part of the front of the capsule from one lateral ligament to the other close to the attachment of the capsule to the femur, and the anterior wall of the joint together with the distal portion of the quadriceps extensor muscle was turned down. The quadriceps was divided at a somewhat higher level than the capsule, and the bursa beneath the suprapatellar tendon divided is the frontal plane, to show the communication of this bursa with the joint.
FIG. 473.—Articulatio Genu, the Knee-Joint: The Semilunar Fibrocartilages, the Alar Ligaments, and the Mucous Ligament; the Insertion into the Synovial Membrane of the Subcrureus Muscle; the Extension of the Synovial Membrane of the Knee-Joint to Form the Synovial Sheath of the Tendon of the Popliteus Muscle and the Bursa between that Muscle and the Posterior Surface of the Outer Tuberosity of the Tibia, and the Relation of the Synovial Sheath of the Tendon to the External Lateral Ligament of the Knee-Joint. (The Proximal Extremities of the Bones of the Leg with the Anterior Wall of the Capsule of the Knee-Joint seen from Behind.)

After the joint had been injected, and the injected material allowed to solidify, the capsule of the joint was prepared from without, the quadriceps extensor cruris muscle being left intact; the lateral ligaments and the tendon of the popliteus muscle were then divided, and the capsule was opened behind and on either side at a higher level than the semilunar cartilages, and was divided in front along the line of its reflection on to the anterior surface of the femur; after division of the crucial ligaments, the femur was removed.

Articulatio genu—The knee-joint.
Fig. 474.—Articulatio Genu, the Knee-Joint: Crucial Ligaments and Ligament of Wrisberg; Bursa beneath the Internal Lateral Ligament of the Knee-Joint. (The Right Knee-Joint Seen from the Inner Side.)

The capsule was removed, the patellar ligament and the internal lateral ligament were turned downwards; the femur was divided sagittally through the middle of the intercondylar fossa, and the external condyle placed in the position it occupies during extension of the knee-joint, while the internal condyle was turned backwards and rotated on its median axis to the extent of 180°.

Articulatio genu—The knee-joint.
Fig. 475.—The Distal Articular Surfaces of the Knee-Joint: The Interarticular Semilunar Fibrocartilages, and the Extension of the Anterior Extremities of these in the Transverse Ligament of the Semilunar Fibrocartilages. The Communication between the Superior Tibiofibular Articulation and the Synovial Sheath of the Tendon of the Popliteus Muscle. (The Proximal Extremity of the Left Tibia with the Semilunar Fibrocartilages and the Head of the Fibula, seen from Above.)

The capsule was divided above (proximal to) the semilunar fibrocartilages, the crucial ligaments were cut across, and the femur was removed.

Fig. 476.—The Proximal Articular Surfaces of the Knee-Joint, and the Femoral Attachments of the Crucial Ligaments.

The distal extremity of the femur removed from the preparation shown in Fig. 475, seen from below.

Articulatio genu—The knee-joint.
Fig. 477.—Articulatio Tibiofibularis et Syndesmosis Tibiofibularis, the Tibiofibular Articulations. The Interosseous Membrane, or Ligament, of the Right Leg; the Anterior Superior and Anterior Inferior Tibiofibular Ligaments. (Seen from Before.)

The Tibiofibular Articulations.
The plane of section passes through the lowermost parts of the lateral portions of the superior articular surface of the astragalus.
Fig. 479.—The Capsular Ligaments and the Superficial Posterior Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation. The Relations of the Distal Epiphysial Discs of the Tibia and Fibula to the Ankle-Joint. The Posterior Portions of the Lateral Ligaments of the Ankle-Joint: Ligamentum Talotibiale Posterior, the Posterior Astragalotibial Portion of the Internal Lateral, or Deltoïd, Ligament of the Ankle-Joint; Ligamentum Calcaneotibiale, the Calcaneotibial Portion of the Internal Lateral, or Deltoïd, Ligament of the Ankle-Joint; Ligamentum Calcaneofibulare, the Middle Band, or Calcaneofibular Portion, of the External Lateral Ligament of the Ankle-Joint. Ligamentum Talocalcaneum Posterior, the Posterior Astragalocalcaneal Ligament.—Syndesmosis Tibiofibularis: Ligamentum Malleoli Lateralis Posterior, the Posterior Inferior Tibiofibular Ligament. (The Ankle-Joint and the Astragalocalcaneal Articulation of the Right Leg, seen from Behind.)

Articulationes pedis—The articulations of the foot.
FIG. 480.—Articulationes Talocruralis et Talocalcanea, the Ankle-Joint and the Astragalocalcaneal Articulation; Syndesmosis Tibiofibularis, the Inferior Tibiofibular Articulation; Ligamentum Malleoli Lateralis Posterius, the Posterior Inferior Tibiofibular Ligament. The Posterior Portions of the Lateral Ligaments: Ligamentum Talotibiale Posterius, the Posterior Astragalotibial Portion of the Internal Lateral, or Deltoide, Ligament of the Ankle-Joint; Ligamentum Calcaneotibiale, the Calcaneotibial Portion of the Internal Lateral, or Deltoide, Ligament of the Ankle-Joint; Ligamentum Talofibulare Posterius, the Posterior Band, or Astragalofibular Portion, of the External Lateral Ligament of the Ankle-Joint; Ligamentum Calcaneofibulare, the Middle Band, or Calcaneofibular Portion, of the External Lateral Ligament of the Ankle-Joint. (The Ankle-Joint and the Astragalocalcaneal Articulation of the Right Leg, seen from Behind.)

The thin posterior portion of the capsule of the ankle-joint has been removed. The posterior portion of the capsule of the astragalocalcaneal articulation has been separated from its attachment to the astragalus external to its attachment to the posterior process of that bone, and turned backward on to the os calcis.

Articulationes pedis—The articulations of the foot.
THE ARTICULATIONS OF THE LOWER LIMB

The shaft of the tibia

Epiphysial disc
Synchondrosis epiphyseos

Internal malleolus
Malleolus medialis

Deltoid ligament, or internal lateral ligament of ankle-joint
Calcaneotibial portion of the internal lateral, or deltoid, ligament of the ankle-joint (4)

Outer tubercle of the posterior process of the astragalus (3)
Inner tubercle of the posterior process of the astragalus (6)

Groove of the tendon of the flexor longus hallucis (7)

Astragalonavicular ligament — Lig. talonaviculare (dorsale)

Superior portion of the internal calcaneonavicular ligament — Lig. calcaneonaviculare (dorsale)

Calcaneonavicular ligament — Lig. calcaneonaviculare (plantare)

Dorsal naviculocuneiform ligaments
Ligg. navicularicuneiformia dorsalia

Dorsal tarsometatarsal ligament
Lig. tarsometatarsum dorsale

Tuberosity of the navicular bone (1)
Tuberosity of the cuboid bone (2)
Superficial portion of the inferior calcaneocuboid ligament (long plantar ligament) (3)

Calcaneum, or Os calcis

Internal or first cuneiform bone — Os cuneiforme I.

Tuberositas ossis navicularis
Tuberositas ossis cuboidei
Lig. calcaneocuboidenum plantare

Capsular ligament of the ankle-joint
Capsula articulationis talocruralis

Tibionavicular portion of the internal lateral, or deltoid, ligament of the ankle-joint
Lig. tibionaviculare

Neck of the astragalus — Collum tali
Astragalonavicular ligament — Lig. talonaviculare (dorsale)
Superior portion of the internal calcaneonavicular ligament — Lig. calcaneonaviculare (dorsale)

Dorsal naviculocuneiform ligaments
Ligg. navicularicuneiformia dorsalia

Tuberosity of the navicular bone (i)
Tuberosity of the cuboid bone (2)
Superficial portion of the inferior calcaneocuboid ligament (long plantar ligament) (3)

Calcaneum, or Os calcis

Internal or first cuneiform bone — Os cuneiforme I.

Tuberositas ossis navicularis
Tuberositas ossis cuboidei
Lig. calcaneocuboidenum plantare

See note 1 to p. 245.

Fig. 481.—The Superficial Internal Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation, and the Relation of the Distal Epiphysial Disc of the Tibia to the Ankle-Joint. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the First Metatarsal Bone; seen from the Inner Side.)

Articulationes pedis—The articulations of the foot.
THE ARTICULATIONS OF THE LOWER LIMB

Fig. 482.—The Deep Internal Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the First Metatarsal Bone; seen from the Inner Side.)

The deltoid ligament (internal lateral ligament of the ankle-joint) has been cut across the middle, and the divided ends have been turned up and down. The capsular ligaments of the ankle-joint and of the astragalocalcaneal articulation have been removed, except for the deeper special bands.

Articulationes pedis—The articulations of the foot.
Articulationes pedis—The articulations of the foot.

Fig. 483.—Articulatio Talocruralis, the Ankle-Joint; Syndesmosis Tibiofibularis, the Inferior Tibiofibular Articulation. The Relations of the Distal Epiphysial Discs of the Tibia and Fibula to the Ankle-Joint. Articulationes Intertarseæ et Tarsometatarsae, the Intertarsal and Tarsometatarsal Articulations; Articulationes Intermetatarsæ, the Intermetatarsal Articulations. Ligamenta Tarsi Dorsalia et Tarsometatarsæa Dorsalia et Ligamenta Basium Dorsalia; the Dorsal Ligaments of the Tarsus, the Dorsal Tarsometatarsal Ligaments, and the Dorsal Proximal Intermetatarsal Ligaments. (The Right Tarsus with the Adjoining Portions of the Tibia and Fibula and of the Metatarsus; Dorso-external Aspect.)

The joints are unopened except for the astragalocalcaneal, astragalonaviculare, and naviculocuneiform articulations, which have been partly opened.
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Fig. 484.—Articulationes Talocruralis et Talocalcanea, the Ankle-Joint and the Astragalocalcaneal Articulation; Ligamentum Malleoli Lateralis Anterius, Anterior Inferior Tibiofibular Ligament, The Anterior and Middle Bands of the External Lateral Ligament of the Ankle-Joint (Ligamentum Talofibulare Anterius et Ligamentum Calcaneofibulare): Ligamenta Talocalcanea, Lateralis. Asterius, et Interosseum; the External, Anterior, and Interosseous Astragalocalcaneal Ligaments.—Articulationes Intertarseæ et Tarsometatarsææ, the Intertarsal and Tarsometatarsal Articulations; Articulationes Intermetatarsææ, the Intermetatarsal Articulations: Ligamenta Tarsi Dorsalia, Ligamenta Tarsometatarsææ Dorsalia, et Ligamenta Basium Dorsalia, the Deeper Dorsal Tarsal and Tarsometatarsal Ligaments, and the Dorsal Proximal Intermetatarsal Ligaments. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the Metatarsal Bones; Dorso-external Aspect.)

The anterior ligament of the ankle-joint and the lateral portion of the capsule of the astragalocalcaneal articulation have been removed.

Articulationes pedis—The articulations of the foot.
Fig. 485.—The Superficial Ligaments of the Plantar Surface of the Right Foot and the Relations
of the Tendons of the Tibialis Anticus and Posticus and of the Peroneus Longus Muscles
to these Ligaments. Ligamenta Tarsi et Tarsometatarsae, the Tarsal and the Tarsometatarsal Ligaments: Ligamenta Basium Plantaria, Ligamenta Capitulorum Transversa, et Ligamenta Accessoria Plantaria; the Plantar Proximal Intermetatarsal Ligaments, the Transverse Metatarsal Ligament, and the Inferior Metatarsophalangeal Ligaments (see note above); the Relations
of these Ligaments to the Digital Processes of the Plantar Fascia.

Articulationes pedis—The articulations of the foot.
THE ARTICULATIONS OF THE LOWER LIMB

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**Fig. 485.—The Deep Ligaments of the Sole of the Foot and the Sesamoid Bones of the Metatarsophalangeal Articulation of the Great Toe.**

In the preparation shown in Fig. 485 the tendons of the muscles were removed, also the long plantar ligament except for its posterior extremity, and the transverse metatarsal ligament and the digital processes of the plantar fascia were cut away. Some of the metatarsophalangeal and interphalangeal articulations have been opened; others have been left intact.

Articulationes pedis—The articulations of the foot.

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Note: See note to p. 246.
THE ARTICULATIONS OF THE LOWER LIMB

Capsules of the interphalangeal articulations of the second toe
Capsula articulationum digitii II.

Capsule of the interphalangeal articulation of the great toe
Capsula articulationis hallucis

Capsule of the metatarsophalangeal articulation of the great toe
Capsula articulationis metatarsophalangeae I.

"Dorsal distal intermetatarsal ligament"
"Lig. capitulum dorsale"

Dorsal tarsometatarsal ligaments
Ligg. tarsometatarsae dorsalia

Dorsal intercuneiform ligament
Lig. intercuneiforme dorsale

Middle or second cuneiform bone
Os cuneiforme II.

Internal or first cuneiform bone
Os cuneiforme I.

Dorsal naviculocuneiform ligaments
Ligg. naviculocuneiforma dorsalia

Posterior articular surface of the navicular bone
Facies articularis posterior osis navicularis

Edge of the divided tibiovascular portion of the internal lateral, or deltoid, ligament of the ankle-joint

Internal or inferior calcaneonavicular ligament
Face of the astragalus for articulation with the os calcis

Facies articularis calcanea

Internal astragalocalcaneal ligament
Lig. talocalcaneum mediale

Lateral ligaments of the interphalangeal articulations of the fourth toe
Ligg. collateralia articulationum digitii IV.

Capsule of the third metatarsophalangeal articulation
Capsula articulationis metatarsophalangeae III.

Lateral ligaments of the fourth metatarsophalangeal articulation
Ligg. collateralia articulationis metatarsophalangeae IV.

Dorsal proximal intermetatarsal ligaments
Ligg. basium dorsalis

Dorsal tarsometatarsal ligament
Lig. tarsometatarsae dorsalis

External or third cuneiform bone
Os cuneiforme III.

Dorsal tarsometatarsal ligaments
Ligg. tarsometatarsae dorsalis

Dorsal cubocuneiform ligament
Lig. cuneocuboidem dorsale

Dorsal naviculocuboid ligament
Lig. naviculocuboidem dorsale

Dorsal calcaneocuboid ligament
Lig. calcaneocuboidem dorsale

Dorsal or superior calcaneocuboid ligament

 Pars calcaneocuboides Lig. bifurcatur

External or superior calcaneonavicular ligament

 Pars calcaneonaviculare Lig. bifurcatur

Anterior articular facet
Facies articularis anterior

Middle articular facet
Facies articularis media

Posterior articular facet
Facies articularis posterior

Calcaneum, or os calcis

ARTICULATIONES PEDIS—The articulations of the foot.
THE ARTICULATIONS OF THE LOWER LIMB

Calcaneum or os calcis

Astragalocalcaneal articulation
Articulatio talocalcanea

Interosseous astragalocalcaneal ligaments
Lig. talocalcaneum interosseum

The navicular bone

Interosseous cuboideonavicular ligament
Lig. cuboideonavicularis (1)

Dorsal proximal intermetatarsal ligaments
Lig. basiiim dorsalia

Metatarsophalangeal articulation
Articulatio metatarsophalangea

Interosseous intercuneiform ligament
Lig. intercuneiforme interosseum

The cuboid bone—Os cuboideum

Dorsal interosseous astragalocalcaneal ligament
Lig. talocalcaneum interosseum

Deltoid ligament or internal lateral ligament of the ankle-joint
Lig. deltoidum

The astragalus

Astragalonavicular articulation (3)
Articulatio tarsi transversa (Chopart)

Naviculo-cuneiform articulation
Articulatio cuneonavicularis

Tarsometatarsal articulation
Articulatio tarsometatarsae (Lisfranc)

Interphalangeal articulations of the fourth toe
Articulationes digiti IV.

Epiphysial disc
Synchondrosis epiphyseos

Epiphysial disc
Synchondrosis epiphyseos

Epiphysial disc
Synchondrosis epiphyseos

(1) Articulatio talonavicularis
(2) Articulatio calcaneocuboiidea

Articulationes pedis—The articulations of the foot.

Fig. 488.—Articulationes Intertarsae et Tarsometatarsae, the Intertarsal and Tarsometatarsal Articulations, showing Chopart's (Mediotarsal) Line, and Lisfranc's or Hey's Tarsometatarsal Line: Ligamenta Tarsi Interossea et Ligamenta Cuneometatarsae Interossea, the Interosseous Ligaments of the Tarsus, and the Interosseous Metatarsocuneiform Ligaments. Articulationes Intertarsae, the Intertarsal Articulations. Articulationes Metatarsophalangeae, the Metatarsophalangeal Articulations. Articulationes Digitorum Pedis, the Interphalangeal Articulations of the Toes. The Relations of the Epiphysial Discs of the Metatarsal Bones and of the Phalanges of the Toes to the Respective Articulations. (Horizontal Section through the Articulations of the Right Foot of a Youth aged Seventeen Years. Superior Surface of the Lower Segment.)

See note 1 to p. 245.

2 Known also as the intertarsal or mid-tarsal joint. It is through this joint (the two parts of which are, however, entirely separate articulations) that the foot is divided in Chopart's amputation.

3 It is through the tarsometatarsal articulations that the foot is divided in Lisfranc's amputation.
Fig. 489.—The Articulations of the Right Foot of a Youth Aged Seventeen Years, seen in Sagittal Section, and showing the Relations of these Articulations to the Epiphysial Discs.

The section passes through the distal extremity of the tibia, the astragalus, the os calcis, the middle cuneiform bone, the second metatarsal bone, and the phalanges of the second toe.

Articulatio metatarsophalangea II. (2) Lig. accessorium plantare (3) Os sesamoideum laterale (4) Articulatio metatarsophalangea I.

Articulatio metatarsophalangea II. (2) Lig. accessorium plantare (3) Os sesamoideum laterale (4) Articulatio metatarsophalangea I.

Insertion of the tendon of the tibialis posticus musculo External or third cuneiform bone—Os cuneiforme III.

See note to p. 246.
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TO THE ARTHROLOGY

Certain names in this Index have an asterisk (*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the Latin nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft.

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