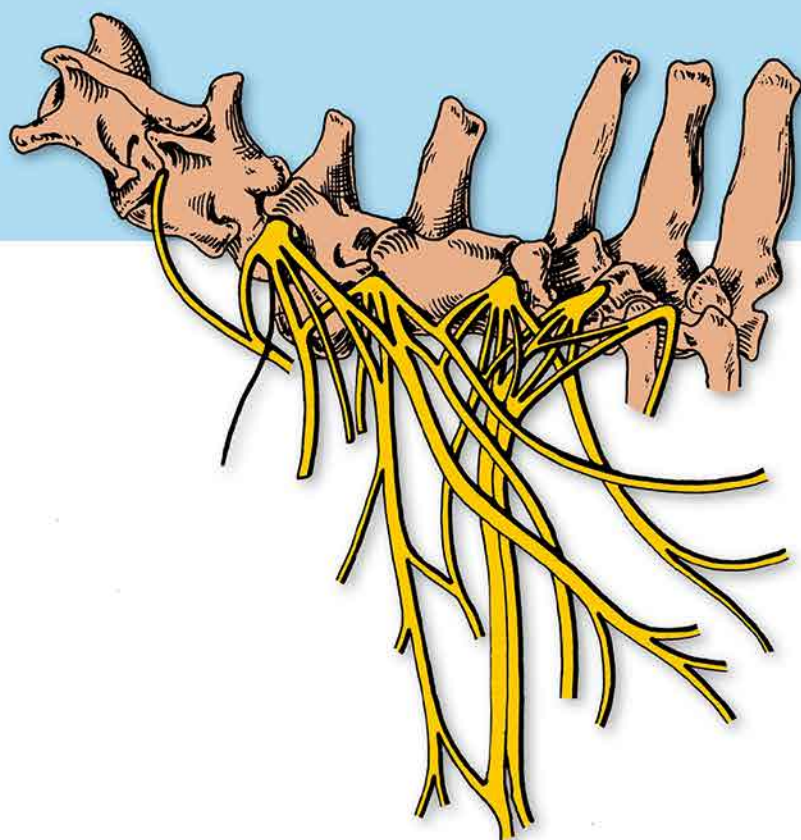


Illustrated Veterinary Anatomical Nomenclature

Edited by
Gheorghe M. Constantinescu

4th edition



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Illustrated Veterinary Anatomical Nomenclature

Former editions with the cooperation of
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Anton Hillebrand, Wolfgang O. Sack†,
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Preface to the 4. edition

Prof. Dr. Dr. Oskar Schaller, the first and sole editor of the first two editions passed away after the previous edition was published. This edition is respectfully dedicated to him, in gratitude of his outstanding contribution to the international veterinary anatomical nomenclature, and veterinary anatomy in general.

The 6th edition of the N.A.V. has been released in November 2017, including more than 60 new and changed terms of structures. Therefore, the Georg Thieme publishing company asked me to update the 3rd edition of this book. (The previous editions have been published by Enke Verlag). No changes on the Osteology, Arthrology, Myology, Systema nervosum periphericum and autonomicum chapters are made. Most of the changes are updated in the chapters of Splanchnology, Angiology, and Systema nervosum centrale. A few changes are made in the chapters of Systema endocrinum and Termini generales. The term "Apparatus" has been replaced by "Systema", and the names of some structures have been

updated to correspond with the detailed list of terms provided by the Nomina Histologica Veterinaria. All changes in this 4th edition are made to contribute to the harmonization of the three veterinary nomenclatures: gross anatomy, histology, and embryology.

The Editorial Committee of I.C.V.G.A.N. has a new member, Mario Pereira-Sampaio, the President of W.A.V.A. Several changes of the chairpersons of the subcommittees of I.C.V.G.A.N. from the 5th edition can be found in the 6th edition of the N.A.V. as follows: Termini generales, Partes and regiones corporis; Osteologia et Arthrologia; Systema nervosum centrale; Organa sensuum.

My gratitude goes to Thieme, especially to Ms. Désirée Schwarz, managing editor/project manager, who gave me the opportunity to revise and update the 4th edition of this book, and to her team.

Columbia, Missouri USA, March 26, 2018
Gheorghe M. Constantinescu

Preface to the 3. edition

The book published in 1992 was based on the 3rd edition of the *Nomina Anatomica Veterinaria* (N.A.V.), 1983. The present edition is updated from the last (5th) edition of the N.A.V., 2005, and revised in both text and figures. Updating the text was followed by updating the labels of the figures. In addition, some figures have been replaced by new and original drawings. The revision included some changes in the text, comments, and footnotes. It was a sustained and continuous work over one year and four months spent by myself as the sole editor including the new drawings, in addition to my duties as professor of veterinary anatomy, including teaching, scholar activity and participation in international meetings.

From the contributors to the first edition, Professors Wolfgang O. Sack and Nestor R. de Vos passed away. The veterinary anatomist community is grateful for their valuable contribution and the success of the book. The name of Prof. Dr. Anton Hillebrand, from the University Spiru Haret in Bucharest, Romania was added to the list of contributors. I am deeply grateful to the three colleagues who sent their comments on the first edition. They are Prof. Emeritus Dr. Alexander de Lahunta, from Cornell, Assoc. Prof. Dr. Brian L. Frappier, from the University of Columbia, Missouri, and Prof. Dr. Michael Stoffel from the University of Bern. I am also thankful to Assist. Prof. Dr. Ileana A. Constantinescu for proof reading and suggestions.

Many explanatory comments and footnotes are added for better understanding of the text.

In the footnotes the *Nomina Anatomica Veterinaria* is abbreviated as N.A.V.,

and the *Nomina Anatomica* as N.A. Many structures of the 1st edition were omitted from the 5th edition of the N.A.V. and they are mentioned in the footnotes.

Due to the limited space of the pages and as many as 8 footnotes were necessary to be added to some structures, the Publisher with the consent of the Editor decided to include the majority of footnotes in the text.

The International Committee on Veterinary Gross Anatomical Nomenclature (I.C.V.G.A.N.) has now a new Chairman and Secretary, and several new chairpersons of the Subcommittees, as follows:

Chairman: Prof. Hagen Gasse, Hannover, Germany. Secretary: Prof. Wim Van den Broek, Gent, Belgium

Termini generales, Partes et Regiones corporis: Prof. Yoshiharu Hashimoto, Sapporo, Japan, Chairman of the Subcommittee

Osteologia et Arthrologia: Prof. Karl-Dieter Budras, Berlin, Germany, Chairman of the Subcommittee

Myologia: Prof. Gheorghe M. Constantinescu, Columbia, Missouri, U.S.A., Chairman of the Subcommittee

Splanchnologia: Prof. A. S. Saber, Minoufia University, Egypt, Chairman of the Subcommittee

Angiologia: Prof. Paul Simoens, Gent, Belgium, Chairman of the Subcommittee

Integumentum commune: Prof. H. Bragulla, Berlin, Germany, Chairman of the Subcommittee

Systema nervosum centrale: Prof. Ignacio Salazar, Lugo, Spain, Chairman of the Subcommittee

Systema nervosum periphericum: Prof. Peter Sötönyi, Budapest, Hungary, Chairman of the Subcommittee

Organa sensuum: Prof. Heinz Augsburger, Zurich, Switzerland, Chairman of the Subcommittee

The names of all members of the Subcommittees are listed in the 5th edition of the N.A.V. A very interesting and educational History of I.C.V.G.A.N., the Procedure to change terms in the N.A.V., the Principles of the N.A.V., Hints for the user of the N.A.V., and a Brief Latin grammar for anatomists can be found in the 5th edition of the N.A.V. Those interested in the Illustrated Veterinary Anatomical Nomenclature are encouraged to read them before searching for an anatomical term.

A list of eponyms for Systema nervosum centrale is provided at the end of the book. These eponyms are used by neurologists, by neuroanatomists, by neurosurgeons, and by those especially interested in the Systema nervosum centrale.

In general, structures are symmetrical. The vertebral column and sternum, some cranial bones, several ligaments and muscles are nonsymmetrical. The latter are mentioned as such. Therefore, there is no need to use the plural for the symmetrical structures.

For some muscles the origin is mentioned by "O" (from "Origo = origin"), and the insertion by "T" (from "Terminatio = insertion"). However, there are some muscles with reversible action, the origin and insertion being interchangeable under different circumstances – such as

the Biceps femoris, Semitendinosus, Semimembranosus, Gluteus medius, Psoas major, Psoas minor and the Triceps brachii muscles. In these cases the term "attachment" is preferable for both origin and insertion.

In the 5th edition of the N.A.V. a list of structures precedes each chapter from "Osteologia" to "Systema nervosum" (separate for the Systema nervosum centrale, Systema nervosum periphericum and Systema nervosum autonomicum). All these lists and other different terms were together subject to a special chapter in the 1st edition of this book, called "Termini generales", and I decided to leave them in the same place, with the necessary changes. The name of the chapter is now "Termini generales et peculiares".

Lastly, and paraphrasing John F. Kennedy, "I decided to take this responsibility not because it was easy, but because it was hard".

I cannot finish without sending my sincere and great thanks especially to Dr. Ulrike Arnold, Ms. Gesina Cramer and Dr. Sonja Ruffer from the MVS Medizinverlage Stuttgart GmbH & Co. KG, also to Ms. Uta Schödl (the copy editor), and to my wife, Ileana, for her understanding, moral support, constructive comments and encouragements.

Columbia, Missouri, U.S.A., January 2011
Gheorghe M. Constantinescu

Preface to the 1. edition

The *Nomina Anatomica Veterinaria* (N.A.V.) constitute the first internationally recognized list of terms serving the gross anatomy of the domestic animals, specifically the cat, dog, pig, ox, sheep, goat, and horse. The N.A.V. were first published in 1968 by the International Committee on Veterinary Anatomical Nomenclature (I.C.V.A.N.) which was appointed by the World Association of Veterinary Anatomists. The third edition appeared in 1983. The present work already includes the changes that have been approved for the fourth edition of the N.A.V. This was possible because the authors are either members or chairmen of subcommittees of the International Committee on Veterinary Gross Anatomical Nomenclature (I.C.V.G.A.N.).

The *Nomina Anatomica Veterinaria* are 6,545 Latin terms (synonyms and terms of structures present only in primates not counted) of which fewer than ten percent are explained in footnotes. Besides, the nine figures illustrating the list are all in the section on the central nervous system. Some terms appear repeatedly; ramus caudalis and tunica muscularis, for instance, 13 times each.

Similar circumstances with the *Nomina Anatomica* (N.A.) of human anatomy prompted Heinz Feneis in 1967 to publish an illustrated anatomical nomenclature with the original title of "Anatomisches Bildwörterbuch der Internationalen Nomenklatur". The book was well received and subsequently translated into several languages. It proved useful not only to students, teachers, and researchers of anatomy, but also in many other branches of medicine and biology.

The editor of the present *Illustrated Veterinary Anatomical Nomenclature* was Chairman of the International Committee on Veterinary Anatomical Nomenclature (I.C.V.A.N.) from 1965 to 1980 and soon recognized the need for an illustrated version similar to that of Feneis. He was fortunate in securing as authors outstanding veterinary anatomists who were active in matters of veterinary anatomical nomenclature and were members of the respective subcommittees of the International Committee on Veterinary Gross Anatomical Nomenclature (I.C.V.G.A.N.):

Parts and regions of the body: W. O. Sack, U.S.A., Chairman of the subcommittee;

Osteology and arthrology: O. Schaller, Austria, former Chairman of the subcommittee;

Myology: Begun by the late L. E. St. Clair, U.S.A., former Chairman of the subcommittee; continued by O. Schaller;

Splanchnology: R. E. Habel, U.S.A., Chairman of the subcommittee;

Angiology: Begun by N. R. de Vos, Belgium, former Chairman of the subcommittee; continued by P. J. Simoens, Belgium, present Chairman of the subcommittee;

Nervous system: Begun by R. C. McClure, U.S.A., Chairman of the subcommittee on Systema nervosum periphericum; continued by G. Constantinescu, U.S.A., member of the subcommittee;

Sense organs and integument: W. O. Sack, U.S.A., member of the subcommittee on Integumentum commune.

Moreover, O. Schaller was the Chairman and R. E. Habel a member of the Editorial Committee for the first edition of the N.A.V., and R. E. Habel was the Chairman and W. O. Sack was a member of the Editorial Committee for the third edition. The composition of the team of authors thus guarantees that the aims of the International Committee on Veterinary Gross Anatomical Nomenclature (I.C.V.G.A.N.) find expression in the present illustrated version of the list.

The arrangement of text and illustrations – similar to that of the “Feneis” – makes the book easy to use. The left (verso) pages contain numbered terms arranged as in the N.A.V., and each term is followed by a brief definition. The respective illustrations, labeled by numbers that correspond to those of the terms, are on the opposite page. The names of structures, their definition and depiction are therefore easy to find. An index lists all terms alphabetically.

The illustrations were produced by several artists of whom Lewis Sadler, Adrian Cornford, and William P. Hamilton are prominent medical illustrators. Dr. P. J. Simoens, who contributed the chapter on Angiologia, and Dr. G. M. Constantinescu, who contributed the chapter on Systema nervosum, drew most of the figures of those chapters themselves. A few drawings were adopted from other publications for which permission from the respective authors and publishers was obtained and indicated in the legends. The sources are listed under References. Obviously, in many cases the subject matter will be represented by illustrations similar to those in other books, although they were not copied.

I thank the Enke Verlag for publishing this book, but especially Mr. J. Niendorf, Dr. P. Kleiner, and Mr. D. Kosmidis who were directly involved in its production.

Vienna, October 1991

Oskar Schaller

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Directions for the Use of the Book

The three ways for looking up a specific term are

1. to find it by reference to the body systems which are indicated at the top of each page,
2. by reference to the index, or
3. by consulting the relevant illustrations.

Terms of the index set in italics are embryologic terms. On the text pages different type faces indicate the hierarchy of terms. Official alternatives and explanatory additions are set in square brackets []. Common anatomical variations are enclosed in parentheses (), except in *Systema lymphaticum*, where many of the lymph nodes cited are variable in occurrence. Terms for ontogenetic structures are designated by (ont).

The species of domestic animals considered in the N.A.V. are:

Oryctolagus	(or)		
Carnivora	(Car)	Ruminantia	(Ru)
Felis catus	(fe)	Bos taurus	(bo)
Canis familiaris	(ca)	Ovis aries	(ov)
Ungulata	(Un)	Capra hircus	(cap)
Sus scrofa domestica	(su)	Equus caballus	(eq)

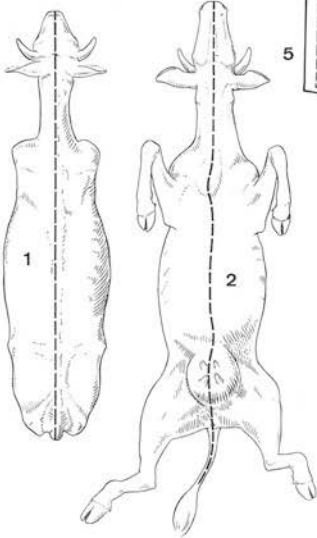
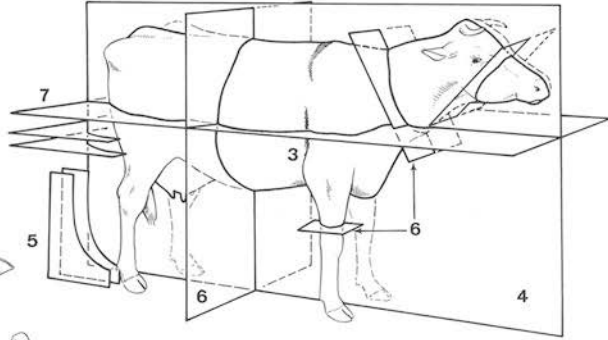
The larger group designations are, of course, restricted in their meaning to the species of domestic mammals designated; for example, "Ungulata" includes only *Sus scrofa domestica*, *Ovis aries*, *Capra hircus*, *Bos taurus* and *Equus caballus*. The term *Artiodactyla*, used in the definitions, means *Sus scrofa domestica* and *Ruminantia* (*Bos taurus*, *Ovis aries*, *Capra hircus*), the term *Carnivora* means *Felis catus* and *Canis familiaris*. *Oryctolagus (cuniculus)* – the rabbit was introduced in the 5th edition of the N.A.V., 2005 as a new species, so far only in *Osteologia*, *Arthrologia* and *Systema lymphaticum*. When a species designation is listed after a term, it indicates that the structure occurs only in that species among domestic mammals. However, the absence of a species designation does not necessarily mean that the structure is present in all domestic mammals. In the nomenclature of the blood vessels and peripheral nerves it was often necessary to make separate lists for different species. Such lists begin with a heading that gives the species or order in capitals. At the end of the separate list, the nomenclature common to all species is resumed under the heading **TERMINI COMMUNES**, and the special terms under the heading **TERMINI PECULIARES**. The latter are listed for each chapter.

The following is a list of useful abbreviations and Latin terms:

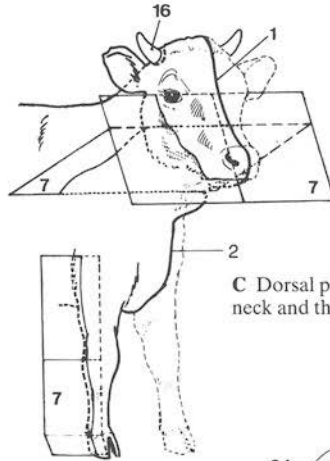
abs. = absent	esp. = especially
cum = with	o = origo, origin
dext. = the right (limb, part of the body, structure etc.), dexter (masc.), dextra (fem.), dextrum (neutr.)	s = sive (or – this is not the symbol for the rabbit!)
sin. = the left (limb, part of the body, structure etc.), sinistrum (masc.), sinistra (fem.), sinistrum (neutr.)	T = Terminatio, insectation
	vide = see

- 1 *Linea mediana dorsalis*. Dorsal midline. Longitudinal line in the middle of the dorsal surface of head, neck, trunk, and tail. A C
- 2 *Linea mediana ventralis*. Ventral midline. Longitudinal line in the middle of the ventral surface of head, neck, trunk, and tail. A C
- 3 *Margo tricipitalis*. Formed by the caudal border of M. triceps brachii. B
- 4 *Planum medianum*. Median plane, dividing the body in two symmetrical halves. B
- 5 *Plana sagittalia [paramediana]*. Sagittal planes, parallel to the median plane. B
- 6 *Plana transversalia*. Transverse planes, at right angles to the longitudinal axis of the body, limbs, or any other organ or part. B
- 7 *Plana dorsalia*. Dorsal planes, parallel to the Dorsum (back) and corresponding surfaces of the head, neck, and tail, Dorsum manus, and Dorsum pedis. They are perpendicular to the median and transverse planes. B C
- 8 **Regiones capitis**. Regions on the surface of the head.
- 9 **Regiones cranii**. Cranial regions, regions on the dorsocaudal part of the head.
- 10 *Regio frontalis*. Frontal region, over the frontal bone. In bo it extends caudally to the Regio occipitalis. D
- 11 *Regio parietalis*. Parietal region, over the parietal bone. In bo the parietal bone is on the caudolateral surface of the head. D
- 12 *Regio occipitalis*. Occipital region, over the occipital bone. D
- 13 *Regio temporalis*. Temporal region, over the temporal bone and muscle. D
- 14 *Fossa supraorbitalis*. Supraorbital fossa, the depression caudal to the Orbita and dorsal to the Arcus zygomaticus. D
- 15 *Regio auricularis*. Auricular (ear) region. D
- 16 *Regio cornualis*. Cornual (horn) region. C
- 17 **Regiones faciei**. Regions on the rostroventral or facial part of the head.
- 18 *Regio nasalis*. Nasal region. D
- 19 *Regio dorsalis nasi*. Dorsal nasal region. D
- 20 *Regio lateralis nasi*. Lateral nasal region. D
- 21 *Regio naris*. Region surrounding the nostril. D
- 22 *Regio oralis*. Oral region, surrounding the Rima oris. D
- 23 *Regio labialis superior*. Region of the upper lip. D
- 24 *Regio labialis inferior*. Region of the lower lip. D E
- 25 *Regio mentalis*. Region of the chin. D E
- 26 *Regio orbitalis*. Orbital region, outlined by the margin of the bony orbit. D
- 27 *Regio palpebralis superior*. Region of the upper eyelid. D
- 28 *Regio palpebralis inferior*. Region of the lower eyelid. D
- 29 *Regio zygomatica*. Zygomatic region, over the Arcus zygomaticus, ventral and caudal to the Orbita. D
- 30 *Regio infraorbitalis*. Infraorbital region, rostroventral to the Orbita. D
- 31 *Regio articulationis temporomandibularis*. Region of the temporomandibular joint, caudal to the Regio zygomatica. D
- 32 *Regio masseterica*. Masseteric region, over M. masseter. D E
- 33 *Regio buccalis*. Buccal region, between Regio masseterica and Regio oralis. D E
- 34 *Regio maxillaris*. Maxillary region, over the maxilla, between Regio buccalis and Regio nasalis. D
- 35 *Regio mandibularis*. Mandibular region, over the Corpus mandibulae, ventral to the Regio buccalis. D E
- 36 *Regio intermandibularis*. Intermandibular region, between the two mandibles, extending from the Regio mentalis to the Regio subhyoidea. E
- 37 *Regio subhyoidea*. Subhyoid region, over the Basihyoideum, caudal to the Regio intermandibularis. E

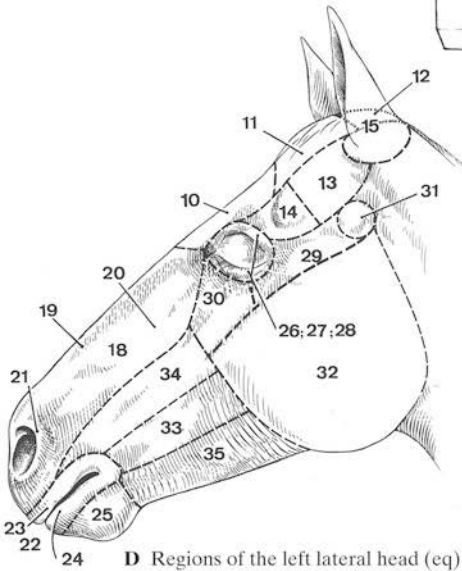
B Planes of the body (bo) (Dyce, Sack, Wensing)



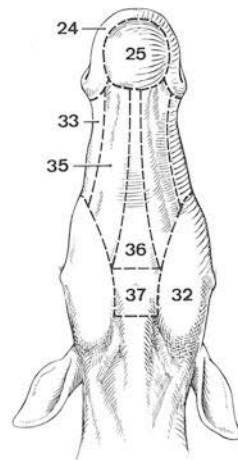
A Dorsal and ventral midlines (bo)



C Dorsal planes on head, neck and thoracic limb (bo)

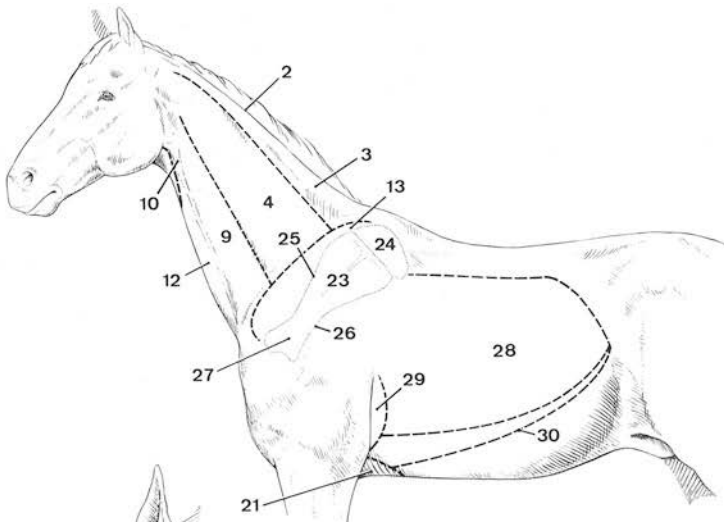


D Regions of the left lateral head (eq)

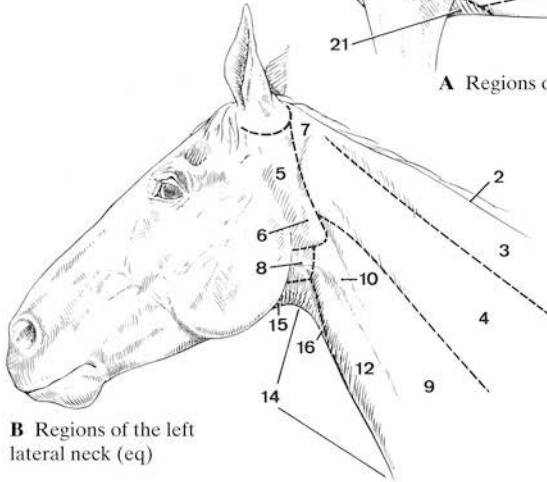


E Regions of the ventral head (eq)

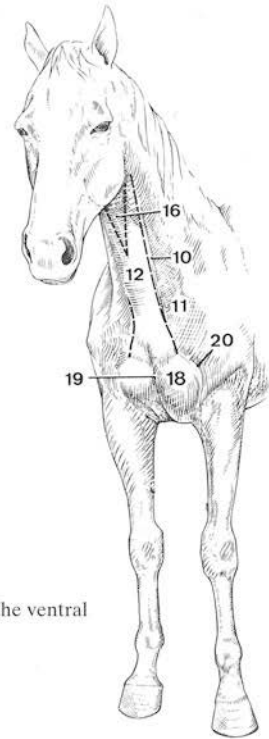
- 1 **Regiones colli.** Neck regions.
- 2 **Margo colli dorsalis.** Dorsal border of the neck, the crest in the horse. A B
- 3 **Regio colli dorsalis.** Dorsal neck region. A B
- 4 **Regio colli lateralis.** Lateral neck region. A B
- 5 **Regio parotidea.** Parotid region, over the parotid gland at the cranial end of the neck. B
- 6 **Fossa retromandibularis.** Retromandibular fossa, the depression in the Regio parotidea, caudal to the mandible and ventral to the Ala atlantis. B
- 7 **Regio retroauricularis.** Retroauricular region. B
- 8 **Regio pharyngea.** Pharyngeal region, over the pharynx between Regio parotidea and Regio laryngea. B
- 9 **Regio brachiocephalica.** Brachiocephalic region, over M. brachiocephalicus, ventral to Regio colli lateralis. A
- 10 **Sulcus jugularis.** Jugular groove, the depression over V. jugularis externa, bounded dorsally by M. brachiocephalicus and ventrally by M. sternocephalicus. A B C
- 11 **Fossa jugularis.** Jugular fossa, the depression at the caudal end of the Sulcus jugularis. C
- 12 **Regio sternocephalica.** Sternocephalic region, over M. sternocephalicus ventral to the Sulcus jugularis. A B C
- 13 **Regio prescapularis [prae-].** Prescapular region, cranial to the scapula at the caudal end of the neck. A
- 14 **Regio colli ventralis.** Ventral neck region, ventral to Regio sternocephalica, and consisting of Regio laryngea and Regio trachealis. B
- 15 **Regio laryngea.** Laryngeal region, on the ventral surface of the neck between Regio subhyoidea and Regio trachealis. B
- 16 **Regio trachealis.** Tracheal region, the wedge-shaped region over the trachea ventral to the Regio sternocephalica and caudal to Regio laryngea. B C
- 17 **Regiones pectoris.** Regions on the surface of the chest.
- 18 **Regio presternalis [prae-].** Presternal region, over M. pectoralis descendens, between Sulcus pectoralis lateralis and Sulcus pectoralis medianus. C
- 19 **Sulcus pectoralis medianus.** Median pectoral groove. The groove between the right and the left M. pectoralis descendens. D
- 20 **Sulcus pectoralis lateralis.** Lateral pectoral groove, between M. pectoralis descendens and M. brachiocephalicus; in the depth of the groove is the V. cephalica and the ramus deltoideus a. cervicalis superficialis. C
- 21 **Regio sternalis.** Sternal region, over the sternum. A D
- 22 **Regio mammaria thoracica.** Region of the thoracic mammary glands in Car and su. D
- 23 **Regio scapularis.** Scapular region, over the scapula. A
- 24 **Regio cartilaginis scapulae.** Region of the scapular cartilage. A
- 25 **Regio supraspinata.** Supraspinatus region, over M. supraspinatus. A
- 26 **Regio infraspinata.** Infraspinatus region, over M. infraspinatus. A
- 27 **Regio acromialis.** Acromial region, over the acromion or over the ventral end of the Spina scapulae. A
- 28 **Regio costalis.** Costal region, over the ribs excluding the costal cartilages. A
- 29 **Regio cardiaca.** Cardiac region, over the heart caudal to the Margo tricipitalis. It can be enlarged by advancing the thoracic limb, to ease the approach to the auscultation and/or percussion of the heart. A
- 30 **Arcus costalis.** Costal arch, formed by the Cartilagine costales of the asternal ribs and connecting the ventral end of the last rib with the sternum. A



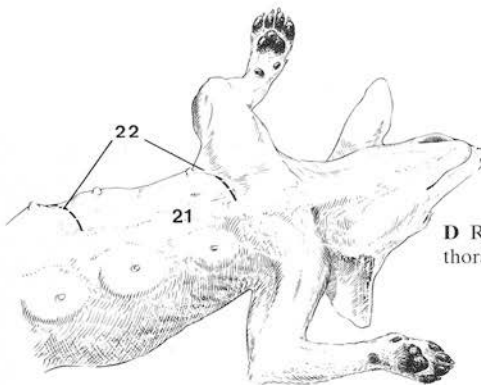
A Regions of the left lateral neck and thorax (eq)



B Regions of the left lateral neck (eq)

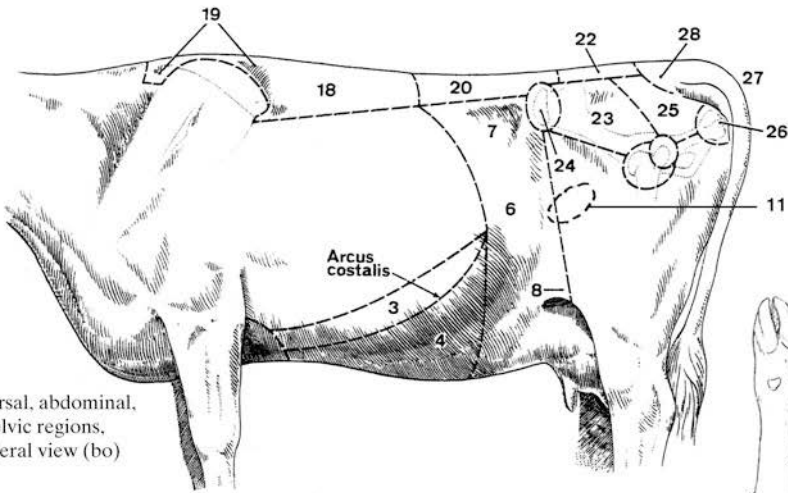


C Regions of the ventral neck and cranial thorax (eq)

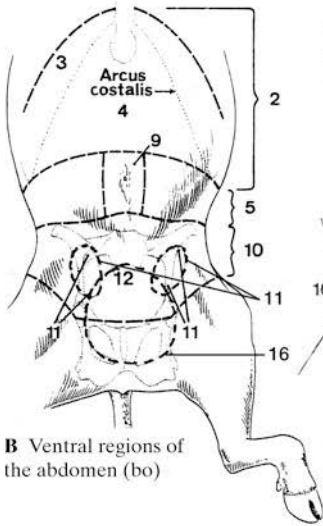


D Regions of the ventral thorax (ca)

- 1 **Regiones abdominis.** Regions on the surface of the abdomen.
- 2 **Regio abdominis cranialis.** Cranial abdominal region, consisting of Regio hypochondriaca (dextra et sinistra) and Regio xiphoidea. B
- 3 **Regio hypochondriaca.** Hypochondriac region, the band of abdominal wall over the costal cartilages. A B
- 4 **Regio xiphoidea.** Xiphoid region, the ventral surface of the abdomen between the Arcus costales, extending to the level of the ventral end of the last rib. A B
- 5 **Regio abdominis media.** Middle abdominal region, consisting of Regio abdominis lateralis (dextra et sinistra) and Regio umbilicalis. B
- 6 **Regio abdominis lateralis.** Lateral abdominal region, called the flank, extending to the level of the Tuber coxae. A (The flank is conventionally divided in the large mammals in three parts; in a dorsoventral order they are: the paralumbar fossa, [fossa or hole of the flank], the cord of the flank [attachment of muscular fibers of the internal abdominal oblique muscle on the last costochondral joint], and the slope of the flank. They are very important in assessing the topography of the abdominal viscera in the large mammals. The 5th ed. of the N.A.V. does not mention anything specific distal to the cord of the flank.)
- 7 **Fossa paralumbalis.** Paralumbar fossa, a depression bounded dorsally by the lumbar transverse processes, ventrally by the part of M. obliquus abdominis internus passing from the Tuber coxae to the last rib (conventionally called "the cord of the flank", see 6), and cranially by the last rib. A
- 8 **Regio plicae lateris.** Region of the fold of the flank. A
- 9 **Regio umbilicalis.** Umbilical region. B
- 10 **Regio abdominis caudalis.** Caudal abdominal region, the ventral surface of the abdomen between the folds of the flank, and extending from the Regio abdominis media to the Pecten ossis pubis. B
- 11 **Regio inguinalis.** Inguinal region, lateral to the Regio pubica. In A it is located deep, out of reach from this perspective. A B C
- 12 **Regio pubica.** Pubic region, cranial to Os pubis, between right and left Regiones inguinales. B C
- 13 **Regio preputialis [prae-].** Preputial region. C
- 14 **Regio mammaria abdominalis.** Region of the abdominal mammary glands in Car and su. E
- 15 **Regio mammaria inguinalis.** Region of the inguinal mammary glands in Car and su. E
- 16 **Regio uberis.** Region of the udder. D E
- 17 **Regiones dorsi.** Regions on the surface of the back.
- 18 **Regio vertebralis thoracis [Reg. dorso-costalis].** Region of the thoracic vertebrae, extending from the Regio colli dorsalis to the Regio lumbalis. A
- 19 **Regio interscapularis.** Interscapular region, between the dorsal borders of the scapulae or of the Cartilagine scapulae. Owing to the length of the Processus spinales in large domestic mammals, it forms a high ridge, the withers. A
- 20 **Regio lumbalis.** Lumbar region, over the lumbar vertebrae. A
- 21 **Regiones pelvis.** Regions on the surface of the pelvis.
- 22 **Regio sacralis.** Sacral region, over the Os sacrum. A
- 23 **Regio glutea [glutaea].** Gluteal region, over the M. gluteus medius, caudal to the Regio tuberis coxae. A
- 24 **Regio tuberis coxae.** Region of the Tuber coxae. A
- 25 **Regio clunis.** The caudal end of the rump (part of the Pelvis dorsal to the level of the Tuber ischiadicum), lateral to the Radix caudae. A
- 26 **Regio tuberis ischiadici.** Region of the Tuber ischiadicum. A F
- 27 **Regio caudalis.** Tail region. A F
- 28 **Regio radices caudae.** Region of the root of the tail. A
- 29 **Regio perinealis.** Perineal region. F
- 30 **Regio analis.** Anal region, surrounding the anus. F
- 31 **Regio urogenitalis.** Urogenital region, ventral to the Regio analis and between the thighs. In the male of most species it extends to the caudal attachment of the scrotum, but, owing to the short distance between the scrotum and the anus in fe and su, includes the scrotum in these species. C F
- 32 **Regio scrotalis.** Scrotal region. Its position in some species would justify the inclusion in Regiones pelvis. C
- 33 **Regio supramammaria.** Supramammary region, in Ru and eq the region dorsal to the caudal attachment of the udder. F



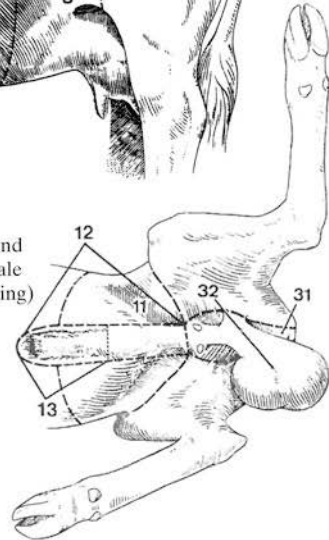
A Dorsal, abdominal, and pelvic regions, left lateral view (bo)



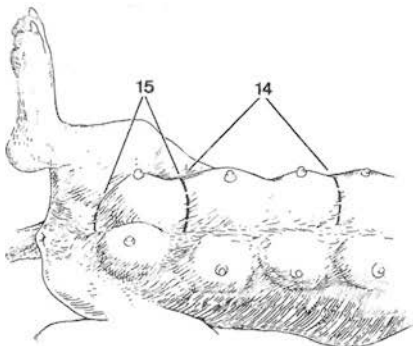
B Ventral regions of the abdomen (bo)



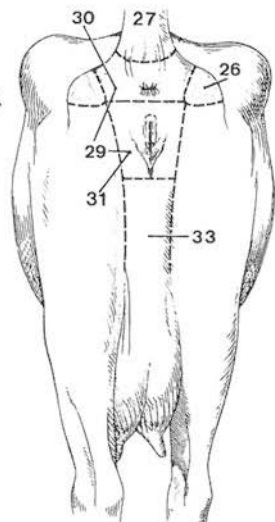
C Ventral abdominal and pelvic regions of the male (ov) (Dyce, Sack, Wensing)



D Region of the udder, ventral view (bo)

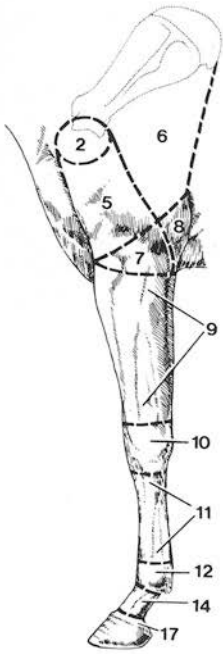


E Abdominal regions of the female, ventral view (ca)

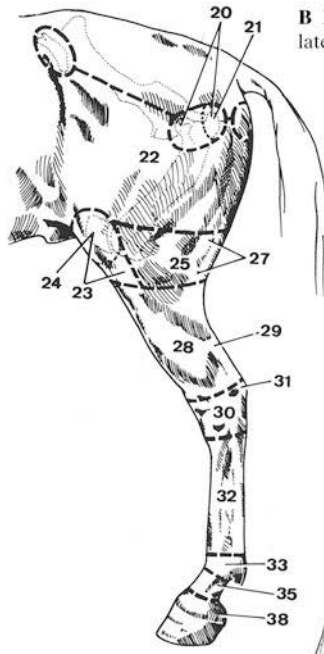


F Caudal regions of the pelvis (bo)

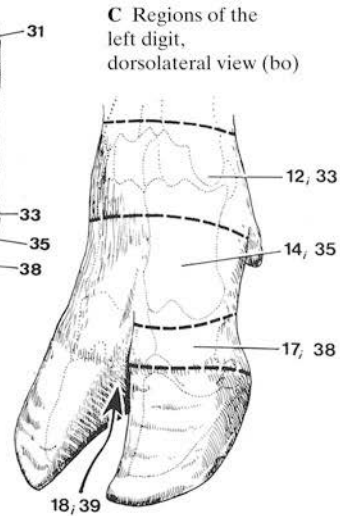
- 1 **Regiones membri thoracici**. Regions on the surface of the thoracic limb.
- 2 **Regio articulationis humeri**. Shoulder joint region. A
- 3 **Regio axillaris**. Axillary region. F
- 4 **Fossa axillaris**. Axillary fossa, the depression between arm and thorax. F
- 5 **Regio brachii**. Brachial region, on the arm distal to the Regio articulationis humeri. A F
- 6 **Regio tricipitalis**. Triceps region, over Caput longum m. tricipitis brachii. A F
- 7 **Regio cubiti**. Region of the elbow joint, distal to the Regio brachii. A F
- 8 **Regio olecrani**. Olecranon region, distal to the Regio tricipitalis. A F
- 9 **Regio antebrachii**. Antebrachial region. A F
- 10 **Regio carpi**. Carpal region. A D F
- 11 **Regio metacarpi**. Metacarpal region. A D
- 12 **Regio metacarpophalangea**. Metacarpophalangeal region, the surface over the Articulatio metacarpophalangea. In the large animals it is also called the fetlock. A C D
- 13 **Regio phalangis proximalis**. Proximal phalangeal region. D
- 14 **Regio compedis**. Pastern region, part of the digit of Un between metacarpophalangeal joint and Regio coronalis. A C
- 15 **Regio interphalangea proximalis**. Proximal interphalangeal region, surrounding the Articulatio interphalangea proximalis. D
- 16 **Regio phalangis mediae**. Middle phalangeal region. D
- 17 **Regio coronalis**. Coronal region, slightly raised band of skin that joins the narrower Regio compedis to the coronet (junction of skin and hoof). A C
- 18 **Spatium interdigitale**. Interdigital space. C
- 19 **Regiones membri pelvini**. Regions on the surface of the pelvic limb.
- 20 **Regio articulationis coxae**. Hip joint region. B
- 21 **Regio trochanterica**. Region over the Trochanter major. B
- 22 **Regio femoris**. Region of the thigh. B
- 23 **Regio genus cranialis**. Cranial stifle region. B
- 24 **Regio patellaris**. Region of the patella. B
- 25 **Regio genus lateralis**. Lateral stifle region. B
- 26 **Regio genus medialis**. Medial stifle region.
- 27 **Regio poplitea**. Popliteal region, caudal to the stifle. B
- 28 **Regio cruris**. Crural region. B
- 29 **Regio tendinis calcanei communis**. Region of the common calcanean (Achile's) tendon. B
- 30 **Regio tarsi**. Tarsal region. In the large animals it is also called the hock. B E
- 31 **Regio calcanea**. Region over the calcaneus. B E
- 32 **Regio metatarsi**. Metatarsal region. B E
- 33 **Regio metatarsophalangea**. Metatarsophalangeal region, the surface over the Articulatio metatarsophalangea. Homologous to #12. B C E
- 34 **Regio phalangis proximalis**. Proximal phalangeal region. E
- 35 **Regio compedis**. Pastern region, part of the digit of Un between metatarsophalangeal joint and Regio coronalis. B C
- 36 **Regio interphalangea proximalis**. Proximal interphalangeal region, surrounding the Articulatio interphalangea proximalis. E
- 37 **Regio phalangis mediae**. Middle phalangeal region. E
- 38 **Regio coronalis**. Coronal region, slightly raised band of skin that joins the narrower Regio compedis to the coronet (junction of skin and hoof). B C
- 39 **Spatium interdigitale**. Interdigital space. C



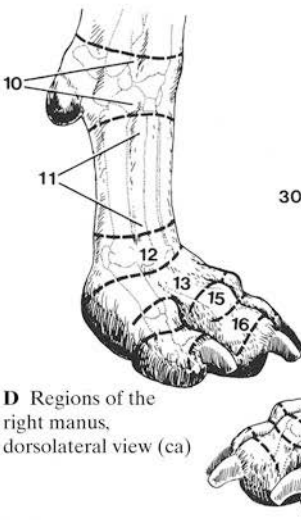
A Regions of the left thoracic limb, lateral view (eq)



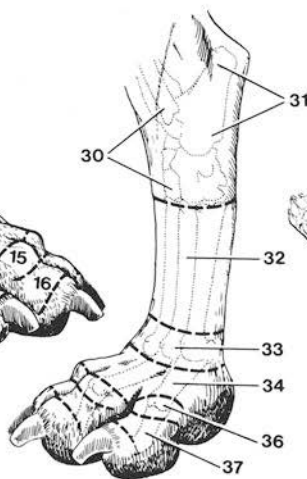
B Regions of the left pelvic limb, lateral view (eq)



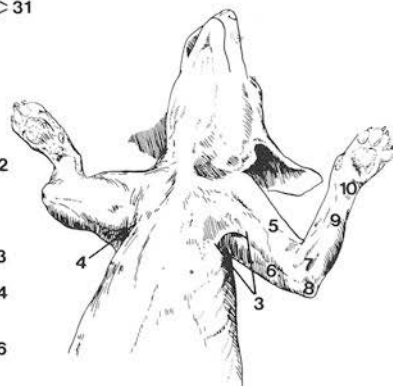
C Regions of the left digit, dorsolateral view (bo)



D Regions of the right manus, dorsolateral view (ca)



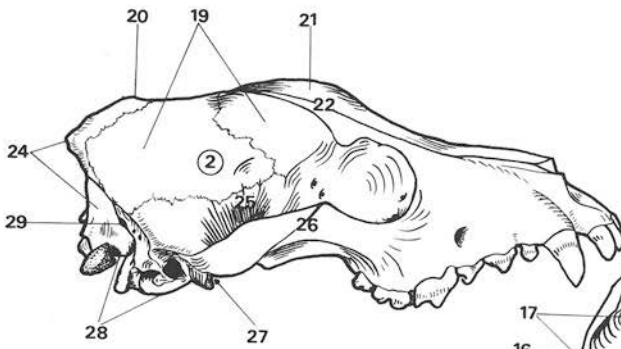
E Regions of the left pes, dorsolateral view (ca)



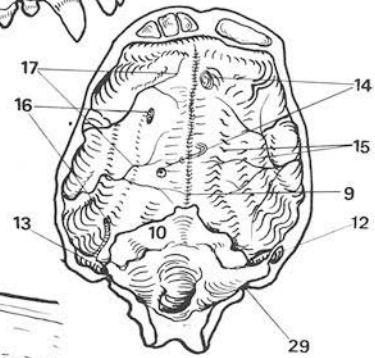
F Regions of the thoracic limb, medial view (ca)

- 1 **SKELERON AXIALE**. Axial skeleton, formed by Ossa cranii, Ossa faciei, Columna vertebralis, and Skeleton thoracis.
- 2 **CRANIUM**. Part of the skull that encloses the brain (formerly Neurocranium). A
- 3 **Cavum cranii**. Cranial cavity, encloses the brain with its membranes and vessels.
- 4 **Pericranium**. Periosteum on the external surface of the skull. B
- 5 **Lamina externa**. External lamina of cranial bones. B
- 6 **Diploë**. Spongiosa between Lamina externa and Lamina interna of the cranial bones. B
- 7 **Canales diploici**. Venous canals in the diploë. B
- 8 **Lamina interna**. Internal lamina of the cranial bones. B
- 9 **Sulcus sinus sagittalis dorsalis**. Groove for the dorsal sagittal sinus. C
- 10 **Tentorium cerebelli osseum**. Osseous shelf over the dorsal surface of the cerebellum in Car and eq, formed by Processus tentoricus of Os occipitale, Os interparietale and Ossa parietalia. C
- 11 **Eminentia cruciformis**. Cruciform elevation on the inner surface of the Calvaria in su and Ru with the Protuberantia occipitalis interna in the center. D
- 12 **Meatus temporalis**. Temporal meatus (passage), formed by Os temporale and Os parietale (except bo) for the Sinus temporalis, rudimentary in fe and su. C
- 13 **Canalis sinus transversi**. Canal for the transverse sinus in ca and eq in the Tentorium cerebelli osseum. C
- 14 **Foveolae granulares**. Pits for arachnoid granulations on the inner surface of the Calvaria. C
- 15 **Impressiones digitatae**. Shallow grooves accommodating the gyri of the brain. C
- 16 **Sulci venosi**. Grooves for veins on the inner surface of the cranial bones. C
- 17 **Sulci arteriosi**. Grooves for arteries on the inner surface of the cranial bones. C
- 18 **(Ossa suturarum)**. Sutural bones, occasionally in the sutures of the skull. F
- 19 **Calvaria**. Roof of the cranium. A B C E F
- 20 **Vertex**. Highest part of Calvaria in the normal position of the head. A
- 21 **Frons**. Forehead. A
- 22 **Fossa frontalis**. Shallow depression on the external surface of the Ossa frontalia. A
- 23 **Protuberantia intercornualis***. Thick border, separating nuchal and frontal surfaces of the skull in bo. E
- 24 **Occiput***. Back part of the skull. A
- 25 **Fossa temporalis**. Temporal fossa, area surrounded by the Linea temporalis. A
- 26 **Arcus zygomaticus***. Zygomatic arch, consisting of the Processus zygomaticus of the squamous part of the temporal bone and the Processus temporalis of the zygomatic bone. In some species also the Processus zygomaticus ossis frontalis. A
- 27 **Fossa infratemporalis**. Ventral extension of the Fossa temporalis. A
- 28 **Basis cranii externa**. External surface of the base of the skull. A
- 28a **Foramen jugulare**. Jugular foramen, between occipital and petrosal bones for passage of cranial nerves IX, X, and XI. Formerly called Foramen lacerum aborale. See 12.1.
- 29 **Foramen mastoideum**. Mastoid foramen, dorso-lateral to the Foramen magnum, for blood vessels, absent in su. A

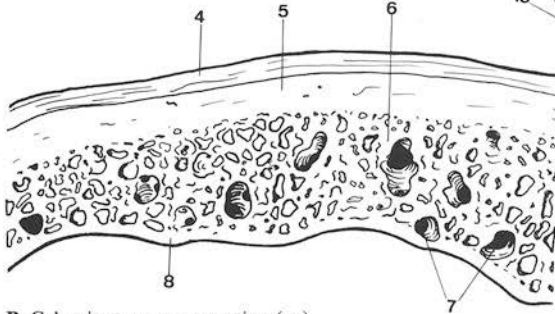
* Reminder: The structures followed by an asterisk are landmarks for physical examination and/or clinical approach.



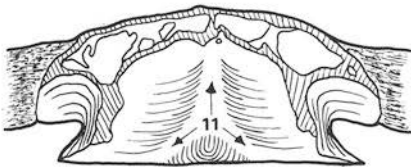
A Skull (ca)



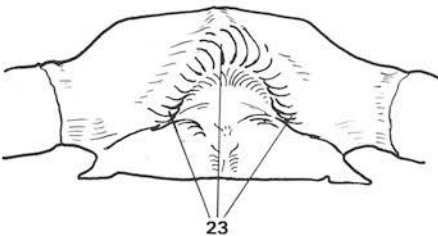
C Calvaria, interior aspect (ca)



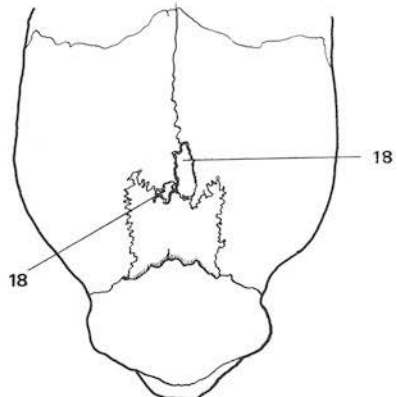
B Calvaria, transverse section (ca)



D Occiput, interior aspect (bo)



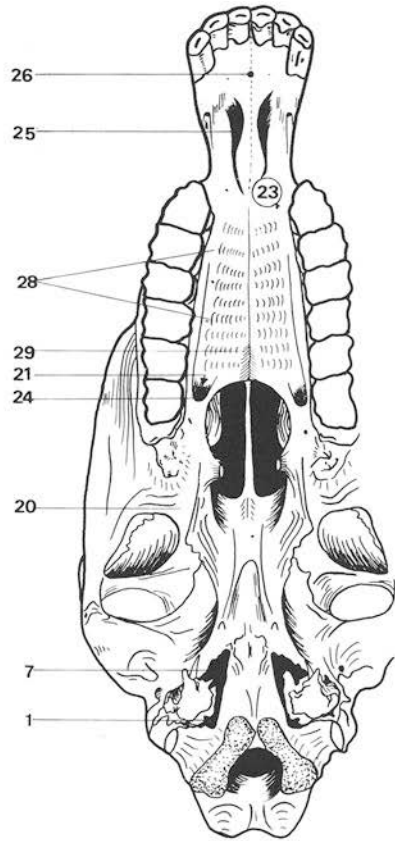
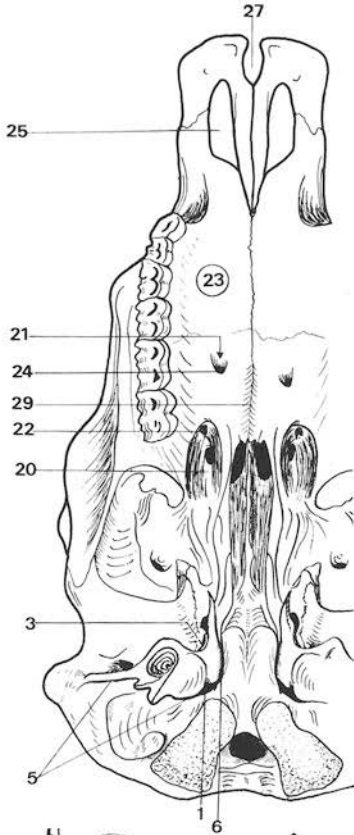
E Calvaria, caudal aspect (bo)



F Calvaria, dorsal aspect (eq, young)

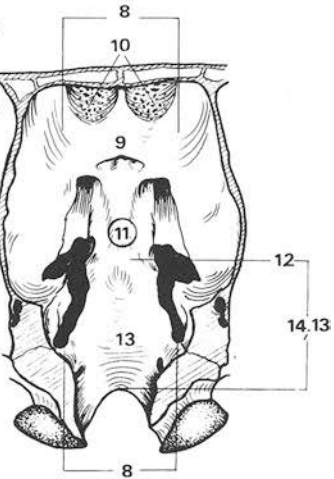
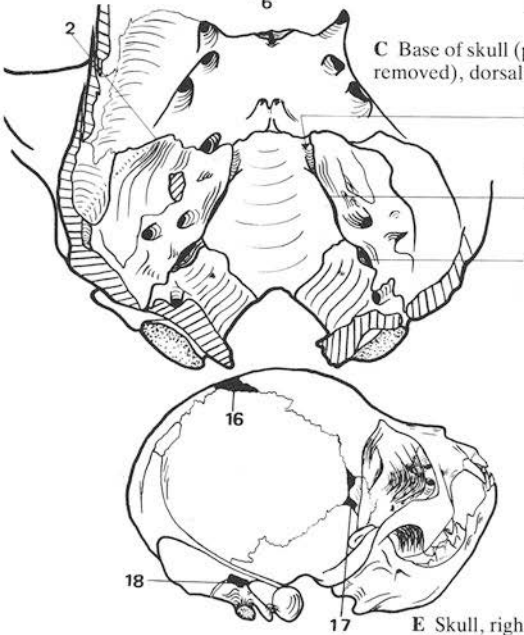
- 1 *Foramen jugulare*. Jugular foramen, between occipital and petrosal bones for passage of cranial nerves IX, X, and XI. A B C (This structure is listed as 28a in the previous page after Basis cranii externa according to the 5th edition of the N. A. V.)
- 2 *Fissura sphenopetrosa* (Car). Sphenopetrosal fissure, between Pars petrosa of Os temporale and Os basisphenoidale. C
- 3 *Fissura sphenotympanica* (Car, Ru). Sphenotympanic fissure, between Pars tympanica of Os temporale and Os basisphenoidale. A
- 4 *Fissura petrooccipitalis* (Car, Ru). Petrooccipital fissure, between Pars petrosa of Os temporale and Os occipitale. C
- 5 *Fissura tympanooccipitalis* (Car, Ru, eq). Tympanooccipital fissure, between Pars tympanica of Os temporale and Os occipitale. A
- 6 *Canalis petrooccipitalis*. Petrooccipital canal, within the Fissura petrooccipitalis for passage of the Sinus petrosus ventralis in ca and Ru. A C
- 7 *Foramen lacerum*. Large opening with irregular border between Os temporale, basisphenoidale, and occipitale in su and eq (formerly Foramen lacerum orale). B
- 8 *Basis cranii interna*. Internal surface of the base of the skull. D
- 9 *Fossa cranii rostralis*. Rostral cranial fossa, between the Lamina cribrosa and the Alae ossis presphenoidalis. D
- 10 *Fossae ethmoidales*. Ethmoidal fossae, for the Bulbi olfactorii. D
- 11 *Fossa cranii media*. Middle cranial fossa, from the caudal borders of the Alae ossis presphenoidalis to the Crista sphenooccipitalis and the Cristae partis petrosae of Os temporale. D
- 12 *Crista sphenooccipitalis*. Sphenooccipital crest. D
- 13 *Fossa cranii caudalis*. Caudal cranial fossa, from the Crista sphenooccipitalis and Cristae partis petrosae of Os temporale to the Foramen magnum. D
- 14 *Clivus*. Part of the Basis cranii interna between Dorsum sellae and Foramen magnum. D
- 15 *Fonticuli cranii*. Membranous intervals between cranial bones in youngsters, called fontanelles. They ossify after birth at different ages depending on species. E (Four fontanelles are listed in the N.A., and up to 14 in Medical Dictionaries.)
- 16 *Fonticulus frontoparietalis*. Median space between Os frontale and parietale, existing for some time only in small breeds of dogs. E
- 17 *Fonticulus sphenoidalis*. Space between Os frontale, parietale, temporale, and presphenoidale. E
- 18 *Fonticulus mastoideus*. Space between Os parietale, occipitale, and temporale. E
- 19 **FACIES**. Part of the skull that encloses parts of Apparatus digestorius and respiratorius (formerly Splanchnocranium).
- 20 *Fossa pterygopalatina*. Pterygopalatine fossa. Space between Processus pterygoideus of Os basisphenoidale and Maxilla. A B
- 21 *Canalis palatinus major*. Greater palatine canal, formed by Os palatinum and Maxilla – in bo only by Os palatinum – for A. palatina major and N. palatinus major. A B
- 22 *Foramen palatinum caudale*. Caudal opening of the Canalis palatinus major. A
- 23 *Palatum osseum*. Osseous palate consisting of Processus palatinus of Ossa incisiva and Ossa maxillae, and Lamina horizontalis Ossa palatini. A B
- 24 *Foramen palatinum majus*. Rostral opening of the Canalis palatinus major. A B
- 25 *Fissura palatina*. Paramedian fissure in the rostral part of the osseous palate. The Canalis incisivus is accommodated in it. A B
- 26 *Canalis interincisivus*. Median canal between the Ossa incisiva in ca and eq. B
- 27 *Fissura interincisiva*. Median fissure between the Ossa incisiva in su and Ru. A
- 28 *Impressiones rugales*. Impressions on the ventral surface of the osseous palate, caused by Rugae palatinae in older swine and horses. B
- 29 *Torus palatinus*. Median longitudinal protuberance caudally, on the ventral surface of the osseous palate. A B

A Base of skull and hard palate (bo)



B Base of skull and hard palate (eq)

C Base of skull (part of the left petrosal bone removed), dorsal aspect (ca)

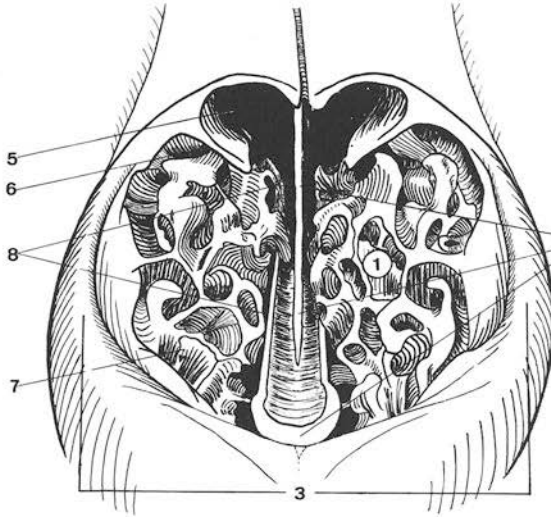


D Base of skull, dorsal aspect (eq)

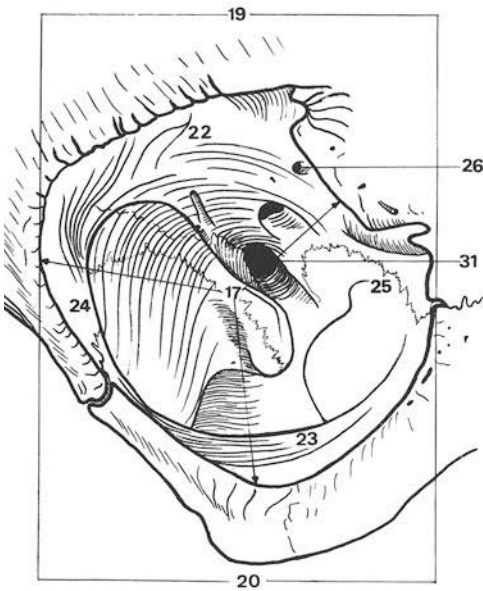
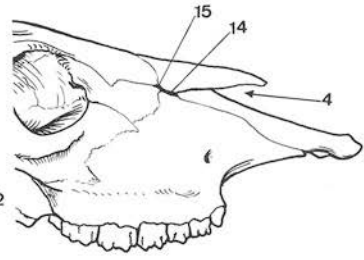
E Skull, right caudodorsal aspect (ca, newborn)

- 1 **Cavum nasi**. Nasal cavity. A
- 2 **Septum nasi osseum**. Osseous nasal septum, composed of Vomer and Lamina perpendicularis ossis ethmoidalis. A
- 3 **Apertura nasi ossea**. Rostral opening of the nasal cavity in the skull. A
- 4 **Incisura nasoincisiva** *. Nasoincisive notch, between nasal and incisive bones. B
- 5 **Meatus nasi dorsalis**. Dorsal nasal meatus, situated dorsal to the dorsal concha. A
- 6 **Meatus nasi medius**. Middle nasal meatus, between the dorsal and ventral conchae. A
- 7 **Meatus nasi ventralis** *. Ventral nasal meatus, ventral to the ventral concha. A
- 8 **Meatus nasi communis**. Common nasal meatus, space between the nasal septum and the conchae. A
- 9 **Canalis nasolacrimalis**. Nasolacrimal canal, in the lateral wall of the nasal cavity for the nasolacrimal duct. C
- 10 **Meatus nasopharyngeus**. Caudal continuation of Meatus nasi ventralis. C
- 11 **Choanae**. The caudal openings of the nasal cavity. C
- 12 **Foramen sphenopalatinum**. Sphenopalatine foramen, opening of the nasal cavity into the Fossa pterygopalatina. C
- 13 **Recessus maxillaris**. In Car there is no Sinus maxillaris within the Maxilla; the Recessus is bounded medially by the Lamina orbitalis of the Os ethmoidale and laterally by the Maxilla and Os palatinum, in ca also by the Os lacrimale. It is very reduced in fe. C
- 14 **Fissura nasomaxillaris**. Fissure between Os nasale and Maxilla in ov, cap, and sometimes bo. B
- 15 **Fissura nasolacrimalis**. Fissure between Os nasale and Os lacrimale in Ru. B
- 16 **Orbita** *. Orbit. D E
- 17 **Aditus orbitae**. Orbital entrance. D E
- 18 **Margo orbitalis** *. Orbital margin. E
- 19 **Margo supraorbitalis**. Supraorbital margin, dorsal part of the Margo orbitalis. D E
- 20 **Margo infraorbitalis**. Infraorbital margin, ventral part of the Margo orbitalis. D E
- 21 **Lig. orbitale**. Between Processus temporalis of the Os frontale and Os zygomaticum, forming the lateral part of the Margo orbitalis in Car and su, it is very short in fe. E
- 22 **Paries dorsalis**. Dorsal wall of the orbit. D E
- 23 **Paries ventralis**. Ventral wall of the orbit. D E
- 24 **Paries lateralis**. Lateral wall of the orbit. D
- 25 **Paries medialis**. Medial wall of the orbit. D E
- 26 **Foramen ethmoidale**. Ethmoidal foramen, in medial wall of orbit for like-named nerve and vessels. D
- 27 **Foramina ethmoidalia**. There are usually two Forr. ethmoidalia in ca. Sometimes one is situated rostral to, but often dorsal to the other. E
- 28 **Sulcus lacrimalis**. Groove in Os lacrimale, whose border is formed by the Processus frontalis of the maxilla in fe. F
- 29 **Fossa sacci lacrimalis**. Listed also under Orbita, because in fe it is formed not only by the Os lacrimale, but also by the Processus frontalis of the Maxilla. F
- 30 **Fissura orbitalis**. Orbital fissure, between the wings of the pre- and basisphenoids for nerves and vessels in Car and eq. E
- 31 **Foramen orbitorotundum** (or, su, Ru). Wide opening by fusion of Fissura orbitalis and Foramen rotundum. D

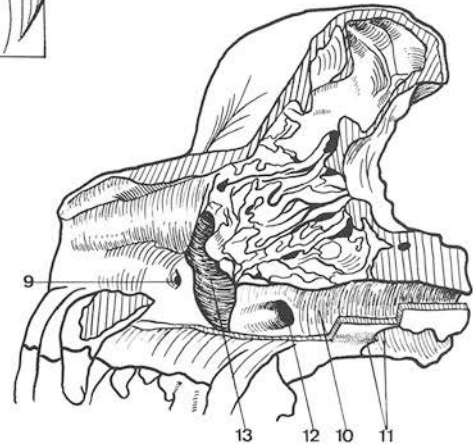
A Nasal cavity, rostral aspect (ca)



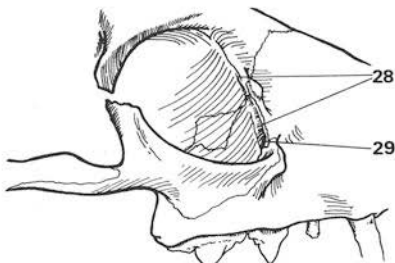
B Right facial bones (bo)



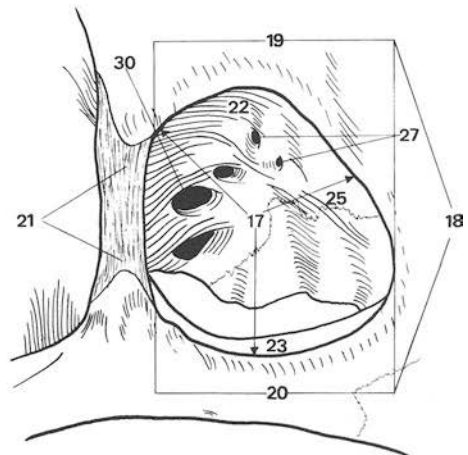
D Right orbit, rostralateral aspect (bo)



C Lateral wall of right half of nasal cavity (nasal conchae partly removed), rostromedial aspect (ca)

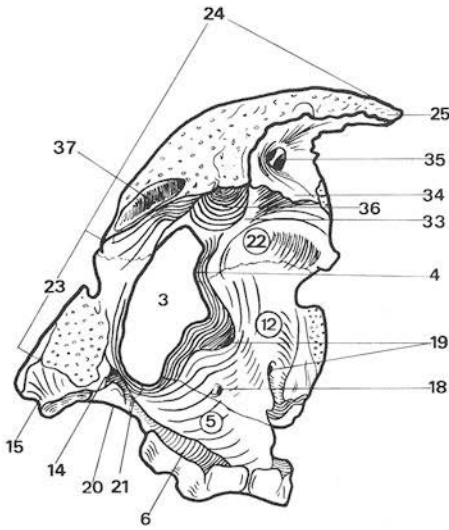


F Right orbit, lateral aspect (fe)

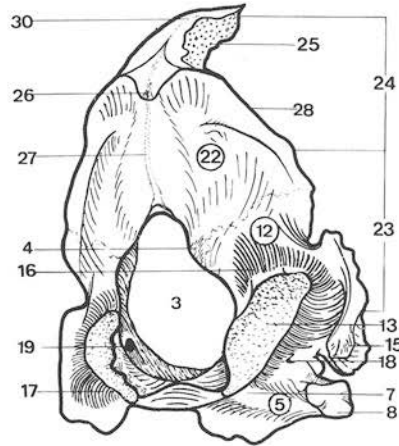


E Right orbit, rostralateral (and dorsal) aspect (ca)

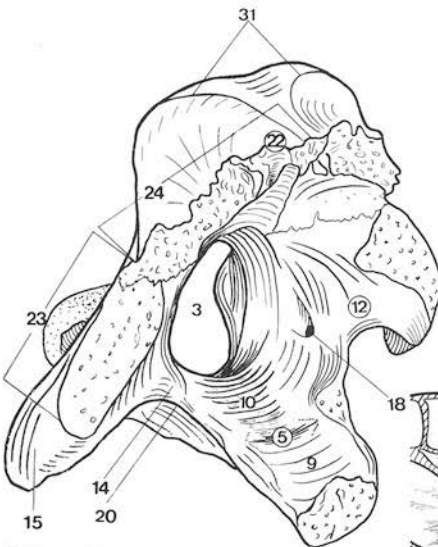
- 1 **OSSA CRANII.** Cranial bones.
- 2 **Os occipitale.** Occipital bone. A B C
- 3 **Foramen magnum.** Large foramen for the Medulla oblongata. A B C
- 4 **Tuberculum nuchale.** Tubercle on the dorsolateral border of the Foramen magnum in Car and su. A B
- 5 **Pars basilaris.** Basilar part of Os occipitale. A B C
- 6 **Sulcus sinus petrosi ventralis.** Groove for ventral petrosal sinus in Car and Ru. A
- 7 **Tuberculum pharyngeum.** Small median tubercle on the ventral surface of the Pars basilaris in Car. B
- 8 **Tuberculum musculare.** Paramedian tubercle on the ventral surface of the Pars basilaris. B
- 9 **Impressio pontina.** Impression for the Pons. C
- 10 **Impressio medullaris.** Impression for the Medulla oblongata. C
- 11 **Sinus sphenoidalis.** May excavate also Os occipitale in elder su. D
- 12 **Pars lateralis.** Lateral part of Os occipitale. A B C
- 13 **Condylus occipitalis.** Occipital condyle, for articulation with the atlas. B E
- 14 **Processus jugularis.** Process lateral to the Foramen jugulare, corresponding to a transverse process of a vertebra. A C E
- 15 **Processus paracondylaris*.** The Processus jugularis projects laterally from the base of the Condylus occipitalis in man and domestic mammals. From this projects, in domestic mammals, an apophysis for muscular attachment (not homologous with Processus paramastoideus of man). A B C D E
- 16 **Fossa condylaris dorsalis.** Depression dorsal to the Condylus occipitalis. B E
- 17 **Fossa condylaris ventralis.** Depression ventral to the Condylus occipitalis. B
- 18 **Canalis n. hypoglossi.** Canal for the twelfth cranial nerve. A B C D
- 19 **Canalis condylaris.** Canal for the Sinus condylaris, absent in su and eq. A B
- 20 **Incisura jugularis.** Jugular notch, at the caudal border of Os occipitale for the Foramen jugulare. A C
- 21 **Processus intrajugularis.** Opposite to jugular process within the cranial cavity. A
- 22 **Squama occipitalis.** Dorsal part of Os occipitale. A B C
- 23 **Margo mastoideus.** Mastoid margin, connected with Os temporale. A B C
- 24 **Margo parietalis.** Parietal margin, connected with Ossa parietalia and Os interparietale. A B C
- 25 **Processus interparietalis.** Extends between Ossa parietalia, formed by prenatal fusion of Os interparietale with Squama occipitalis in ca. A B
- 26 **Protuberantia occipitalis externa*.** Median protuberance on the external surface of the squama. Absent in su. B E
- 27 **Crista occipitalis externa.** Crest from Protuberantia occipitalis externa to Foramen magnum. B E
- 28 **Crista nuchae.** The sharp transverse crest on the external surface of the squama in or, Car, su and eq, which corresponds to the Linea nuchae of Ru. B D
- 29 **Linea nuchae.** Transverse line on the external surface of the squama in Ru. E
- 30 **Crista sagittalis externa.** Median sagittal crest on the dorsal surface of the squama in Car and eq. B
- 31 **Linea temporalis*.** The border of the Fossa temporalis, to which the Fascia temporalis is attached. The part on the Os frontale was formerly called Crista frontalis (externa), and the part on the Os parietale was called Crista parietalis. C E
- 32 **Protuberantia occipitalis interna.** In su and Ru. F
- 33 **Crista occipitalis interna.** Internal occipital crest. A
- 34 **Processus tentoricus.** Part of Tentorium cerebelli osseum in ca and eq. A
- 35 **Foramen sinus sagittalis dorsalis.** On the rostral surface of the Processus tentoricus in Car. The venous sagittal sinus joins the venous transverse sinus via this foramen. A
- 36 **Impressio vermialis.** Impression by Vermis cerebelli. A
- 37 **Sulcus sinus transversi.** Groove for the Sinus transversus. A
- 38 **Sinus frontalis caudalis.** Excavates also the squama in su and Ru. D
- 39 **Septum sinuum frontalem.** Separates the symmetrical frontal sinuses. D



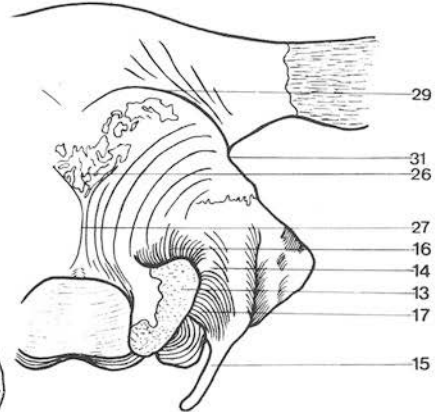
A Os occipitale, right rostral aspect (ca)



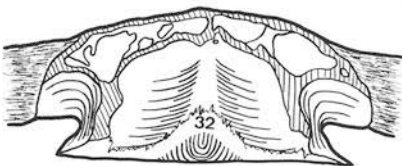
B Os occipitale, right caudal aspect (ca)



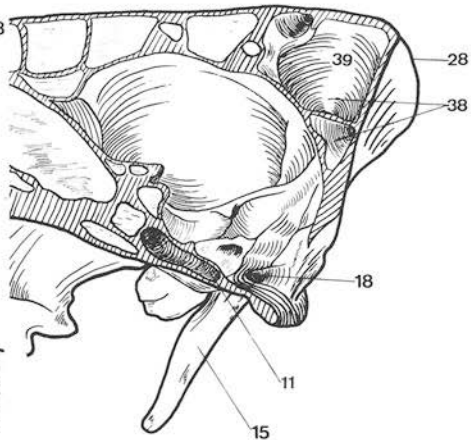
C Os occipitale, right rostradorsal aspect (cq)



E Back of skull, right half, caudal aspect (bo)



F Calvaria, interior aspect (bo)



D Cranium, median section (Pars petrosa removed), right half (su)