



Elijah Walker, del et lith.

Prof. A. S. Smith, sculp.

DROMEDARIES NEAR SINAI.



# THE CAMEL:

ITS ANATOMY,

PROPORTIONS, AND PACES.

BY

ELIJAH WALTON.

LONDON:

PUBLISHED BY DAY & SON,

LITHOGRAPHERS TO THE QUEEN AND TO H.R.H. THE PRINCE OF WALES,

6, GATE STREET, LINCOLN'S INN FIELDS, W.C.

1865.

599 736 Tylopoda

Jan 19 1861

TO

RICHARD OWEN,

M.D. D.C.L. LL.D. F.R.S. &c.

THE GREATEST OF LIVING ANATOMISTS,

BY KIND PERMISSION,

THIS VOLUME IS DEDICATED

BY AN ARTIST,

IN THANKFUL RECOGNITION OF THE VALUE TO ART

OF ANATOMICAL SCIENCE.



## P R E F A C E .

I N presenting this Work to the Public, I am aware how much there is yet to be done to render complete our knowledge of the structure of the Camel. Nevertheless, having given several years' study to the subject, I have some ground to hope that the following series of Plates may be useful to the Anatomist, Naturalist, and Artist. The Original Drawings were made in the East during the years 1862-4, and a large number of them while I was encamped in the desert in the neighbourhood of Cairo.

Among the numerous friends who have aided me during the progress of the Work, I am happy to record my especial obligations to JOHN PATTERSON, Esq., M.D., of Cairo, and WILLIAM MATHEWS, Jun., Esq., of Birmingham. I am indebted to the former gentleman for the loan of his instruments for dissection, and other valuable services; and to the latter for the kind assistance he has rendered to me during the passage of the sheets through the press.

ELIJAH WALTON.



# CONTENTS.

---

## THE SKELETON.

	PLATE
The Entire Skeleton; Side View . . . . .	1
The Skull . . . . .	2
Cervical Vertebrae . . . . .	3, 4, 5
Vertebrae of the Back and Loins . . . . .	6
The Scapula . . . . .	7
The Os Humeri . . . . .	8
Radius and Ulna . . . . .	9
The Carpus and Tarsus . . . . .	10
Metacarpus . . . . .	11
The Pelvis . . . . .	12
Femur or Thigh-Bone . . . . .	13
The Sternum and Ribs . . . . .	14
The Tibia . . . . .	15
Metatarsal Bones and Phalanges . . . . .	16
The Sternum and Bones of the Tail . . . . .	17
Bones of the Carpus . . . . .	18
Bones of the Tarsus . . . . .	19

## THE MUSCLES.

External Muscles and Tendons; Front View . . . . .	20
Ditto ditto Side View . . . . .	21
Ditto ditto Back View . . . . .	22



		23
Muscles of the Head . . . . .		24
Ditto ditto and Anterior Extremity . . . . .		25
Ditto Neck . . . . .		26
Front View and Back View of the Left Posterior Extremity . . . . .		27
Posterior, Left Extremity . . . . .		28
Left Anterior Extremity . . . . .		29
Inner Side of Posterior Extremity . . . . .		30
The Left Anterior Extremity . . . . .		31
Ditto ditto Inner Side . . . . .		32
The Under Side of the Neck, showing the Spines of the Vertebrae . . . . .		

### THE TENDONS.

Tendons of the Right Hind Foot; Front View . . . . .		33
Ditto ditto Inner Side . . . . .		34
Ditto ditto Back View . . . . .		35
Right Fore Foot; Front View . . . . .		36
Ditto Side View . . . . .		37
Ditto Back View . . . . .		38
Tendons of the Carpus; Front View . . . . .		39
Inner Side, ditto . . . . .		40
Outer Side, ditto . . . . .		41
Back View, ditto . . . . .		42
Tendons of the Tarsus or Hock; Right Hind Leg, Front View . . . . .		43
Ditto ditto External Side . . . . .		44
Ditto ditto Back View . . . . .		45
Ditto ditto Inner Side . . . . .		46

### PROPORTIONS.

Camel Resting; Front View . . . . .		47
Ditto Side View . . . . .		48
Ditto Back View . . . . .		49



CONTENTS.

11

Camel Standing: Front View . . . . .	PLATE 50
Ditto ditto Side View . . . . .	51
Ditto ditto Back View . . . . .	52
Dromedary: Side View . . . . .	53
Ditto Back View . . . . .	54
Camel, No. 3 . . . . .	55

THE PACES.

Camel Walking . . . . .	56
Unusual Pace . . . . .	57
Full Speed . . . . .	58

FOOT-PRINTS LEFT UPON THE SAND.

Foot-Prints . . . . .	59
Ditto . . . . .	60
Ditto . . . . .	61
Ditto . . . . .	62

FEET OF THE CAMEL.

Hind Foot at Rest . . . . .	63
Back View . . . . .	64
Walking and Progression . . . . .	65
When the Camel is Heavily Laden . . . . .	66
Walking . . . . .	67
Ditto and Progression . . . . .	68
Ditto ditto . . . . .	69
Position of the Hocks and Feet when the Camel receives its Burden . . . . .	70
Progression . . . . .	71



	PLATE	72
Standing . . . . .		73
Ditto Front View . . . . .		74
Walking . . . . .		75
Sole of the Hind Foot . . . . .		76
Ditto Fore Foot . . . . .		77
The Eye of the Camel . . . . .		

### POSITIONS.

First and Second Position of Descent . . . . .	78
The Neck when the Camel is Tired or Sleeping . . . . .	79
Head of a Syrian Camel . . . . .	80
Camel Sleeping . . . . .	81
Camel called upon to Stop . . . . .	82
Ditto Sleeping, &c. . . . .	83
Ditto Touching his Hind Leg with his Lips . . . . .	84
Ditto ditto ditto ditto . . . . .	85
Positions of the Neck . . . . .	86
Heads of Dromedaries . . . . .	87
Ditto ditto . . . . .	88
Ditto ditto . . . . .	89

### THE EAR.

Uncertain whence the Sound proceeds . . . . .	90
Sound heard from before . . . . .	91
Repose . . . . .	92
Sound heard from behind . . . . .	93
Camel turning his Head to touch his Hump . . . . .	94



prevent insects from tormenting them. When the skin is unhealthy, it is first shaved, and then rubbed all over with a mixture of rancid oil and butter. In some parts of Syria and Asia Minor, pitch is used instead, which gives the animal a singular and disagreeable appearance, as well as an offensive smell, which, combined with the nauseous breath caused by eating different plants in the Desert, makes him nearly unbearable.

The most beautiful Dromedaries belong generally to the Pachas and men of wealth. They are then well fed and kept thoroughly clean, and they have been known to run from sunrise to sunset, with little or no rest. In these animals the hump is usually large, and covered with long woolly hair.

Draught Camels are frequently joined together in a line, the head of one being attached to the tail of the one before it. Twenty or more thus joined together may often be seen crossing the Desert, laden with merchandise and other burdens.

The time for herding Camels is in the months of February and March. During this season they are both vicious and dangerous, biting even their own masters, and not letting go their hold unless some one is at hand to beat them off. On one occasion, at this time of year, a large drove of young and old Dromedaries passed my tents in the Desert, near Cairo, and wishing to measure one, I induced the Bedouins in charge to stop them. I selected one of two years old, which appeared to be docile, but no sooner had I commenced to measure the hind-leg, than I received a very severe kick, while the animal looked calmly round as if nothing had happened. The Bedouins would not allow me to approach the head or fore-legs, declaring I should inevitably be bitten.

Those Dromedaries and Camels which are constantly ridden and carry heavy burdens are less vicious, and will sometimes even place their lips against your cheek. For it is the custom of the kind master occasionally to put his face against that of his own Dromedary, while talking gently to it. Moreover, the Bedouin seldom or never beats his Dromedary, but treats him with as much kindness as his own children. If one runs away, which it sometimes does for many miles, in search of food or water, he will follow it, and by using soothing sounds invariably induce it to be retaken.

In and about Cairo, and other Eastern cities, the Camel loses to a certain extent those vicious and capricious habits which characterize his brethren at liberty. He will allow himself to be bound by his fore-legs, but will not permit his hind-legs to be touched. If, while he is lying down to receive his burden,



an attempt be made to secure his hind-legs, he will instantly start up and try to run away.

Dromedaries and Camels are very timid, and are startled by the slightest unusual appearance or noise. Although, in this respect also, the city Camels are quieter than those of the Desert, I have seen them even in the streets of Cairo start back at the sight of an unusual object, to the great danger of people and things in their rear. During a journey to Sinai, as I was quietly riding along, I made use of my open umbrella to prevent a fly from settling on the neck of the Dromedary, when the animal suddenly swerved and threw me. At the same time the umbrella was blown along the Desert, and the Camels laden with the tents and baggage, and who were some distance in advance, all turned and stopped to look at it.

They seldom venture through water, and have a great dread of mud; for the soles of their feet being comparatively smooth and flat, have little hold upon a slippery path. In passing over muddy places the Bedouin driver calls out lustily to the Camel to take care, a warning which it always understands, and picks its way accordingly. Once, while on the Suez Canal, in a boat drawn by Dromedaries, ridden by young Bedouins, one of the animals slipped into the mud of which the embankment was made, and lay there, trembling in every limb, until some one came to his assistance.



# THE CAMEL.

---

## THE HEAD.

THE Head of a full-grown Camel is from one foot eleven inches to two feet in length, and one foot across in the widest part. The Skull, as seen in profile, shows a large proportion of face and jaw in comparison with the size of the cranium, the brain-case being extremely small, and the facial angle low. The jaw is large and the bone compact.

The Teeth of the Camel are large and powerful: in the Upper Jaw there are ten molars and six canine teeth; in the Lower Jaw eight molars, three canines, and six incisors; thirty-three in all. There are no incisors in the Upper Jaw, and one canine tooth is wanting in the Lower. (*See Plate 2, the Skull.*) The canine teeth serve in a measure for the defence of the animal; he seizes his victim with the incisors and canines, drags it between his fore legs, and tears it to pieces.

The orbit is placed nearly in the centre of the Head, and is inclined a little forward. The zygoma is joined by a suture to the cheek-bone, and the cheek-bone to the nasal. The Cranium is divided into two nearly equal parts by a spinous ridge, on either side of which lie bodies of the large Temporal muscle, forming two cushions protecting the thin walls of the brain-case. Immediately behind the orbit, under the zygoma, rises the coronoid process of the lower jaw, peculiar for its great length, the action of which can be traced when the jaw is in motion, as the Temporal muscle is implanted upon the surface of the process. The cavity is large when the fatty and cellular tissues are taken away.



The Lower Jaw, with its large ramus and its coronoid and condoloid processes, forms an important feature in the Head. The large Masseter is implanted into its base and along its posterior ridge; while the Great Buccinator Muscle is fixed to its anterior portion. When the jaw is moved from side to side during mastication, these muscles, with the veins under their tendinous sheaths, can be traced with great accuracy. The gland behind and below the Ear is also a conspicuous object.

The whole Skull is most compact, with little or no cancellated structure; the sutures are well joined, and every part bears the appearance of strength, the brain-case excepted, which is small and weak, and appears to require the protection it receives from the two bodies of the Temporal muscle and its spinous ridge.

## THE EYE.

The Eye of the Camel is nearly round, and projects a little beyond the orbital ridge. The pupil is usually of a rich dark brown colour, and little or none of the white cornea is visible. When in health, the Eye is bright and clear. The Eyelids are graceful in outline, and fringed with long Eyelashes. Just above the corner of the Eye nearest the mouth, and covering the anterior portion of the upper surface of the orbit, is the Eyebrow Hair, usually of the same colour and texture as the Eyelashes. The Under Eyelid differs from the Upper one in having the Lash placed below the edge of the Lid, which adds much to the beauty of the Eye. (*See Plate 77.*)

*In Repose or Sleep.*—When the Eye is in perfect repose or sleep, the Upper Eyelid meets the Under, entirely closing the Eye; whilst the Lashes of the Upper rest upon those of the Lower.

*When the Animal is Feeding.*—The Eyeball is thrown forward and nearly seen in full; there is an anxious appearance given by the Upper Eyelid taking an angular form, and the whole expression is that of hunger.

*When Masticating Food a second time.*—The Eye is partly closed; the Upper



Lid descends; the Eyelashes nearly exclude the light, and the expression is that of enjoyment.

*When Angry or Restive.*—When the animal is angry or restive, the Eyelids are drawn back, the Eyeball starts forward, the white of the Eye is seen all round, and the Eyelashes are erect and stiff. By the contraction of the Eyelid, with the action of the Temporal Muscle, the Eyebrow is drawn backward, the hairs standing erect, and giving an appearance of anger and defiance.

*When Walking.*—In walking, the Eye is half open and the Eyelashes droop.

*When Running.*—In running, the Eye is nearly open, and is inquisitive and watchful.

*When Drinking.*—In drinking, the Eye has the same appearance of repose and enjoyment as when the animal is masticating food a second time.

## THE EAR.

The Ear of the Camel is small in proportion to the Head and Frame, being only four inches in length by about three in width. It is so closely attached to the Cranium that it has very little flexibility or power of motion. Its cavity is small, the animal appearing to exercise the sense of hearing less than that of sight. The hollow wing is filled with hair, which in some Dromedaries is long and makes a refined delicate line, giving great character to this part.

*The Action of the Ear.*—In repose, the Ear gently slants backwards, with its surface on the same plane as the Cheek. When the Camel hears a sound from before, both ears are thrown forward; when the sound is heard from behind, the Ears are turned backward. This is the case if the rider sings, when the Camel invariably listens. When it is uncertain whether the sound is behind or before, the Ears are turned in contrary directions, one forward and the other backward, until the direction of the sound is decided.



## THE NOSTRILS.

The Nostrils of the Camel are graceful in form and expression, especially when the animal is seen in the desert, breathing the clear and refreshing breeze. They are long and contracted, and their colour, which is sometimes lighter, sometimes darker than other parts of the face and lips, should be carefully noted in painting. The surface is dull, with little or no moisture upon it.

*When the Animal is in Repose or Sleeping.*—In repose, the Nostrils are nearly closed, dilating a little when the creature breathes through them.

*Walking.*—In walking, the Nostrils are more dilated than in repose.

*When at Full Speed.*—At full speed, the Nostrils are more dilated than in walking, they also dilate and contract in shorter intervals of time. As the Mouth is compressed, the Nostrils open.

*When Drinking.*—In drinking, the expression is the same as in repose. The Nostrils have little or no action, and are gently dilated in breathing.

## EXPRESSION OF THE MOUTH AND FACE.

*When the Camel is Angry or Restive.*—When the Camel is angry or restive, the Mouth is open, showing the Teeth; the Lips are distended, arched and corrugated in the centre, and dropping with foam; the Nostrils inflated and drawn downwards, and the Masseter and Buccinator muscles swollen. The Eye is uncovered, the white partly shown, the Eyelashes at all points erect, and the Ear turned rigidly back.

*When Running.*—In running, the Head is pushed forward, and the Mouth is closed, the Lips pout, and flap up and down, keeping time with the pace; the Eyes nearly uncovered; the Nostrils are a little distended; the whole Head is full of animation and life.



*When Feeding.*—The Camel when feeding draws the food into its mouth by means of its Upper Lip, which is larger than the Lower. If the food be a plant, it is gathered together by the Lips, and cut off by the incisors; during which action the Nostrils are nearly closed, and the Eye turned a little forward towards the object.

### THE LIPS.

The Lips of the Camel are composed of fleshy muscles, varying in texture and expression. The Upper and larger Lip is bisected by a line which, if continued, would divide the Head into two equal parts. It consists of two distinct sides of muscle, and may therefore be appropriately called Upper Lips, rather than Lip. The creature has the power of raising them, and, by contracting the Nostrils, of drawing them inwards and upwards; at the same time it also has the power of throwing them forward in order to gather food, and is able to move one side without materially altering the other; which is, however, drawn back a little by the Zygomatic Muscle. The direction of the Mouth is inward and upwards, and the Lips are largest immediately in front, and gradually decrease as they approach the corners. The skin of the Upper Lips is covered with fine wrinkles, spreading from the centre to the corners of the Mouth. The Under Lip has little to do; it is no more than an assistant to the Upper Lips, and that in a very subordinate degree.

In repose, the Lips are joined together, and have no action. In drinking, the Lips just touch the water, are closed, and a little pouted. In sleeping, the Lower Lip presses the ground, and becomes longer and compressed; the Upper Lips overhang and rest upon it, and, as well as the Lower, are elongated and motionless. In walking, the Mouth is closed, and the Lips hang loosely without compression.

The food of the Camel generally consists of chopped straw and beans. When in the desert it feeds upon many different kinds of plants; one, which it eats with pleasure and ease, is covered with thorns, and bears a little purple flower of exquisite shape. Another is a delicate plant, growing in ravines, and bearing clusters of small yellow flowers. Clover, called Burseem, is also a favourite food, when in season; but this is grown by the Fellah, and not to be had in the desert.



## THE NECK.

The Neck of the Camel is, both by its carriage and proportion, peculiarly adapted to the wants of the creature. The bony structure is composed of Seven Vertebrae, with short and strong spines having little or no necks. The Atlas, or first bone of the Neck, is the smallest; and the sixth and seventh, adjoining the Thorax, are the largest; each Vertebra is eight inches from spine to spine, with the exception of the first, or Atlas. The Atlas has parts peculiar to itself, the Condyles of the Os Occipitis being partially buried in two deep articulating surfaces, allowing the nodding motion. It is especially characterized by strength and compactness, and is admirably adapted for the work it has to do. The lower end of the bone is beautifully grooved to receive the tooth-like process of the Dentatus.

The Dentatus is the second Vertebra of the Neck. It is eight inches long, and differs from the Atlas both in proportion and function. At its upper end is a tooth-like process, below which the bone is smooth and a little curved towards its articulation with the groove of the Atlas, admitting of a slight rotary motion in that Vertebra.

The whole seven Vertebrae are bound together by strong ligaments. The lower spines, which protect the Gullet and delicate parts of the Throat, form a very important feature of the under surface of the Neck; they are conspicuous in every movement of the animal. The Neck has an easy and graceful action, and is seldom moved quickly. When the creature is restive, the Neck is somewhat distended, and drawn into an angular form, showing the lower spines to perfection; in walking, the Neck is curved and the Head is raised a little above the Shoulder.

In running, the carriage of the Neck is straighter, and the Head thrown forward; the strong tendon attached to the Occiput contracting and yielding at every step forward, which gives a nodding motion to the Head and Neck.

The Muscles are strong and powerful, having powerful tendinous fasciae for their attachment to the spines of the Vertebrae; these again are covered by the expansion of the Platysma, which covers the whole of the Neck and spreads over the Shoulder and part of the Chest.



When the rider calls upon the Camel to stop, the effect upon the Neck is as follows: The under part of the Throat is thrown upwards, showing strongly the spines of the Vertebrae; the Head is drawn back, and the Skin wrinkled about the Lower Jaw. As the Head is drawn still further back, and is much raised above the Shoulder, the Neck increases in thickness, and has its upper surface crowded with wrinkles.

The Camel when tired brings his Head and Neck to the ground, and sleeps in this position. The hair about the Neck, both as to quantity and thickness, varies in different Camels, and must be studied carefully from the creature itself.

From the centre of the Neck the hair ascends, dividing at the wrinkles; and is usually most abundant at the back of the Head, just above the two first Vertebrae. It also grows plentifully beneath the lower jaw, extending about a fourth part down the Neck, where it is twisted and of a curly nature.

The Camel has great power in his Neck, being able to turn it so far back as to rest the Head upon the Shoulder. He can also turn it from side to side with the greatest ease; he can raise it into the air, or bring it in contact with the earth.



## PLATE 3.

## FIRST VERTEBRA OF THE NECK, CALLED ATLAS.

1.—The Atlas as seen with its articulating Plates (5, 5), the surfaces of which meet the rounded surface of the Dentatus, while the tooth-like process enters the Great Foramen (3). 6, Upper Arch. 2, 2, Transverse Spines. 4, 4, Spines protecting the deep Socket which receives the two Condoloid processes of the base of the Skull.

2.—Profile of No. 1. In this view will be seen the proportion which the height (6, 2) bears to the length (5, 4).

3.—The same view, showing the deep cavity for the reception of the two Condoloid processes of the Occiput.

4.—Back view, showing the four Spines protecting the Socket (4, 4). The bone is pierced by two Foramina, while the surface is merely smooth.

5.—Front view. In this view is seen the proportion which the width from Spine to Spine (2, 2) bears to the length from Spine (2) to Spine (4), and also the projection of the upper Spines (4, 4), for the protection of the Socket process.

## PLATE 4.

## SECOND VERTEBRA OF THE NECK, CALLED DENTATUS.

1.—Side view of the Dentatus, so called from its tooth-like process (1), which enters into the Great Foramen of the Atlas, while the smooth round surface (6, 6) articulates with the articulating surfaces of the same bone. 2, Spinous protuberances at the end of the Spinous Ridge, to which is attached a portion of the powerful Tendon of the upper part of the Neck as it descends from the Occiput to the Spines of the Dorsal Vertebrae. 3, 3, Spines, the surfaces of which articulate with those of the third Vertebra. 5, Transverse Spines. 4, Body of the bone articulating with the next Vertebra; Inter-Vertebral substance taken away.



2.—View of the Upper Surface. 1, Tooth-like Process. 6, 6, 6, Articulating Surface. 3, 3, Spine articulating with the next Vertebra. 5, 5, Transverse Spines.

3.—Back View, showing the elevation of the Spinous Protuberance above the body of the bone 2, 2. 3, 3, Spines articulating with the next Vertebra. 5, 5, Transverse Spines. 4, Body, with its rings slightly marked.

4.—Under Surface. This view shows the even surface of the tooth-like process 1, also the division of the Articulating Surface 6, 6, and the grooved form of the Transverse Spines 5, 5. 3, 3, Surfaces articulating with the next Vertebra.

---

PLATE 5.

VERTEBRÆ OF THE NECK.

1.—The Third Vertebra, Side View. The change of character in the different Vertebrae is very marked in this bone. The Spine (2) is small; the Articulating Surface in front always projects in a rounded form, while that at the back is flat, or nearly so. 3, 3, Articulating Processes. 5, 5, Transverse Spines. 6, 6, Anterior Spinous Processes. 1, 1, Processes articulating with the Articulating Spines of the Dentatus.

2.—The Under Side of No. 1, showing the smooth hollow surface for the Gullet, and delicate parts of the Throat, protected by the overhanging Spines 5, 5, 6, 6.

3 and 4.—In these two bones the Articulating Head (4) is set nearer to the Body, while the Spines (6, 6) advance. This is necessary on account of the Curve of the Neck, which is never perfectly straight.

5.—This is the largest bone in the Neck, and of great strength. In outline and proportion it is utterly unlike the others, having Anterior and Posterior Transverse Spines, and also a Transverse Spine on each side of the body of the bone. The Spine (2) is very large, while the Articulating Spines (1, 1) are small. The Posterior (3, 3) large.

6.—The Body (4, 4) in this bone is nearly at right angles to the Spine (2). The Articulating Surfaces (1, 1) are large, and the Anterior and Posterior Transverse Spines (5, 6) small. Spines (3, 3) large.



## PLATE 6.

## DORSAL AND LUMBAR VERTEBRÆ.

1.—Dorsal Vertebra, Side View. This bone has the longest Spine of the whole Vertebra of the Back in proportion to the Body. Each Spine is crowned with a small cap (1), showing the joining at 2. To each of these caps is attached a strong Tendon stretching from Spine to Spine. Each Vertebra is joined to the other by the following Articulating Process (3, 4, 6), on the Posterior side. The process (6) meets the Inter-Vertebral substance between each Vertebra. 5, 10, Articulating Surfaces for the Rib. 7, Foramen for the Spinal Marrow.

2.—Front View of No. 1.

3.—Back View.

4 and 5.—Two Lumbar Vertebra. 1, Spinal Caps. 2, Rough Surface articulating with the next Vertebra. 8, Body of the Bone. 4, Posterior Articulating Surfaces. 11, Inter-Vertebral Substance.

6.—Back View of No. 5.

7.—Front View of No. 5.

8.—Front View of No. 4.

9.—Back View of No. 4.

## PLATE 7.

## THE SCAPULA, OR SHOULDER-BLADE.

1.—The Scapula, Front View as it lies upon the Chest. 1, Its Upper Ridge, with the Tendinous Fascia attached. The bone is nearly divided into two equal parts by a Spinous Ridge, which is beak-shaped at its lower extremity (5). 2, The Neck. 3, Protuberance for the attachment of Muscles. 4, Socket articulating with the Humerus.



2.—Back View, showing the perfectly even surface to which the Sub-scapularis Muscles are attached. 4, The Socket articulating with the Humerus.

3.—The Scapula as seen in profile, showing the Spinous Ridge (5), with the Beak at the Lower Extremity. The thickness of the Neck as compared with the thin flat surface of the upper part is well shown in this position.

---

PLATE 8.

HUMERUS.

1.—Front View of the Humerus. This bone is the most powerful one in the Camel, being the Lever of the Shoulder, upon and over which the great muscles of the Shoulder act. For its position *see* Skeleton in full, Plate 1. 1, Articulating Surfaces joining those of the Scapula. 3, Surface articulating with the Ulna, forming a perfect hinge joint. 2, Protuberance for the attachment of Muscles.

2.—Back View. 1, 4, Surfaces articulating with the Scapula. 3, A Cavity in which the back part of the Ulna, called Olecranon, is received.

3.—Inner Side, showing the peculiar twist of the bone from 4 to 3, and also, the comparative smoothness of the surface lying next to the Chest.

4.—Outer Side. In this view is seen the gentle curve of the bone, and also the preponderance of the Head (1, 4) over the base, articulating with the Ulna. Both at the upper and lower ends of the bone are rough ridges for the attachment of Muscles and Tendinous Fasciæ, and also Foramina into which blood-vessels enter to nourish the bone.

---

PLATE 9.

THE RADIUS AND ULNA, FORE LEG (LEFT).

1.—The Ulna, Front View. 1, The Olecranon. 2, Ridge for the attachment of Muscles. 3, The Cavity receiving the Lower Articulating Process of the Humerus. 4, Shaft of the Radius. 5, External Condyle. 7, Internal Condyle. 6, Surfaces articulating with the Carpus.



2.—Back View. In this View is seen the curve the bone takes from the Olecranon (1) to the flatter surface of its lower extremity (6, 6).

3.—External Side.

4.—Internal Side.

---

### PLATE 10.

#### THE CARPUS.

1.—Front View. The Carpus is composed of seven bones, all of which are seen in this View (1, 2, 3, 4, 5, 6, 7). 8, Metacarpul Bone. 9, Lower Extremity of the Ulna.

2.—Back View.

---

#### THE TARSUS.

1.—External Side. The Tarsus is composed of eight bones. 1, Os Calcis. 2, The Astragalus. 3, Os Cuboides. 15, Lower Extremity of the Femur. 4, Metatarsal bone.

2.—Internal Side. 5, 6, 7, Ossa Cuneiformia. 3, Os Cuboides.

3.—Front View. One half natural size.

4.—Back View. One half natural size.

---

### PLATE 11.

#### METACARPUS AND FOOT, FORE LEG (LEFT).

1.—Front View, showing its smooth surface and slender proportions, its division into two equal parts, and the Articulating Hinge Joints at (2, 2), meeting the Articulating Surfaces of the Phalanges (8, 8). 3, 3, Surfaces articulating with the Carpus. 7, 5, 8, Phalanges. 4, 6, Articulating Surfaces.



2.—External Side View of Metacarpus, showing the Hinge Joints (2, 2), as they articulate with the first bones of the Phalanges. 9, Spinous Ridge for the protection of the tendon descending to the foot.

3.—Back View of Metacarpus, showing the Spinous Ridges (9, 9), and the grooved surface upon which the tendon descends to the foot. 2, 2, Back surfaces of articulating joint, divided in the centre by a raised ridge, on either side of which is fixed a small sesamoid bone, acting as groove for the tendons of the Phalanges.

---

## PLATE 12.

### THE PELVIS.

1.—The Pelvis, Side View. 1, The Ilium. 8, Posterior Spine. 2, The Os Sacrum. 4, Acute Process of the Ischium. 5, The Os Pubis. 6, The Acetabulum. 9, The Great Foramen of the Ischium and Pubes.

2.—Back View. 10, 10, Those parts of the Sacrum joined to the Ossa Ilii. 11, 11, Two processes of the Os Coccygis. 7, Os Ischii. 12, 13, Foramina of the Sacrum.

3.—Front View of the Pelvis.

---

## PLATE 13.

### FEMUR, OR THIGH-BONE.

1.—The Femur, Front View. 1, The Head, ball-shaped and deeply set in the Socket of the Pelvis. 2, The Neck, short and strong. 3, Great Trochanter to receive the powerful Muscles of the thigh. 4, Lesser Trochanter. 5, The Shaft. 6, Inner Condyle. 7, Outer Condyle. 8, Articulating surface for the Patella or Knee-Pan.

2.—Back View, showing the back of the bone divided by Rough Spinous Ridges for the attachment of Muscles. 10, Foramen for the Central Ligament. 9, 9, Condylod Articulating Processes.



3.—The External Side, showing the Great Trochanter (3) in full; also the Curved Line the Bone takes from the Head to the Condyles (9, 9). The External Condyle, which is lower than the Internal.

4.—Internal Side.

---

PLATE 14.

THE STERNUM AND RIBS.

1.—Bones of the Sternum, 1, 2, 3, 4, 5, 6; the 7th piece is not seen in this Plate; *see* Sternum complete (Plate 19). 2, 2, 3, 3, Articulating Surfaces, the interstices between which are filled with Cartilaginous Substance.

2.—The First Rib, Back View. 1, The Head, and (2) Articulating with the Vertebra. 3, The Neck. 4, Articulating with the Sternum.

3.—The First Rib, Front View.

4.—Second Rib, External Side.

5.—Second Rib, Internal Side.

6.—The Broadest Rib, External Side. 5, Ridges to which the Interosseous Ligament is attached.

7.—Internal Side.

8.—The Longest Rib, External Side.

9.—Internal Side of (8).

10.—Part of Longest Rib (8), Natural Size, Internal Side. 1, The Head, showing the Articulating Surface in full. 3, The Neck. 6, The smaller Articulating Surface. 2, The larger Articulating Surface, which is nearly flat and smooth. 7, Angle, with part of Groove. This Groove is seen fully in (7) at 7, running down from the Articulating Surface (2). 8, Ridge to which is attached the powerful Ligament binding the Rib to the Vertebrae.



## PLATE 15.

## THE TIBIA AND PATELLA, HIND LEG (LEFT).

1.—The Tibia, Front View. 1, Two Central Spines. 9, Articulating Surfaces to receive those of the Femur or Thigh-Bone. 2, 2, The Condyles. 3, The Shaft, compact and strong. 5, Inner Condyle, which is the longest and largest, overhanging and protecting this part of the Hock Joint. 6, Articulating Surfaces to receive the Hock Joint.

2.—Back View, showing the Articulating Surfaces (9), ending in the two Spines at (1), the Internal Articulating Surface being the largest. The Back of this bone is free from Spinous Ridges, and more or less flat and even.

3.—External Side. This View shows the general contour of the Tibia and the preponderance of bone at the upper part (8, 7), with the Condyle sending a Spinous Ridge down the Shaft, which ends a little below the Middle. 8, Articulating Surface upon which the Patella Glides. *See Bone (1), Front View.* The External Condyle is divided into two parts (4, 6); from the centre of each of these a small Ridge ascends. The Internal Condyle is important in drawing, and should be watched with care in the living animal.

4.—Internal Side, showing a larger surface of Condyle (7), also the comparatively Smooth Surface of the Shaft. The Condyle at the Lower Extremity (5) sends down a projecting protuberance; it is also grooved for the passage of ligaments.

## THE PATELLA, OR KNEE-PAN.

1.—The Patella, Front View. This bone is  $3\frac{1}{2}$  inches in length and  $1\frac{1}{2}$  inch in width; it is rough in texture and has its Frontal Surface pierced with numerous foramina.

2.—External Side.

3.—Back View.

4.—Internal Side.



## PLATE 16.

## METATARSAL BONES AND PHALANGES, HIND LEG (LEFT).

1.—Front View. 1, Tooth-like Process. 2, 2, Articulating Surfaces, joining those of the Tarsus. 3, Shaft. 6, 6, Articulating Surfaces, upon which the first bones of the Phalanges play. 7, 8, Phalanges. 4, 5, Sesamoid Bones. 5, 5, Ditto, ditto, in their proper position joined together. 5x, Sesamoid Bone, Side View, removed a little from the Articulating Surface of the Metatarsal Bone. 4\*, 5\*, Back View of Sesamoid Bones.

2.—Side View of Metatarsal Bone and Phalanges.

3.—Back View of Metatarsal Bone and Phalanges.

9, 10, Sesamoid Bone, Natural Size. 10x, Side View, ditto ditto. 10, 11, Back View.

## PLATE 17.

## BONES OF THE STERNUM AND TAIL.

1.—The Sternum, Side View. 1, Portion to which the First Ribs are attached. 2, 3, 4, 5, 6, 7, Each of these Bones is joined to its fellow by Cartilaginous substance. 8, 8, Cartilage joining the Sternum to the Ribs. 7 is the part of the Sternum upon which the Camel rests.

2.—First two Bones of the Sternum, Front View. 1, 2, Bones of the Sternum. 9, 9, Ribs.

3.—Bones of the Tail.



PLATE 18.

THE CARPUS, NATURAL SIZE.

1.—External Side.

2.—Internal Side.

---

PLATE 19.

THE TARSUS, NATURAL SIZE.

1.—External Side.

2.—Internal Side.



## PROPORTIONS OF CAMELS.

---

### PRINCIPAL MEASUREMENTS.

---

#### CAMEL No. 4.

The Head, 2 feet long and 1 foot deep.  
Full length, from Shoulder to Tail, 5 feet 8 inches.  
Fore Leg, full length, 4 feet 4 inches.  
Hind Leg, full length, 4 feet 4 inches.  
Full Height, from the top of the Hump to the sole of the  
Foot, 7 feet.

---

#### CAMEL No. 5.

Head, full length, 1 foot 6 inches; depth, 10 inches.  
From Shoulder to Tail, 5 feet.  
Full height, 6 feet.  
Fore Leg, full length, 3 feet 8 inches.  
Hind Leg, full length, 3 feet 8 inches.

---

#### CAMEL No. 6.

*This Camel was two years old, and brown.*

Head, length, 1 foot 3 inches.  
Full length, from Shoulder to Tail, 3 feet.  
Fore Leg, full length, 2 feet 10 inches.  
Hind Leg, full length, 2 feet 10 inches.  
Full height, from the top of the Hump to the sole of the  
Foot, 4 feet 8 inches.



## CAMEL No. 7.

Head, full length, 1 foot 10 inches.  
 Full length, from Shoulder to Tail, 5 feet.  
 Fore Leg, 3 feet 8 inches.  
 Hind Leg, 3 feet 8 inches.  
 Full height, 6 feet 6 inches.

---

## CAMEL No. 8.

Head, full length, 1 foot 9 inches.  
 From Shoulder to Tail, 4 feet 8 inches.  
 Fore Leg, 3 feet 8 inches.  
 Hind Leg, 3 feet 8 inches.  
 Full height, 6 feet 5 inches.

---

## DROMEDARY.

Head, length, 1 foot 9 inches; width, 1 foot 2 inches.  
 From Shoulder to Tail, 4 feet 11 inches.  
 Fore Leg, 4 feet.  
 Hind Leg, 4 feet.  
 Full height, 6 feet 6 inches.

---

## CAMEL No. 9.

Head, full length, 1 foot 10 inches; width, 1 foot 2 inches.  
 From Shoulder to Tail, 5 feet 5 inches.  
 Fore Leg, 4 feet.  
 Hind Leg, 4 feet.  
 Full height, 7 feet.



CAMEL NO. 11. SYRIAN CAMEL.

Head, full length, 2 feet.  
 From Shoulder to Tail, 5 feet 3 inches.  
 Fore Leg, 4 feet.  
 Hind Leg, 4 feet.  
 Full height, 7 feet.

---

FEMALE DROMEDARY.

Head, 1 foot 8 inches; width, 1 foot.  
 From Shoulder to Tail, 4 feet 10 inches.  
 Fore Leg, 3 feet 8 inches.  
 Hind Leg, 3 feet 8 inches.  
 Full height, 6 feet 2 inches.

---

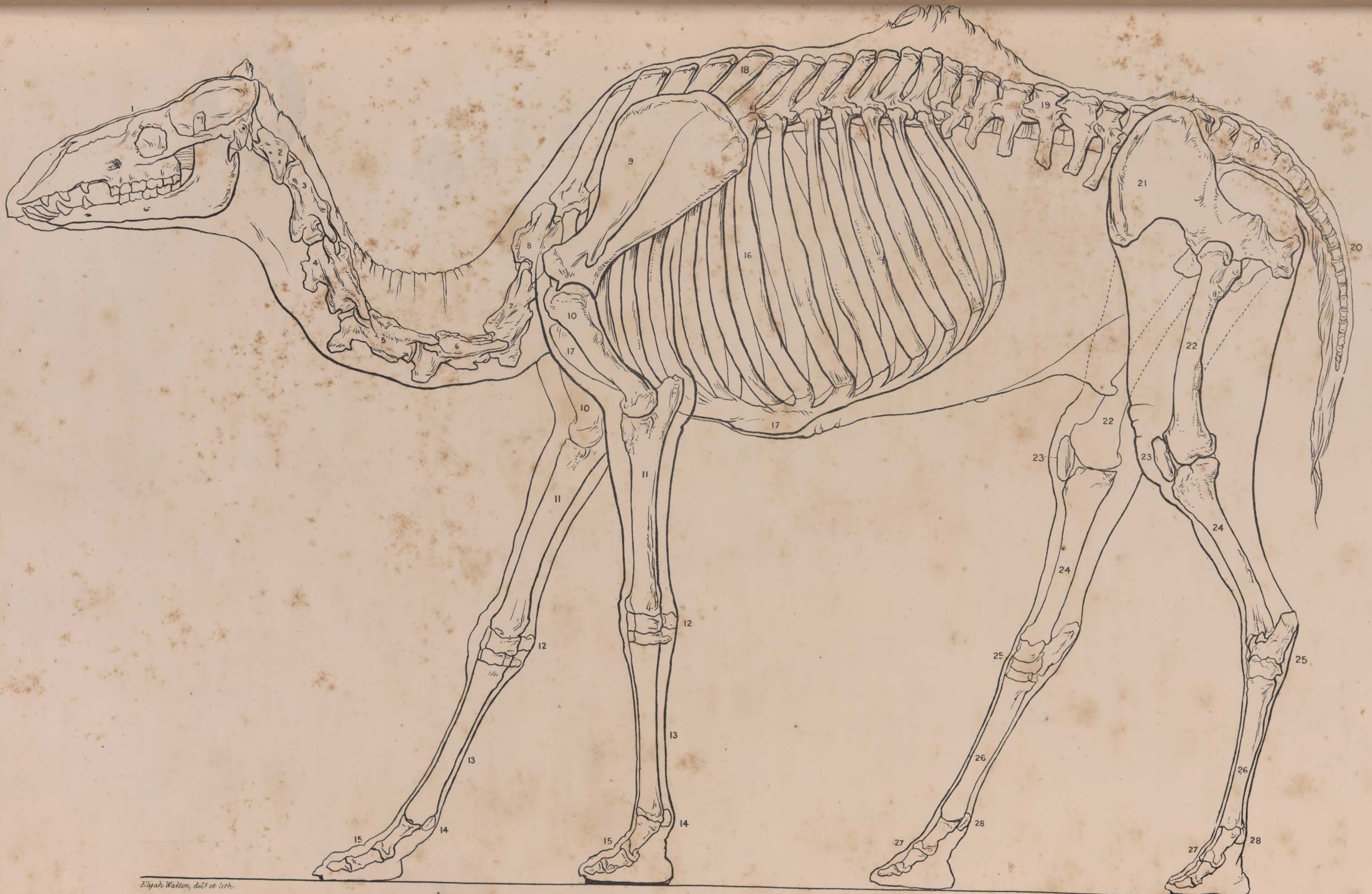
FEMALE BACTRIAN CAMEL,

*In the Zoological Gardens, Regent's Park.*

Head, full length, 2 feet 4 inches.  
 From Shoulder to Tail, 6 feet 1 inch.  
 Fore Leg, equally divided at the Wrist, 3 feet 2 inches.  
 Hind Leg, 3 feet 2 inches.  
 From top of Humps to the soles of the Feet, 7 feet 5 inches.

THE END.





*Elijah Walton, del. et lith.*

SCALE  
0 1/2 1 2 FEET

THE SKELETON.

*Day & Son, Lith. to the Queen*

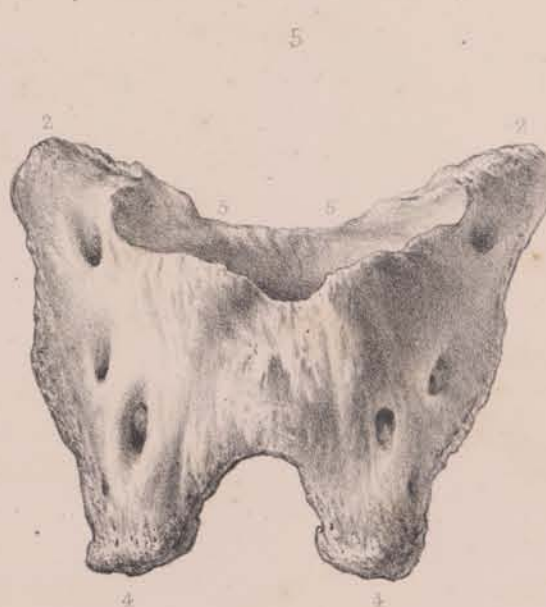






# FIRST VERTEBRA OF THE NECK

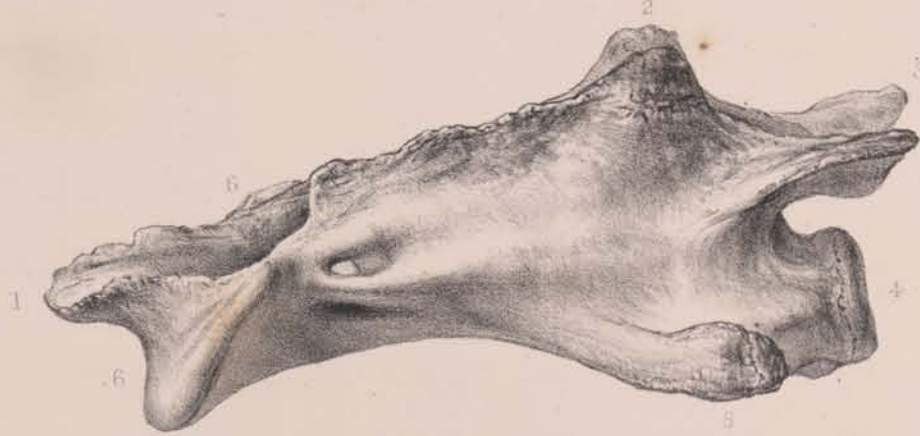
ONE HALF NATURAL SIZE





SECOND VERTEBRA OF THE NECK

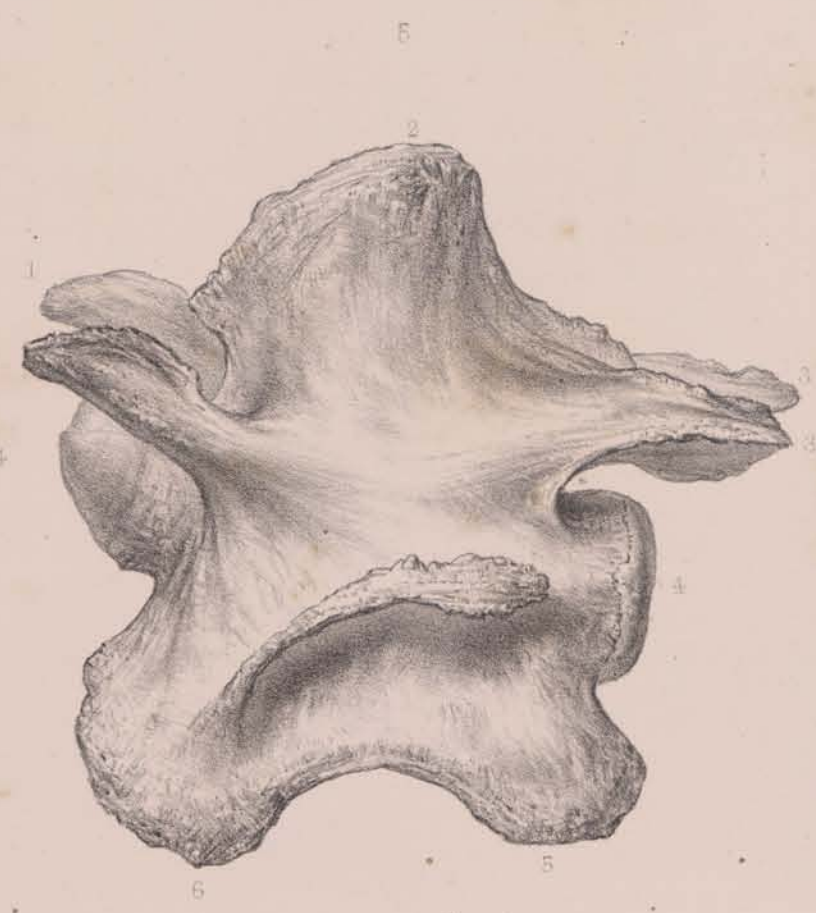
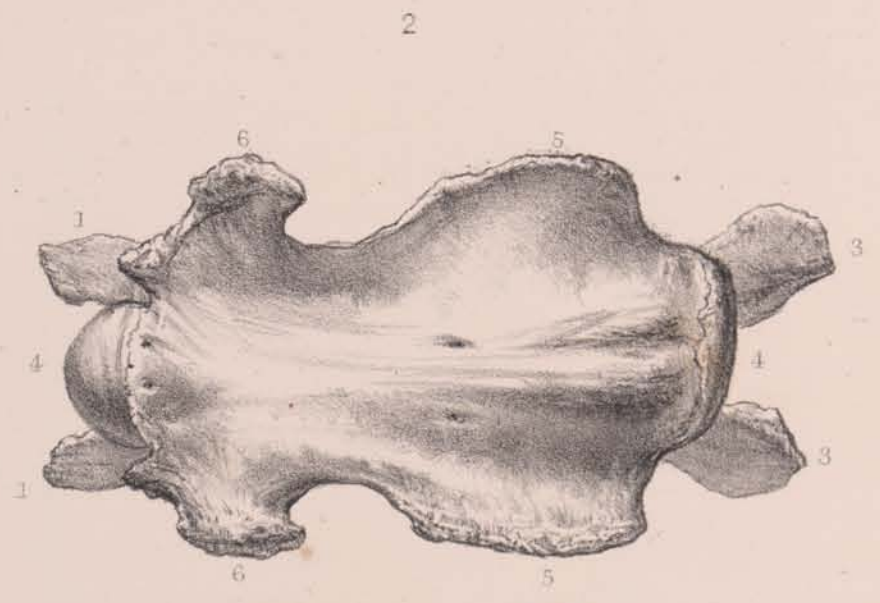
ONE HALF, NATURAL SIZE.





VERTEBRÆ OF THE NECK

HALF NATURAL SIZE





VERTEBRÆ OF THE BACK AND LOINS

1



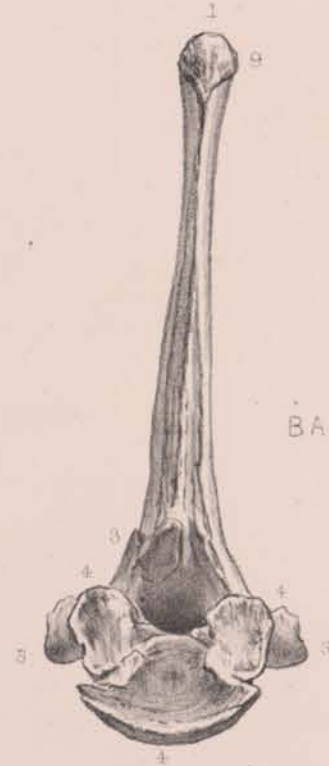
VERTEBRA OF THE BACK  
SIDE VIEW

2



FRONT VIEW

3



BACK VIEW

4



VERTEBRÆ OF THE LOINS

6



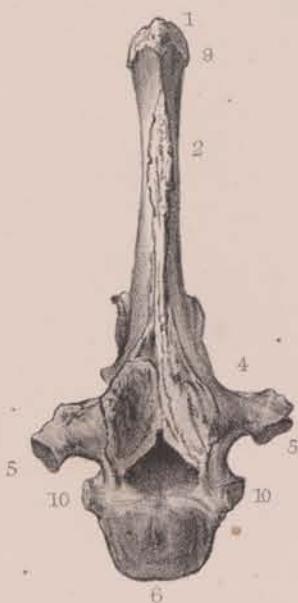
BACK VIEW

7



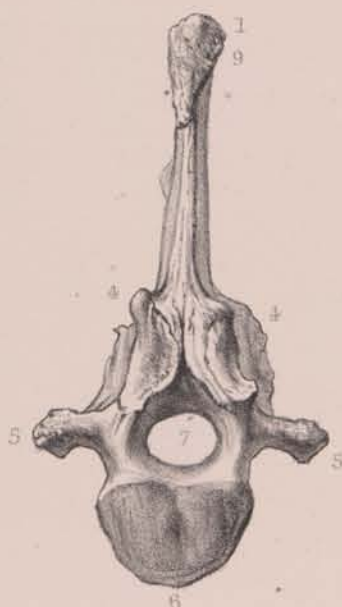
FRONT VIEW

8



FRONT VIEW OF 4

9



BACK VIEW



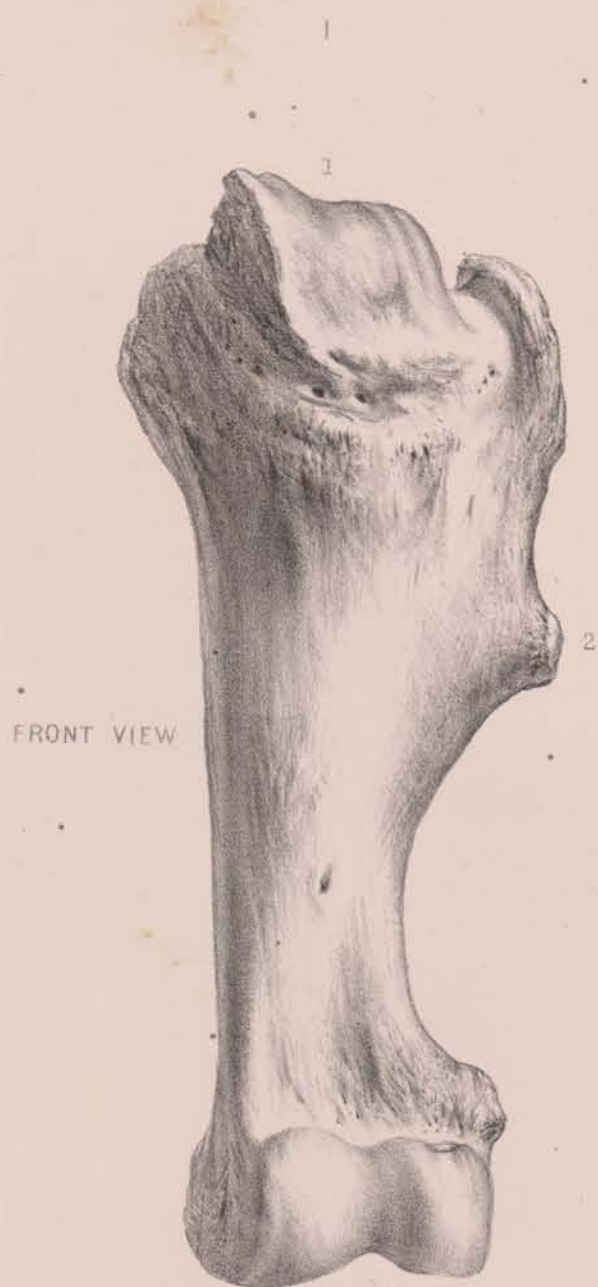
# THE SCAPULA

ONE FOURTH NATURAL SIZE





THE OS HUMERI



FRONT VIEW



BACK VIEW



INNER SIDE



OUTER SIDE



RADIUS  
AND  
THE ULNA . FORE LEG LEFT .

ONE FOURTH NATURAL SIZE



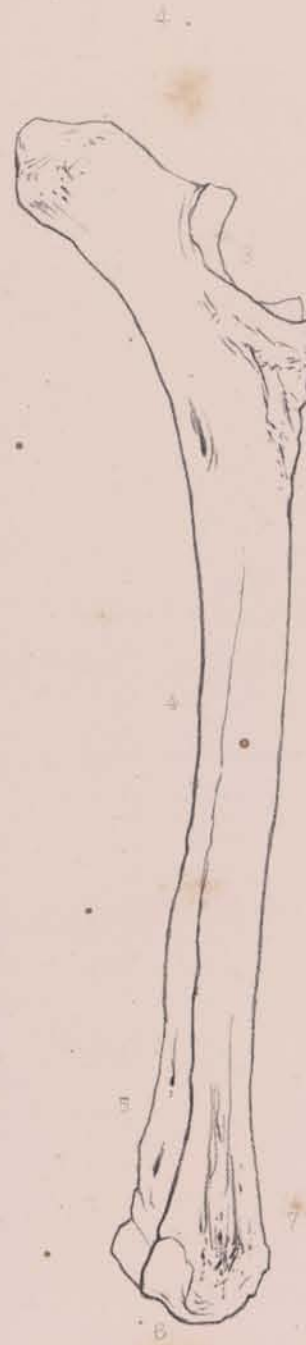
FRONT VIEW



BACK VIEW

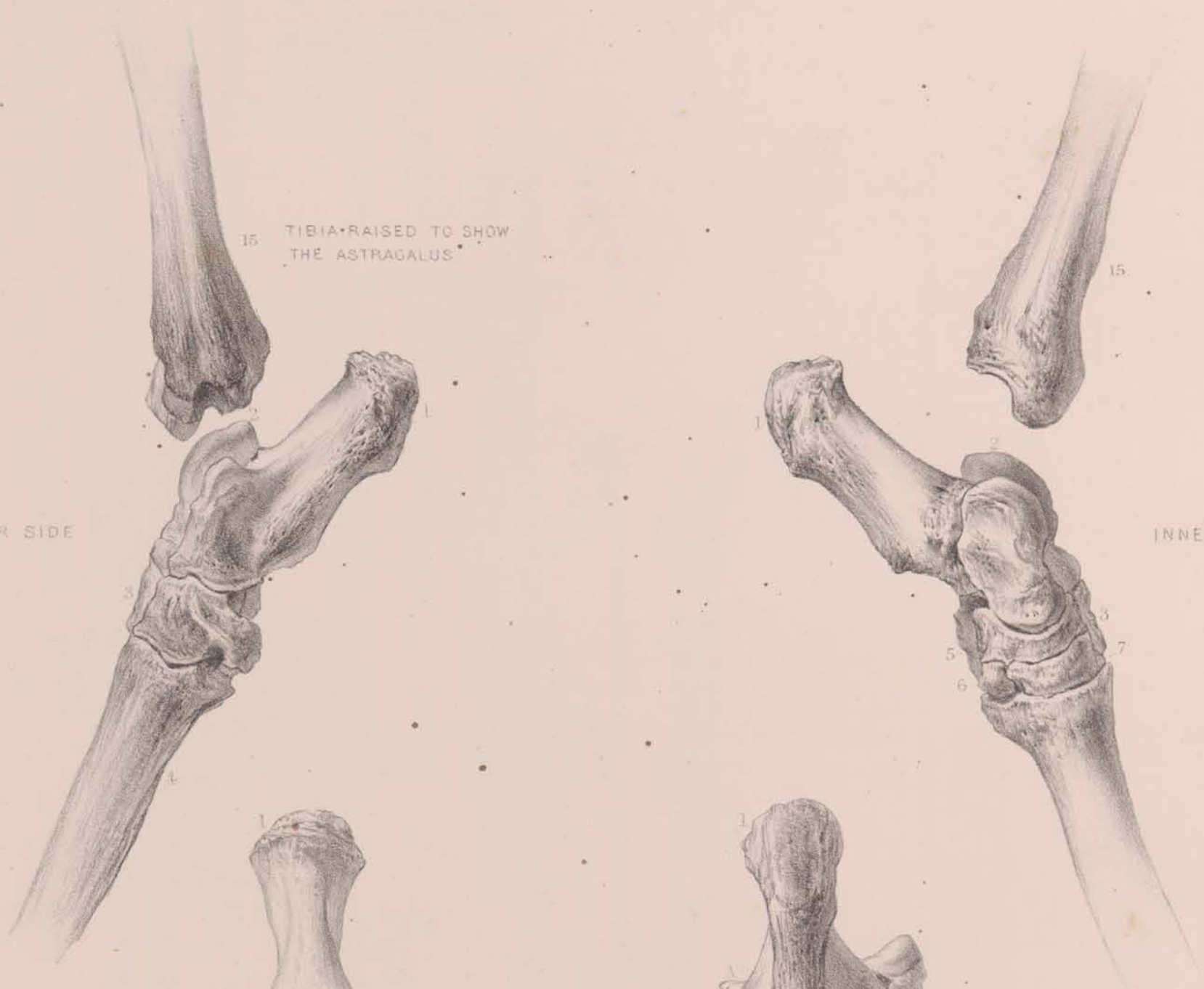


OUTER SIDE



INNER SIDE





OUTER SIDE

INNER SIDE



FRONT VIEW

A SMALL BONE REMOVED FROM A

ONE HALF REAL SIZE.



BACK VIEW

THE CARPUS.

ONE HALF NATURAL SIZE.



FRONT VIEW



BACK VIEW

TARSUS.

- 1 Os Calcis
- 2 " Astragalus
- 3 " Cuboides
- 4 " Metatarsus
- 5 " Naviculare
- 6 " Ecto Cuneiforme
- 7 " Meso Cuneiforme

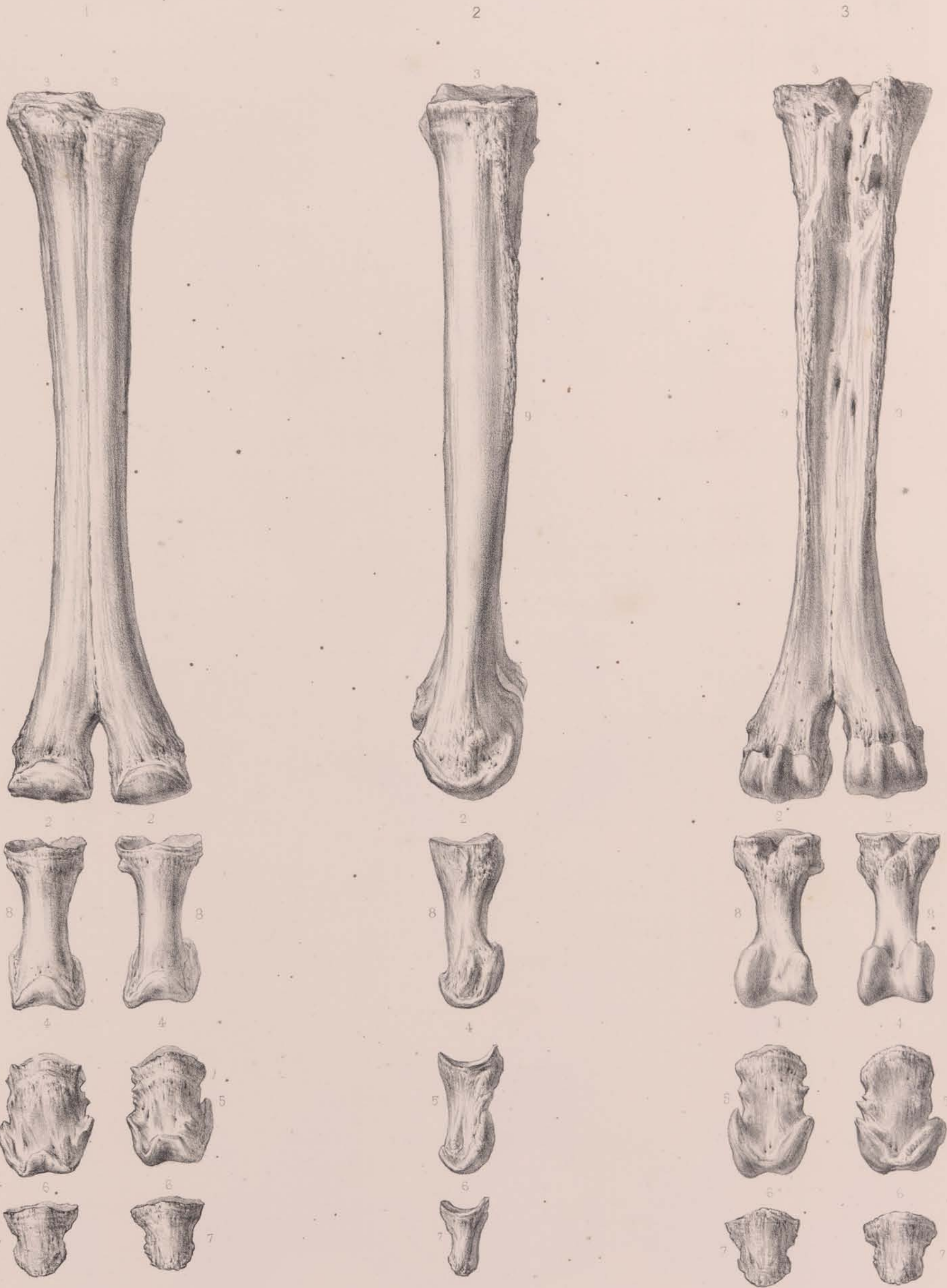
CARPUS.

- 1 Os Scaphoides
- 2 " Semilunare
- 3 " Cuneiforme
- 4 " Unciforme
- 5 " Magnum
- 6 " Trapezoides
- 7 " Proiforme
- 8 " Metacarpus
- 9 " Radius



# METACARPUS.

FORE FOOT LEFT HALF THE NATURAL SIZE.



FRONT VIEW

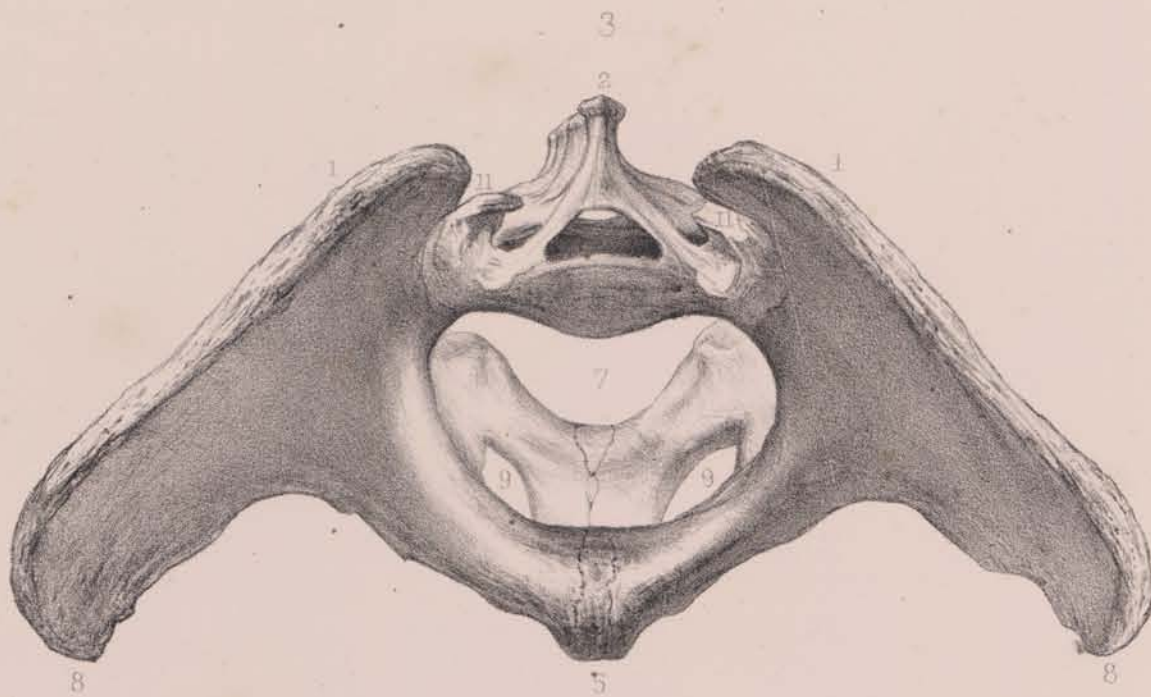
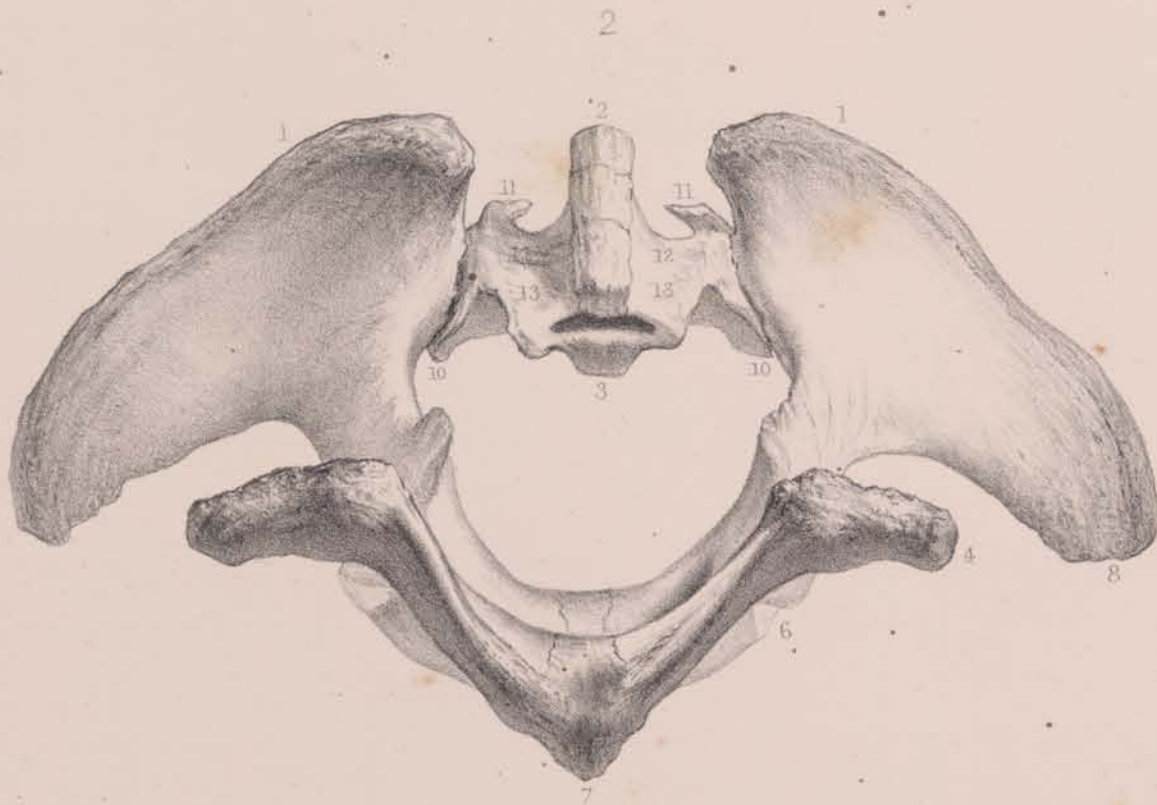
SIDE VIEW

BACK VIEW



# THE PELVIS

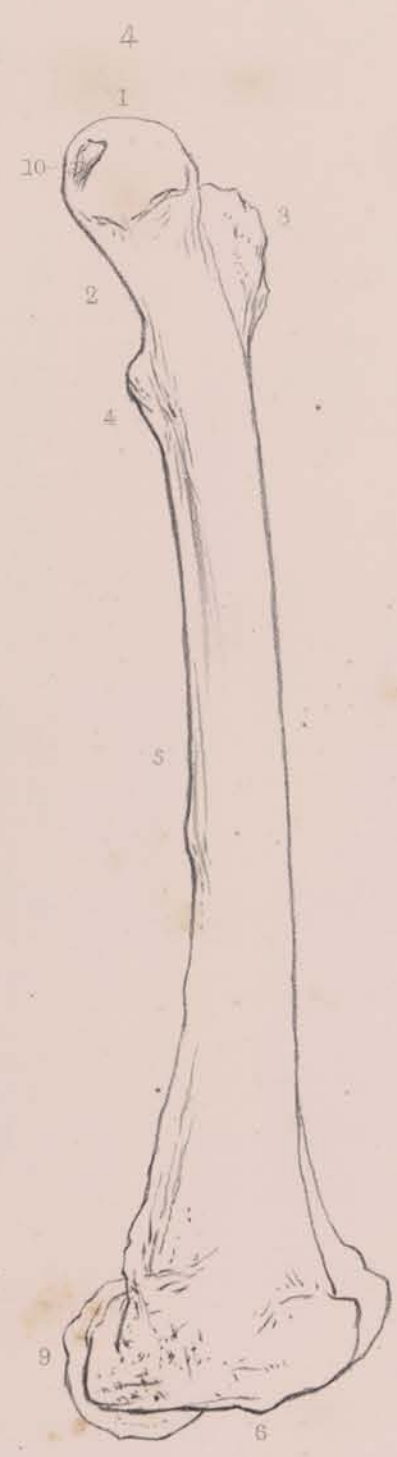
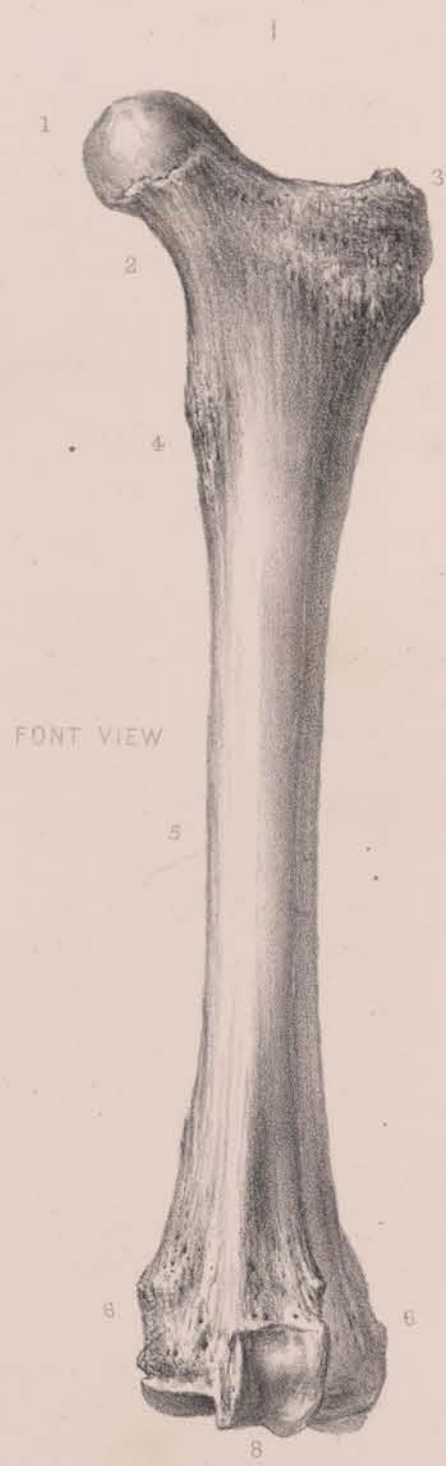
ONE THIRD NATURAL SIZE





# FEMUR OR THIGH BONE

ONE THIRD NATURAL SIZE





# THE STERNUM & RIBS

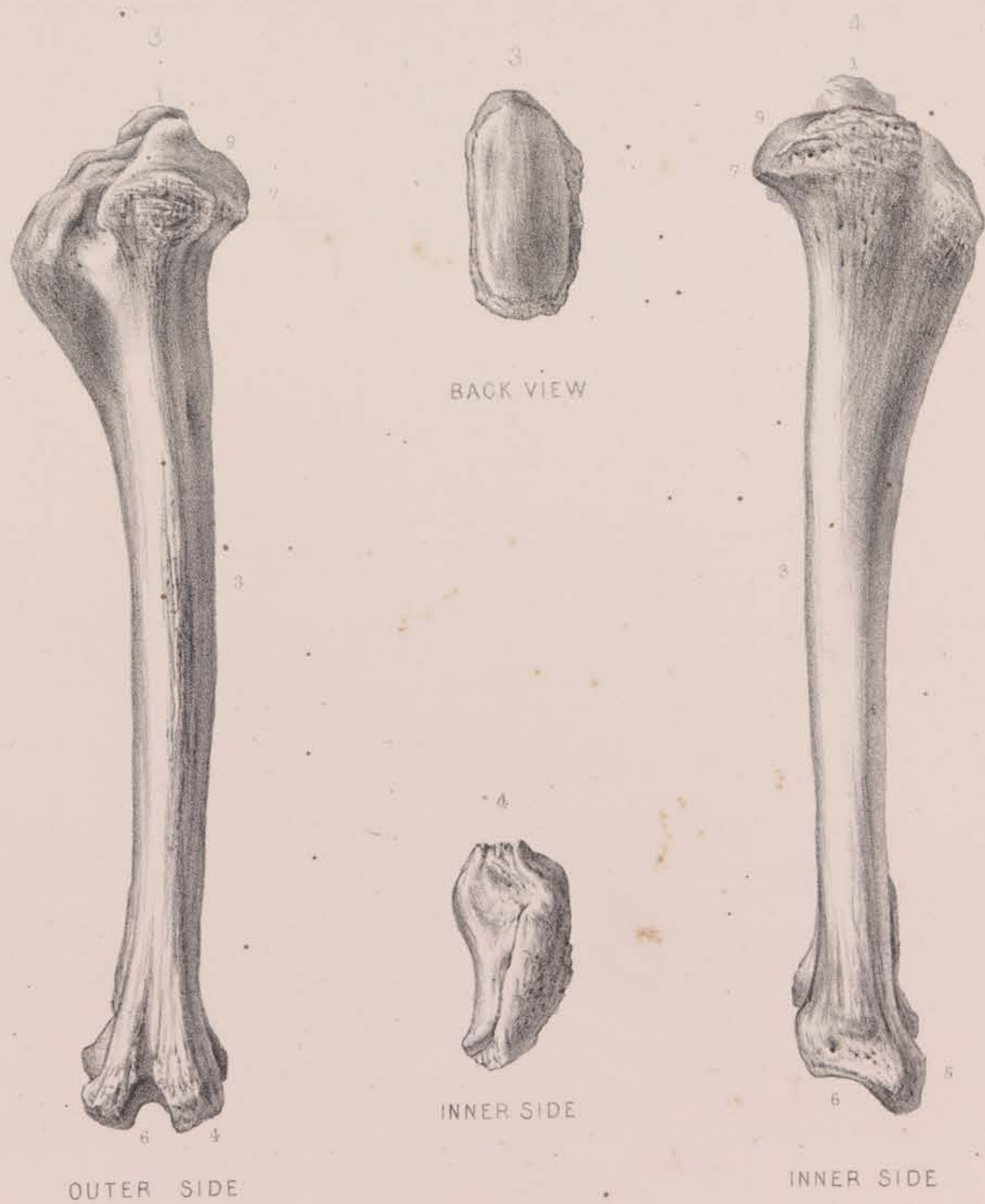
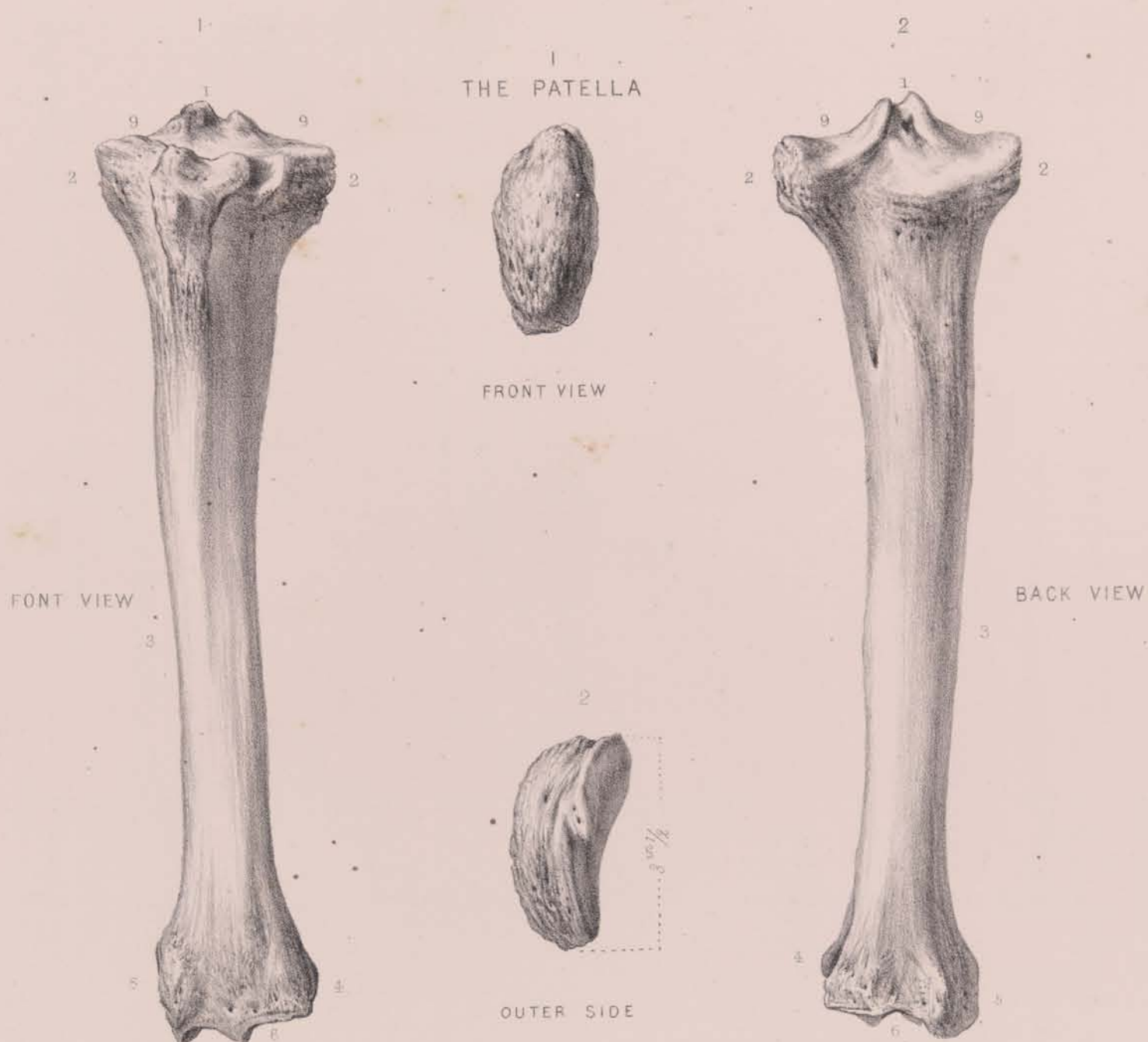
THE THIRD NATURAL SIZE





# THE TIBIA.

ONE THIRD NATURAL SIZE





# METATARSAL BONES & PHALANGES

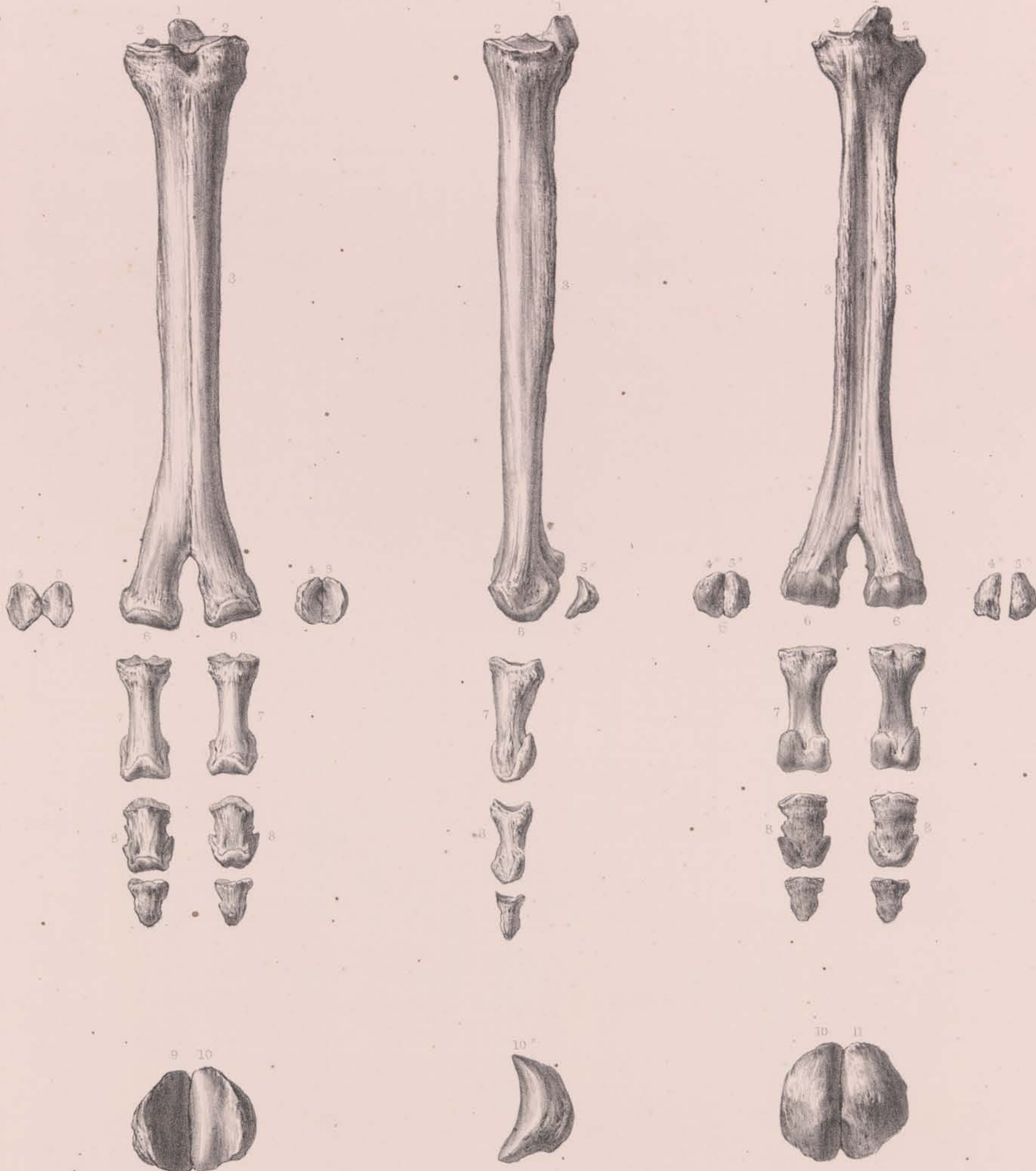
ONE THIRD NATURAL SIZE

HAND - LEG LEFT

1  
FRONT VIEW

2  
EXTERNAL SIDE

3  
BACK VIEW



NATURAL SIZE



THE STERNUM AND BONES OF THE TAIL





BONES OF THE CARPUS.  
NATURAL SIZE.

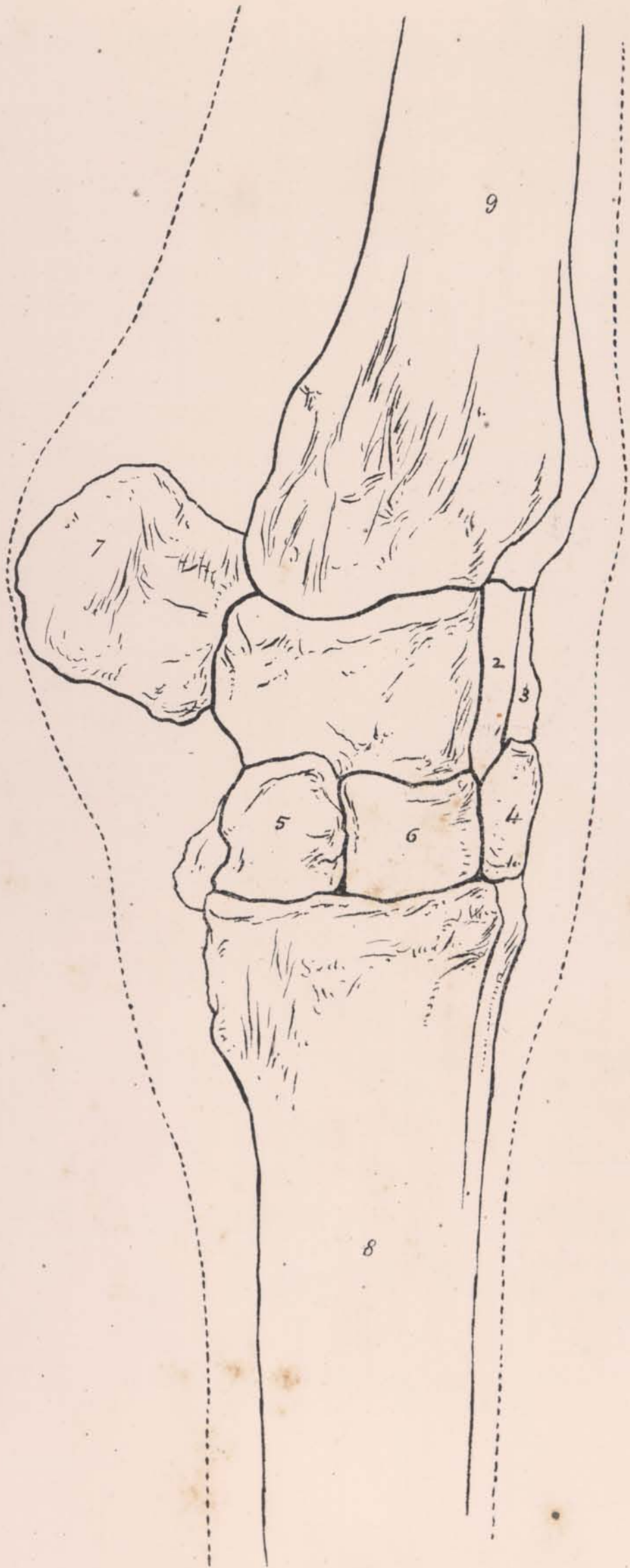
1.

OUTER SIDE



2.

INNER SIDE

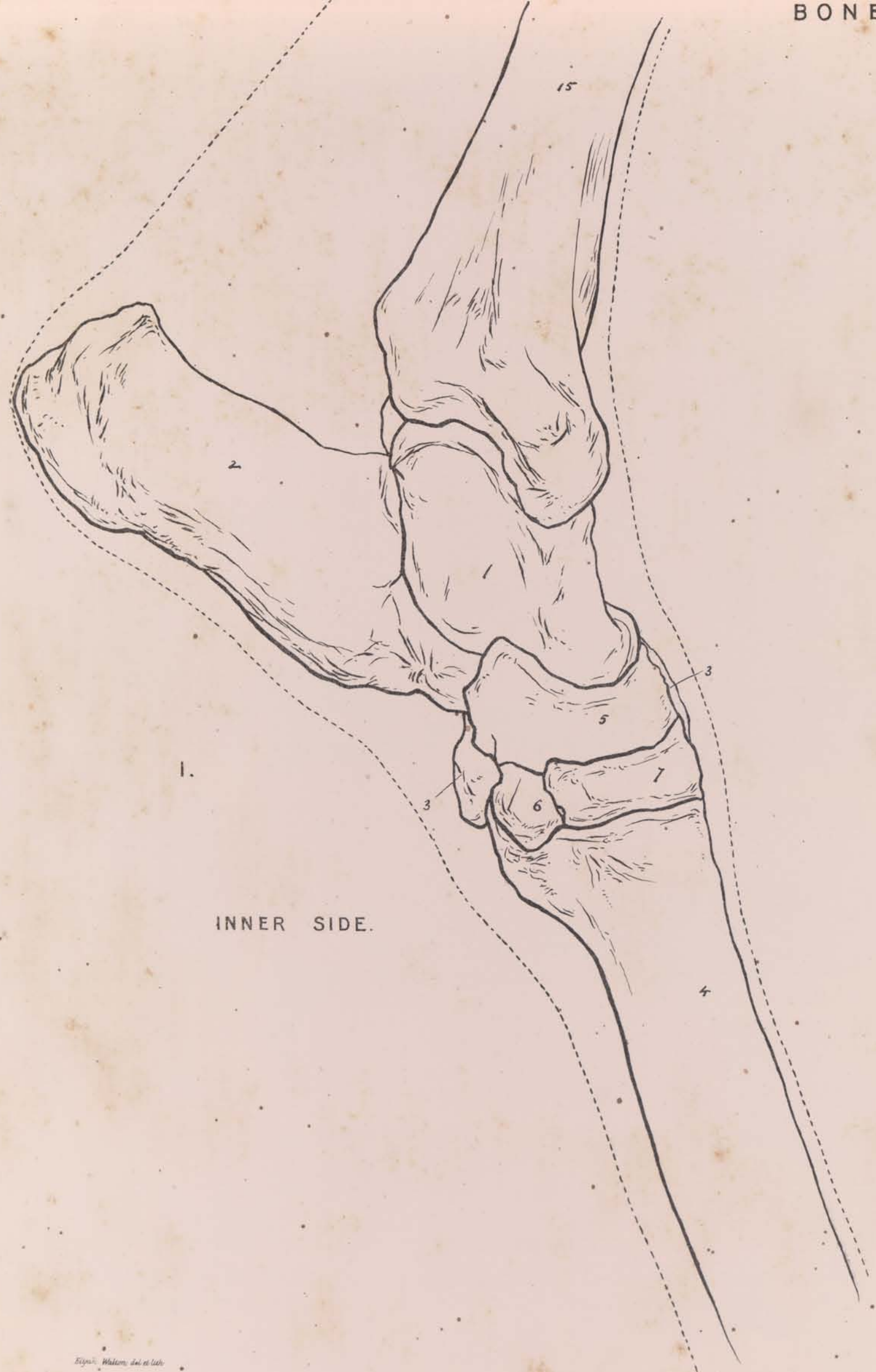


Digit. Museum. Acad. Lib.

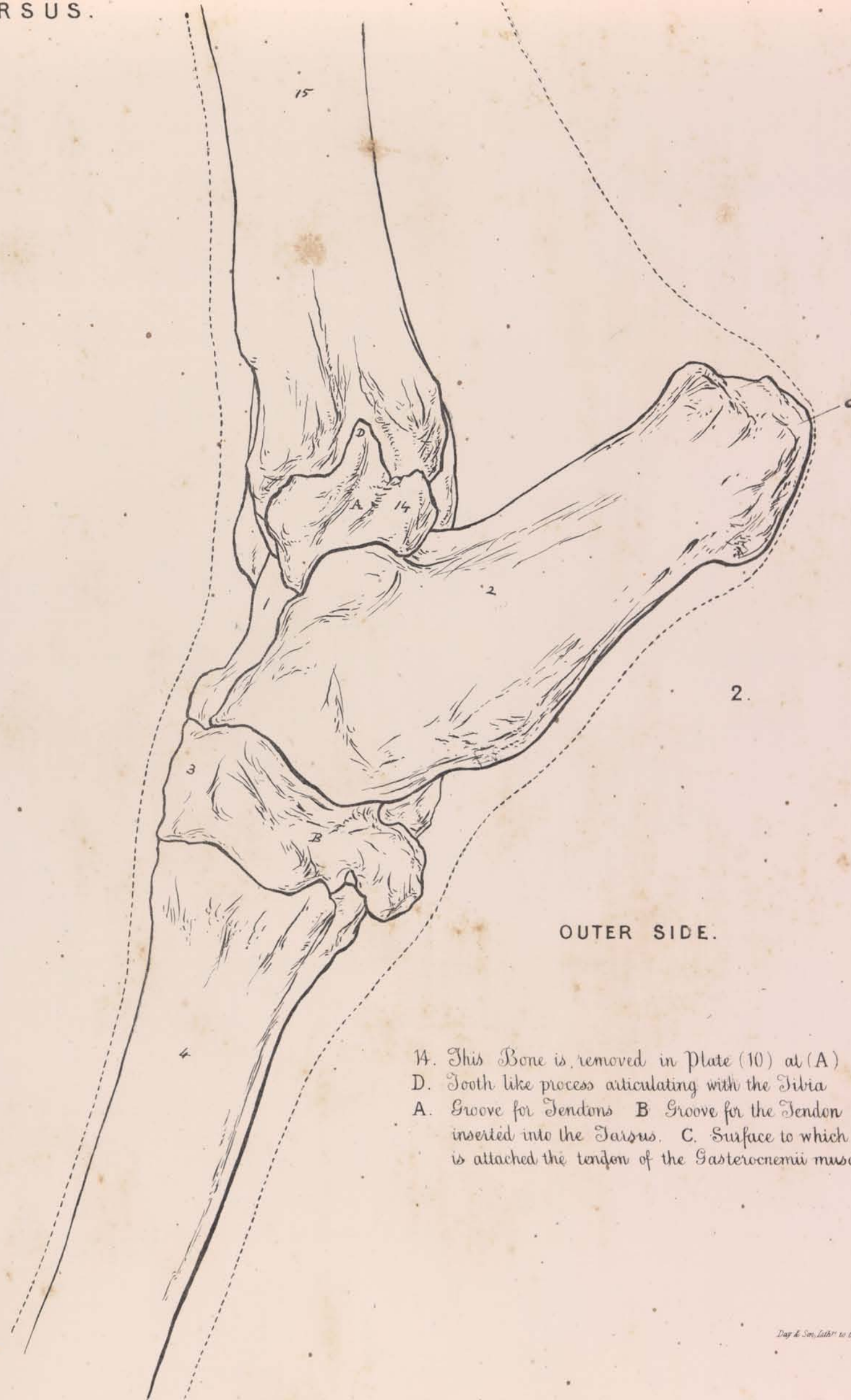
Digit. Lib. Univ. de Bonn



BONES OF THE TARSUS.  
NATURAL SIZE.



INNER SIDE.



OUTER SIDE.

14. This Bone is removed in Plate (10) at (A)  
 D. Tooth like process articulating with the Tibia  
 A. Groove for Tendons B Groove for the Tendon  
 inserted into the Tarsus. C. Surface to which  
 is attached the tendon of the Gastrocnemii muscle.

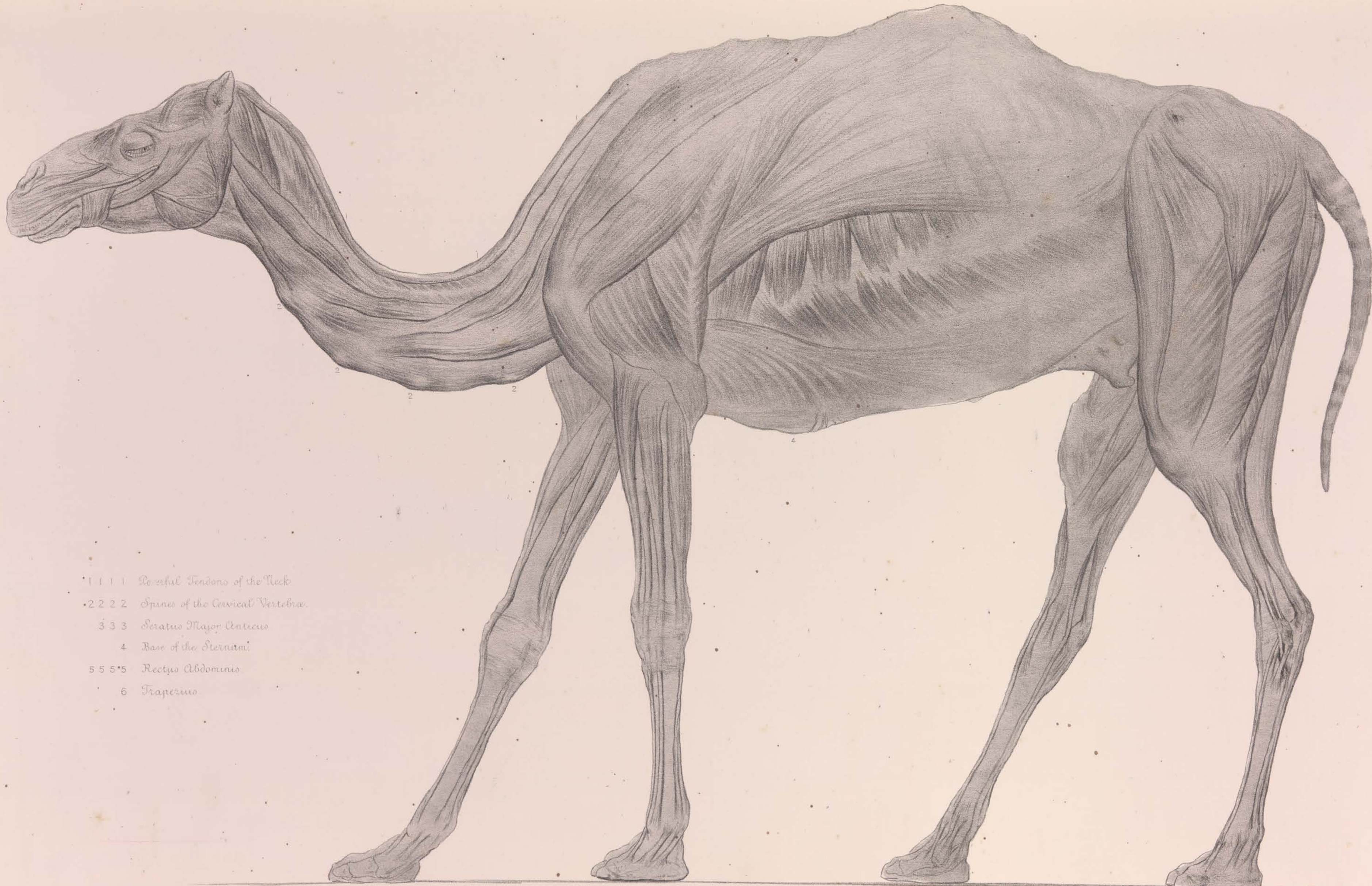


FRONT VIEW.



- 1 1 Powerful Tendon of the Neck, arises from the base of the Cranium, and is inserted into the Spines of the Dorsal Vertebrae.
- 2 2 2 Spines of the Vertebrae of the Neck.
- 3 3 3 Points of the Sternum.
- 4 4 The two Pectoral Muscles.
- 5 5 Tendon of the Extensor Carpi Ulnaris inserted at \*



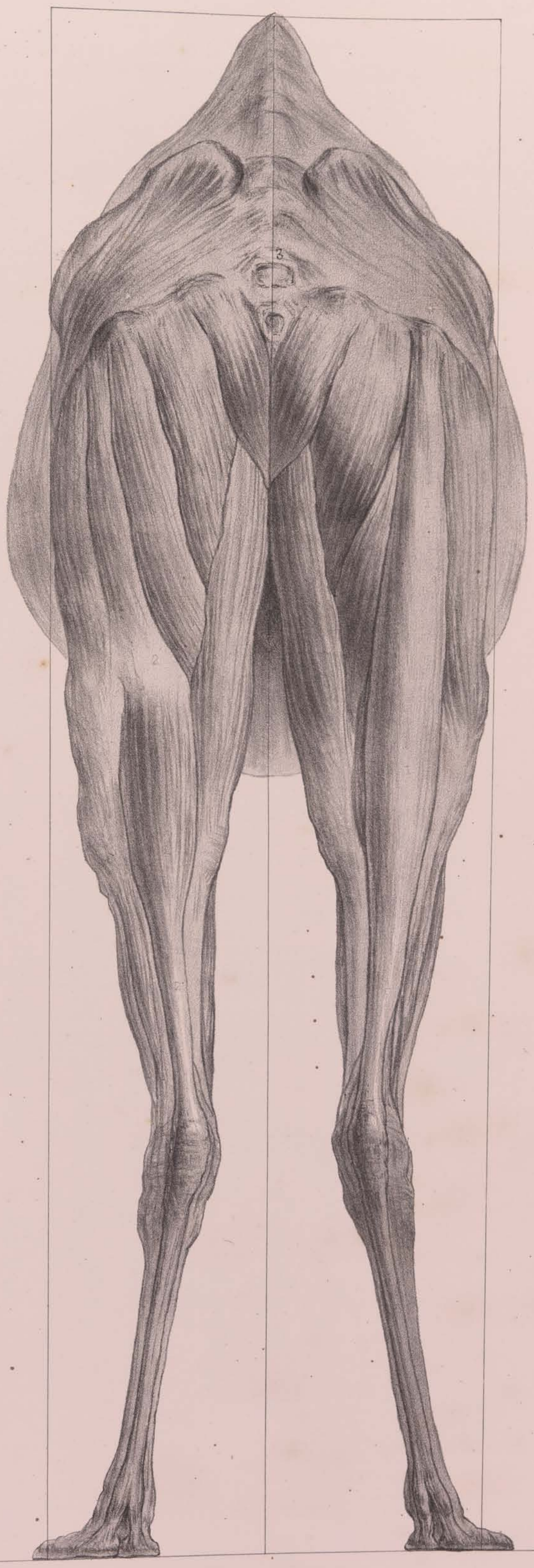


- 1 1 1 1 Powerful Tendons of the Neck
- 2 2 2 2 Spines of the Cervical Vertebrae.
- 3 3 3 3 Serratus Major Anticus
- 4 Base of the Sternum.
- 5 5 5 5 Rectus Abdominis
- 6 Trapezius

EXTERNAL MUSCLES AND TENDONS.



BACK VIEW



- 1 1 1 Powerful Tendinous Fascia arising from the point \* and extending over the whole of the Gastrocnemius muscle
- 2 2 2 Tendinous Fascia Cut away to show the Gastrocnemius muscle.
- 3 Tail Cut away





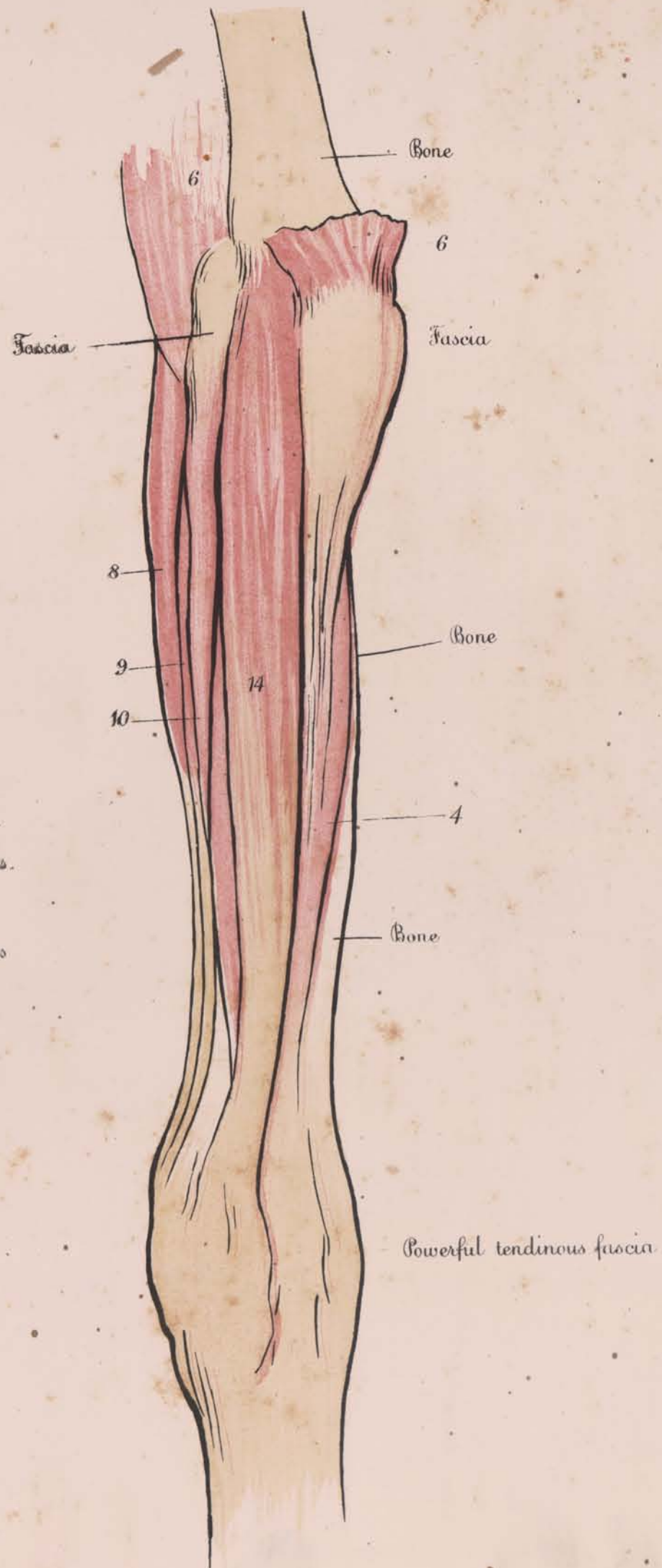
- Hx.* The Orbicular Muscle of the Mouth.  
*B. G.* Lateral dilator of the upper lip & nostril.  
*F.* Depressor Anguli Oris.  
*E.* Zygomatic Muscle, arises from 3.3.  
*D.* Buccinator.  
*K.* Masseter Muscle, arises from *H.H*  
*J.* Temporal Muscle.  
*L.* The Parotid Gland.  
*Ex.* Nasal Muscle.  
*14. 14.* Branch of the External Carotid Artery passing to the face.  
*4.4.4.* Carotid Artery covered by a tendinous sheath.  
*P.P.* Orbicularis Oculi.

*Elijah Walton, del. et lith.*



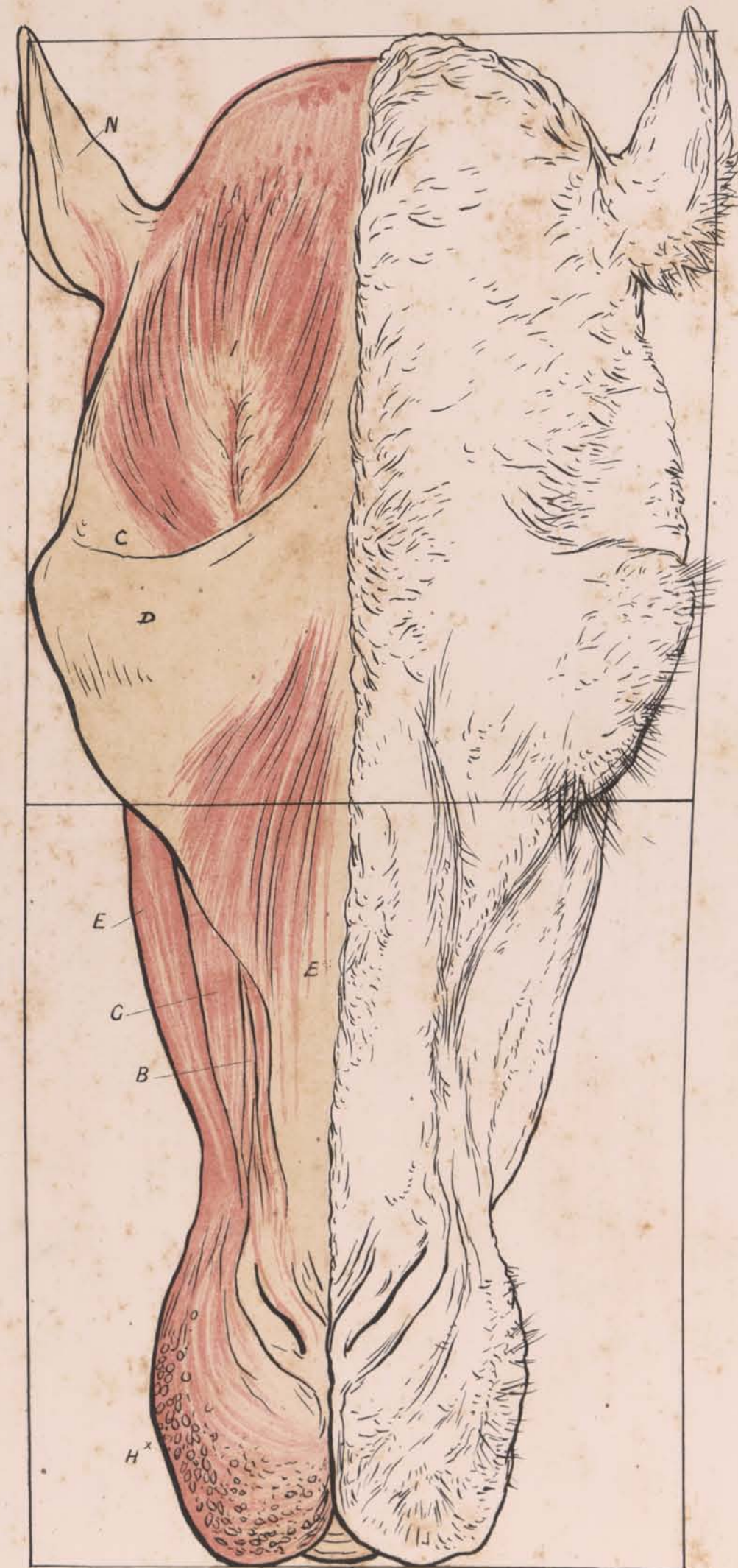
**LEFT ANTERIOR  
EXTREMITY  
BACK VIEW**

- 6 Triceps brachii cut away.
- 14 Flexor Metacarpi Externus.
- 8 Extensor Metacarpi magnus.
- 9 Extensor Pedis.
- 10 Extensor Ovis Suffraginis.
- 4 Flexor Medius.



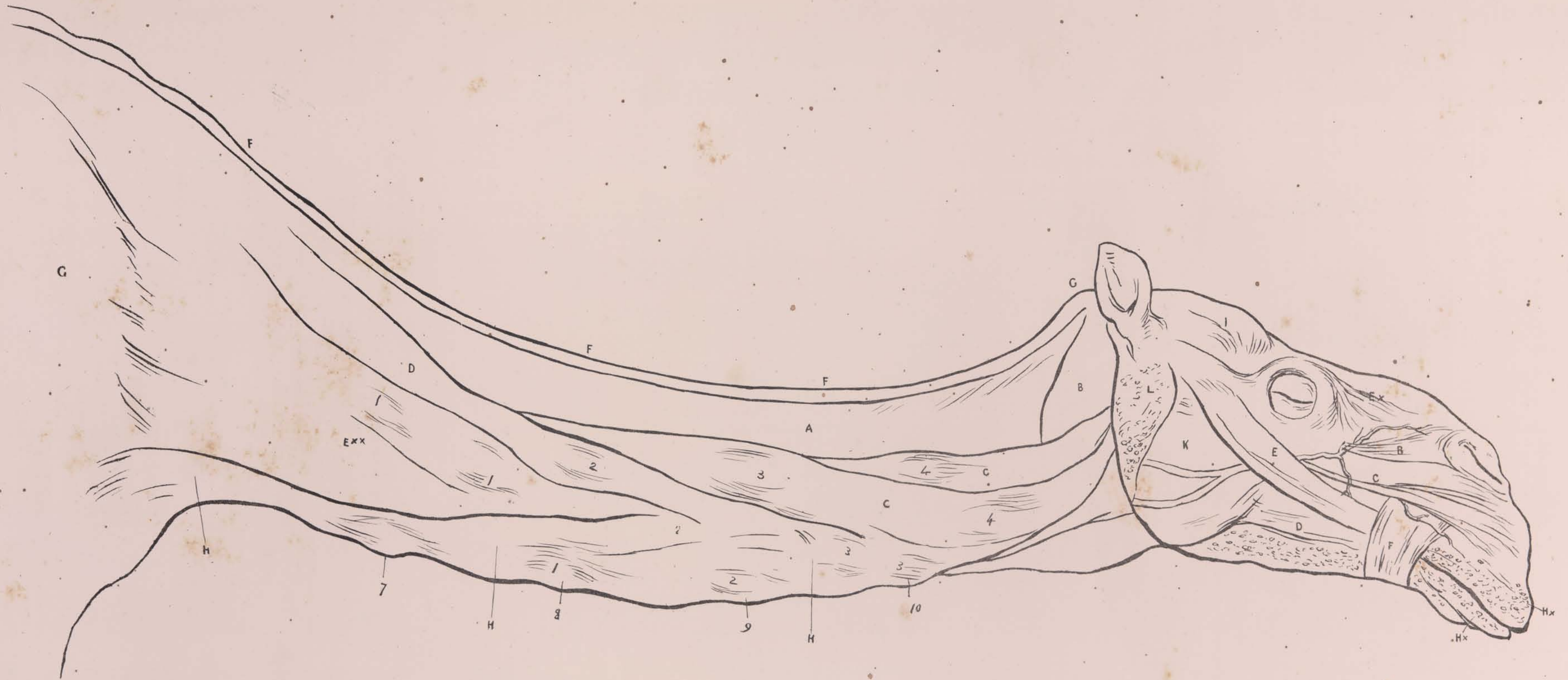
**MUSCLES ON THE HEAD**

- 1 Temporal Muscle.
- B.C. Lateral dilator of the upper lip and nostril.
- E\* Nasal muscle.
- C Fatty cellular substance taken away to show how the temporal muscle descends to be implanted into the Coronoid process of the lower jaw.
- D Bone covered with fascia.
- H\* Orbicularis Oris.
- E Zygomatic muscle.
- N Posterior Cartilage of the ear.





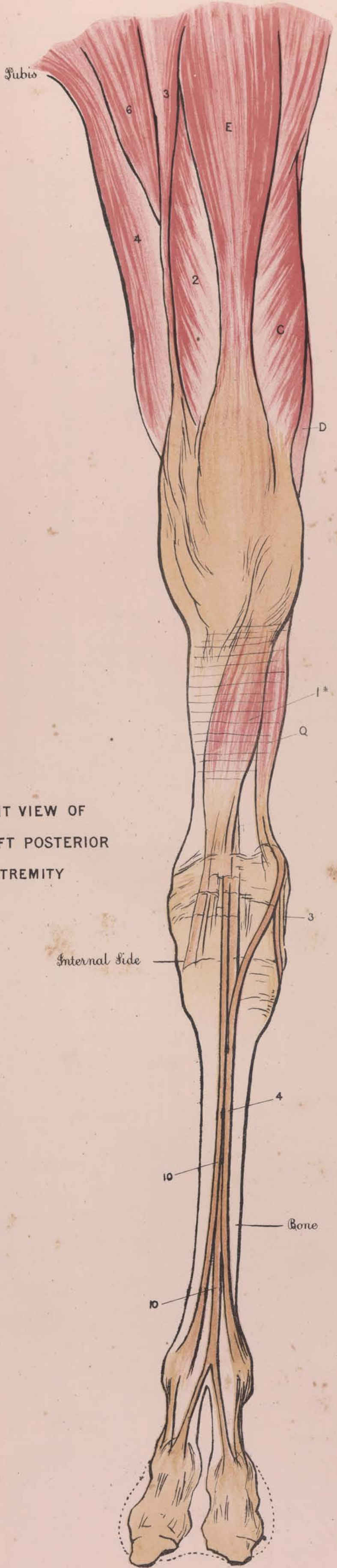
MUSCLES OF THE NECK & HEAD.



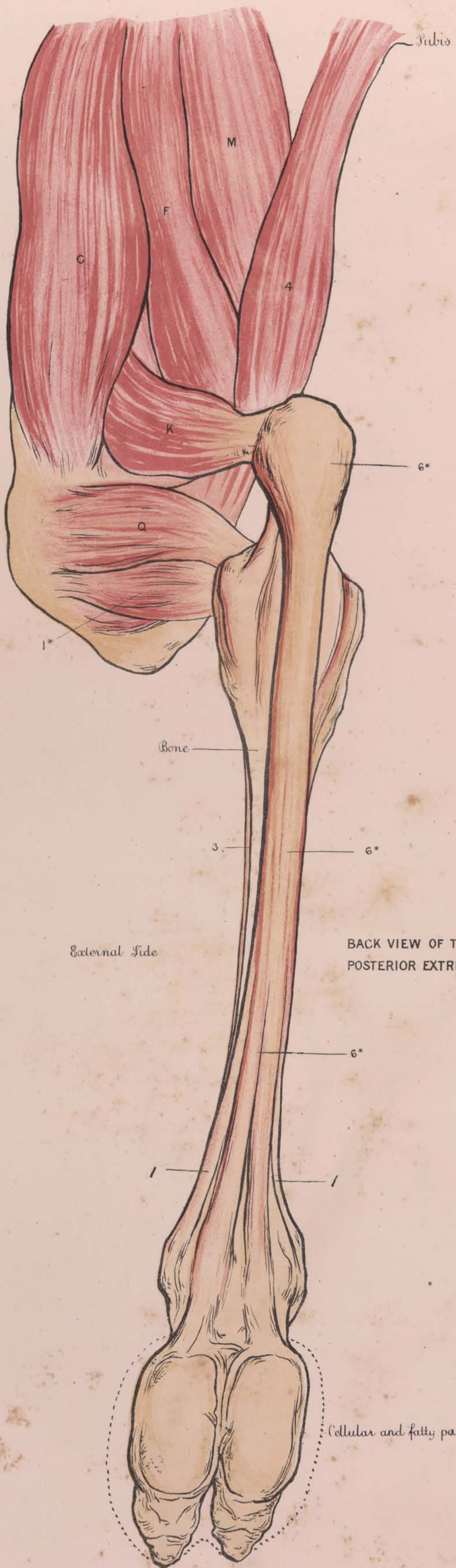
MUSCLES OF THE NECK.

- A. Splenius
- B. Transverse Muscle
- C. C. Rectus internus Major Capitis
- D. Rhomboideus
- E. A Fascia or tendinous part passing over C
- F. F. F. Ligamentum Colli from G. it arises.
- H. H. H. Sterni Mastoideus. 1. 1. 1. 2. 2. 2. 3. 3. 3. 4. 4. Fascia covering the Spines of the Vertebrae into which the Muscles are inserted.





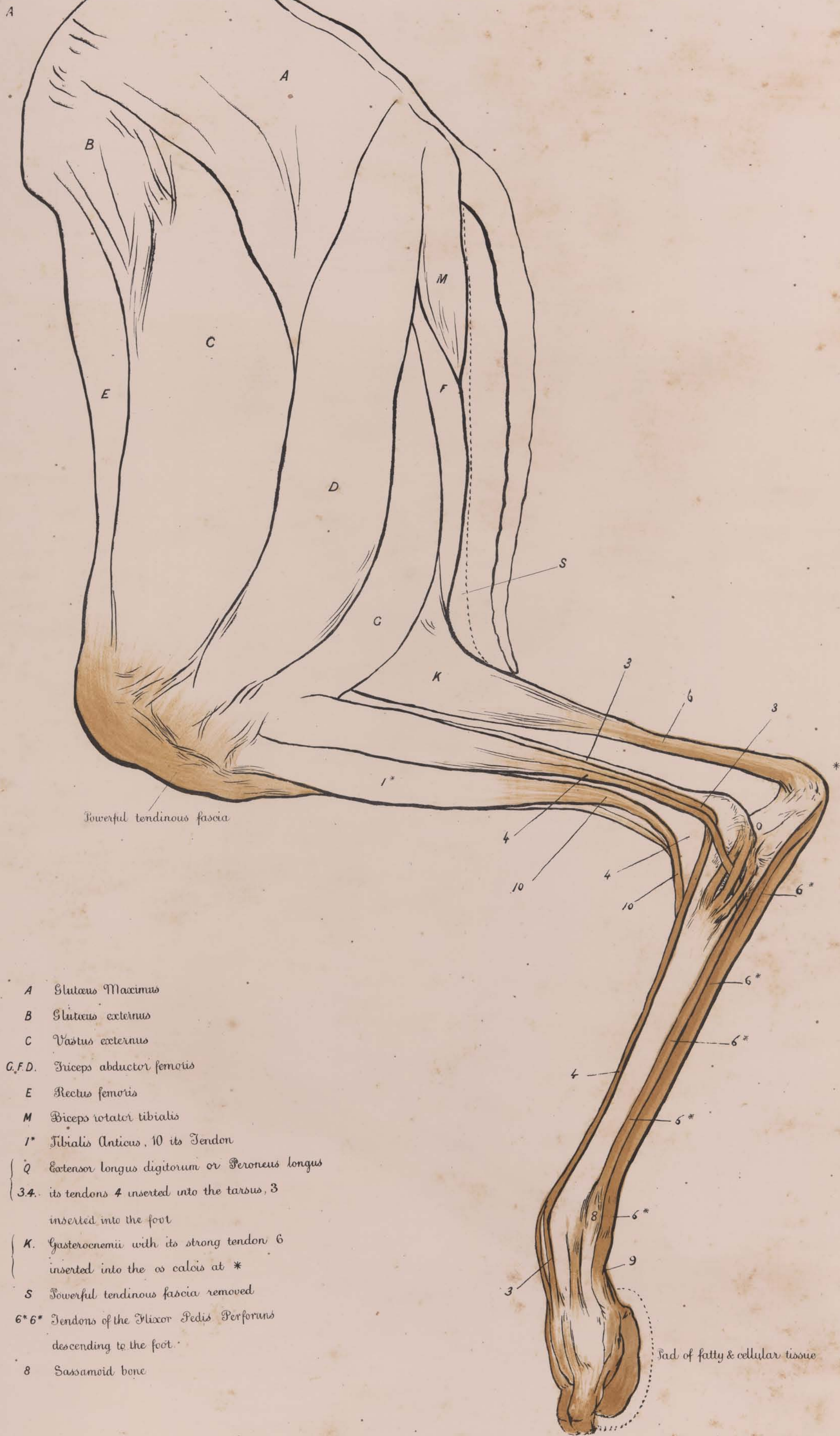
FRONT VIEW OF  
THE LEFT POSTERIOR  
EXTREMITY



BACK VIEW OF THE LEFT  
POSTERIOR EXTREMITY



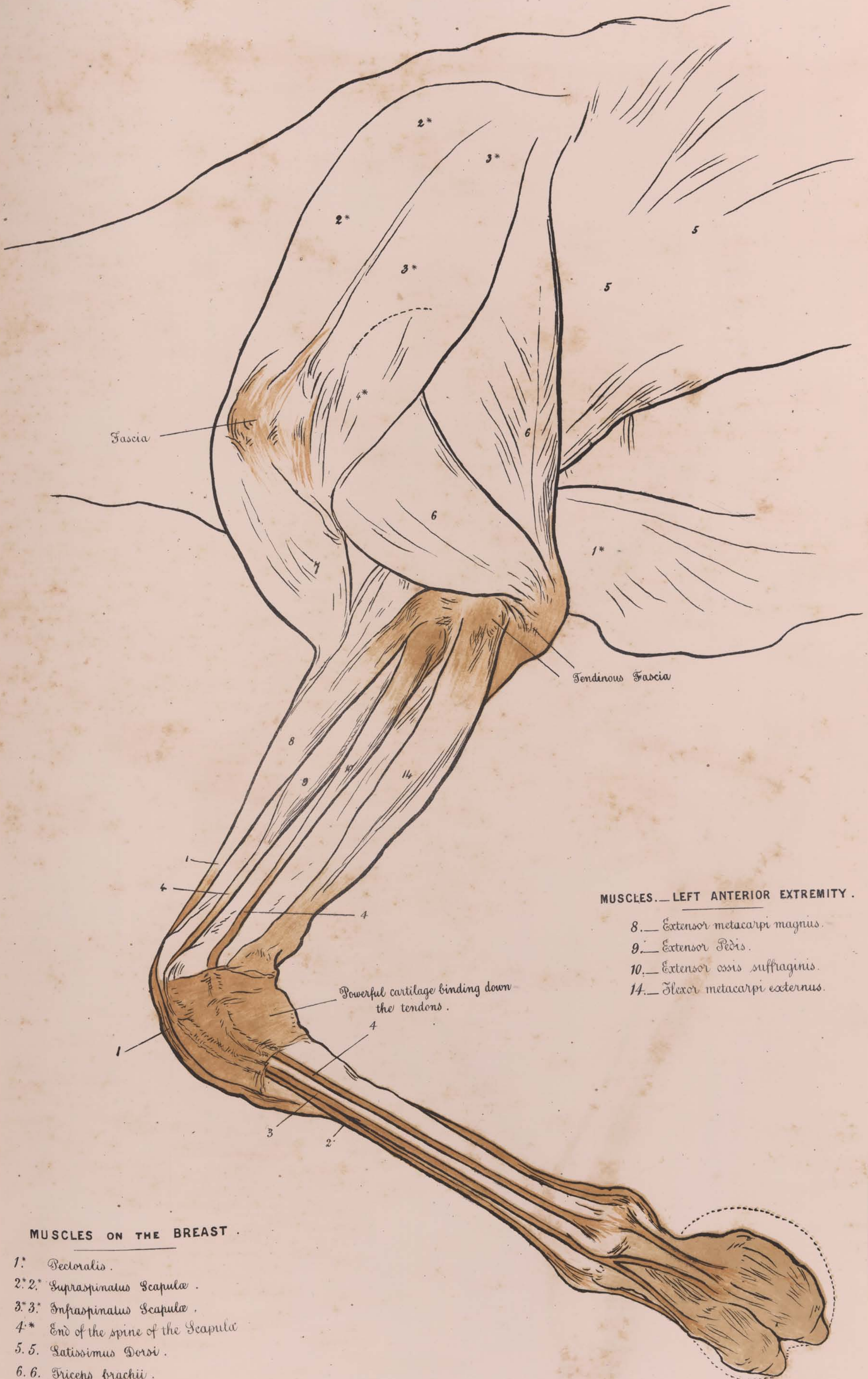
POSTERIOR LEFT EXTREMITY



- A Gluteus Maximus
- B Gluteus externus
- C Vastus externus
- G, F, D. Triceps abductor femoris
- E Rectus femoris
- M Biceps rotator tibialis
- 1\* Tibialis Anticus, 10 its Tendon
- Q Extensor longus digitorum or Peroneus longus
- 3, 4. its tendons 4 inserted into the tarsus, 3 inserted into the foot
- K. Gastrocnemii with its strong tendon 6 inserted into the os calcis at \*
- S Powerful tendinous fascia removed
- 6\*6\* Tendons of the Mixor Pedis Perforans descending to the foot.
- 8 Sarsamoid bone

Pad of fatty & cellular tissue





Fascia

Tendinous Fascia

**MUSCLES.—LEFT ANTERIOR EXTREMITY.**

- 8.— Extensor metacarpi magnus.
- 9.— Extensor Pedis.
- 10.— Extensor ossis suffraginis.
- 14.— Flexor metacarpi externus.

Powerful cartilage binding down the tendons.

**MUSCLES ON THE BREAST .**

- 1\* Pectoralis.
- 2\* 2\* Supraspinatus Scapulae .
- 3\* 3\* Infraspinatus Scapulae .
- 4\* End of the spine of the Scapula
- 5. 5. Latissimus Dorsi .
- 6. 6. Triceps brachii .
- 7. Biceps brachii .





**MUSCLES**

ANTERIOR LEFT EXTREMITY  
INNER SIDE.

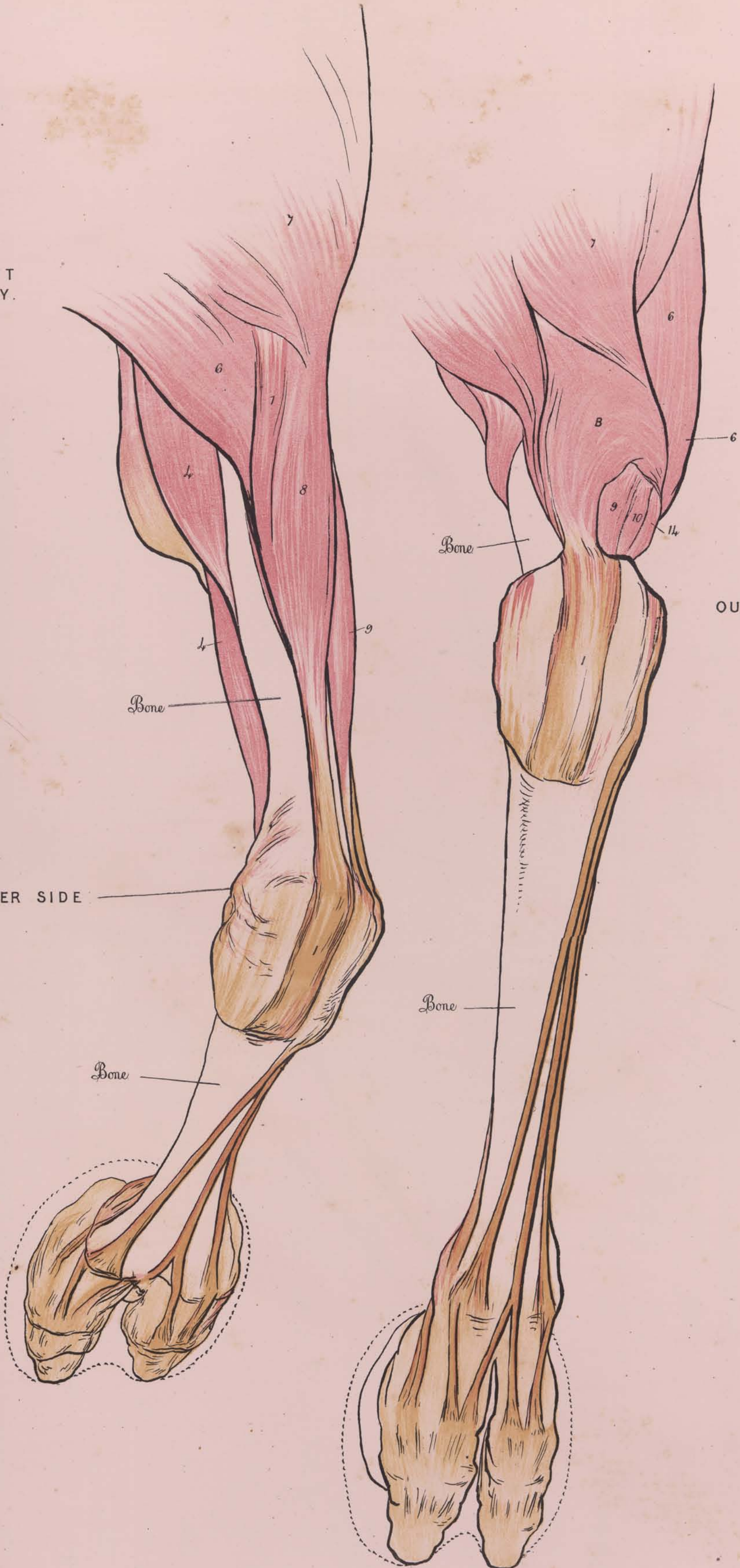
- 1 Rectus Femoris
- 2 Vastus Internus
- 3 Sartorius
- 4 Gracilis
- 5 Tibialis Anticus
- 6 Triceps
- K Gastrocnemius
- L Tendon of the Gastrocnemius  
implanted into the Os calcis at \*



MUSCLES OF THE LEFT ANTERIOR EXTREMITY.

INNER SIDE

OUTER SIDE



Bone

Bone

Bone

Bone



THE MUSCLES.



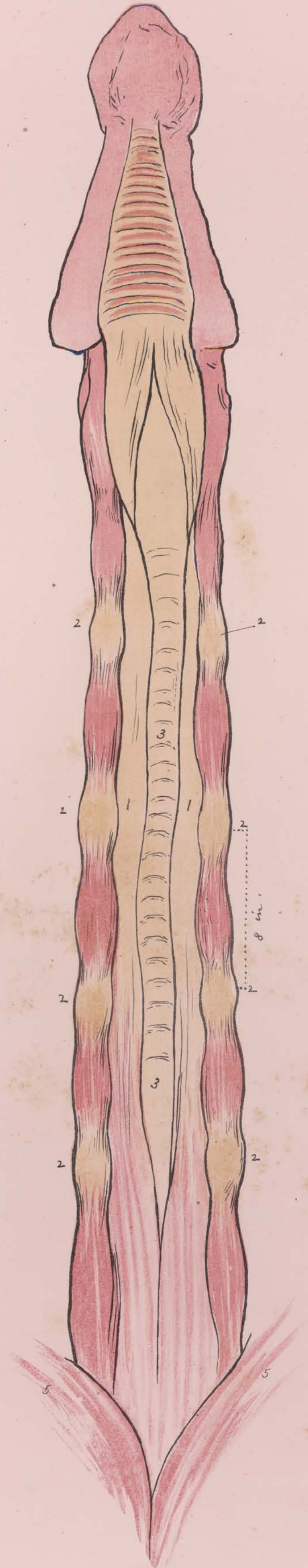
MUSCLES. Left anterior Extremity  
INNER SIDE.

- 1 A part of the Biceps
- 2 Fascia
- 3 Flexor Metacarpi Internus.
- 4 Flexor Metacarpi Medius.
- 5 Extensor Metacarpi Magnus.
- 6 Pectoralis



THE UNDER SIDE OF THE NECK SHEWING  
THE SPINES OF THE VERTEBRÆ

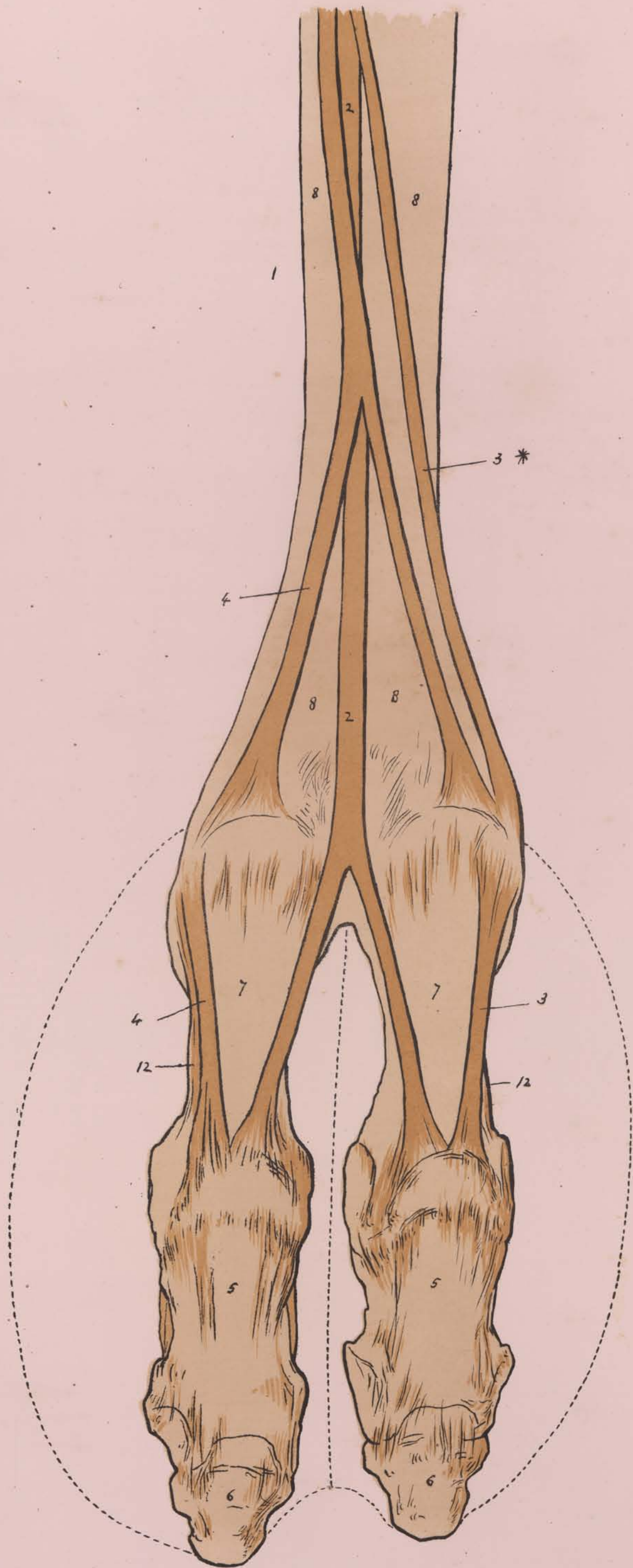
- 1.1. The lower jaw
- 2.2.2. Spines of the Vertebrae
- 3.3. The Gullet.
- 4.4. Delicate parts of the throat covered  
by delicate muscle & fascia.
- 5.5. Pectoralis.





# THE TENDONS

TENDONS OF THE HIND FOOT RIGHT FRONT VIEW.  
*Natural size*

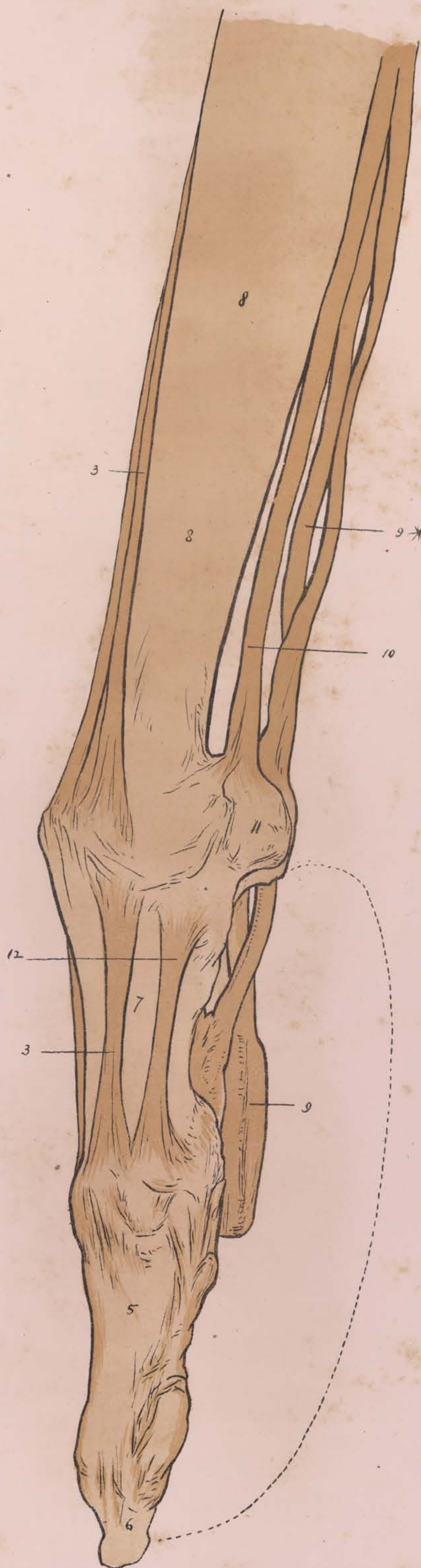


## TENDONS.

- 1 External side
- 2.2. Tendons of the Tibialis Anticus
- 3.4. Tendons of the Extensors of the leg & foot
- 3.12.&4.12. Ligaments binding the Metatarsal Bones to the Phalanges 7.7.8.8. Bone
- 5.5.6.6. Phalanges covered by tendinous fascia



THE TENDONS.  
TENDONS OF THE HIND FOOT RIGHT (INNER SIDE)  
*Natural Size.*



*Tendons.*

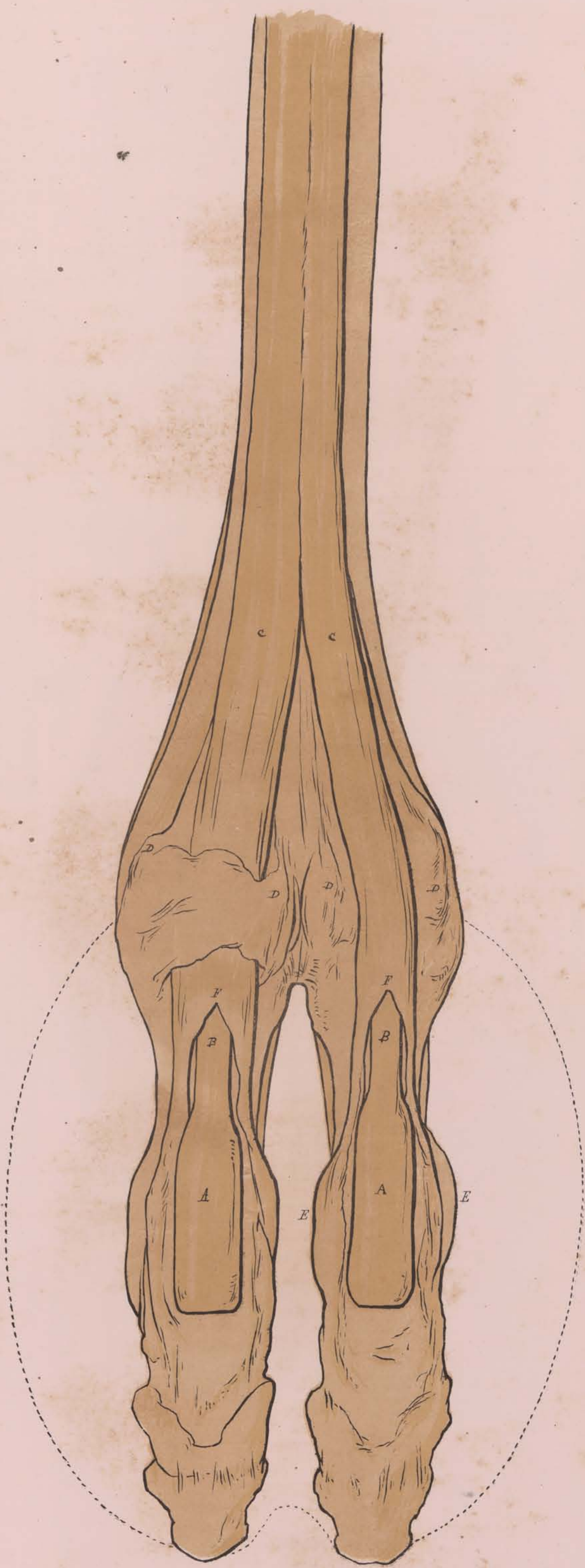
9\*. Tendon descending and passing over the sesamoid Bones 11. and ending in a Pad 9. . 3. 12. Ligaments binding the Metatarsus to the Phalanges. 7. 8. 8. Bone 5. 6. Phalanges covered by Tendinous Fascia. 10 Part of the Great Tendon inserted at 11.



THE TENDONS.

TENDONS OF THE HIND FOOT RIGHT (BACK VIEW)

Natural Size.



*Tendons.*

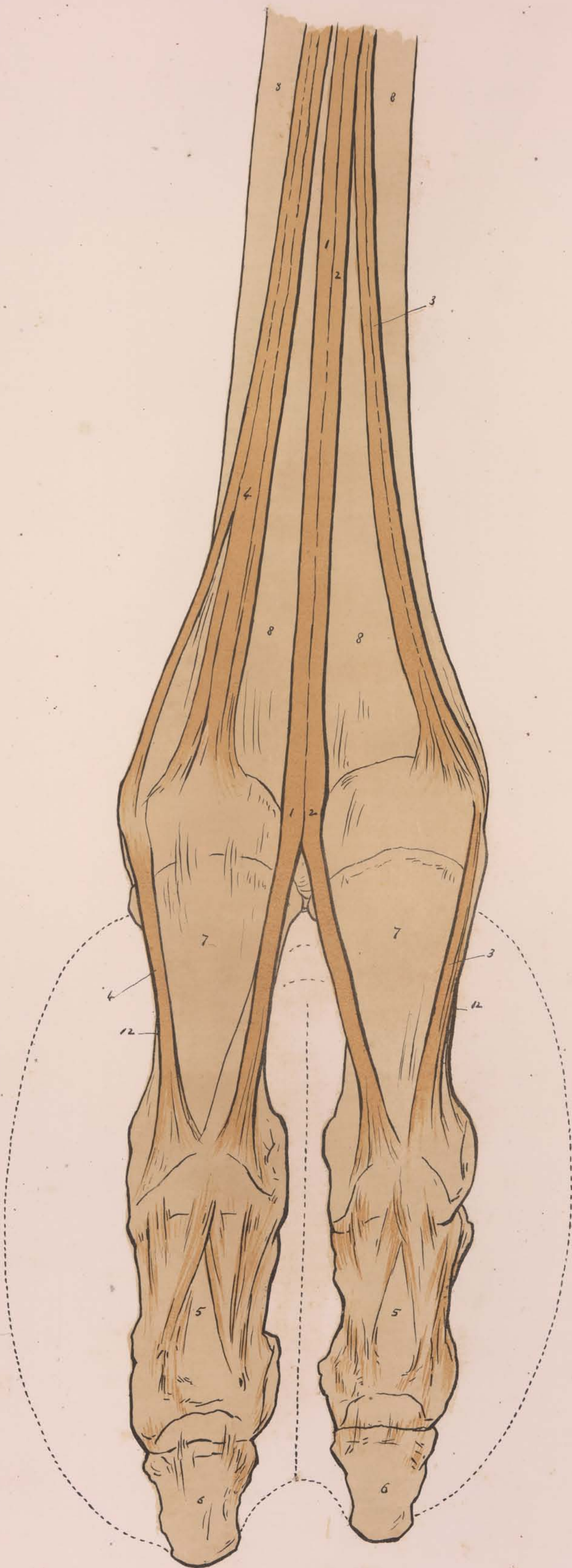
C.C. Tendon descending from the Os Calcis passes over the sesamoid bones at D: D. D. D. and is attached to the Phalanges at E. E. It is divided at F. to allow the tendon B. and its pad A. to act freely. This is again covered by Tendinous Fascia.



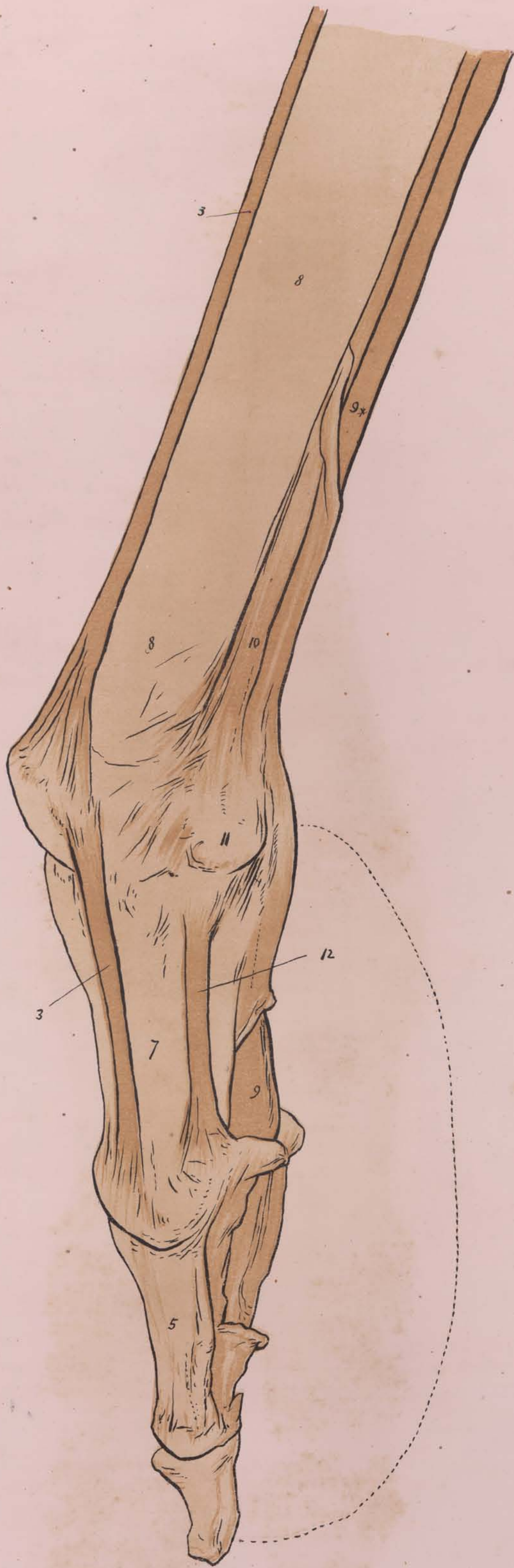
# THE TENDONS

TENDONS OF THE FORE FOOT RIGHT (FRONT VIEW).

*natural size*





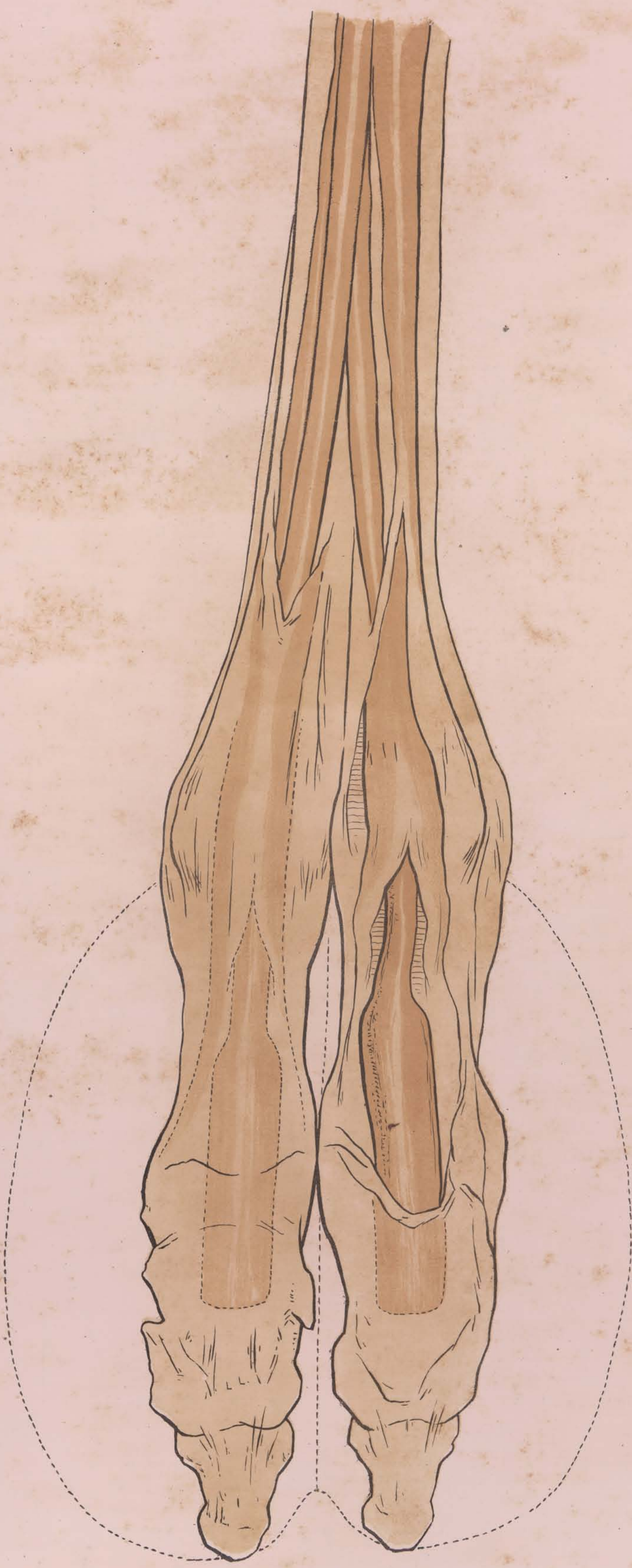


TENDONS OF THE FORE FOOT RIGHT INNER SIDE.  
NATURAL SIZE.



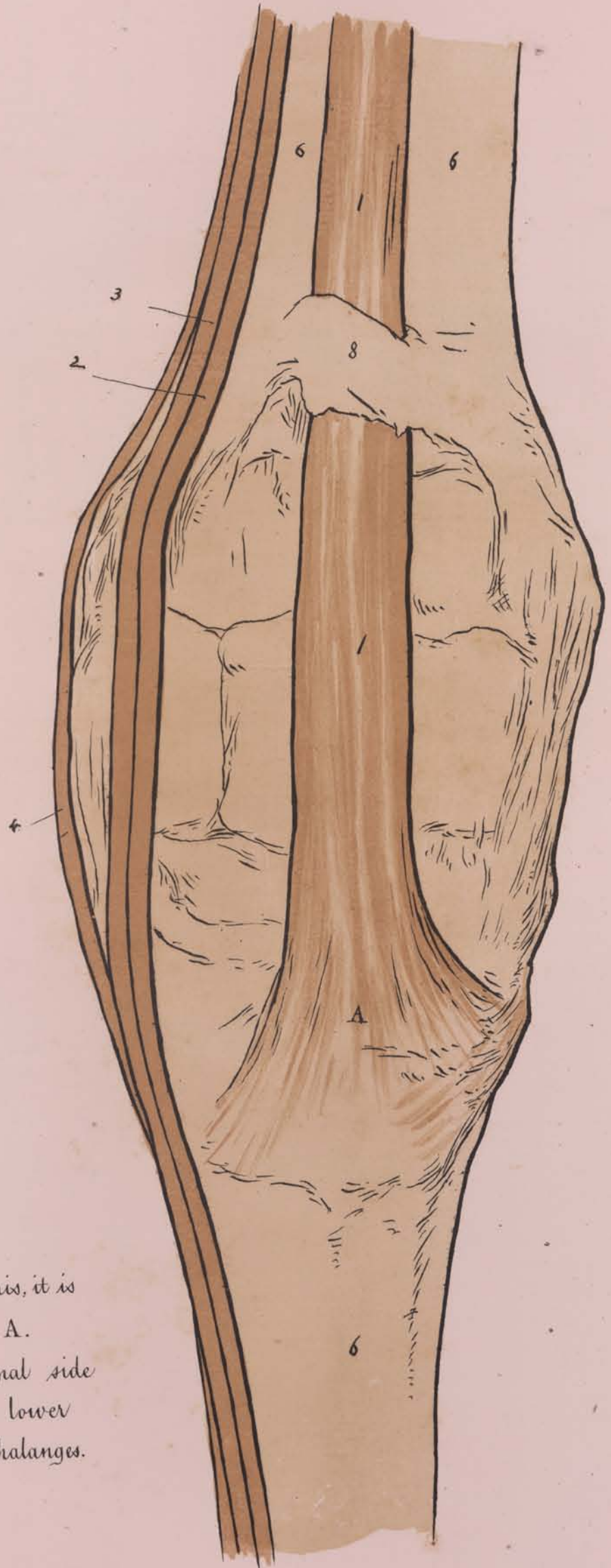
THE TENDONS  
TENDONS OF THE FORE FOOT RIGHT (BACK VIEW)

Natural size





**THE TENDONS**  
 TENDONS OF THE CARPUS OR WRIST (FRONT VIEW)  
*Natural Size*



**TENDONS.**

- 1 Tendon of the Extensor Carpi Ulnaris, it is attached to the Metatarsal bones at A.
- 2, 3, 4 Tendons of the Extensors on the External side descending to be implanted into the lower extremity of the Metatarsal bones & Phalanges.
- 6, 6 Bone



THE TENDONS  
TENDONS OF THE CARPUS OR WRIST (INTERNAL SIDE)  
Natural Size

PLATE 40.



TENDONS.

- 1. Tendon of the Extensor Metacarpi magnus.
- 7.5. Outer covering of the powerful Tendons of the Flexors
- 8. Part of the Tendinous Ligament binding down the tendons of the Carpus.
- 6.6. Bone.



THE TENDONS.  
TENDONS OF THE CARPUS OR WRIST (OUTER SIDE)  
*Natural Size.*





### THE TENDONS.

TENDONS OF THE CARPUS OR WRIST, (BACK VIEW.)

*Natural Size.*



#### TENDONS.

1,2,3,4,5.—Tendons of the Flexors dissected out.  
 9,9.—Knives placed between to show them more fully.  
 6,6,6,6.—Bone.



THE TENDONS  
TENDONS OF THE TARSUS OR HOCK  
*Natural Size*



TENDONS.

- 1. Great Tendon of the Tibialis anticus which is implanted at A upon the upper part of the Metatarsal bones
- 2. 3. Tendons descending to the foot.
- \*\* Part of the Ligament for binding down the tendons
- 15. Bone.

RIGHT HIND LEG FRONT VIEW



THE TENDONS.  
TENDONS OF THE TARSUS OR HOCK (EXTERNAL SIDE)  
*Natural Size.*

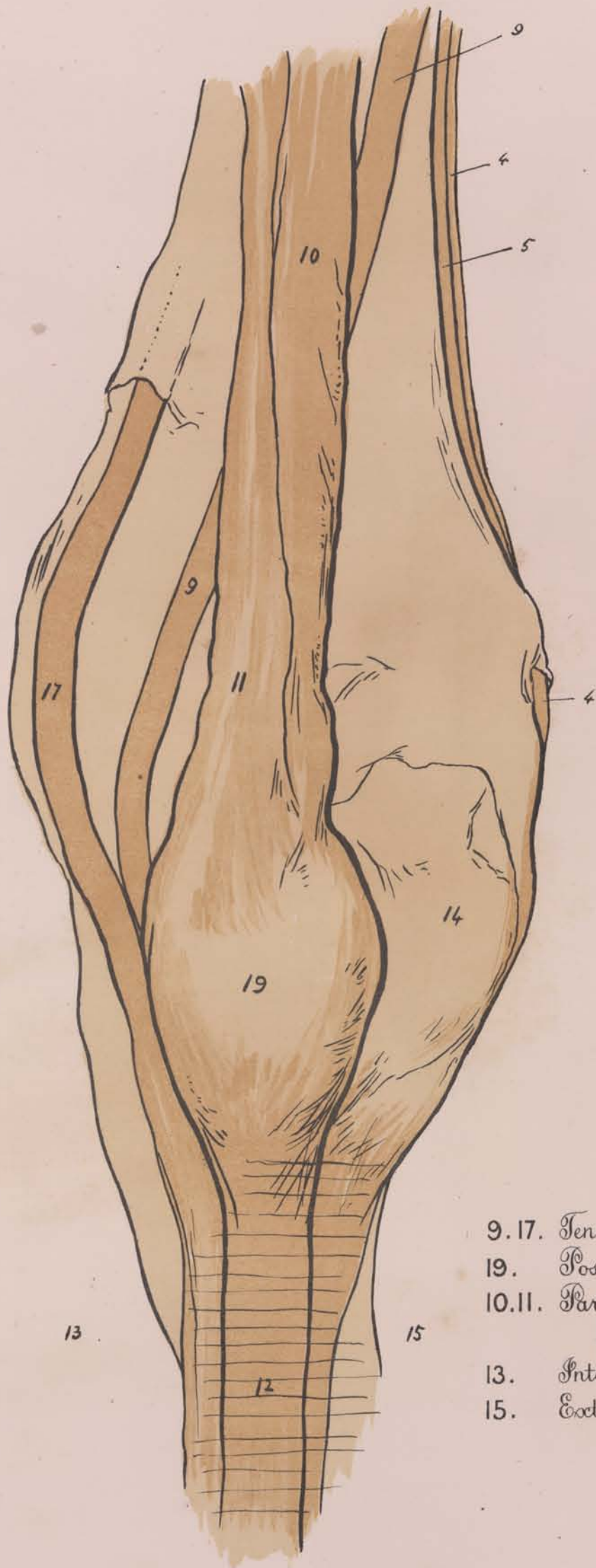


TENDONS.

- 11. Great Tendon of the Gastrocnemius.
- 14. The Os Calcis.
- 6. Ligaments binding the Tarsus to the Metatarsus.
- 7. Tendon binding the Tibia to the Metatarsus.
- The Tendon 4 is inserted into the Tarsus at A.



THE TENDONS  
TENDONS OF THE TARSUS OR HOCK  
*Natural Size*



TENDONS.

- 9. 17. Tendons of the Flexor muscles of the leg.
- 19. Posterior Extremity of the Os Calcis.
- 10. 11. Parts of the Great tendon of the Gastrocnemius Muscle.
- 13. Internal side.
- 15. External side.

RIGHT HIND LEG BACK VIEW



TENDONS OF THE TARSUS OR HOCK (INNER SIDE)  
*Natural Size*

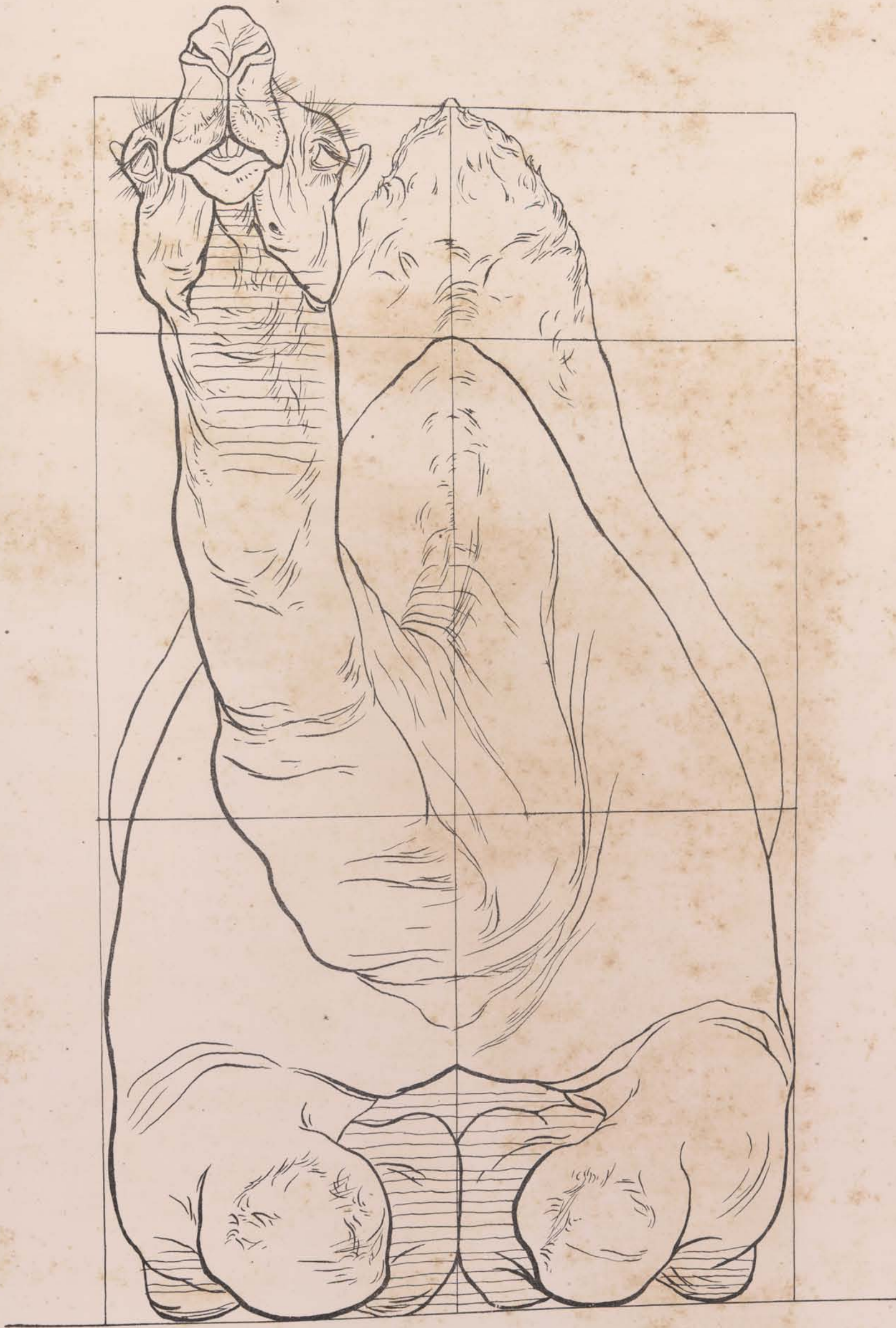


*Engl. & Sons, Lith. in the Queen*

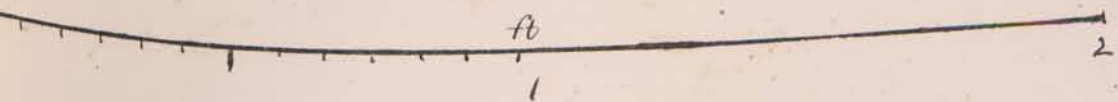
*Elijah Walton, delt. et lith.*



PROPORTIONS

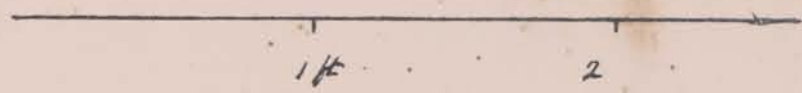
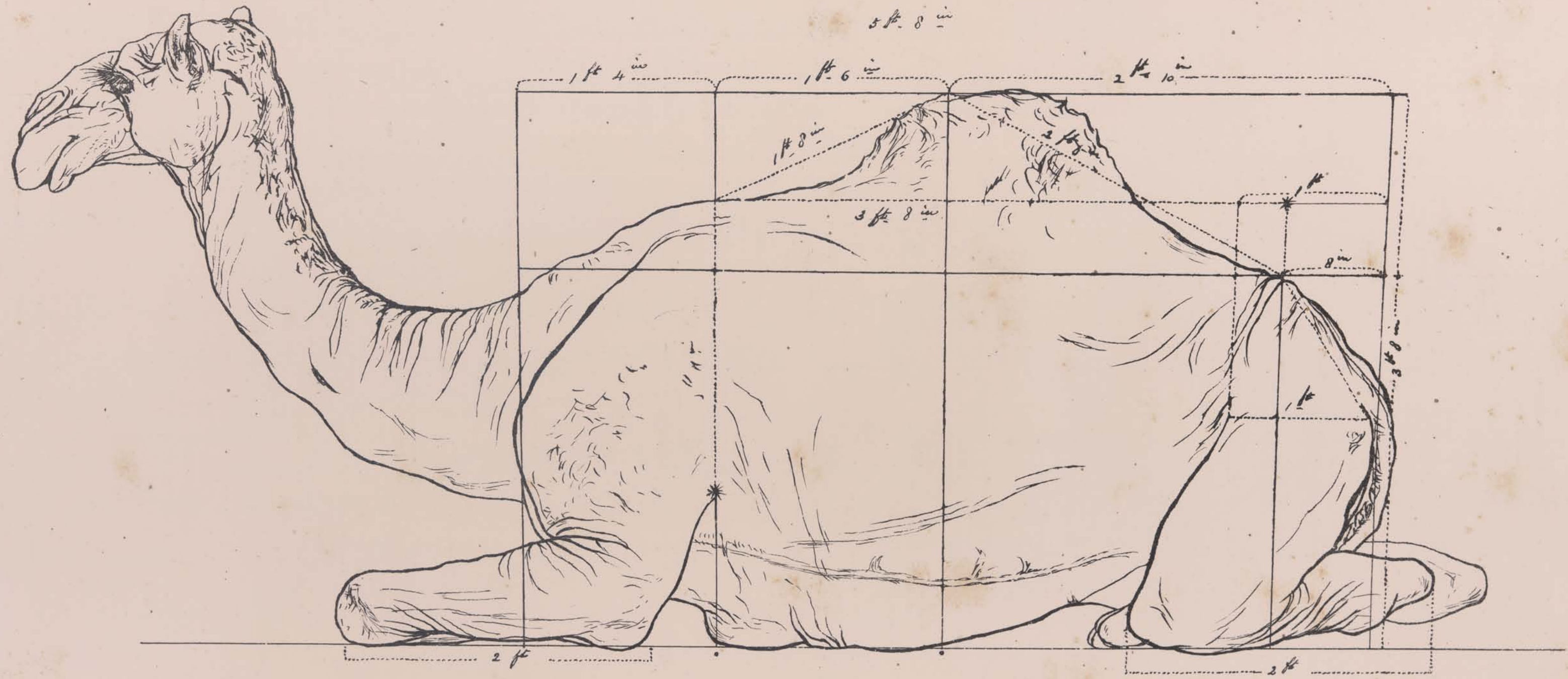


CAMEL



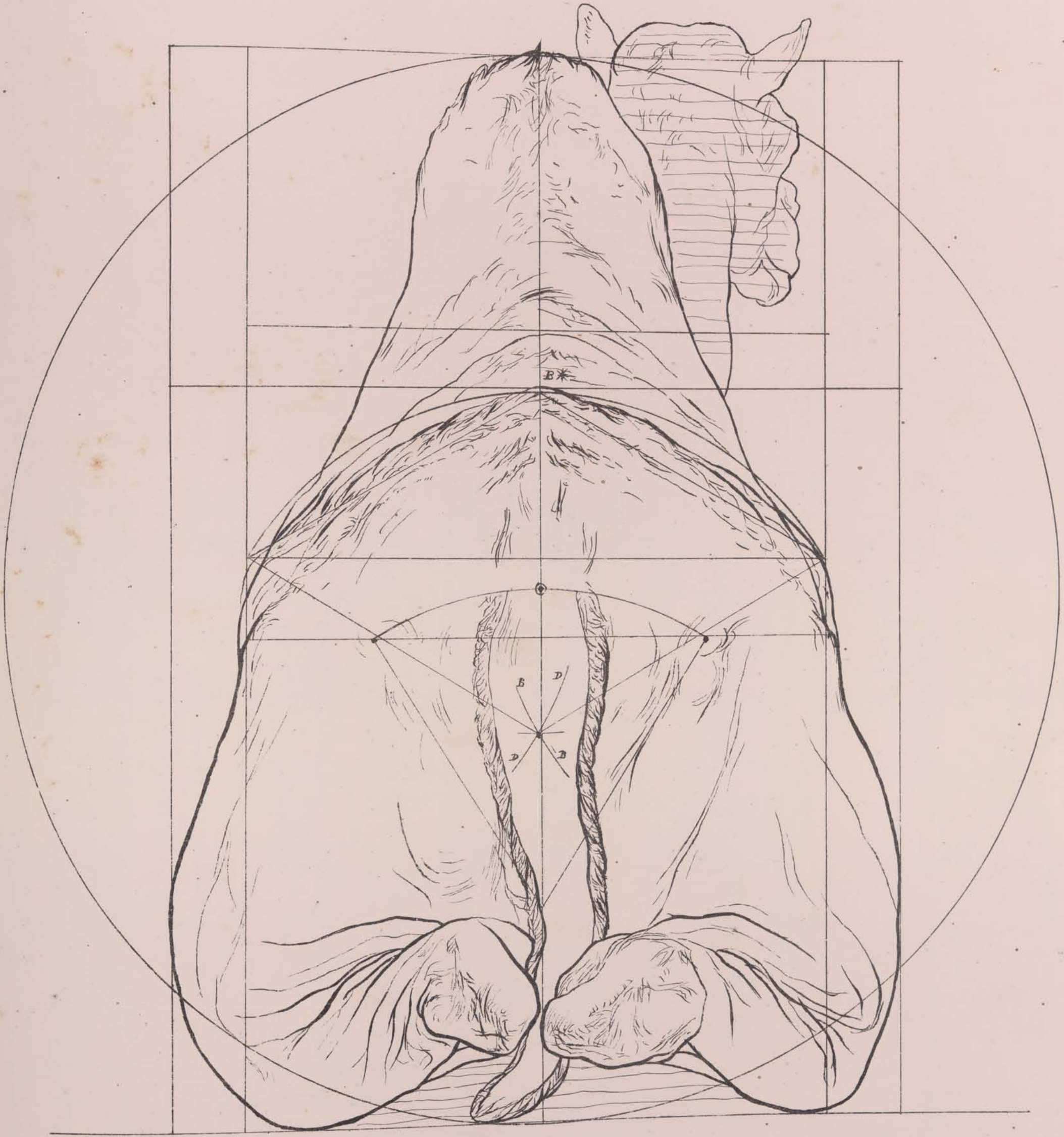


CAMEL. PROPORTIONS.



*Elijah Walton, del. et lith.*







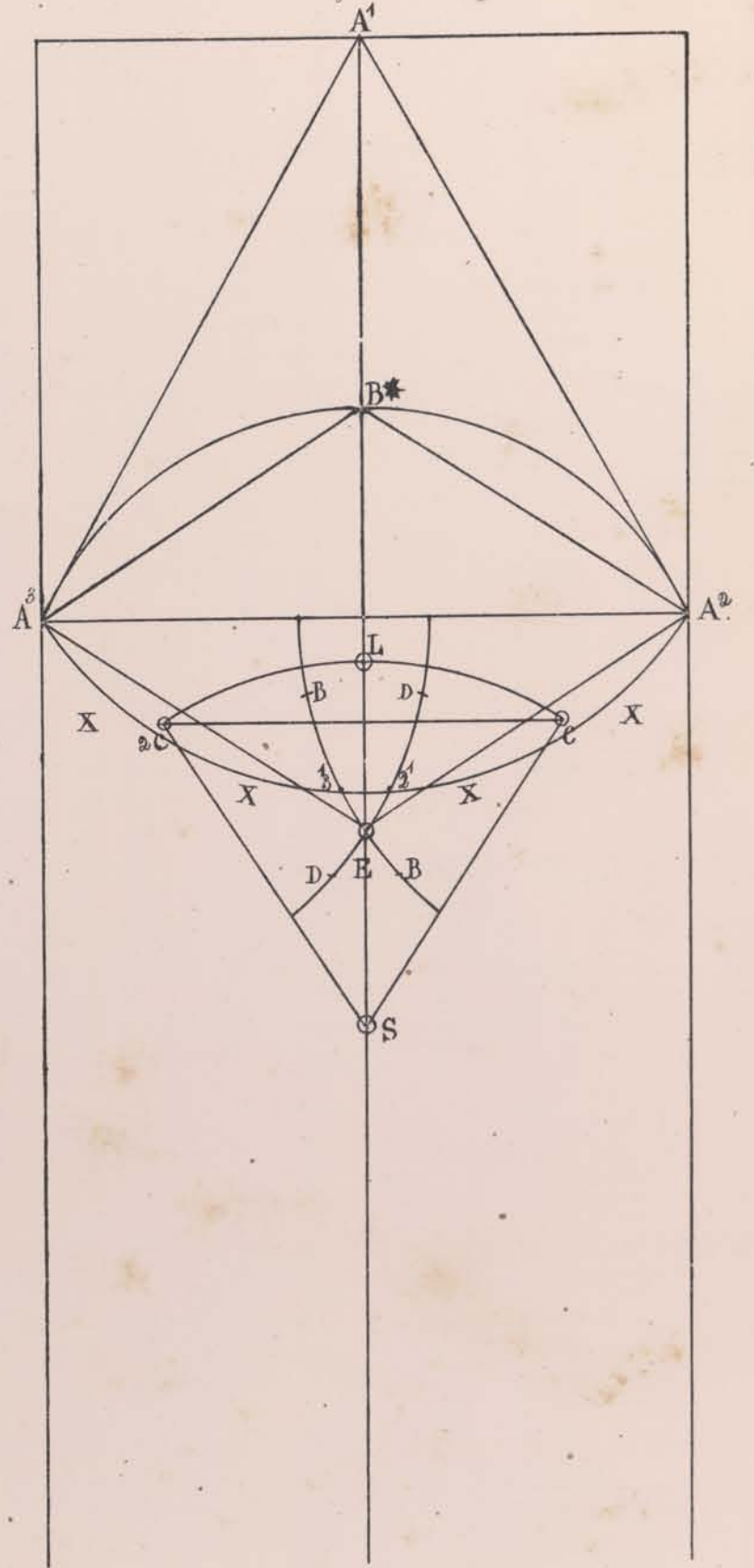
Back View.

Principal Measurements.

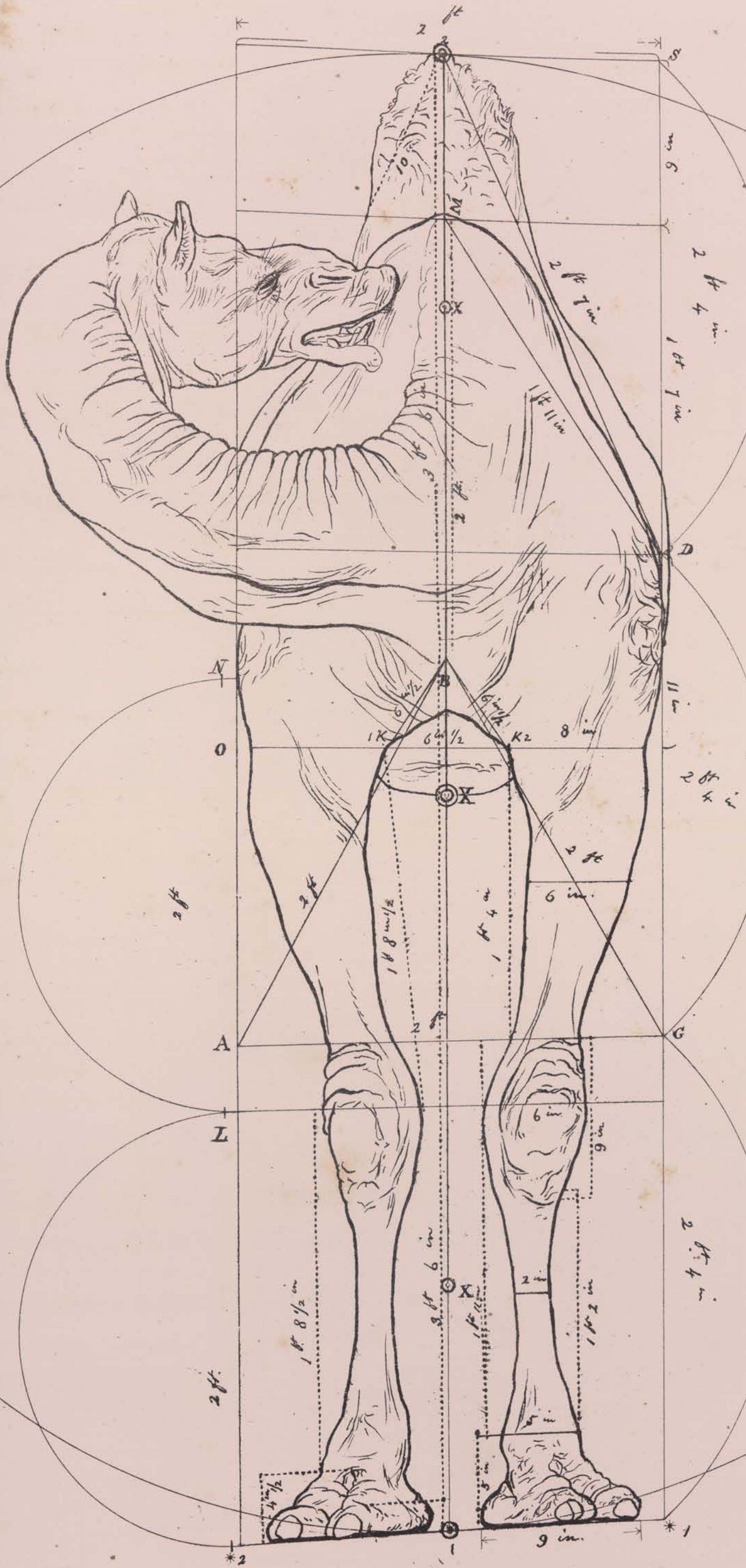
	Feet	Inches
* <sup>1</sup> to * <sup>2</sup> From feet to top of hump	2	0
* <sup>2</sup> to * <sup>3</sup> A little more than full width it not being so wide as the chest	1	9
⊙ <sup>2</sup> to ⊙N Centre of circle 4. 4. 4.	1	9
⊙N to ⊙H Centre of circle 5. 5. 5.	1	9
⊙H to ⊙L Centre of circle 6. 6. 6.	1	9
⊙L to A Top of Hump	3	6
⊙ <sup>2</sup> to ⊙H One half of the height of the Animal	4	2
⊙ <sup>2</sup> to ⊙S At this point the thighs join	0	7
⊙S to E The Fundament		
⊙S to C This is the end point of the Pelvis and the line C.C. crosses the under root of the tail and is unequal in length to the line S.C. and C <sup>2</sup> S. therefore S.C. C.S. are equal. These points are very important. From S describe the Arc C <sup>2</sup> I. S. ⊙I being the outer root of the tail.		
* <sup>2</sup> to A <sup>2</sup> Join A <sup>2</sup> E E A <sup>2</sup> with the point of the Compass in A <sup>2</sup> describe the arc D.D again with the foot of the Compass on A <sup>2</sup> describe the arc BB with the same distance in the Compasses place one foot on B* and describe the arc XXX which gives the Points 3 and 2 on B.B & D.D place the foot of the Compass on the point 3 with the distance 3 A <sup>2</sup> and describe the Arc B* A <sup>2</sup> also with the point of the Compass on the point 2 with the distance 2 A <sup>2</sup> describe the Arc A <sup>2</sup> B* this Arc beautiful in form gives the upper line of the Pelvis the highest point being at B*.	5	4
A <sup>2</sup> to *	1	8
Join A <sup>2</sup> and A <sup>3</sup> also A <sup>3</sup> to A <sup>1</sup> . A <sup>1</sup> to A <sup>2</sup> these three lines are equal to one another and its angles equal therefore it is an equilateral triangle - so the line B*.A <sup>2</sup> is equal to A <sup>2</sup> E. and the line B* E. is equal to E. A <sup>2</sup> therefore B* E. & E. A <sup>2</sup> and A <sup>2</sup> B* are equal to one another and is an Equilateral Triangle so of B*.A <sup>2</sup> A <sup>2</sup> E & E B*.	2	0
G to F Half the length of the leg	2	0
F to E' Second half of leg		

See Fig. 2.

Figure 2.





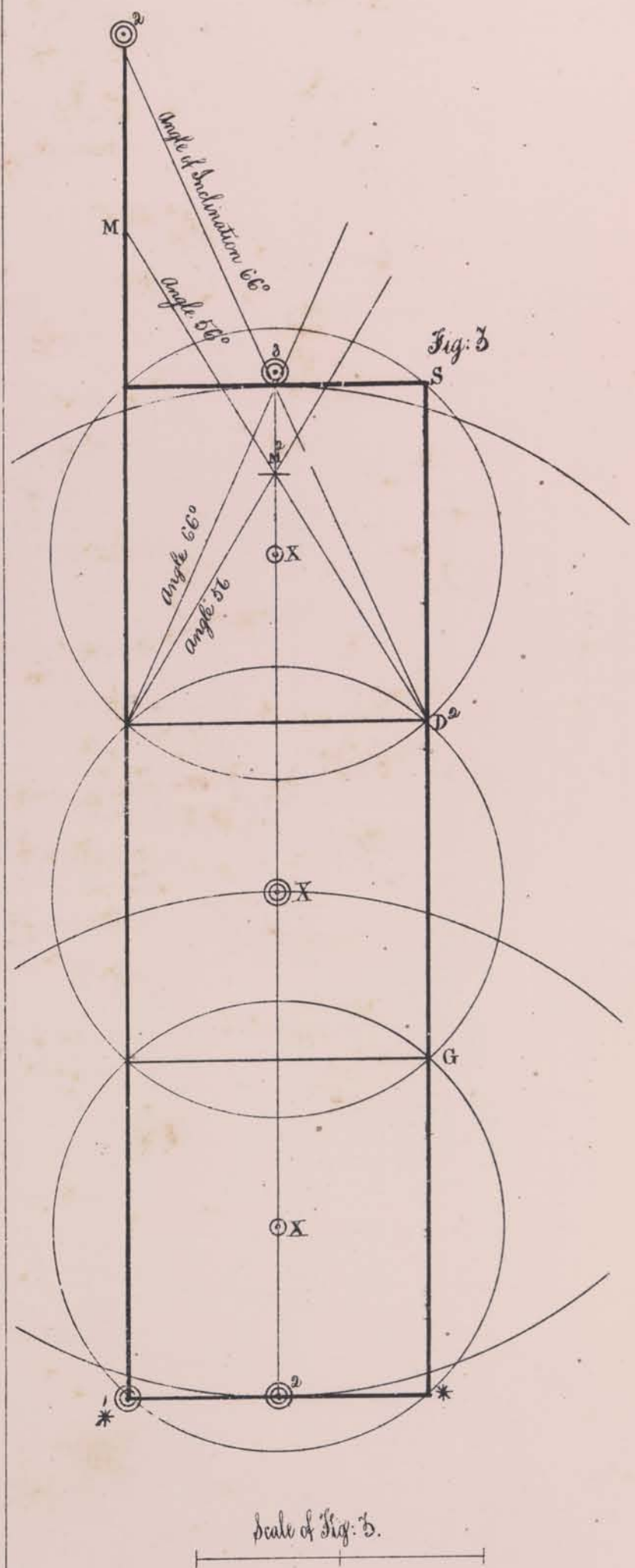




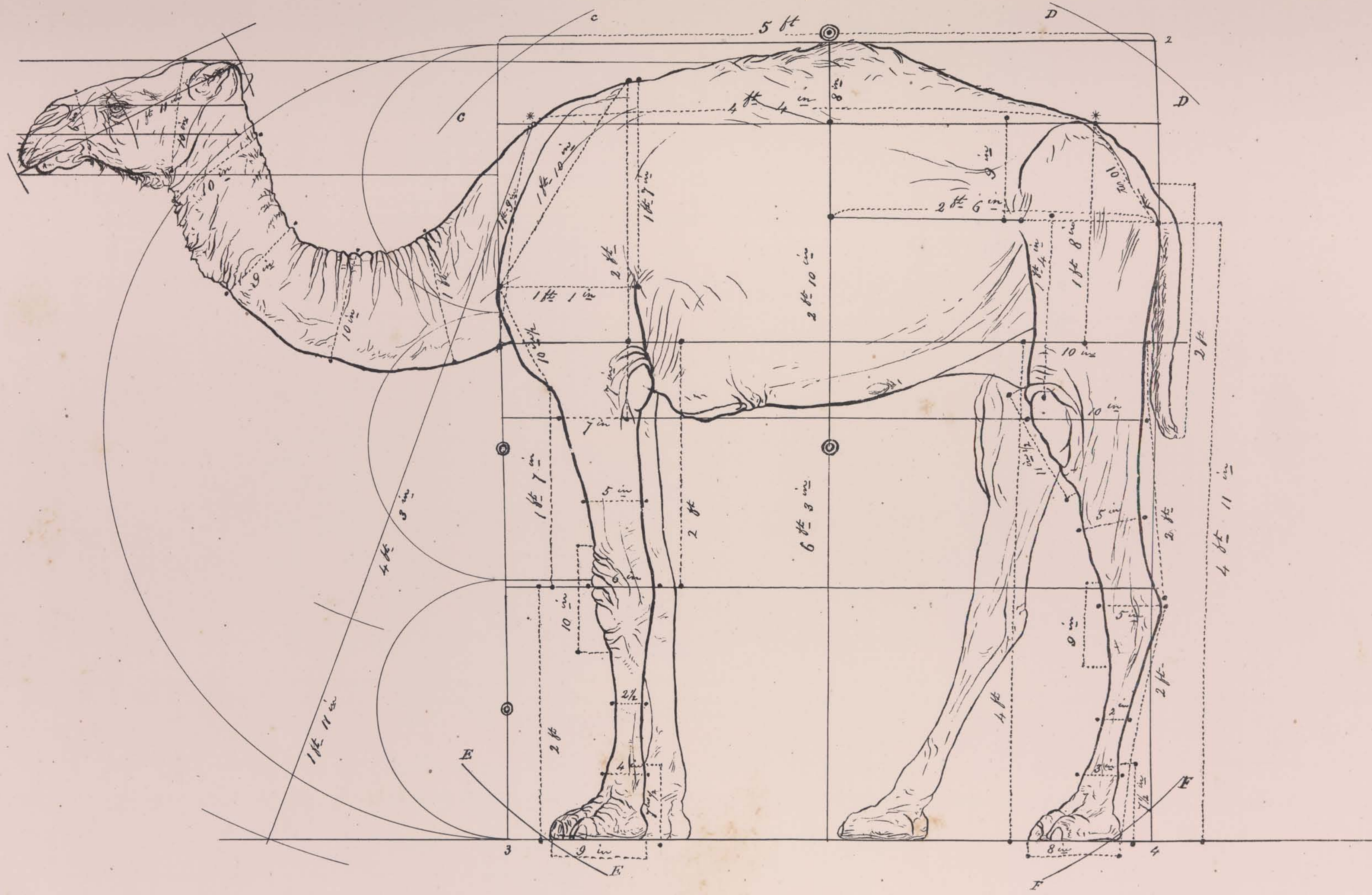
Description of Plate 50 and Figure 3 Principal Measurements.

Proportions.

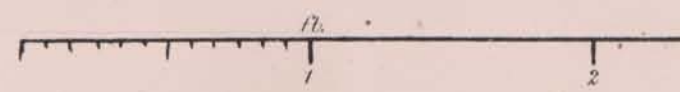
Front View		Feet	Inches
⊙ to ⊙ Full height from sole of foot to top of hump	-----	7	0
⊙ to ⊙ One half of the height of the whole Animal	-----	3	6
* to * Full width from shoulder to shoulder	-----	2	0
⊙ to ⊙ First Centre	-----	1	2
⊙ to ⊙ Second Centre	-----	2	4
⊙ to ⊙ Third Centre	-----	2	4
⊙ to ⊙ Top of hump	-----	1	2
⊙ to point B being the lowest point of insertion of the Neck & Fore point of the sternum or Breast Bone	-----	4	2
B to M the highest point of the shoulder from these two points the Neck springs	-----	2	1
* 1 to G from C. to D and from D to S are equal, each 2 <sup>ft</sup> <sup>in</sup> the whole.	-----	7	0
* 2. to I. Half length of fore leg	-----	2	0
I to N Upper half of fore leg	-----	2	0
<u>The Line.</u>			
A. G crosses the upper part of the joints of the fore legs A. G. being 2 feet; a line drawn from A to B is equal to A. G. and a line drawn from B to C is equal to G. A forming an equilateral triangle So from the point 1. K a line drawn to B is equal to K. K. 2. and the line from 1. K to K. 2. so 1. K. K. K. 2. is also an equilateral triangle.			
M to ⊙ Top of shoulder to top of hump.	-----	0	9
* 2 to 0	-----	3	8½
<u>Fig 3.</u>			
Is the proportion of Plate 4 half size	-----	2	0
* * Full width	-----	7	0
⊙ <sup>2</sup> to ⊙ <sup>3</sup> Full height	-----		
⊙ <sup>2</sup> to D Full length of inclination of Plate 50	-----		
⊙ <sup>3</sup> to D Fig. 3. Angle of inclination - 66°	-----		
M <sup>2</sup> Angle of 56°	-----		





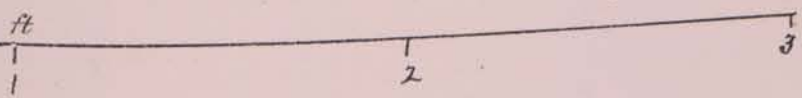
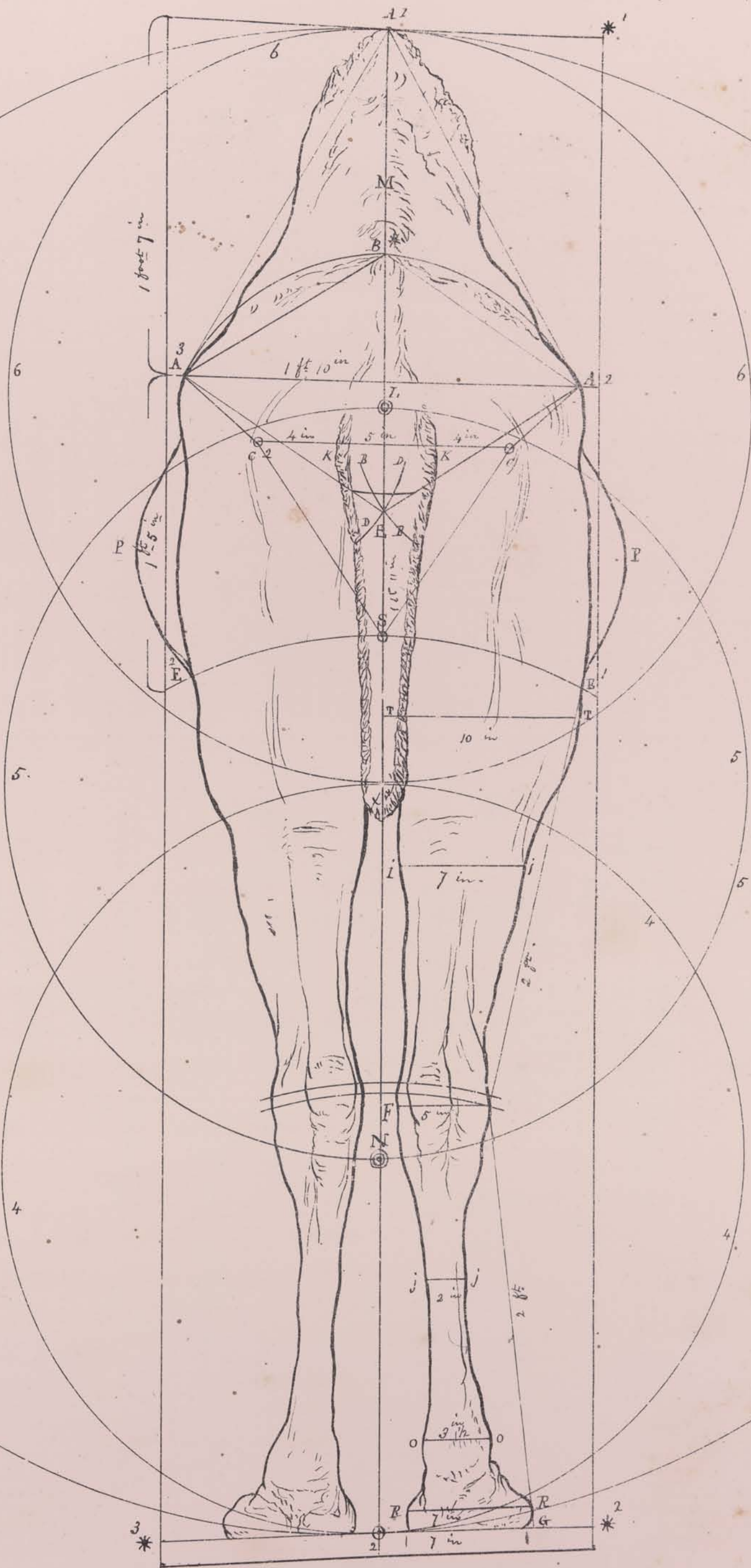


Walton, delt et lith.

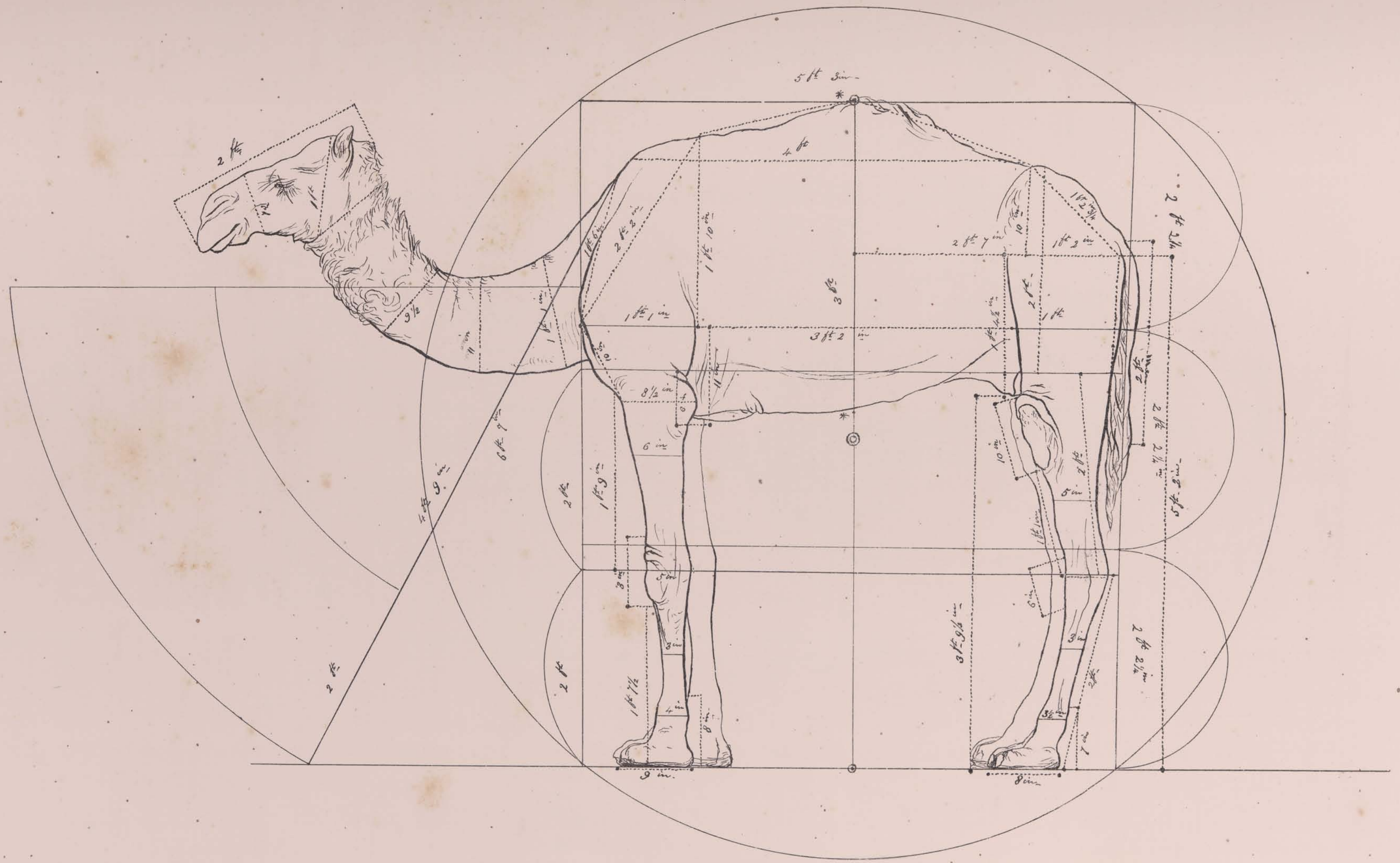




# CAMEL. PROPORTIONS.







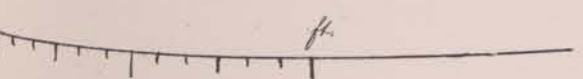
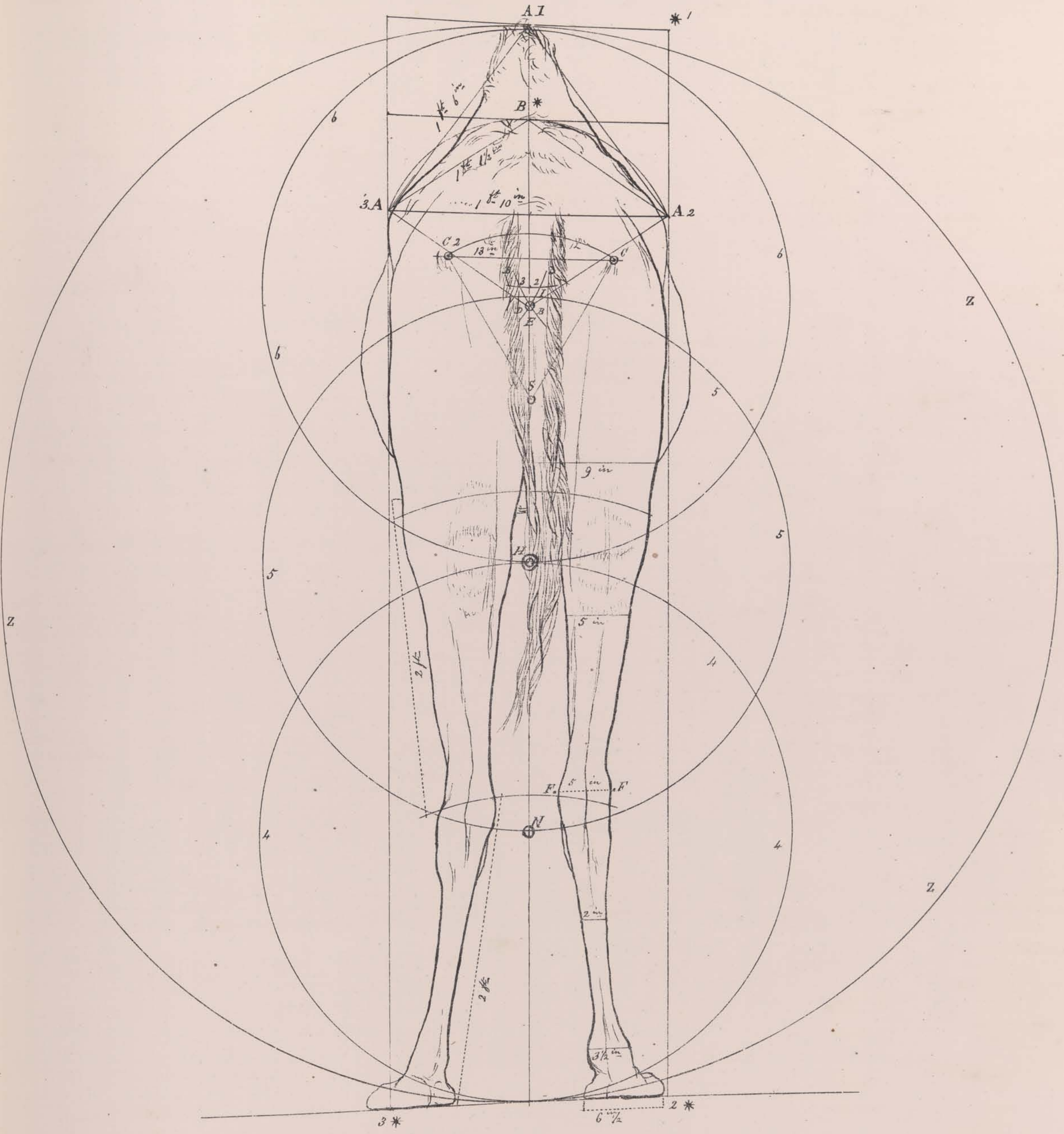
DROMEDARY

Elijah Walton, del. et lith.

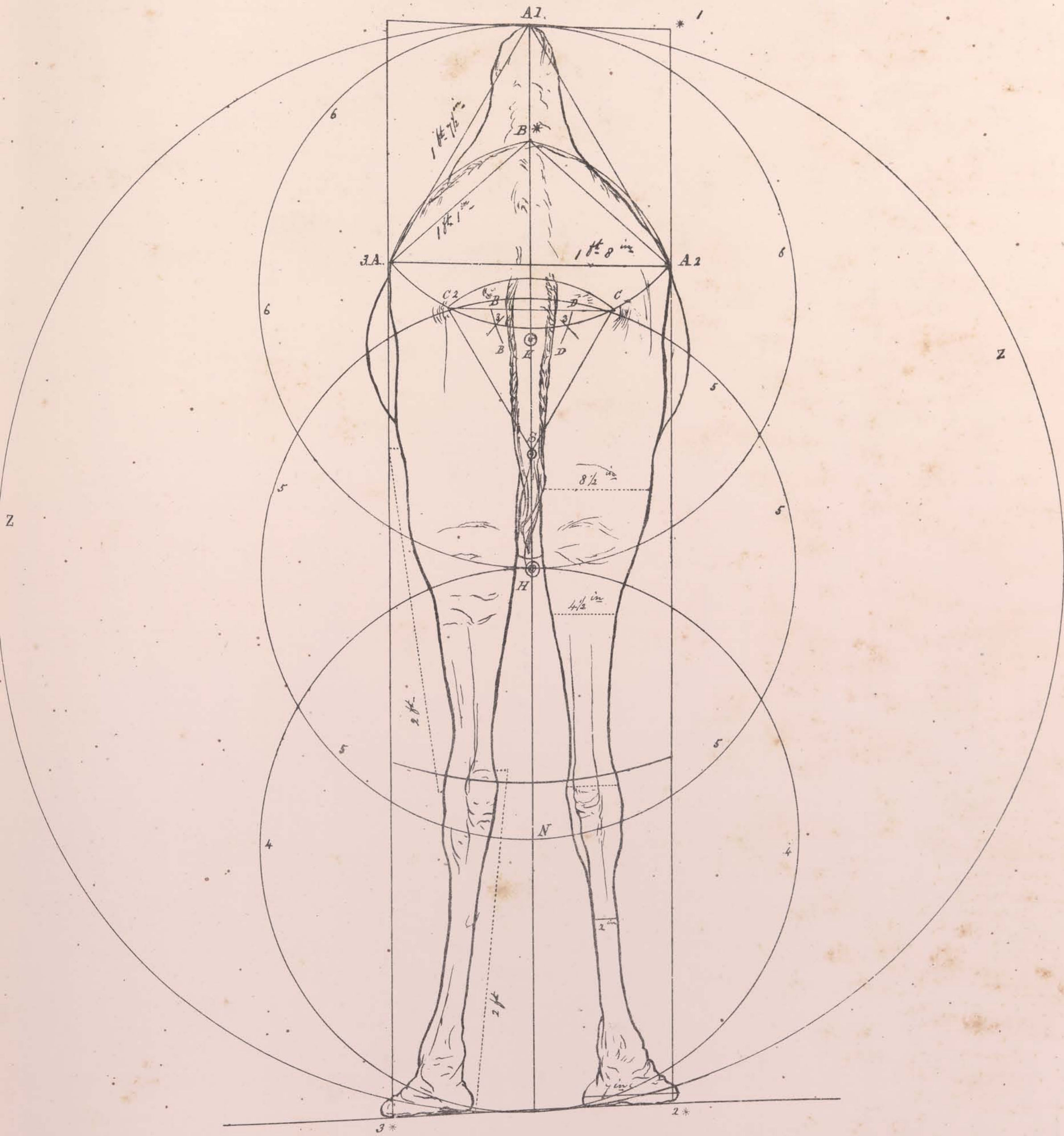
Day & Son lith. to the Queen.



DROMEDARY.

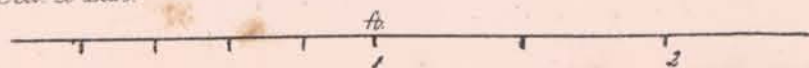
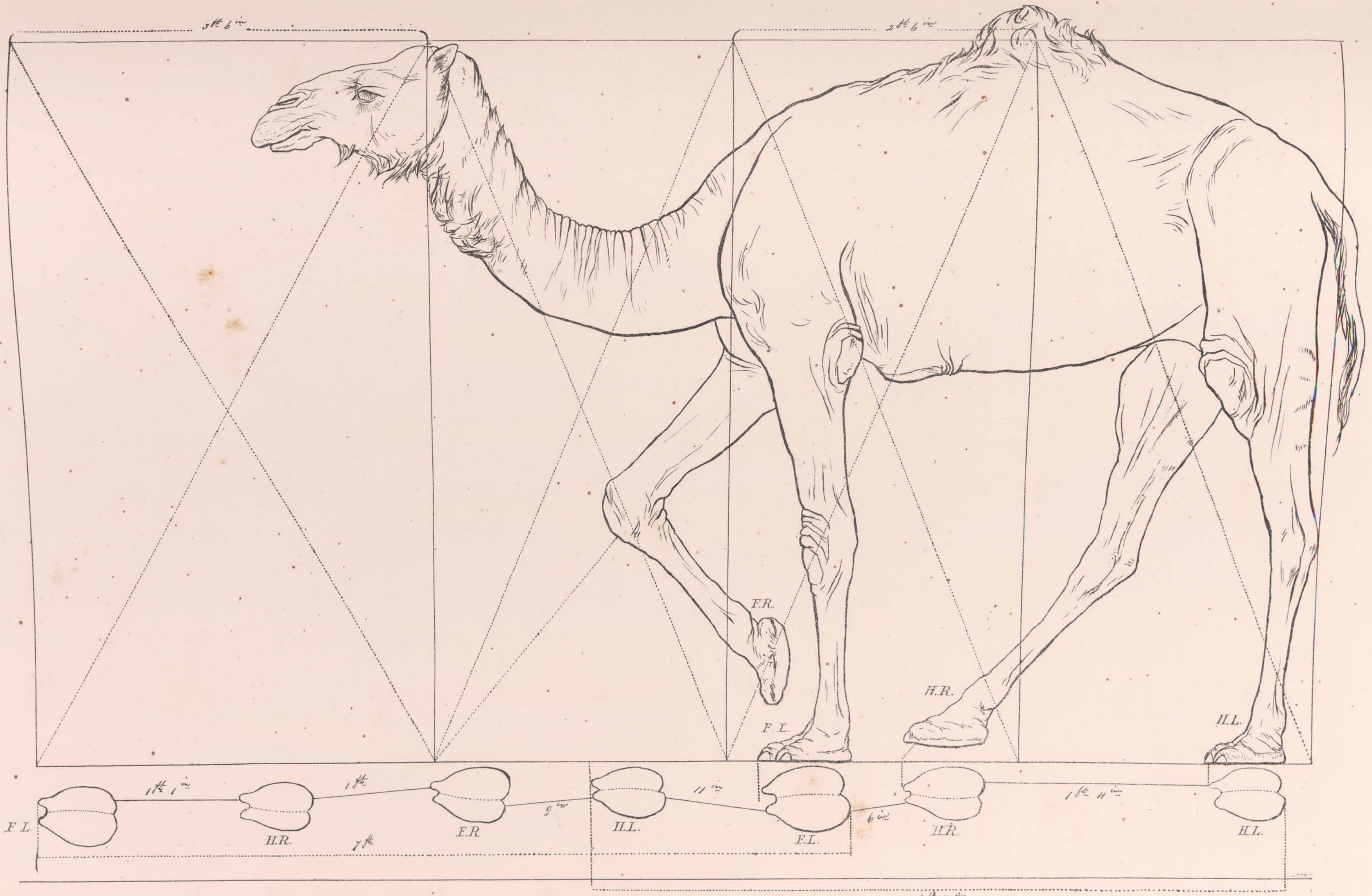






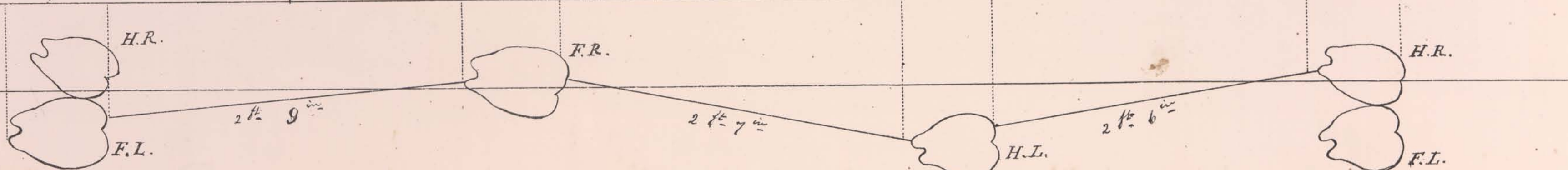
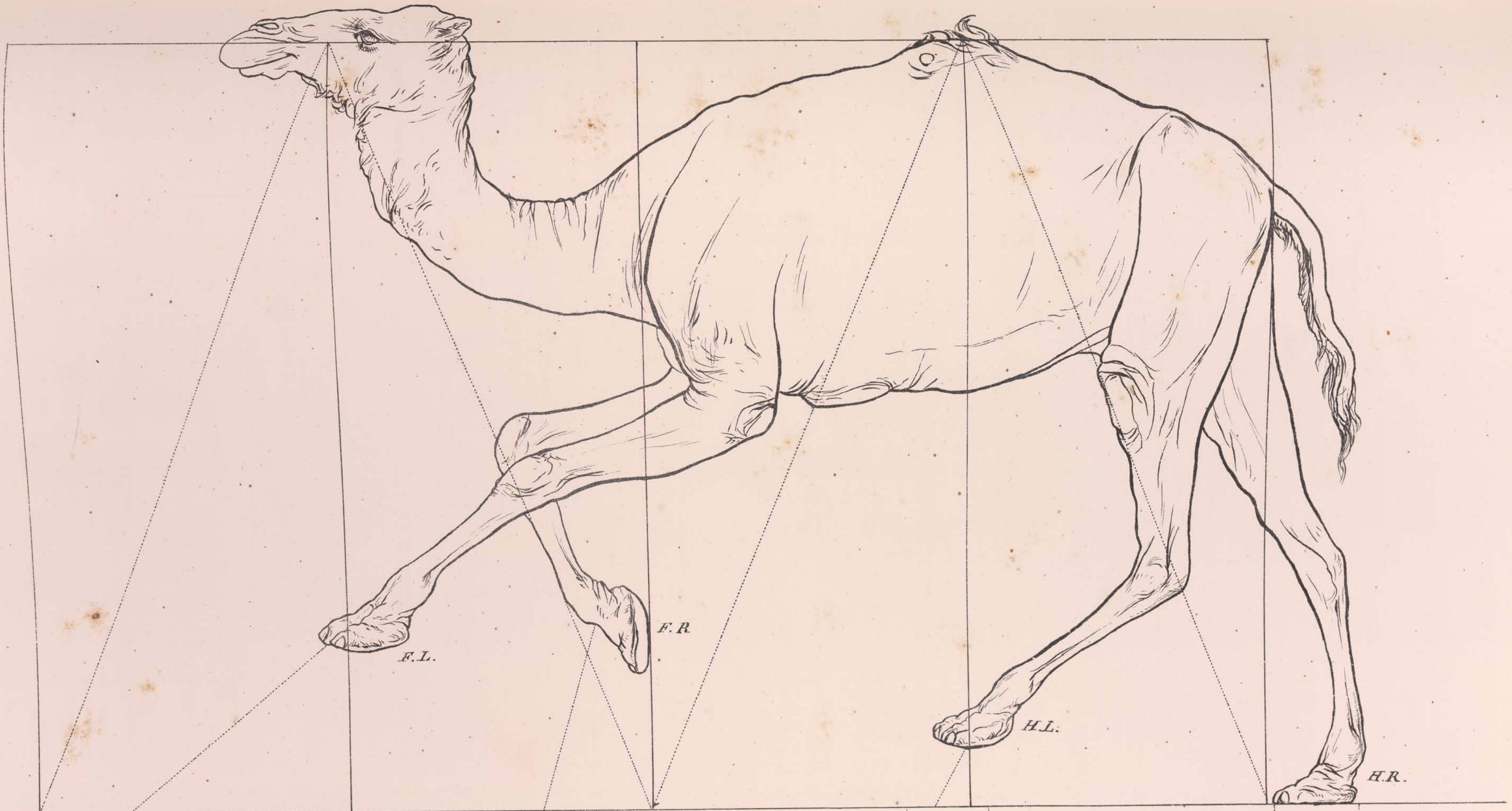
1 ft





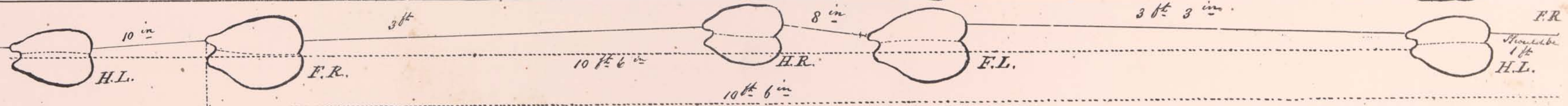
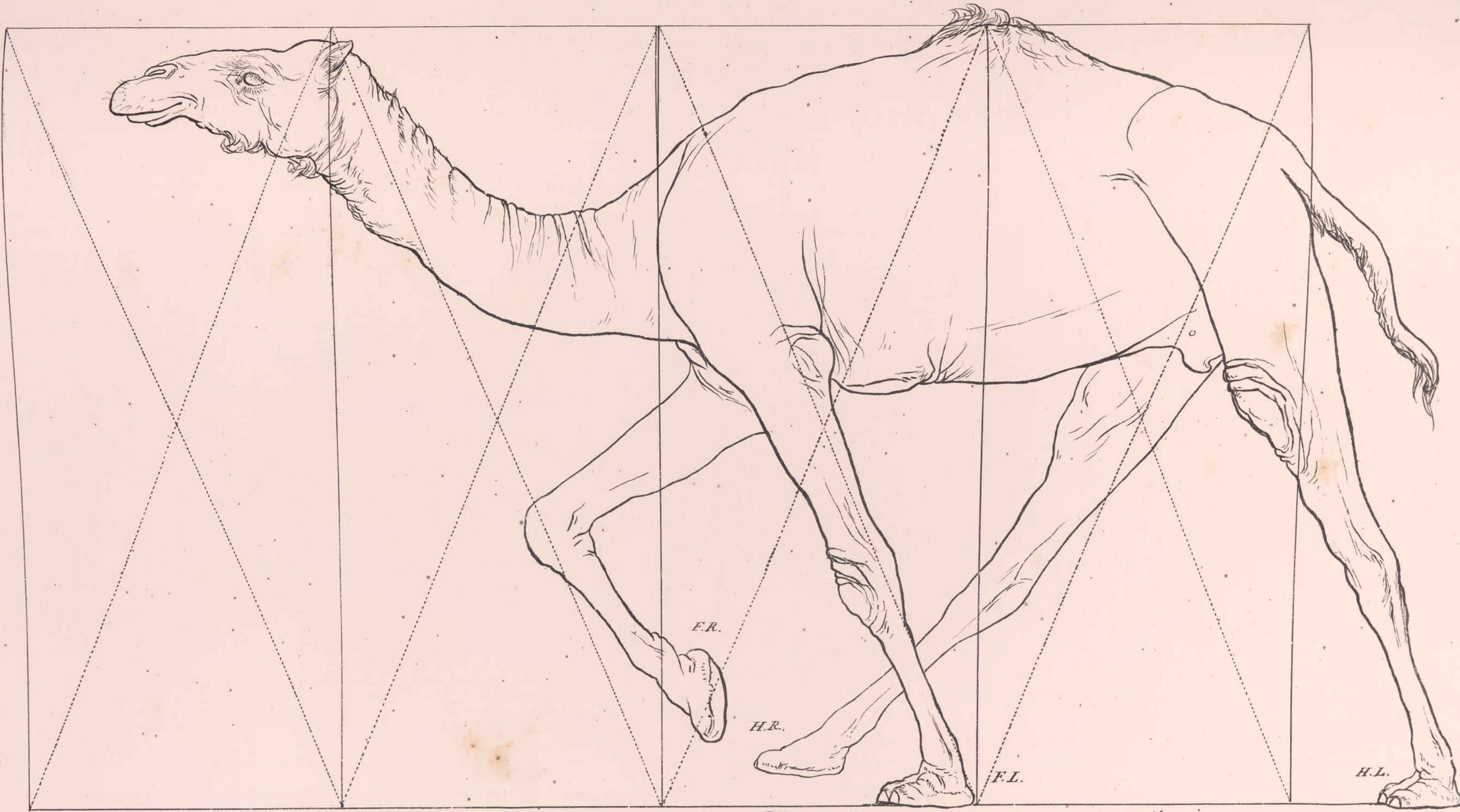
FOOTPRINTS





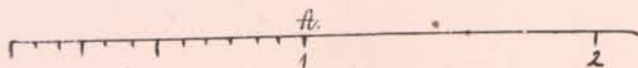
FOOTPRINTS





Elijah Walton. Del. et Lith.

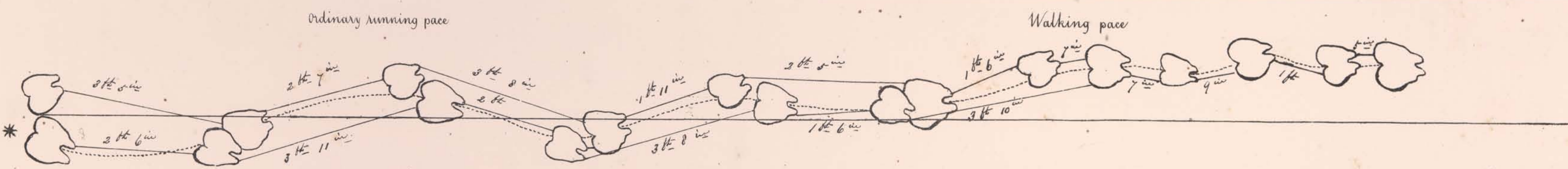
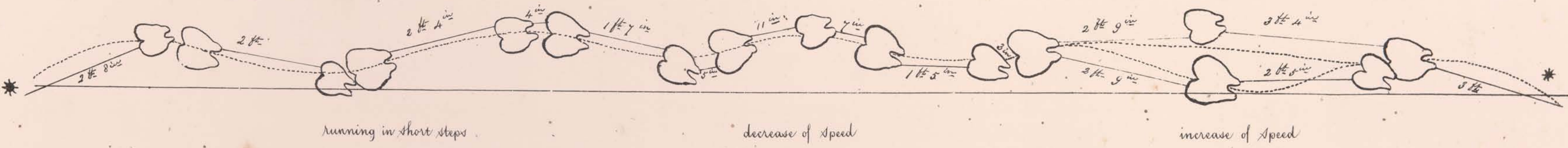
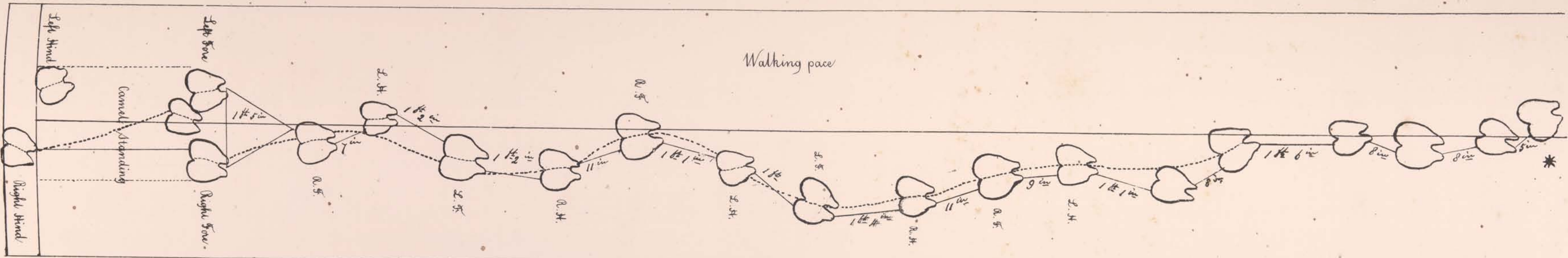
FOOTPRINTS



Day & Son lith. to the Queen



FOOT PRINTS  
FROM IMPRESSIONS  
LEFT UPON THE SAND

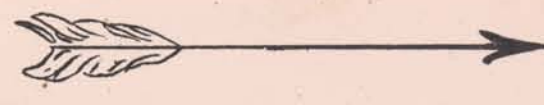
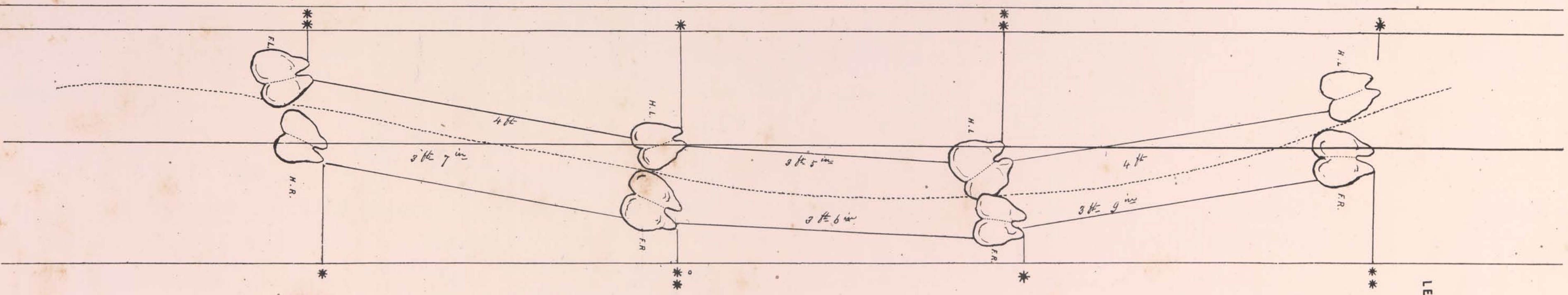


Byg & Shroy, 2400 16th St. S.W.

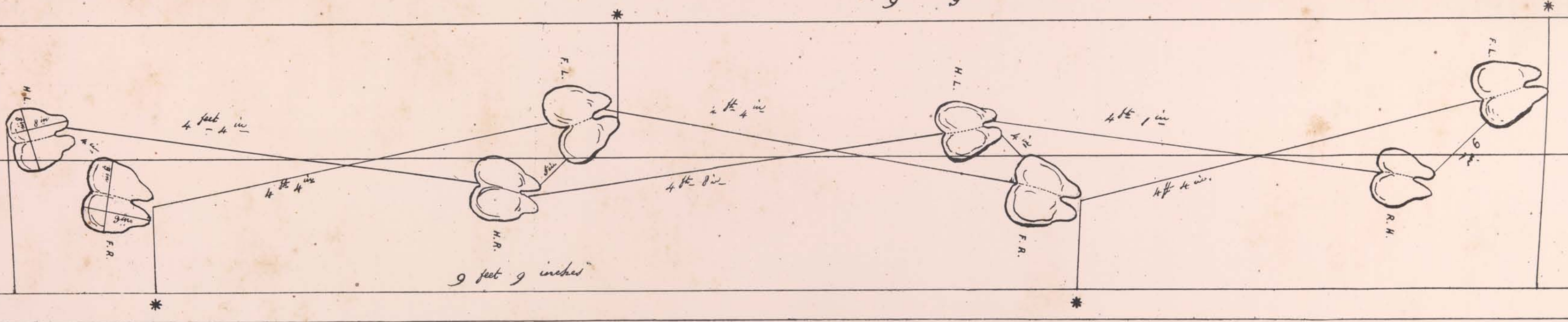


FOOT PRINTS

LEFT UPON THE SAND.



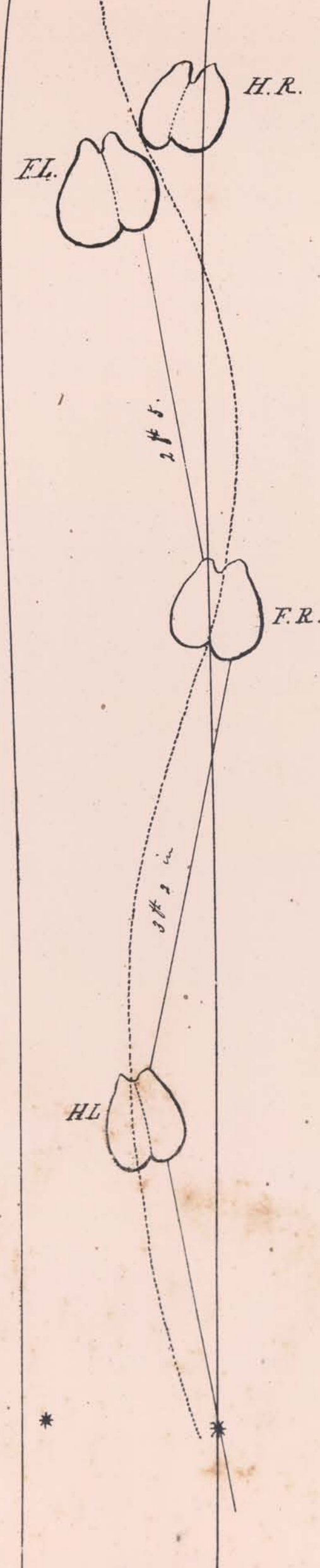
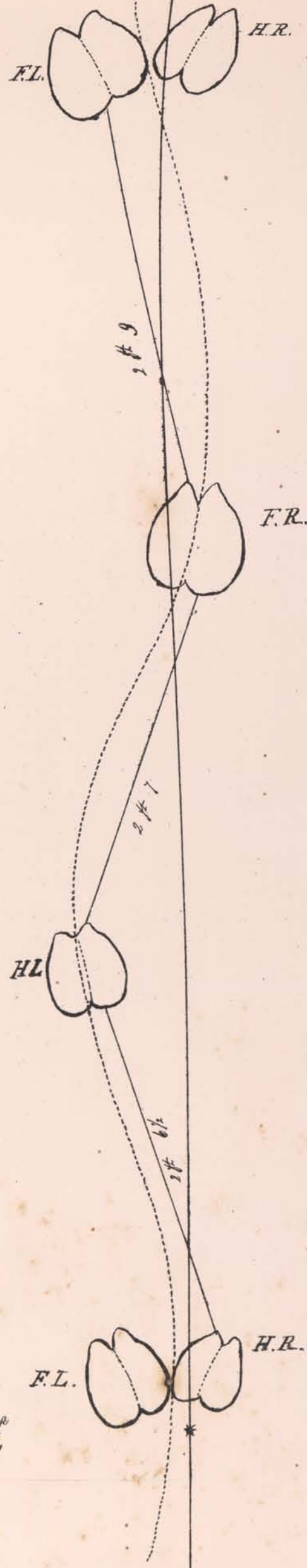
9 feet 9 inches



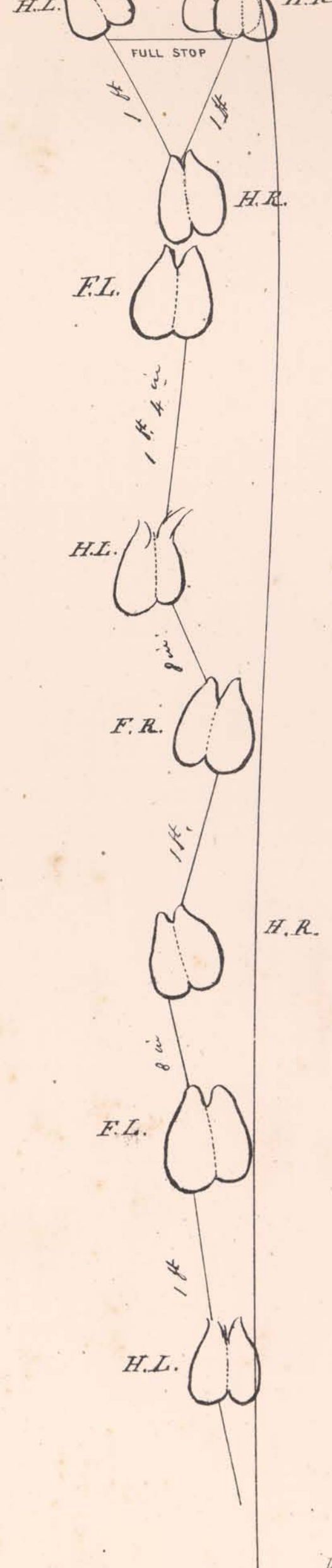
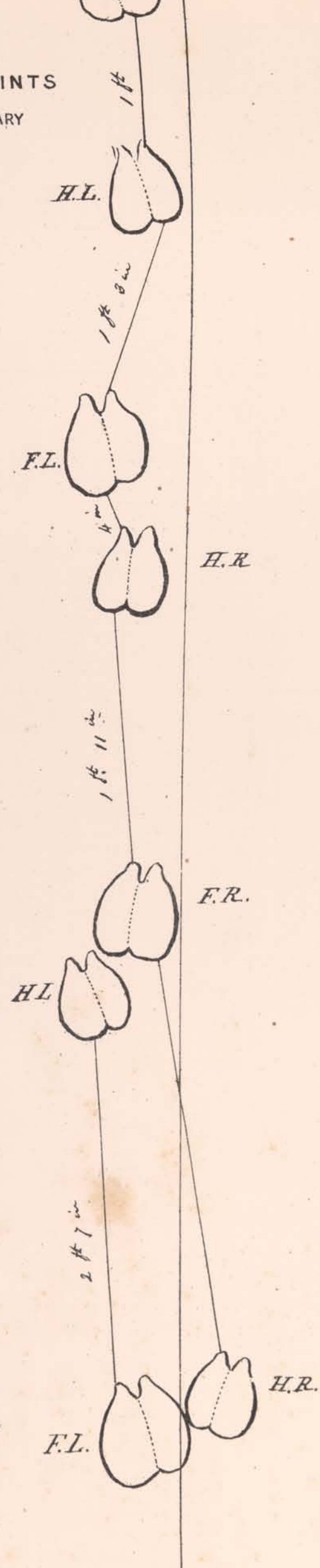
1  
2  
3



FOOT PRINTS  
FROM IMPRESSIONS  
LEFT UPON THE SAND

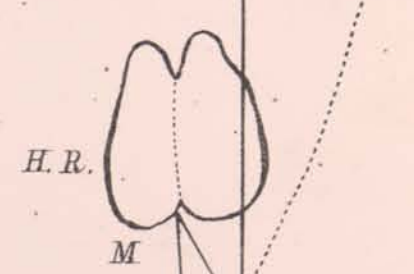
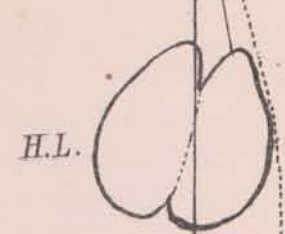
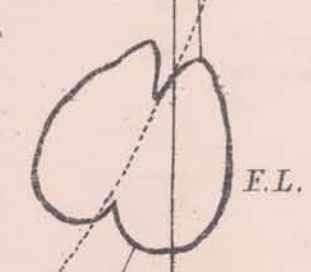
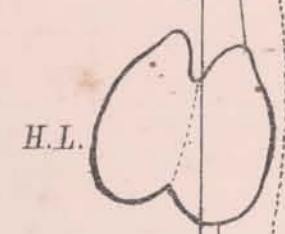
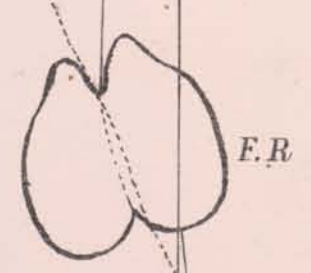
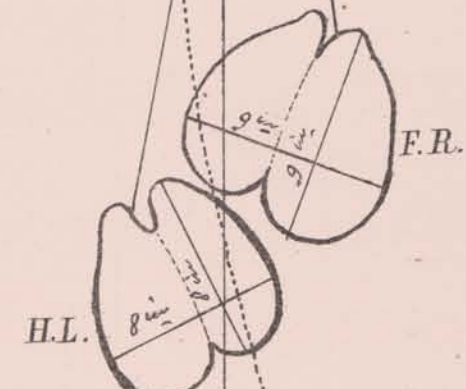
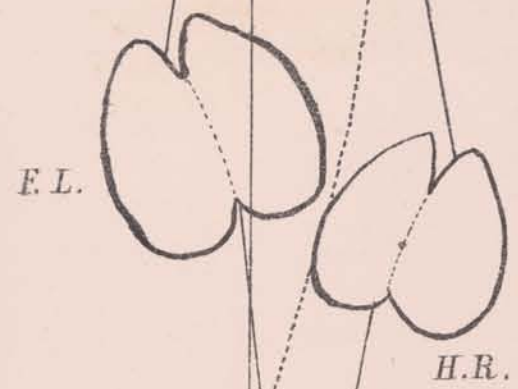
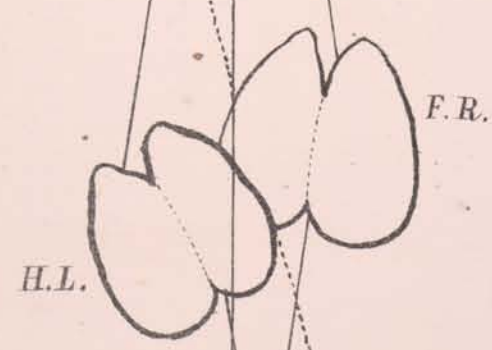


FOOT PRINTS  
OF DROMEDARY

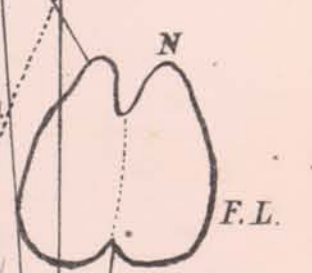




PRINTS FROM  
 SESSIONS LEFT  
 ON THE SAND.

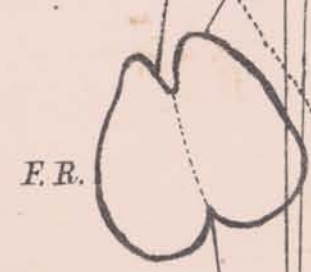


The Greater Speed  
 The greater the speed the further the hind leg is projected before the fore leg, as seen at M. N.



4 ft 11 in

5 ft 3 in







HIND FOOT AT REST.



CAMEL N° 3.



HIND FOOT - BACK VIEW FULL SIZE.



CAMEL N° 3.



RIGHT HIND FOOT WALKING



RIGHT HIND FOOT PROGRESSION

*Egypt. Museum, del. et lith.*



CAMEL N° 3.



*Elipha Waller del. et lith.*

*Day & Son, Litho in the Queen.*

THE FORE FOOT RIGHT WHEN THE CAMEL IS HEAVILY LADEN. FULL SIZE.



CAMEL N<sup>o</sup> 3.



RIGHT HIND FOOT WALKING





RIGHT HIND FOOT WALKING



RIGHT HIND FOOT PROGRESSION





RIGHT HIND FOOT JUST RAISED TO BE THROWN FORWARD



RIGHT HIND FOOT

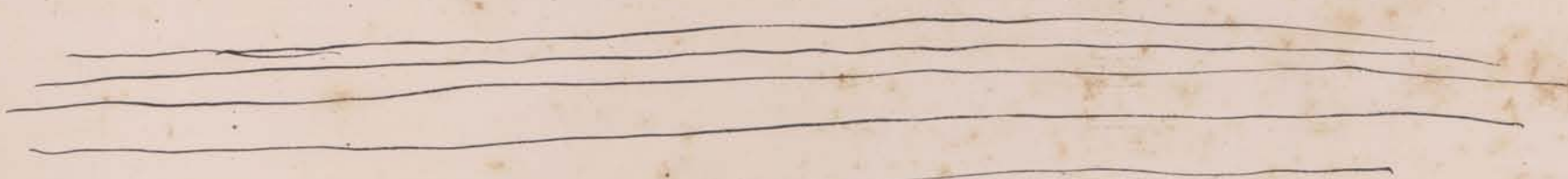




POSITION OF THE HOCKS AND FEET WHEN THE CAMEL RECEIVES ITS BURDEN



CAMEL N° 3.



FORE FOOT RIGHT IN PROGRESSION.



CAMEL N<sup>o</sup> 3.



FORE FOOT RIGHT, FULL SIZE.



CAMEL N° 3.

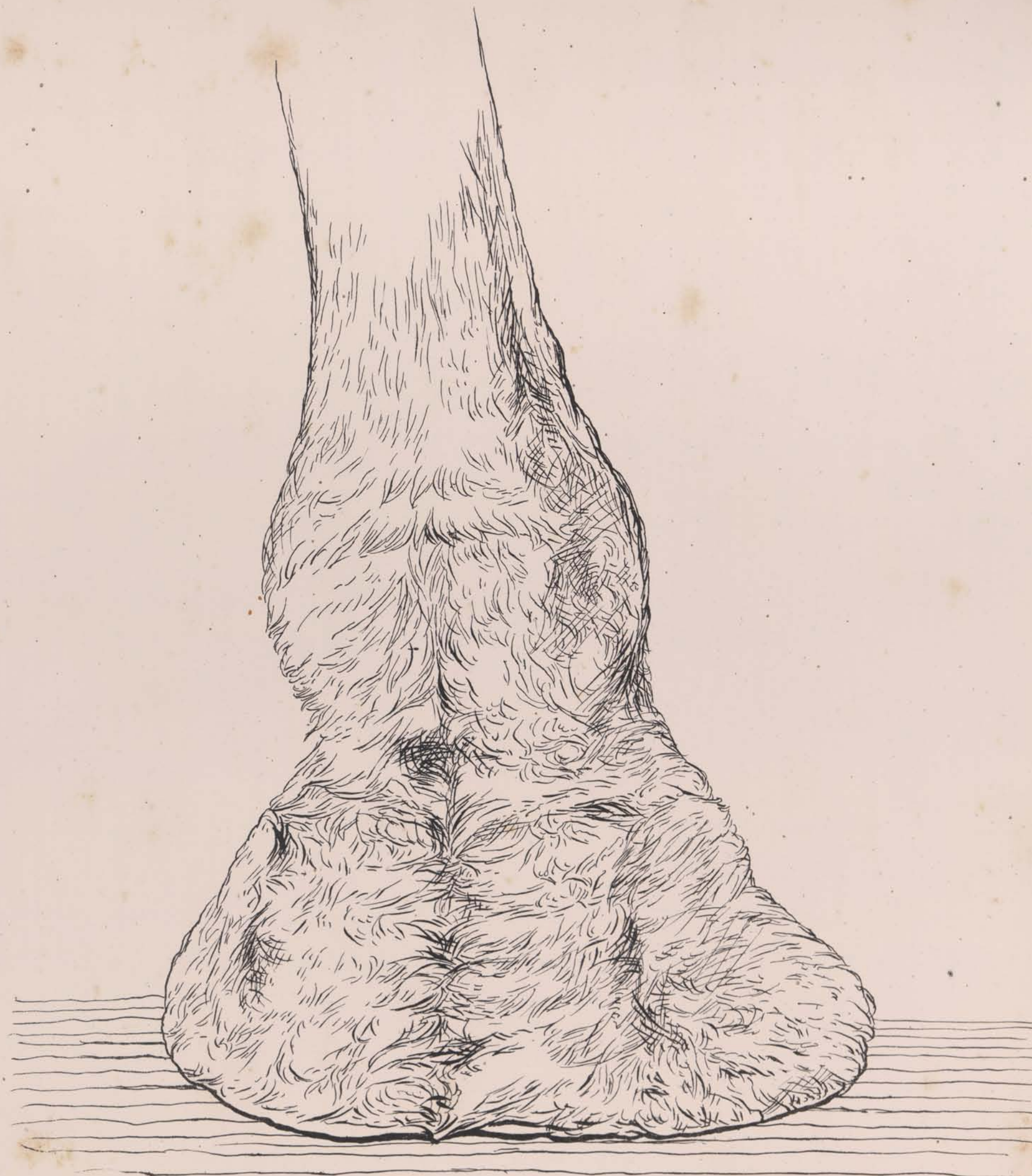


FORE FOOT RIGHT FULL SIZE.  
REPOSE





FORE FOOT RIGHT WALKING



BACK VIEW OF FORE FOOT RIGHT





*Outer Side  
the largest Half of the  
sole of the foot.*



SOLE OF THE HIND FOOT FULL SIZE.



CAMEL N° 3



External side  
the largest Half of the  
sole of the foot.

1.1. Sole of the foot formed of thick Horny  
Substance nearly 1/4 of an inch thick



SOLE OF FORE FOOT RIGHT FULL SIZE.



THE EYE

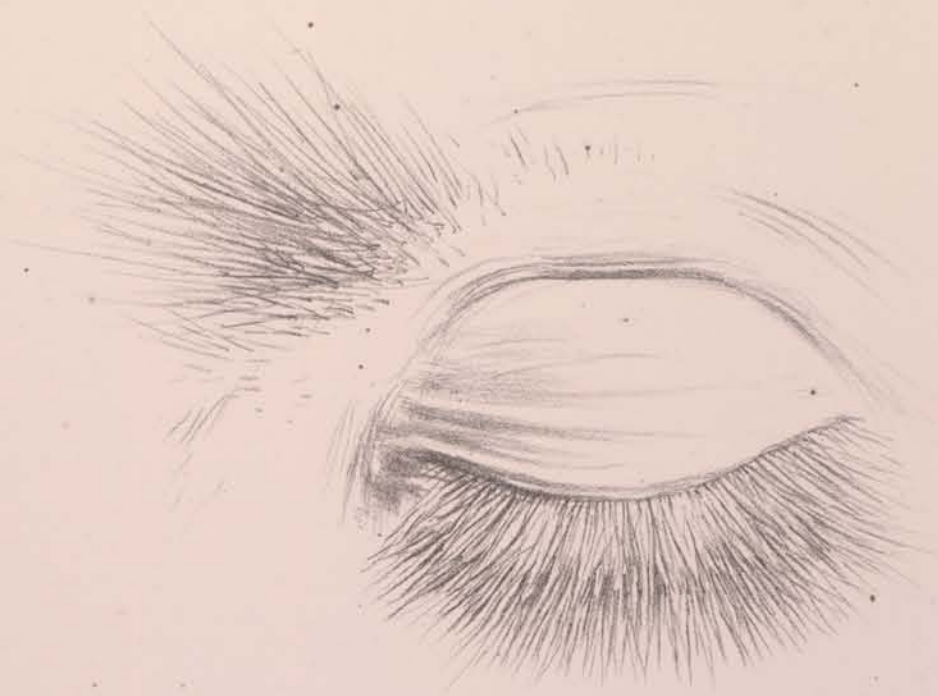
PLATE 77



WHEN WALKING



WHEN RESTIVE

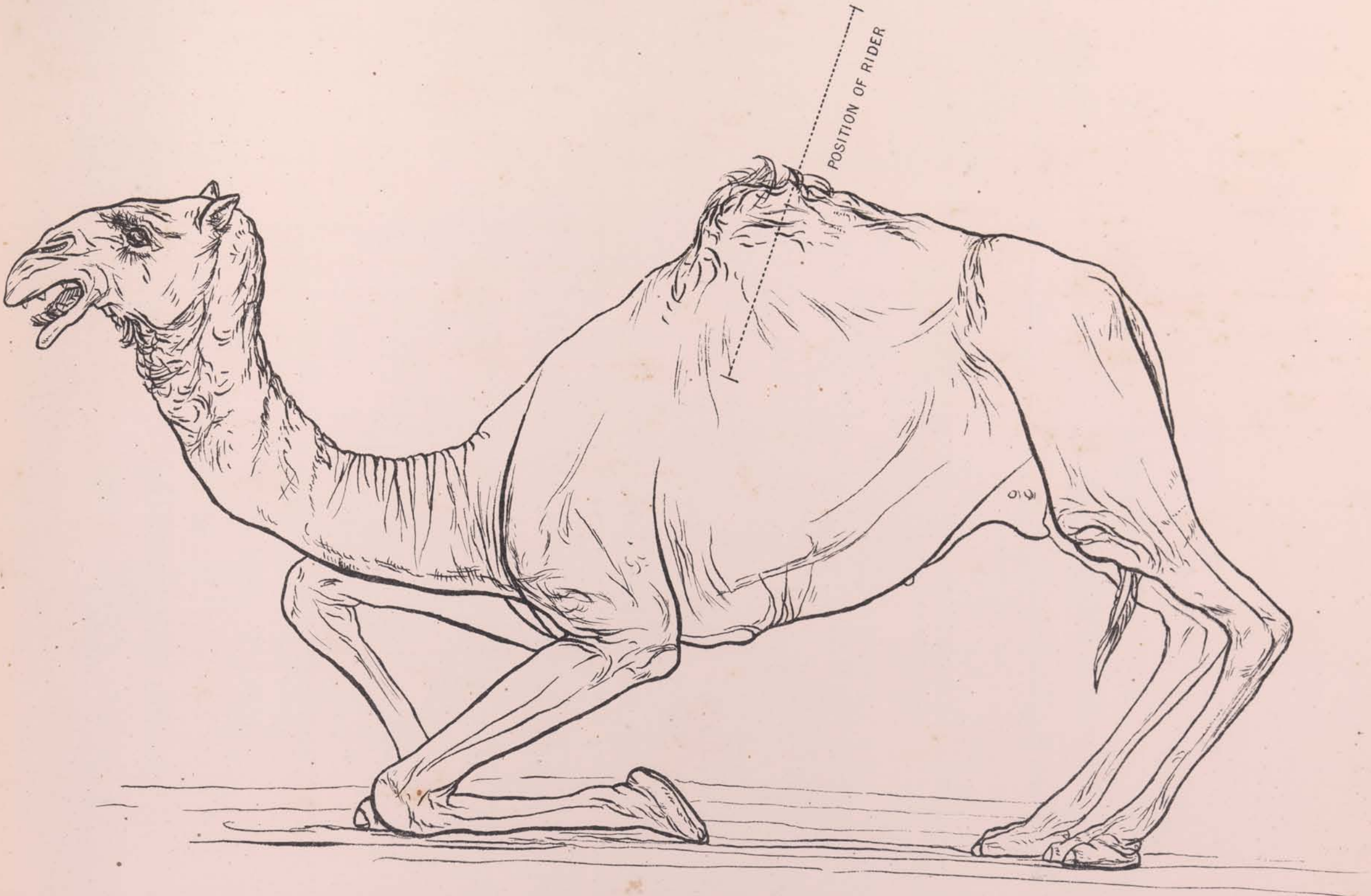


WHEN SLEEPING



WHEN RUNNING





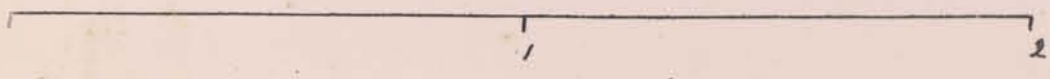
FIRST POSITION OF DESCENT



SECOND POSITION OF DESCENT



THE CAMEL WHEN TIRED AND SLEEPING



*Elijah Walton. Del. et Lith.*

*Day & Son. Lith. to the Queen.*





POSITION & CARRIAGE OF THE HEAD & THE ANGLE IT MAKES WITH THE NECK.

75° is the most usual position, seldom or ever 80°. When the neck is arched & drawn back, the head rises as at 60° and 50°. See Plate (86.)

Elijah Walton, del. et lith.

Das. & Son. Lith. to the Queen.





CAMEL SLEEPING.

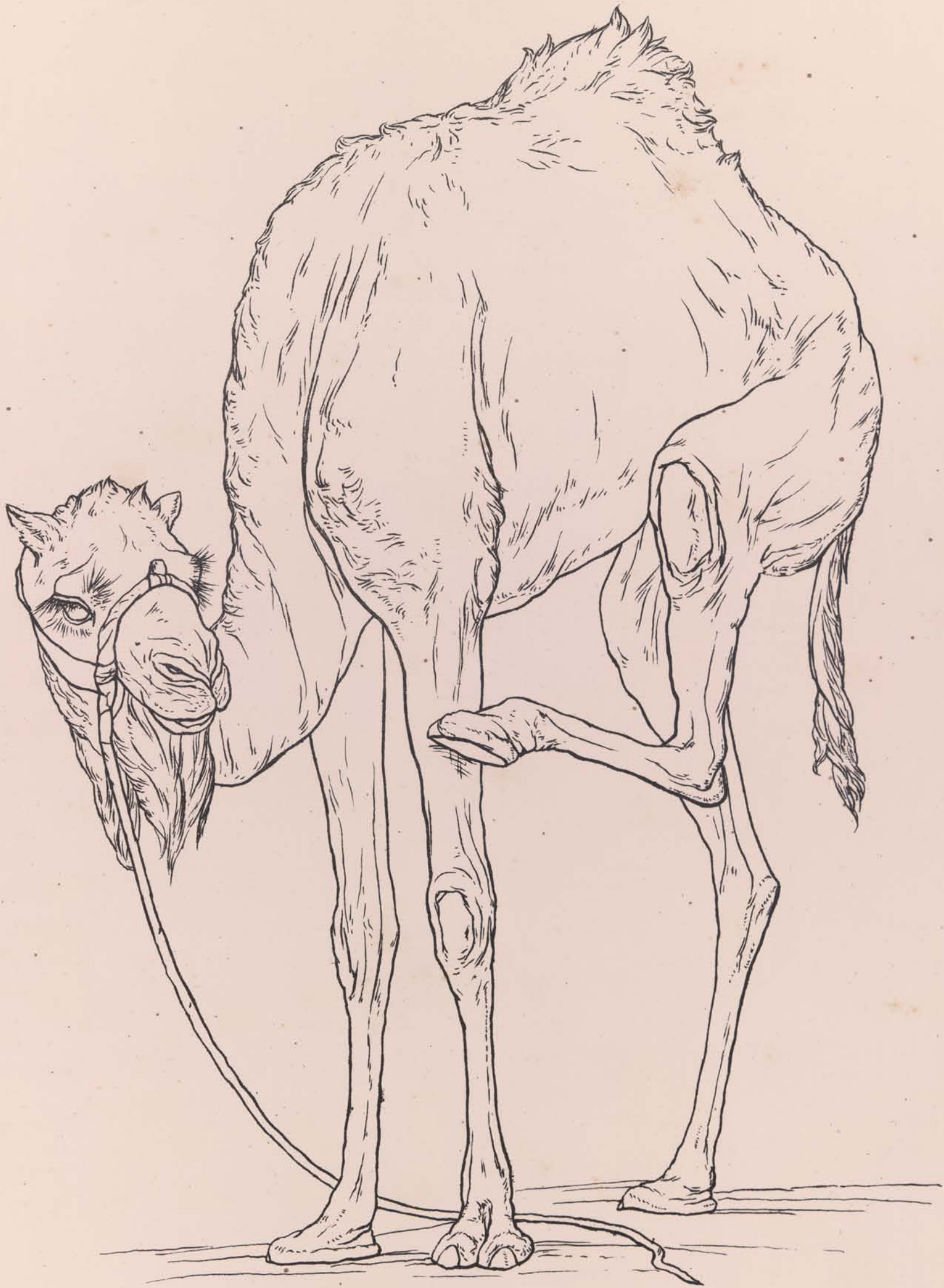






THE CAMEL CALLED UPON TO STOP





CAMEL SCRATCHING HIS FORE LEG.





CAMEL SCRATCHING HIS HIND LEG.



WITH HIS LIPS.

*From A. S. Smith's "The Camel"*



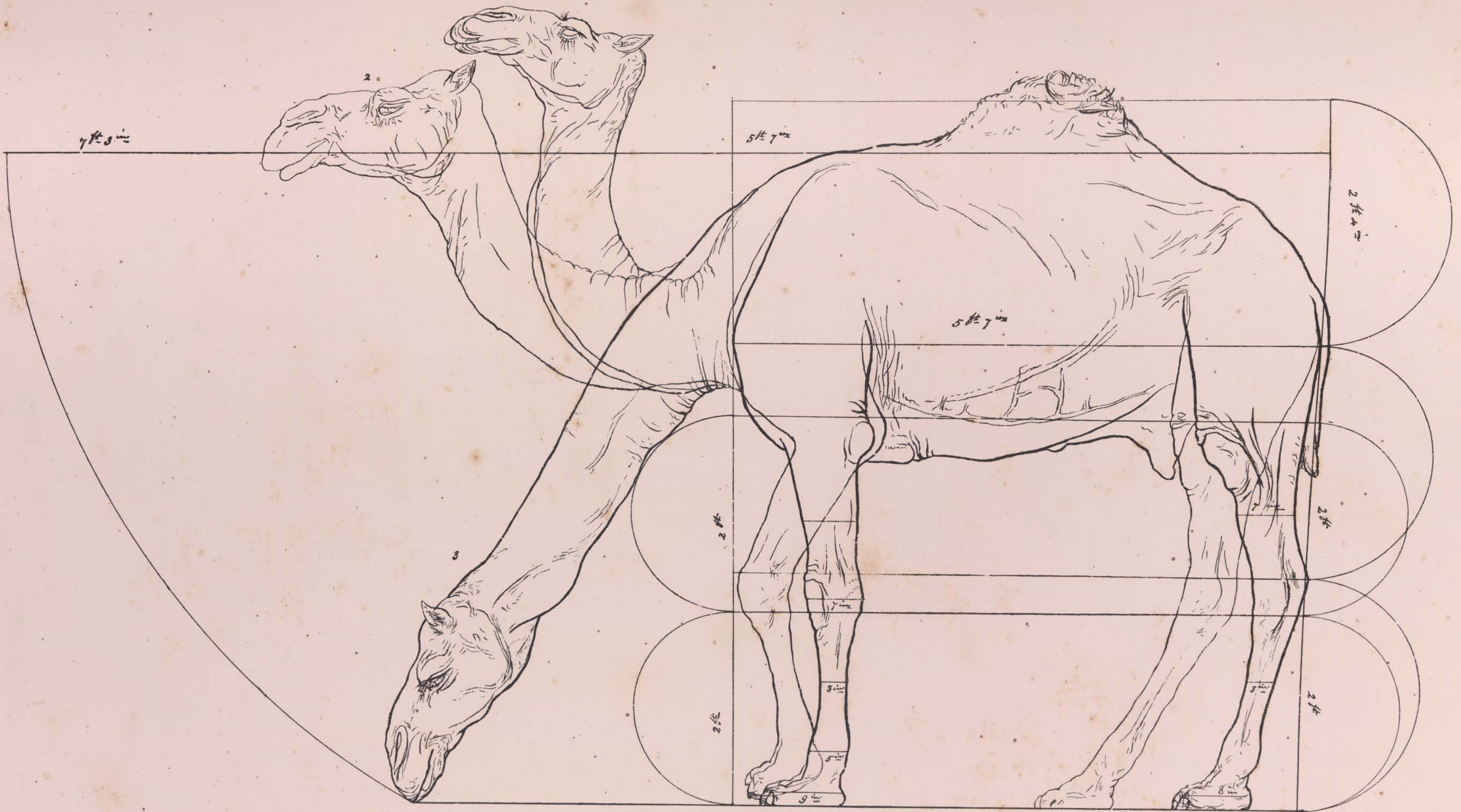


CAMEL TURNS HIS HEAD TO HIS SHOULDER.

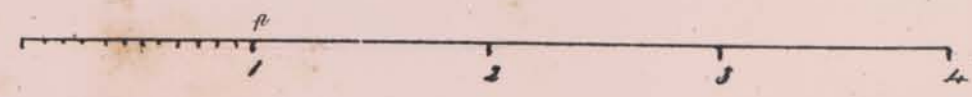


CAMEL TOUCHING HIS HIND LEG WITH HIS LIPS.





SCALE



POSITION OF THE HEAD & NECK.

- 1. Position when the rider wishes the animal to stop.
- 2. When walking.
- 3. When drinking.





HEAD OF A DROMEDARY FROM SINAI.



HEAD OF A DROMEDARY FROM SINAI.

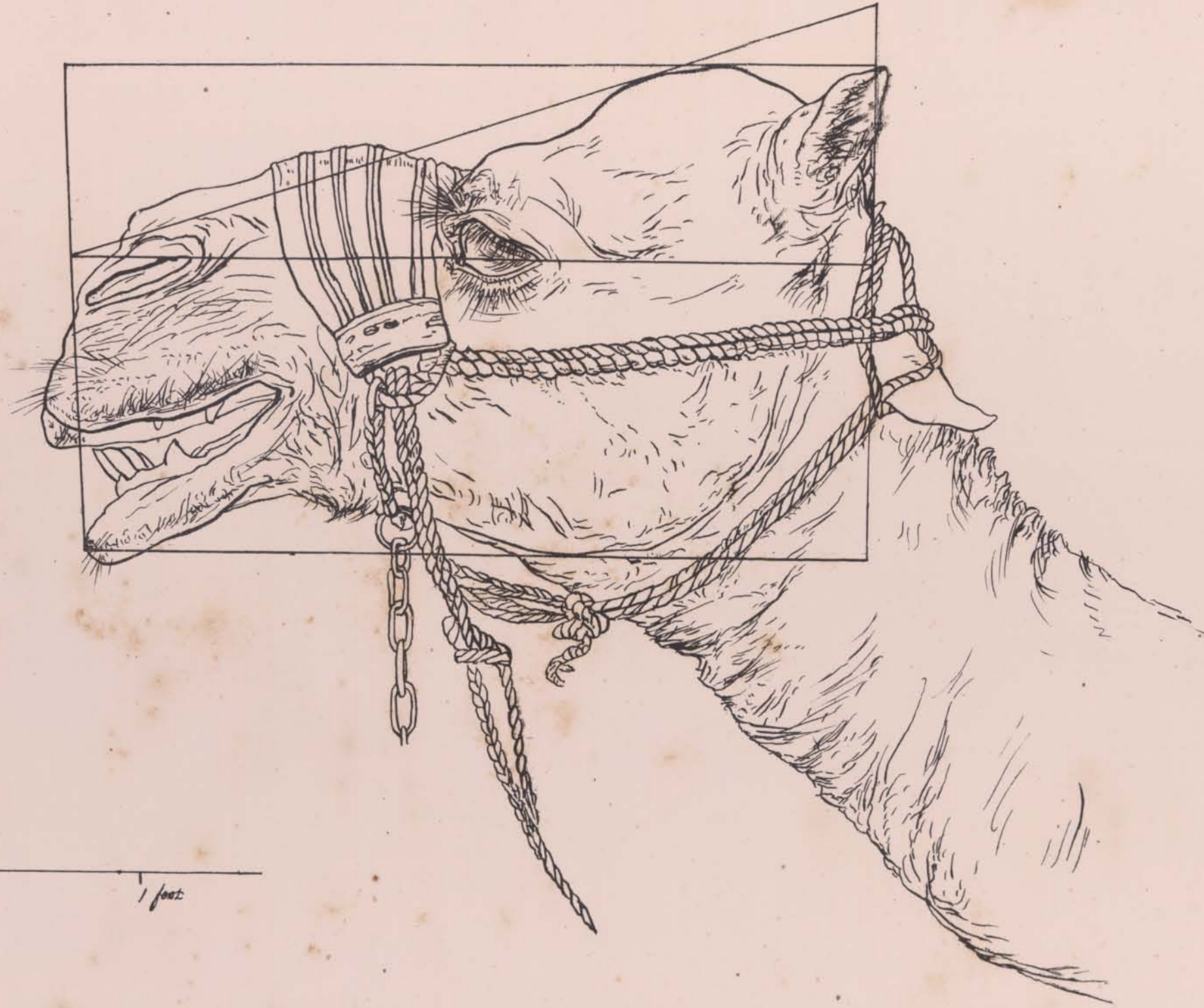


HEAD OF A DROMEDARY.



DROMEDARY INFLATING THE BLADDER,  
Which lies at back Part of the root of the tongue.







THE EAR.



THE EARS WHEN THE SOUND IS HEARD FROM BEFORE.



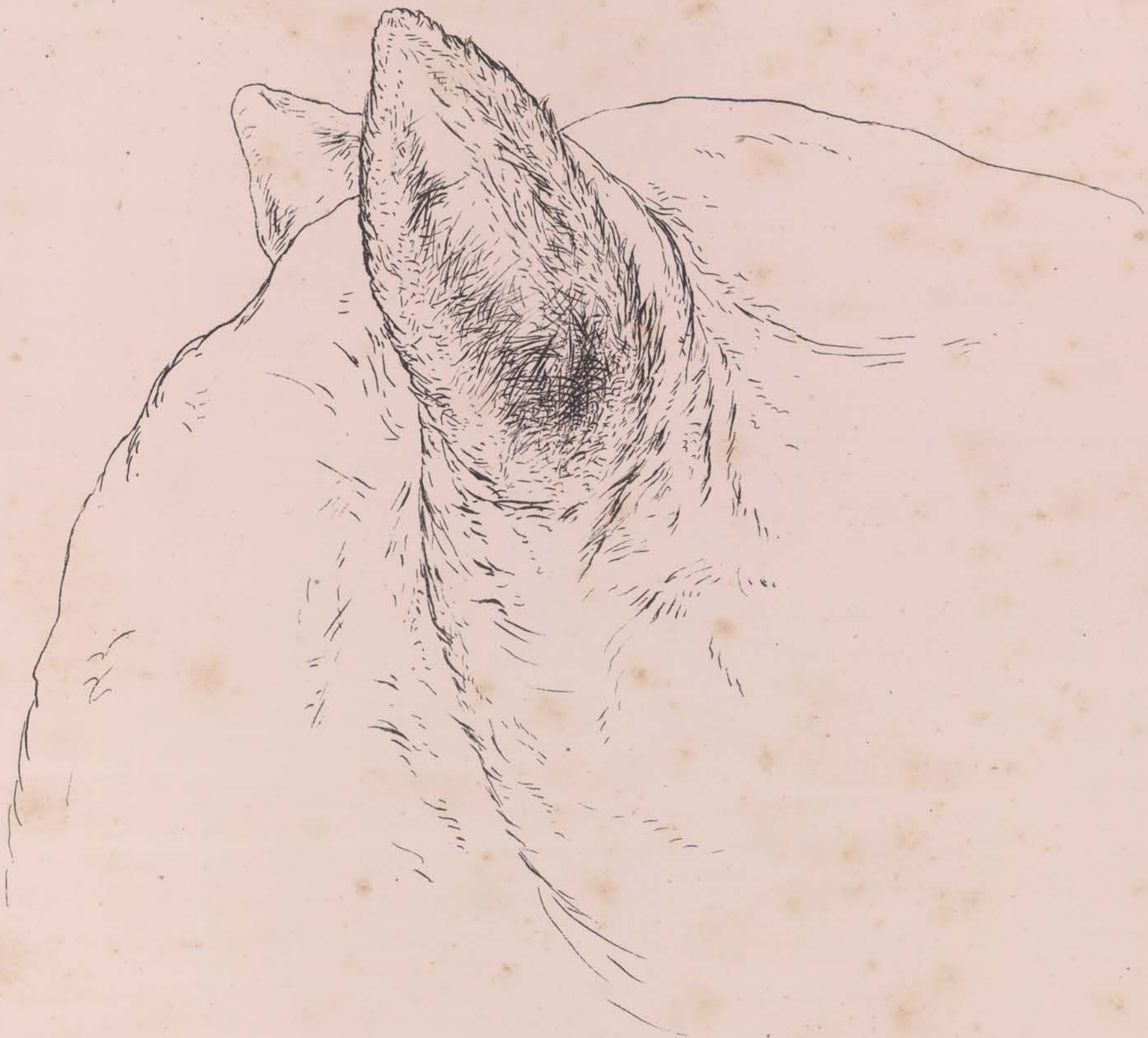
THE EAR



RIGHT EAR REPOSE.  
*Full Size.*



THE EAR.



SOUND HEARD FROM BEHIND.





CAMEL TURNING HIS HEAD TO TOUCH HIS HUMP.  
SHOWING THE ELASTICITY OF THE NECK.