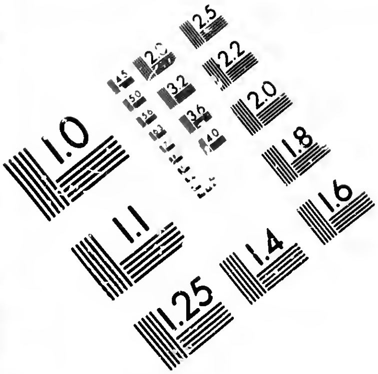

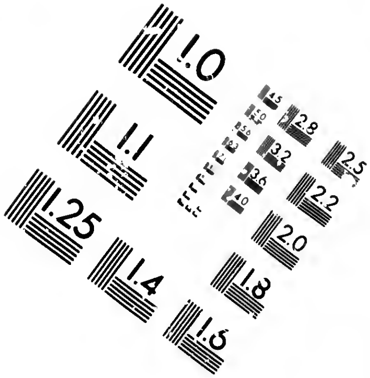

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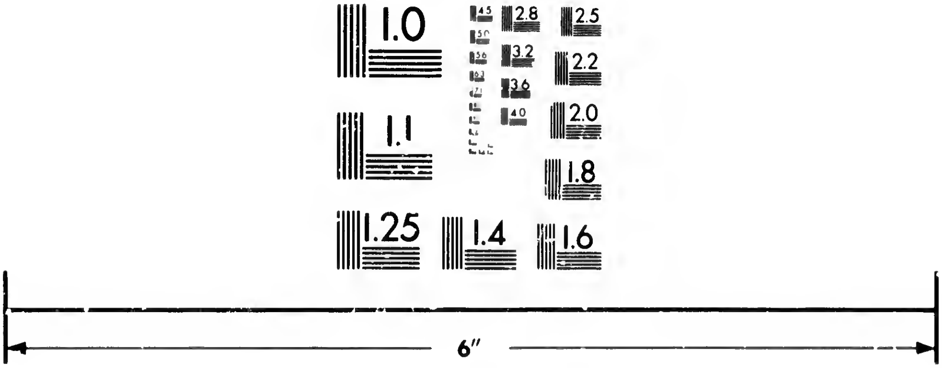

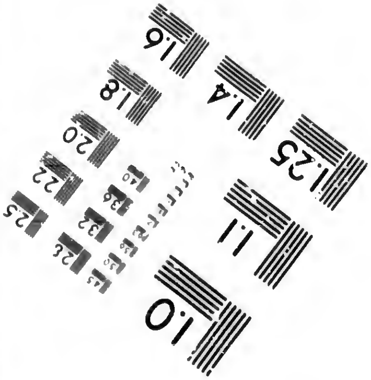

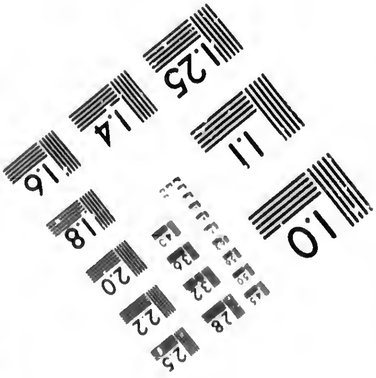

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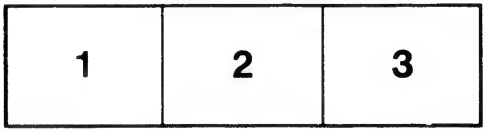
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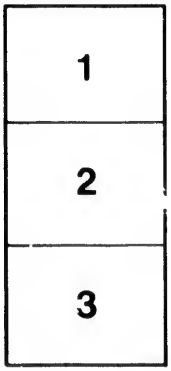
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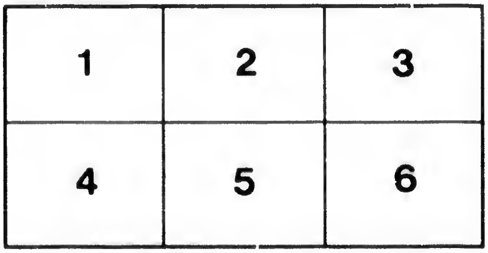
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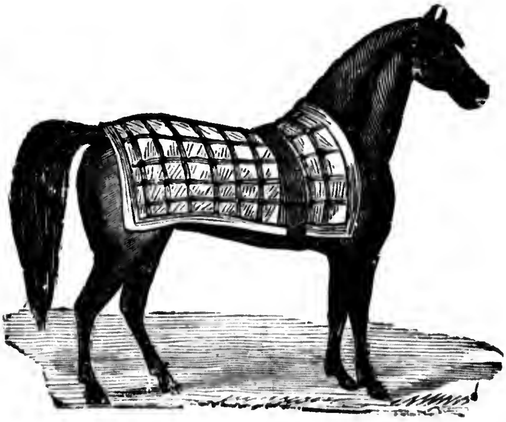
EQUINE MYOLOGY.

BY

A. H. KING, V.S.



TORONTO:
J. A. CARVETH & CO., MEDICAL PUBLISHERS.
1891

PREFACE

SEVERAL years' experience as a teacher of equine myology has convinced us that the great difficulty that students experience in acquiring a good knowledge of the subject arises from the fact that beginners almost invariably attempt to master too many details. We are satisfied that if the principal origin and insertion, together with the action, were first fixed on the mind, and the less important ones left to be gradually acquired in the dissecting room by practical work, the result would be more satisfactory.

Most of the facts recounted in this little hand-book, though by no means original, have been verified by the author, and arranged in such a way as to enable students to grasp at once the most important points.

My best thanks are due Mr. E. B. Holmes for his assistance in correcting the proofs.

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EQUINE MYOLOGY.

Myology is that branch of descriptive anatomy which treats of the muscles.

A Muscle is an organ capable of contracting when irritated chemically or by nerve stimulus.

There are two varieties of muscular tissue, striated and non-striated.

Striated Muscles are under the control of the will, with one exception, and are connected with bones, cartilage, ligaments, or skin.

Non-Striated Muscles are not under the control of the will; this kind of muscle is found forming the contractile coats of the stomach, bladder, etc.

Striated muscles are attached to other structures either directly or by means of tendons, aponeuroses or fasciæ.

Tendons are white cords or bands, formed almost exclusively of white fibrous tissue. They are inelastic and connect the muscular tissue with the parts on which they act.

Aponeuroses are membranous expansions of white fibrous tissue serving similar purposes to a tendon.

Fasciæ.—They are laminæ of fibrous or fibro-areolar tissue insheathing or serving to divide and attach muscles.

Muscles are divided according to their absolute form into long, wide and short.

Long Muscles are found principally in the limbs.

Wide Muscles are found immediately beneath the skin or around the great cavities.

Short Muscles.—These are found particularly around short bones.

Muscles are sometimes named according to the arrangement of their fibres. In some they run longitudinally with a tendon at either end.

A Penniform Muscle is one in which the fibres converge, like the plumes of a feather, to one side of a tendon which runs the entire length.

A Bi-Penniform is one in which the fibres converge from both sides of a tendon.

Radiating Muscles where the fibres converge from a broad surface to a tendinous point.

Digastric Muscle is one with the tendon in the centre.

The origin of a muscle is the most fixed and central point from which the muscle acts.

The insertion is the movable point to which the muscular force is directed; but in many muscular acts the part usually described as the insertion becomes the fixed point, and the origin the movable one.

PANNICULUS CARNOSUS.

This muscle is thin and sub-cutaneous, and covers the greater part of the body. It is divided into four portions, viz:—Facial, Cervical, Thoracic, and Abdominal.

The Facial

is thin and passes from the angle of the mouth over the masseter muscle to the zygoma.

The Cervical

is attached posteriorly to the cariniform cartilage and is fleshy; anteriorly it extends into the intermaxillary space. Laterally, above the levator humeri it is aponeurotic and blends with the funicular portion of the ligamentum nuchae.

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The Thoracic

portion is attached superiorly to the highest point of the withers; inferiorly to the point of the elbow.

The Abdominal

portion, like the cervical, is well developed; it is attached anteriorly to the internal trochanter of the humerus; posteriorly to the stifle and fascia of the thigh.

Action It corrugates the skin.

THE ABDOMINAL REGION.

This region consists of a single group of four muscles, which are in pairs:

External Oblique.	Rectus Abdominis.
Internal Oblique.	Transversalis Abdominis.

The Abdominal Tunic.

A broad sheet of yellow elastic tissue is found covering this group of muscles. It is thickest in the centre and posteriorly becoming thinner as it proceeds outwards over the External Oblique. Posteriorly it furnishes the suspensory ligaments of the sheath in the male, and slips to mammary gland in the female. It is exceedingly well developed in the ox. It serves to support the abdominal viscera and take the strain off of the abdominal muscles.

The Linea Alba,

Or white line, is a fibrous cord extending from the Ensiform Cartilage to the Pubes. It is formed by the intersection of the aponeurosis of abdominal muscles, and passes over the centre of the abdominal cavity. The name common or prepubian tendon is sometimes given to the insertion of the Linea Alba.

External Oblique.

(Obliquus Externus Abdominis.)

Origin It is attached to the outer surface of the 14 last ribs from their centres to their cartilages, the anterior slips interdigitating with serratus magnus.

Insertion	To Linea Alba, Common Tendon, and external angle of the Ilium.

Note.—Posteriorly the aponeurosis of the external oblique appears to divide into two parts, one descending on the internal muscles of the thigh to constitute the crural aponeurosis; the other reflected upwards forming Poupart's ligament or crural arch, which is attached by its extremities from the symphysis pubes to the external angle of ilium; the upper edge is lost on the sublumbar muscles. The external inguinal ring lies in the angle formed by Poupart's ligament and the common tendon and is simply an opening through the external oblique. The crural ring is a triangular orifice behind Poupart's ligament.

Internal Oblique.

Origin	From the external angle of the ilium.
Insertion	To the linea alba, last rib, and its fellow of the opposite side.

Rectus Abdominis.

Origin	From the ensiform cartilage of the sternum.
Insertion	To the symphysis pubis, also to the linea alba throughout its whole extent.

Transversalis Abdominis.

Attachments	Superiorly to the transverse processes of the lumbar vertebræ and the inner surface of the cartilages of the false ribs; inferiorly to the linea alba, and by the common tendon to the symphysis pubis.
Action	Of the abdominal muscles. They assist in the passage of urine, fæces, and in parturition and difficult breathing. The rectus flexes the spine.

With this group we may rightly include another small muscle.

The Retractor of the Last Rib.

(Unimportant.)

Origin	From the transverse processes of the first four lumbar vertebræ.

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Insertion	To the posterior border of the last rib.
Action	To assist in expiration by drawing back and fixing the last rib.

CERVICAL REGION.

This region comprises all the muscles grouped around the cervical vertebræ. They are divided into two groups, *Superior* and *Inferior Cervical.*

Superior Cervical.

Trapezius cervicalis
Rhomboideus longus
Splenius
Trachelo mastoideus
Complexus major
Rectus capitus posticus major
Rectus capitas posticus minor
Obliquis capitis posticus
Obliquis capitis anticus
Spinalis colli
Intertransversalis colli

Trapezius Cervicalis.

Origin	From funicular portion of ligamentum nuchæ as high as the third cervical vertebra.
Insertion	To tubercle on spine of the scapula.
Action	To elevate and draw the shoulder forward.

Rhomboideus Longus.

Origin	From funicular portion of ligamentum nuchæ as high as the 2nd cervical.
Insertion	To inner surface of anterior angle of the scapula and cartilage of prolongation.
Action	To elevate and draw the scapula forward.

Splenius.

Origin	Superiorly it is attached to the ligamentum nuchæ as far forward as the crest of the occipital, and back as far as the fifth dorsal spine.
Insertion	Inferiorly it digitates and is inserted to mastoid crest, wing of the atlas, transverse processes of the second, third, and fourth cervical vertebræ.

Action	With its fellow, it elevates the head ; alone, it draws it to one side.

Trachelo Mastoideus.

Origin	From the transverse processes of the first two dorsal and oblique processes of the last five cervical.
Insertion	By two tendons, one to the wing of the atlas, the other to the mastoid crest.
Action	With its fellow, to elevate the head ; alone, to draw it to one side.

Complexus Major.

Origin	From the transverse and spinous processes of the first five dorsal and the oblique processes of all the cervical.
Insertion	To the occipital tuberosity.
Action	To extend the head.

Rectus Capitis Posticus Major.

Origin	Spine of dentata.
Insertion	To the occipital.
Action	Extends the head.

Rectus Capitis Posticus Minor.

Origin	From supero-anterior part of atlas.
Insertion	To the occipital tuberosity.
Action	To assist the major.

Obliquis Capitis Posticus.

Origin	From the side of the superior spine of the axis.
Insertion	To wing and body of the atlas.
Action	Rotates the head.

Obliquis Capitis Anticus.

Origin	From wing of atlas.
Insertion	To the occipital.
Action	It inclines the head on the atlas, and slightly extends it.

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Spinalis Colli.

(Semispinalis Colli).

This muscle consists of five bundles.

Origin From the oblique processes of the last five cervical vertebræ.

Insertion To the superior spines of all the cervical vertebræ, except the first and seventh.

Action Acting together, the right and left muscles will extend the cervical portion of the spinal column; singly they rotate and incline it to one side.

Intertransversalis Colli.

Consists of five bundles.

Origin From the oblique process of one cervical vertebræ.

Insertion To the transverse process of the vertebræ in front.

Action To bend the neck to one side.

Inferior Cervical Group.

Levator humeri.
Sterno maxillaris.
Sterno-thyro-hyoideus.
Subscapulo-hyoideus.
Rectus capitus anticus major.
Rectus capitus anticus minor.
Rectus capitus lateralis.
Scalenus.
Longus Colli.

Levator Humeri (2).

(Mastoido Humeralis).

Origin From the crest of the occipital, mastoid process and crest of the temporal, attached to the wing of the atlas, transverse processes of the second, third and fourth cervical vertebræ.

Insertion To the deltoid ridge of the humerus.

Action It extends and rotates the shoulder joint. When the limb is fixed it draws the head to one side.

Sterno Maxillaris (2)

Origin	From the cariniform cartilage of the sternum.
Insertion	To the angle of the inferior maxillary bone.
Action	To flex the head when acting with its fellow; singly to incline it to one side

NOTE.—These muscles are in contact in the lower half of the neck.

Sterno-Thyro-Hyoideus (2).

Origin	From the cariniform cartilage of the sternum.
Insertion	To the thyroid cartilage and body of the hyoid bone.
Action	It draws down the base of the tongue and larynx.

NOTE.—This is a digastric muscle; below the central tendon the two muscles are in intimate relation; above they separate, forming a sling for the trachea.

Subscapulo-Hyoideus.

Origin	From the fascia covering the subscapularis muscle.
Insertion	To the hyoid bone.
Action	It depresses the hyoid apparatus.

Rectus Capitus Anticus Major.

Origin	From the transverse processes of the third, fourth and fifth cervical vertebræ.
Insertion	To the basilar process of the occiput.
Action	With its fellow, it flexes the head downwards; when acting alone, it draws it to one side.

Rectus Capitus Anticus Minor.

Origin	From the lower part of the ring of the atlas.
Insertion	To the basilar process of the occiput.
Action	It assists in flexing the head.

Rectus Capitus Lateralis.

Origin	From the inferior part of the atlas.
Insertion	To the styloid process of the occiput.
Action	To assist the preceding muscles.

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Scalenus.

Origin	From the transverse processes of the four last cervical vertebræ.
Insertion	To the upper third of the first rib.
Action	When the first rib is fixed together these muscles extend the neck; acting singly, each turns it to one side. When the neck is fixed, by drawing the rib forward it assists in inspiration.

Longus Colli.

Origin	From the inferior surface of the bodies of the first six dorsal and last six cervical.
Insertion	To the tubercle of the atlas.
Action	It flexes the neck downwards.

PECTORAL REGION.

In this region there are two groups, the pectoral and the sternal.

Pectoral Group.

Anterior superficial pectoral
Posterior superficial pectoral.
Anterior deep pectoral.
Posterior deep pectoral.

Anterior Superficial Pectoral.

(*Pectoralis Anticus.*)

Origin	From the cariniform cartilage and first bone of the sternum.
Insertion	To the deltoid ridge of the humerus.
Action	To adduct the arm.

Posterior Superficial Pectoral.

(*Pectoralis Transversalis.*)

Origin	From the greater part of inferior border of the sternum.
Insertion	To the deltoid ridge of the humerus and the fascia on the inner surface of the fore-arm.
Action	To adduct the arm.

Anterior Deep Pectoral.

(*Pectoralis Parvus.*)

Origin	From the side of the anterior half of the sternum; cariniform cartilage, and cartilages of the first four ribs.
Insertion	To the fascia of the antea spinatus.
Action	It draws the shoulder backwards and downwards.

Posterior Deep Pectoral.

(*Pectoralis Magnus.*)

Origin	From the posterior half of the sternum, abdominal tunic, ensiform cartilage and cartilages of the four last true ribs.
Insertion	To the inferior prominence of the internal trochanter of the humerus.
Action	To pull the shoulder joint, and thus draw the whole limb backwards.

Sternal Group.

Consists of two muscles:

Lateralis sterni.
Triangularis sterni.

Lateralis Sterni.

Origin	From the outer surface of the first rib.
Insertion	To the fourth segment of the sternum.
Action	It assists in expiration.

Triangularis Sterni.

Origin	From the superior sternal ligament and segments.
Insertion	To the cartilages, and inner surfaces of the distal ends of the true ribs, except the first.
Action	To assist in expiration.

SUBLUMBAR REGION.

Consists of a single group.

Psoas magnus.
Psoas parvus.
Iliacus.
Quadratus lumborum

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Psoas Magnus.

Origin	From the under surface of the last two ribs, the bodies of last two dorsal, and the transverse processes of all the lumbar vertebræ, except the last.
Insertion	To the small internal trochanter of the femur.
Action	When the spine is fixed to flex and rotate the femur outwards; when the femur is fixed to flex the spine.

Psoas Parvus.

Origin	From the bodies of last four dorsal, and all the lumbar vertebræ.
Insertion	To the ilio-pectineal eminence.
Action	To flex the pelvis on the spine, when both muscles act; if the pelvis is fixed to arch the back.

Iliacus.

Origin	From the venter surface of the ilium outside its union with the sacrum.
Insertion	To the internal trochanter of the femur, with psoas magnus.
Action	To flex the femur.

NOTE.—Posteriorly this muscle is grooved for the passage of the tendon of the psoas magnus.

Quadratus Lumborum.

Origin	From the inferior sacro-iliac ligament.
Insertion	To the tips of the lumbar transverse processes, and to the last rib.
Action	To assist in respiration and lateral flexion of the lumbar vertebræ.

DIAPHRAGM.

This is a very important muscle, separating the thoracic from the abdominal cavity. It is divided into two portions, a flat and fleshy:

Attachments	The flat, or main, portion is attached to the ensiform cartilage of the sternum, and the cartilages of the twelve last ribs. It is composed of muscular tissue on the outside and is tendinous in the centre. The fleshy portion, or pillars, the left of which is the smaller, run back along the bodies of the lumbar vertebræ, to which they are attached.
Action	It is the great muscle of inspiration.
Foramina	*Foramen dextrum*, below and to the right, for the passage of the posterior vena cava. *Foramen sinistrum*, is to the left, for the passage of the œsophagus and pneumogastric nerve. *Hiatus Aorticus*, between the pillars—for the passage of the posterior aorta, vena azygos and thoracic duct.

MUSCLES OF THE FORE LIMB.

These are divided into four principal regions :—

Shoulder or Scapular.
Arm or Brachial.
Fore-arm or Antibrachial.
Foot or Metacarpal.

The shoulder or scapular comprises two groups, an external and an internal.

External Scapular Group.

Antea-spinatus Deltoid.
Postea-spinatus, Teres Minor.

Antea Spinatus

Origin	Antea-spinatus, fossa as high as the cartilage of prolongation.
Insertion	By two tendons, one to the summit of the external trochanter, and one to the summit of the internal trochanter of the humerus.
Action	To extend the humerus on the scapula.

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Postea-spinatus.

Origin	Postea-spinatus, fossa as high as the cartilage of prolongation.
Insertion	By two tendons, one to the convexity of the external trochanter of the humerus, the other passes over the convexity and is inserted to the deltoid ridge.
Action	To abduct the humerus.

Deltoid.

(*Teres Externus.*)

Origin	It is in two portions, one originates from the tubercle on the spine of the scapula, and the other from the posterior angle.
Insertion	To the deltoid ridge of the humerus.
Action	To abduct and rotate the humerus outwards, and flex the shoulder joint.

Teres Minor.

(*Postea Spinatus Minor.*)

Origin	From the posterior border of the scapula and the ridges in the lower part of the postea spinatus fossa.
Insertion	To the deltoid ridge above its tubercle.
Action	Same as the deltoid.

INTERNAL SCAPULAR GROUP.

Subscapularis.

Origin	Subscapularis fossa.
Insertion	To the posterior prominence of the internal trochanter of the humerus.
Action	To adduct the arm.

Teres Internus.

(*Teres Major.*)

Origin	From the posterior angle and border of the scapula.
Insertion	The internal tuberosity of the humerus.
Action	To adduct and rotate the humerus inwards, and flex the shoulder joint.

Scapula Humeralis Posticus.

Origin	From the posterior part of the scapula, just above the glenoid cavity.
Insertion	To the posterior part of the humerus immediately below the head.
Action	To render tense the capsular ligament of the joint.

THE BRACHIAL REGION

Comprises two groups, anterior and posterior.

Anterior Brachial Group.

Flexor-brachii.
Coraco-humeralis.
Humeralis-obliquus.

Flexor Brachii.

(*Biceps, long Flexor of Fore-arm.*)

Origin	Coracoid process of the scapula.
Insertion	To the bicipital tuberosity of the radius.
Action	To flex the fore-arm on the arm. It also has a slight extension action on the shoulder joint.

Note.—This muscle is very important; after leaving the coracoid process of the scapula, it passes through the bicipital groove of the humerus. It is tendinous here, and has a large synovial bursa interposed; below this it has a large fleshy belly, which passes over the anterior surface of the humerus.

Coraco Humeralis.

Origin	From the coracoid process of the scapula.
Insertion	By two tendons, one to the internal, and the other to the anterior surface, of the humerus.
Action	To adduct and flex the shoulder joint.

Humeralis Obliquus.

(Brachialis Anticus).

Origin	From the posterior surface of the humerus, just below the head; passes down the musculo-spiral groove.

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Insertion	It is inserted to the radius immediately below the bicipital tuberosity; also to the ulna.
Action	To flex the elbow joint.

POSTERIOR BRACHIAL GROUP.

Triceps extensor brachii.
Scapulo-ulnaris.
Anconeus.

Triceps Extensor Brachii.

Comprises: Caput magnum,
Caput medium,
Caput parvum.

Caput Magnum.

Origin	From the posterior border of the scapula.
Insertion	To the upper part of the olecranon.

Caput Medium.

Origin	From the supero-external part of the humerus.
Insertion	To the superior part of the olecranon.

Caput Parvum.

Origin	From the internal surface of the humerus, below the internal tubercle.
Insertion	To the olecranon.
Action	They all extend the fore-arm upon the arm, and the magnum has a flexion action on the shoulder joint.

Scapulo Ulnaris.

Origin	From the posterior angle of the scapula.
Insertion	To the olecranon.
Action	To assist the caput magnum.

Anconeus.

Origin	From the borders of the olecranon fossa.
Insertion	To the anterior and external part of the olecranon.
Action	To tense the capsular ligament of the elbow joint.

ANTIBRACHIAL REGION, OR FORE-ARM.

Comprises { **Anterior Antibrachial Group.**
Posterior " "

Anterior Antibrachial Group.

Extensor metacarpi magnus.
Extensor metacarpi obliquus.
Extensor Pedis.
Extensor suffraginis.

Extensor Metacarpi Magnus.

(*Anterior extensor of the Metacarpus.*)

Origin	From the external condyle of the humeru and capsular ligament of the elbow joint.
Insertion	To the supero-anterior part of the larg metacarpal.
Action	To extend the metacarpal bones.

Extensor Metacarpi Obliquus.

(*Oblique extensor of the metacarpus.*)

Origin	From the lower third of the external borde of the radius.
Insertion	To the head of the internal small metacarpa
Action	To aid the large extensor.

Note.—It passes over the tendon of the magnus an has a bursa interposed.

Extensor Pedis.

(*Anterior extensor of the phalanges.*)

Origin	It originates from the external condyle of th humerus, also attached to the externa tuberosity and outer border of the radiu
Insertion	To the pyramidal process of the os pedis. I is also attached to the capsular ligament the fetlock joint, os suffraginis and corona
Action	To extend the interphalangeal joints, the fe lock and the carpus.

Note.—Like the extensor metacarpi magnus, it h a large fleshy belly at its upper part. It becomes te dinous about two-thirds of the way down the radiu

RE-ARM.

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The tendon is double, and passes through a groove on the antero-inferior part of the distal end of the radius, where it is bound down by the anterior annular ligament. After emerging at the lower part of the ligament the two tendons separate, one going to join the extensor suffraginis, the main one passing down to the pyramidal process of the os pedis. In its course over the os suffraginis it is joined by the bifurcations of the suspensory ligaments.

Extensor Suffraginis.

(*Lateral Extensor of the Phalanges.*)

Origin	From two points; one from the external tuberosity at the proximal extremity of the radius, and one from the ulna.
Insertion	To the supero-anterior part of the os suffraginis.
Action	It extends the digit.

NOTE.—This muscle is small, and passes down the outer side of the radius through a groove in the external tuberosity at the distal extremity, and under the annular ligament; upon emerging it is supported by a slip from the tendon of the extensor pedis, and one from the annular ligament. It then passes to the os suffraginis.

POSTERIOR ANTEABRACHIAL GROUP.

Flexor metacarpi externus.
Flexor metacarpi medius.
Flexor metacarpi internus.
Flexor pedis perforatus.
Flexor pedis perforans.
Ulnaris accessorius.
Radialis accessorius.

Flexor Pedis Perforatus.

(*Superficial Flexor.*)

Origin	From the internal condyle of the humerus.
Insertion	To the lateral sides of the os coronæ.
Action	To flex the pastern and fetlock joints, and assist in flexing the carpus.

NOTE.—The perforatus is more superficial than the perforans. It becomes tendinous as it approaches the knee, and receives a fibrous stay from the posterior surface of the radius, which holds it in its place. The tendons of both muscles pass through the carpal arch; as they descend the perforatus receives a slip on each side from the metacarpal, or check, ligament. It helps to form an arch at the fetlock through which the perforans passes. Below the fetlock it becomes still wider, and at about the middle of the phalangeal region it divides before becoming inserted to the sides of the os coronæ.

Flexor Pedis Perforans.

(Deep Flexor of the Phalanges.)

Origin	At the internal condyle of the humerus.
Insertion	To the tendinous surface of the os pedis.
Action	It flexes the joints below the carpus and assists in flexing the latter.

NOTE.—This muscle is larger than the perforatus, and becomes tendinous just above the carpus. Its tendon passes through the posterior carpal sheath. About one-half way down the metacarpal it receives the metacarpal, or check ligament, which holds it in position. At the fetlock it passes through the incomplete arch formed by the perforatus, and widens out before becoming inserted. The synovial membranes are one at the knee, common to both tendons; one at the fetlock, also common to both tendons. At the navicular bone there is a special one for the perforans.

Ulnaris Accessorius.

(Unimportant.)

Origin	From the posterior border and summit of the olecranon.
Insertion	It blends with the tendons of the perforans near the carpus.
Action	It assists the flexor perforans.

Flexor Metacarpi Externus.

(External flexor of the metacarpus).

Origin	From the external condyle of the humerus and capsular ligament of the elbow joint.

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Insertion	By two tendons, one to the superior border of the trapezium, and one to the external small metacarpal.

Flexor Metacarpi Medius.

(Oblique flexor of the metacarpus).

Origin	From the internal condyle of the humerus and the olecranon.
Insertion	To the trapezium.

Flexor Metacarpi Internus.

Origin	From the interal condyle of the humerus.
Insertion	To the head of the internal small metacarpal bone.
Action	The action of the last three muscles is to flex the metacarpus on the radius.

Radialis Accessorius.

(Unimportant).

Origin	From the posterior part of the shaft of the radius.
Insertion	It joins the tendon of the perforans.
Action	To assist the flexor perforans.

METACARPAL REGION.

This region consists of two pairs of exceedingly small muscles.

Interossei Metacarpi. } *(Unimportant).*
Lumbricales.

Interossei Muscles (2).

These muscles are very slender, and are situated on the inner side of the small metacarpal bones.

Origin	From near the head of the small metacarpal.
Insertion	To the bifurcations of the suspensory ligament.

Lumbricales (2).

These muscles originate on either side of the perforans, just above the fetlock, and are lost in the coverings of the fetlock joint.

COSTAL REGION.

Consists of a single group.

Trapezius dorsalis.
Rhomboideus brevis.
Latissimus dorsi.
Serratus magnus.
Transversalis costarum.
Serratus anticus.
Serratus posticus.
External intercostal.
Internal intercostal.
Levatores costarum.

Trapezius Dorsalis.

Origin	From the supraspinous ligament, extending from the highest point of the withers to the 12th dorsal vertebra.
Insertion	To the tubercle on the spine of the scapula.
Action	To draw the scapula upwards and backwards.

Serratus Anticus.

(*Part of superficialis costarum.*)

Origin	From the summits of the dorsal spines, from the 1st to the 13th inclusive.
Insertion	It digitates inferiorly and is attached to the anterior border of the nine ribs succeeding the fourth.
Action	To assist in inspiration.

Serratus Posticus.

(*Part of superficialis costarum.*)

Origin	From the spinous processes of the dorsal vertebræ after the fourth, and to some lumbar vertebræ.
Insertion	To the posterior border of the nine last ribs.
Action	To assist in expiration.

External Intercostals.

(17 *pairs.*)

Origin	From the posterior border of each rib.
Insertion	To the anterior border of each succeeding rib.
Action	They are inspiratory muscles.

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Internal Intercostals.

(17 *pairs.*)

Origin and Insertion	The same as the externals, but the fibres run downwards and forwards.
Action	They are expiratory muscles.

Rhomboideus Brevis.

Origin	From the spines of the first five dorsal vertebræ.
Insertion	To superior part of the inner surface of the scapula and cartilage of prolongation.
Action	To draw the scapula upwards.

Latissimus Dorsi.

Origin	It is attached superiorly to the supraspinous ligament from the highest point of the withers to the last lumbar vertebræ.
Insertion	To the internal tuberosity of the humerus.
Action	To flex the shoulder joint.

NOTE.—This muscle is continuous posteriorly with the gluteal fascia.

Serratus Magnus.

Origin	From the transverse processes of the five posterior cervical vertebræ and the external surface of the eight true ribs from their middles to their cartilages.
Insertion	To the venter surface of the scapula between the origin of the subscapularis and the insertion of the rhomboideus brevis.
Action	To draw the scapula close to the body, and when the limbs are fixed it elevates the neck.

Transversalis Costarum.

Origin	From the transverse processes of the first lumbar vertebræ, and the ribs near their angles.

Insertion	To the external surface of all the ribs below the inferior border of longissimus dorsi, a tendon to each, and one to the last cervical vertebræ.
Action	It assists in expiration.

Levatores Costarum,

(17 *pairs*.)

Origin	From the transverse processes of the dorsal vertebræ.
Insertion	To the external faces of the ribs, just above their angles.
Action	It assists in inspiration.

DORSO LUMBAR REGION.

Consists of a single group.

Longissimus dorsi.
Semispinalis dorsi.

Longissimus Dorsi.

Origin	From the crest and venter surface of the ilium; the spinous and transverse processes of the first two bones of the sacrum: the spinous transverse and oblique processes of all the lumbar vertebræ; the spinous and transverse processes of all the dorsal vertebræ; the supraspinous ligament of the dorsal and lumbar regions, and the ribs as far outwards as their angles.
Insertion	To the transverse and spinous processes of the four last cervical vertebræ.
Action	It extends the spine and elevates the neck.

NOTE.—Anteriorly the muscle divides into an inner and outer part, and between the two divisions, which are difficult to separate, the complexus major and trachelo-mastoideus originate. The inner portion, the spinalis dorsi of some writers, is attached to the supraspinous ligament as far back as the twelfth dorsal

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vertebræ, and to the first six dorsal spines, and is inserted into the spinous processes of the four last cervical.

Semispinalis of the Back and Loins.

(Semispinalis dorsi et lumborum).

Origin	From the sacrum, the oblique processes of all the lumbar, and the transverse processes of all the dorsal.
Insertion	To the spinous process of the third or fourth anterior vertebræ.
Action	The right and left muscles, acting together, extend the spine; singly, they are lateral flexors.

COCCYGEAL REGION.

This group contains four pairs of muscles :—

Erector coccygis (2).
Depressor coccygis (2).
Curvator coccygis (2).
Compressor coccygis (2).

Erector Coccygis.

Attached	To the upper part of the sacrum and coccygeal bones.
Action	When acting together, to elevate the tail; singly, to draw it upwards and outwards.

Depressor Coccygis.

Attached	To the under surface of the sacrum and coccygeal bones.
Action	To bend the tail downwards; singly, to draw it to one side.

Curvator Coccygis.

Attached	To the lateral side of the sacrum and coccygeal bones.
Action	To curve the tail sideways.

Compressor Coccygis.

Origin	From the inner surface of the sacro-sciatic ligament.
Insertion	To the last two sacral and first two coccygeal vertebræ.
Action	With its fellow, it forcibly depresses the tail; singly, it draws it to one side.

Muscles of the Posterior Limb.

These form four principal regions:

Gluteal.
Femoral.
Tibial.
Metatarsal.

GLUTEAL REGION.

This region comprises several muscles, viz:

Gluteus externus.
Gluteus maximus.
Gluteus internus.
Rectus parvus.
Obturator internus.
Obturator externus.
Pyriformis.
Gemellus anticus.
Gemellus posticus.

Gluteus Externus.

(Superficial Gluteus.)

Origin	This muscle has two origins, one from the spines of the sacrum, and one from the external angle of the ilium.
Insertion	To the trochanter minor externus of the femur.
Action	To flex and abduct the femur.

Gluteus Maximus.

(Middle Gluteus.)

Origin	From the tendinous envelope of the longissimus dorsi, upper surface of the ilium and sacro-sciatic ligament.
Insertion	By two tendons, one to the summit of the

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	trochanter major, and the other passes over the convexity and is inserted to a roughened ridge below.
Action	To extend the femur on the pelvis, and when the posterior limbs are fixed to assist in rearing.

Gluteus Internus.

(Deep Gluteus.)

Origin	From the shaft of the ilium.
Insertion	To the hollow inside of the trochanter major of the femur.
Action	Abducts and rotates inwards the hip-joint.

Rectus Parvus.

Origin	From the rim of the acetablum.
Insertion	To the supero-anterior part of the femur.

Obturator Externus.

Origin	From the outside of the obturator foramen.
Insertion	In the trochanteric fossa.

Obturator Internus.

Origin	From the inside of the obturator foramen.
Insertion	In the trochanteric fossa.

Pyriformis.

Origin	From two points, one from the transverse processes of the sacrum, and one from the inner surface of the shaft of the ilium.
Insertion	In the trochanteric fossa.

Gemellus, } Anticus, Posticus.

Origin	From the shaft of the ischium, one in front and one behind the conjoined tendon of the obturator internus and pyriformis.

Insertion Trochanteric fossa.
Action The last six muscles rotate the limb outwards and help to abduct it.

FEMORAL REGION.

Divided into four groups :—

Internal,
External,
Anterior,
Posterior.

Internal Femoral Group.

Sartorius,
Gracilis,
Pectineus.

Adductor brevis,
Adductor longus,
Adductor magnus.
} Triceps. adductor. femoris.

Sartorius.

(*Long adductor of the leg.*)

Origin From the iliac fascia near the tendon of the psoas parvus.
Insertion To the internal straight ligament of the patella and supero-internal part of the libia.
Action To adduct and flex the femur.

Gracillis.

(*Short adductor of the leg.*)

Origin From the inferior surface of the ischo-pubio symphysis.
Insertion To the internal straight ligament of the patella and supero-internal part of the libia.
Action To adduct the limb.

Pectineus.

Origin From the inferior surface of the pubis by two tendons—one each side of the pubio-femoral ligament.
Insertion To the internal border of the femur, near the nutrient foramen.
Action To adduct and flex the femur.

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Adductor Brevis.

(Small adductor of the thigh.)

Origin	Superiorly from the inferior surface of the pubis.
Insertion	To the posterior surface of the femur—about the middle.
Action	To adduct and rotate the femur outwards.

Adductor Longus.

(Great adductor of the thigh.)

Origin	From the inferior surface of the ischium.
Insertion	By two tendons, one to the middle of the femur with the brevis, and one to the internal condyle.
Action	To adduct and rotate the femur outwards.

Adductor Magnus.

(Semi-membranosus.)

Origin	From the coccygeal fascia and tuberosity of the ischium.
Insertion	To the internal condyle of the femur.
Action	To adduct the limb and extend the thigh.

EXTERNAL FEMORAL GROUP.

One muscle.

Triceps Abductor Femoris.

Origin	From the spines of the sacrum, sacro-sciatic ligament and ischial tuberosity.
Insertion	By three divisions, one to between the two small trochanters of the femur, one to the patella, and one to the thigh by fascia.
Action	It abducts the entire limb ; the anterior half of the muscle extends the stifle and the posterior half flexes it.

ANTERIOR FEMORAL GROUP.

Tensor vaginæ femoris.
Vastus externus.
Rectus femoris.
Vastus internus.
Crureus.

Tensor Vaginæ Femoris.

Origin	From the external angle of the ilium.
Insertion	Into the fascia lata.
Action	It flexes the hip joint, and renders tense the fascia lata.

Rectus Femoris.

Origin	From two depressions in front of the acetabulum.
Insertion	To the superior surface of the patella.
Action	To flex the hip joint and extend the stifle.

Vastus Internus.

Origin	From the internal border and inner half of the anterior surface of the femur.
Insertion	To the patella and is continuous with the internal straight ligament of the same.
Action	To extend the stifle.

Vastus Externus.

Origin	From the external border and outer half of anterior surface of the femur.
Insertion	To the patella, and is continuous with the external straight ligament.
Action	To extend the stifle.

Rectus Parvus.

Origin	From brim of the acetabulum.
Insertion	To the anterior and upper part of the femur.
Action	Tenses the capsular ligament of the hip-joint.

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POSTERIOR FEMORAL GROUP.

Biceps rotator tibialis.
Ischio femoralis.

Biceps Rotator Tibialis.

(Semitendinosus).

Origin	From the spines of the sacrum, sacro-sciatic ligament, and ischial tuberosity.
Insertion	To the crest of the tibia.
Action	To flex the stifle and rotate the leg inwards.

Ischio Femoralis.

(Unimportant).

Origin	From the inferior surface of the ischium.
Insertion	To the upper third of the posterior surface of the femur.
Action	To extend and adduct the femur.

TIBIAL REGION.

Divided into anterior and posterior groups.

Anterior.	Flexor metatarsi.	Flexors.
	Extensor pedis.	Extensor.
	Peroneus.	

Flexor Metatarsi.

Origin	From a pit between the external condyle and trochlea of the femur.
Insertion	To the supero-anterior part of the large metatarsal, the cuboid and small cuneiform.
Action	It flexes the tarsal joint.

NOTE.—This is one of the most important muscles in the body, and is made up of a tendinous and a fleshy portion. The tendinous portion arises as indicated above from the femur. The fleshy portion, arises from the groove on the outer surface of the tibia.

Extensor Pedis.

Origin	From the pit between the external condyle and trochlea of the femur.
Insertion	To the pyramidal process of the os pedis.
Action	To extend the entire digit and flex the tarsal joint.

Note.—It is bound down by the anterior annular ligament. About one-half way between the hock and fetlock it is joined by the tendon of the peroneus.

Peroneus.

Origin	From the head and body of the fibula.
Insertion	It joins the tendon of the extensor pedis.
Action	It assists the extensor pedis.

POSTERIOR TIBIAL REGION.

Extensors.	Gastrocnemius externus. Plantaris.
Flexors.	Gastrocnemius internus. Flexor pedis perforans. Flexor pedis accessorius. Popliteus.

Gastrocnemius Externus.

Origin	From each side of the supracondyloid fossa.
Insertion	To the summit of the os calcis.
Action	To flex the stifle joint and extend the hock.

Soleus, or Plantaris.

Origin	From the head of the fibula.
Insertion	It joins the tendon of the gastrocnemius externus.
Action	It assists very slightly the gastrocnemius externus.

Gastrocnemius Internus.

Origin	In the supracondyloid fossa. It becomes tendinous and winds from within outwards

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	until it becomes external and forms a cap for the os calcis. Below this it is known as the perforatus, which is inserted the same as in the fore limb.
Action	To flex the fetlock, pastern, and stifle joints, and extend the hock.

Flexor Pedis Perforans.

Origin	From the posterior surface of the tibia below the oblique line.
Insertion	To the tendinous surface of the os pedis.
Action	To flex the phalanges and assist in extending the tarsal joint.

NOTE.—It has a fleshy belly, but forms a tendon before reaching the tarsal arch, through which it passes. Where it passes through the arch there is a very large synovial sac, which extends below the hock. About one-third of the way down the large metatarsal it is joined by the check ligament and the tendon of the flexor pedis accessorius. Below this it has the same arrangement as in the fore limb.

Flexor Pedis Accessorius.

Origin	From the external tuberosity of the tibia. It passes through a groove on its inner aspect.
Insertion	It joins the tendons of the flexor perforans.
Action	To assist the flexor pedis perforans.

Popliteus.

Origin	From the external condyle of femur.
Insertion	To the posterior surface of the tibia above the oblique line.
Action	It flexes the stifle joint.

REGION OF THE HEAD.

Anterior Maxillary Group.

Orbicularis oris.
Zygomaticus.
Buccinator.
Supernaso-labialis.
Supermaxillo-labialis.
Dilator naris lateralis.
Dilator naris transversalis.
Dilator naris inferioris.
Dilator naris superioris.
Depressor labii superioris.
Depressor labii inferioris.
Levator labii inferioris.

Orbicularis Oris.

This is a layer of muscular fibres, forming a sphincter around the anterior opening of the mouth.

Zygomaticus.

Origin	From the fascia of the masseter, near the anterior extremity of the maxillary spine.
Insertion	To the orbicularis oris.
Action	It retracts the angle of the mouth.

Buccinator.

Origin	From the alveoli of the molar teeth of the superior and inferior maxillary.
Insertion	To the orbicularis oris.
Action	It presses the food between the teeth.

Levator Labii Superiori Alaequi Nasi.

(*Supernaso labialis*).

Origin	From the frontal and nasal bones.
Insertion	To the nostril and upper lip.
Action	It raises the upper lip and dilates the nostril.

Nasalis Longus.

(*Supermaxillo Labialis, Levator Labii Superioris Proprius*)

Origin	From the superior maxilla.
Insertion	With its fellow by a common tendon to the upper lip.
Action	To elevate the upper lip.

Dilator Naris Lateralis.

Origin	From the anterior extremity of the maxillary spine.
Insertion	To the side of the nostril and upper lip
Action	To dilate the nostril.

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Dilator Naris Transversalis.

Origin	From the nasal peak.
Insertion	To the cartilage of the nostrils.
Action	It dilates the nostrils.

Dilator Naris Inferioris.

Origin	From the pre-maxillary.
Insertion	To the nostril.
Action	It dilates the nostrils.

Dilator Naris Superioris.

Origin	From the free portion of the nasal bone.
Insertion	To the side of the nostril.
Action	It dilates the nostril.

Depressor Labii Superioris.

Origin	From the premaxilla.
Insertion	To the upper lip and nasal cartilage.
Action	To close the upper lip and dilate the nostril.

Depressor Labii Inferioris.

Origin	From the border of the inferior maxillary just behind the last molar.
Insertion	To the lower lip.
Action	To depress the lower lip.

Levator Labii Inferioris.

Origin	From the alveoli of the inferior maxilla, between the lateral incisors and tusks.
Insertion	To the under lip.
Action	It elevates the lower lip.

Posterior Maxillary Group.

Masseter.
Temporal.
Stylor. maxillaris.
Pterygoideus externus.
Pterygoideus internus.
Digastricus.

Masseter.

Origin	From the external surface and spine of the superior maxillary.

Insertion	To the posterior part of the external surface of the inferior maxillary.
Action	To close the mouth.

Temporal.

Origin	Around the temporal fossa.
Insertion	To the coronoid process of the inferior maxillary.
Action	It elevates the lower jaw and moves it from side to side.

Stylo-Maxillaris.

Origin	From the styloid process of the occipital bone.
Insertion	To the posterior border of the inferior maxillary.
Action	To open the mouth.

Pterygoideus Externus.

Origin	From the pterygoid process and body of the sphenoid.
Insertion	To the neck of the condyle of the inferior maxillary.
Action	Acting with its fellow it protrudes the lower jaw; singly it produces lateral motion.

Pterygoideus Internus.

Origin	From the pterygoid process and body of the sphenoid.
Insertion	To the internal surface of the inferior maxillary opposite the masseter.
Action	With its fellow it elevates the lower jaw, singly it moves it to one side.

Digastricus.

Origin	From the styloid process of the occipital.
Insertion	To the inner surface of the lower jaw near the symphysis.
Action	It elevates the hyoid bone, and depresses the inferior maxillary.

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HYOIDEAN GROUP.

Mylo-hyoideus.
Hyoideus Magnus.
Hyoideus Parvus.
Genio-hyoideus.
Hyoideus Transversus.
Stylo-hyoideus.

Mylo-Hyoideus.

This muscle is attached externally to the inner surface of the rami of the inferior maxillary as far forward as the symphysis; posteriorly to the spur process and body of the hyoid bone; internally it meets its fellow of the opposite side.

Action	It elevates the tongue, and forms a sling for the same.

Hyoideus Magnus.

Origin	From the posterior inferior angle of the cornu of the os hyoides.
Insertion	To the heel process of the os hyoides.
Action	It draws the os hyoides backwards and upwards.

Hyoideus Parvus.

Origin	From the inferior border of the anterior extremity of the cornu, and the posterior border of the corniculum.
Insertion	To the body and heel process of the os hyoides.
Action	It approximates the three bones to which it is attached.

Genio Hyoideus.

Origin	From the lower jaw near the symphysis.
Insertion	To the free axtremity of the spur process of the os hyoides.
Action	It draws the os hyoides towards the antero-inferior part of the maxillary space.

Hyoideus Transversus.

Attachments	To the two cornicula of the os hyoides.
Action	To approximate the two cornicula.

Stylo Hyoideus.

Origin	The anterior border of the styloid process.
Insertion	The posterior part of the cornu.
Action	It draws back and depresses the os hyoides.

The Palpebral and Auricular groups are unimportant.

LINGUAL MUSCLES.

The Lingual muscles are divided into extrinsic and intrinsic.

The extrinsic are as follows :—

Hyo-glossus Longus.
Genio-hyo-glossus.
Hyo-glossus brevis.
Hyo-glossus parvus.
Pharngo-glossus
Palato-glossus.

Unimportant.

Hyo-Glossus Longus.

Origin	From the external surface of the cornu of the os hyoides.
Insertion	To the substance of the tongue.
Action	With its fellow to retract the tongue; singly to draw it to one side.

Genio-hyo Glossus.

Origin	From the hyoid bone.
Insertion	To near the symphysis of the inferior maxilla.
Action	To protrude or retract or depress the tongue.

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