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EXPLANATION
OF THE
ANATOMICAL ATLAS

OF
DR. M. J. WEBER,
PROFESSOR AT THE ROYAL PRUSSIAN UNIVER-
SITY, FREDERICK WILLIAM, AT BONN.

PARTS III. & IV.

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EXPLANATION

OF THE

ANATOMICAL TABLES

OF

DR. M. J. WEBER

HONORARY AT THE ROYAL PRUSSIAN UNIVERSITY
OF BERLIN

PARTS III & IV

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ALL THE BOOKSELLERS IN LONDON AND THE PRINCIPAL BOOKSELLERS IN THE VARIOUS PARTS OF THE UNITED KINGDOM AND IN THE CONTINENT

C O N T E N T S.

- I. First and second Layers of the MUSCLES on the front
of the Body.
- II. Third and fourth *ib.* *ib.*
- III. First and second *ib.* back of the Body.
- IV. Third and fourth *ib.* *ib.*
- TAB. XVII. Appendix to the Four Muscular Bodies.*
- XVIII. Anatomy of the ORGANS OF RESPIRA-
TION, and of the NOSE.
- XIX. Anatomy of the ORGAN OF VISION.
- XX. and XXI. Anatomy of the HEART—of the
FŒTAL CIRCULATION, and the MEM-
BRANES OF THE OVUM.
- XXII. and XXIII. Anatomy of the ORGANS OF
DIGESTION.

* In order to render the description of the Plates more clear, the muscles have been divided into regions, so that each explanation, and also each muscle, either on the front or back part, bears its proper mark. Thus, for instance, it denotes on the head: A. the Occipito frontalis, and A. the Attollens aurem; on the neck, A. the Platysma Myoides; on the breast, A. the Pectoralis Major, and on the back of the neck, A. the Trapezius or Cucullaris, &c.

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DESCRIPTION
OF THE
FIRST, SECOND, THIRD, AND FOURTH
BODIES OF MUSCLES.*

Muscles of the Head, *musculi capitis*.

Muscles of the Skull, *M. cranii*.

A. *M. frontalis*. B. *M. occipitalis*. 1. 2. 2. *galea aponeurotica cranii*.

Muscles of the Face, *M. faciei*.

I. *M. orbicularis palpebrarum*. 1. *Ligamentum palpebrale internum*. 2. *Stratum internum*. 3. *Externum*. a. *M. ciliaris*. β. *M. levator palpebrae superioris*.
II. *M. corrugator superciliorum*. III. *M. compressor nasi*. IV. *M. levator labii superioris alaeque nasi*. V. *M. levator labii superioris proprius*. VI. *M. zygomaticus minor*. * A peculiar slip. VII. *M. zygomaticus major*. VIII. *M. levator anguli oris*. IX. *M. depressor anguli oris*. X. *M. depressor labii inferioris*. XI. *M. buccinator*. XII. *M. depressor septi mobilis*. XIII. *M. orbicularis oris*. XIV. *M. depressor alae nasi*. XV. *M. levator menti*. XVI. *M. masseter*. 1. outer, 2. inner Portion. XVII. *M. temporalis*. XVIII. *M. pterygoideus internus*. XIX. *M. pterygoideus externus*.

* After *Albinus: Tabulae sceleti et musculorum corporis humani*, Lugd. Batav. 1747, and from Nature.

—20 *M. levator veli palatini*. 21. *M. tensor veli palatini seu circumflexus palati*.

Muscles of the Ear, *M. auriculae*.

A. *M. atollens auriculae*. B. *M. attrahens auriculae*.
C. *M. retrahentes auriculae*. D. *M. helix major*. E.
M. helix minor. F. *M. tragicus*. G. *M. antitragicus*.
H. *M. transversus auriculae*.

N. B. These muscles, as well as the internal muscles of the ear, have been already engraved and described on the 2nd plate; and those of the globe of the eye, or the internal ocular muscles, on the 13th plate.

Muscles of the Trunk, *M. trunci*.

Muscles of the Neck, *M. colli*.

A. *M. subcutaneus colli*. B. *M. sterno-cleido-mastoideus*. C. *M. omohyoideus*. D. *M. sternohyoideus*. E. *M. sternothyroideus*. a. Air tube, *aspera arteria*. b. *Cartilago cricoidea*. c. *Cartilago thyroidea*. d. *Os hyoideum*. F. *M. hyothyroideus*. G. *M. digastricus maxillae inferioris*. H. *M. mylohyoideus*. I. *M. geniohyoideus*. K. *M. genioglossus*. L. *M. hyoglossus*. M. *M. stylohyoideus*. N. *M. styloglossus*. O. *M. stylopharyngeus*.

N. B. The greater number of these muscles are engraved separately on Table XVIII and Table XIX, as well as those of the velum palati and pharynx.

Muscles of the Chest, *M. thoracis*.

A. *M. pectoralis major*. B. *M. pectoralis minor*. 1. Portion, which runs into the *Aponeurosis* of the *M. obliquus externus*. C. *M. subclavius*. D. *M. serratus ma-*

jor. 1. 2. 3. 4. 5. 6. 7. 8. Its slips, *dentationes*. E. M. *intercostales externi*. F. M. *intercostales interni*. a. *pleura*. G. M. *triangularis sterni*. This is also engraved on Tab. III. Fig. 5., and Tab. XVII. Fig. 8.

Muscles of the Belly, M. *abdominales*.

A. M. *obliquus externus*. a. b. c. d. e. f. g. h. i. k. l. The *aponeurosis* of this muscle, which first passing towards the mesial line of the body, connects itself with that of the other side, and so forms the central white line, *linea alba abdominis*, (b. b.) in which the navel a is found ; it then secondly passes down towards the *symphysis ossium pubis*, and divides into two *crura*, a *crus superius seu internum* (k.), and a *crus inferius seu externum* (l. l.), by which the external abdominal ring, *annulus abdominalis externus* (i) is formed. d. d. Points at which the M. *obliquus internus* shines through the *aponeurosis* of the *obliquus externus*. e. e. Points at which the *aponeurosis* of the M. *obliquus internus* commences, connects itself with the M. *obliquus externus*, and then commonly proceeds with the M. *rectus abdominis* to the Linea alba f. f. shining through, and connected with, the *aponeurosis* of the M. *obliquus externus et internus*. *The *Inscriptiones tendinae* of the M. *rectus abdominis*. h. Points out the course of the inguinal canal, *canalis inguinalis*, through which the spermatic cord, *funiculus spermaticus*, and the M. *cremaster* pass. g. g. g. g. Are the four upper dentations of this muscle, which are connected with that of the M. *serratus magnus* D. 5. 6. 7. 8. and that of the M. *latisimus dorsi* B. 1. 2. B. M. *obliquus internus*. m. m. A part of the front layer of the *aponeurosis* of this muscle, which passes with that of the M. *obliquus externus* before the M. *rectus abdominis* D. n. A part of the hinder layer of the *aponeurosis* of

the *obliquus internus*, which passes behind the *M. rectus* connected with the front *aponeurosis* of the *M. transversus abdominis*, to the *linea alba*. * *M. cremaster*, which comes from the *M. obliquus internus* and *M. transversus*, and spreads on the common coat of the spermatic cord and testicle, *tunica vaginalis funiculi spermatici et testis*(**). C. *M. transversus*. C¹. Anterior *aponeurosis* of this muscle. *. *. Points where this *aponeurosis* is connected with the *M. obliquus internus*, and where the anterior plate of the *aponeurosis* of the *M. obliquus internus* is cut away. **. The common *aponeurosis* of the hinder *lamella* of the *M. obliquus internus* and of the *M. transversus*, which passes behind the *M. rectus*, so that this muscle also lies in a peculiar tendinous sheath. This posterior common *aponeurosis* of the *M. rectus* does not, however, descend so far down as the anterior, therefore the *peritoneum* (***) only is visible.—a. β. γ. δ. Spermatic cord, *funiculus spermaticus*. a. β. *Venae spermaticae*. γ. *Arteria spermatica interna*. δ. *Vas deferens*.—D. *M. rectus abdominis*. E. *M. pyramidalis*. F. *Diaphragma*. I. *Pars costalis*. 1. Portion, which arises from the Ensiform Cartilage. 2. Portion which is attached to the *peritoneum*. 3. 4. 5. 6. 7. 8. Portions which arise from, 7. 8. 9. 10. 11. and 12. Ribs and their cartilages. II. *Pars lumbaris*. 9. *Crura interna*. 10. *Crura media*. 11. *Crus externa*. 12. *Crus quartum sinistrum*. 13. Portion which arises from the surface of the *M. quadratus lumborum*, but is not always present. 14. Another portion on the right side, which is not always found on both sides, and arises from the transverse processes of the first and second *lumbar vertebrae*. 15. *Hiatus oesophageus*. 16. *Hiatus aorticus*. III. *Pars tendinea*. 17. *Foramen quadrilaterum*.—Compare also Tab. XII.—

Muscles of the Loins, *M. lumborum*.

G. *M. psoas major*. H. *M. psoas minor*. I. *M. iliacus internus*. K. *M. Quadratus lumborum*.

Muscles of the Neck and Back, *M. cervicis et dorsi*.

A. *M. cucullaris*. B. *M. latissimus dorsi*. C. *M. rhomboideus minor*. D. *M. rhomboideus major*. E. *M. serratus posticus superior*. F. *M. serratus posticus inferior*. G. *M. splenius capitis*. H. *M. splenius colli*. I. *M. levator scapulae*. K. *M. biventer cervicis*. L. *M. complexus*. M. *M. trachelomastoideus*. N. *M. transversalis cervicis*. O. *M. cervicalis descendens*. P. *M. scalenus anterior*. Q. *M. scalenus medius*. R. *M. scalenus posterior*. S. *M. longissimus dorsi*, and T. *M. sacrolumbalis*. U. *M. spinalis dorsi*. V. *M. semispinalis dorsi*. W. *M. semispinalis cervicis*. X. *M. multifidus spinae*. Y. *M. levatores costarum breves*. Z. *M. levatores costarum longi*. I. *M. interspinales cervicis, dorsi, lumborum*. II. *M. rectus capitis posterior major*. III. *M. rectus capitis posterior minor*. IV. *M. obliquus capitis inferior s. major*. V. *M. obliquus capitis superior s. minor*. VI. *M. intertransversarii cervicis anteriores a. et posteriores b.* VII. *M. intertransversarii dorsi et lumborum*. VIII. *M. longus colli*. IX. *M. rectus capitis anterior major*. X. *M. rectus capitis anterior minor*. XI. *M. rectus capitis lateralis*.

Muscles of the *Perinaeum*.

A. *M. transversus perinaei superficialis*. B. *M. transversus perinaei profundus*. C. *M. sphincter ani externus*. D. *M. sphincter ani internus*. E. *M. levator ani and coccygeus*. F. *Coccygeus*.

Muscles of the Male and Female Organs of Generation,
M. genitalium sexus potioris et sequioris.

G. *M. ischio-cavernosus penis.* H. *M. accelerator urinae s. bulbo-cavernosus.* I. *M. ischio-cavernosus clitoridis.* K. *M. constrictor ostii vaginae.*

Muscles of the Upper Extremities, *M. extremitatum superiorum.*

Muscles of the Shoulder Blade, *M. scapulae.*

I. *M. deltoides.* II. *M. supraspinatus.* III. *M. infrapinatus.* IV. *M. teres minor.* V. *M. teres major.* VI. *M. subscapularis.*

Muscles of the Upper Arm, *M. humeri.*

A. *M. biceps brachii.* B. *M. coracobrachialis.* C. *M. brachialis internus.* D. *M. triceps brachii.* 1. *Anconaeus longus.* 2. *Anconaeus externus.* 3. 5. 6. *Anconaeus internus seu brachialis externus.* 5. Their common tendon.

Muscles of the Fore Arm, *M. cubiti.*

I. *M. pronator rotundus.* II. *M. palmaris longus.* III. *M. flexor carpi radialis.* IV. *M. flexor carpi ulnaris.* V. *M. flexor digitorum sublimis.* 1. 2. 3. 4. Its four tendons. 5. 6. 7. 8. Points where these four tendons divide, and the tendons *a. b. c. d.* of the deep flexor pass through. VI. *M. flexor digitorum profundus.* VII. *M. flexor pollicis longus.* VIII. *M. pronator quadratus.* IX. *M. supinator longus.* X. *M. extensor carpi radialis longus.* 7. *Ligamentum intermusculare externum.* XI. *M. extensor carpi radialis brevis.* XII. *M. supinator brevis.* XII. *a. ejus pars posterior.* XIII. *M.*

anconaeus quartus s. parvus. XIV. *M. extensor digitorum communis.* XV. *M. extensor carpi ulnaris.* XVI. *a. b. c. d. M. abductor pollicis longus.* XVII. *M. extensor pollicis brevis.* XVIII. *M. extensor pollicis longus.* XIX. *M. extensor digiti indicis.* XX. *M. extensor digiti minimi proprius.* A. B. *lig. carpi dorsale commune.*

Muscles of the Hand, *M. manus.*

A. *M. palmaris brevis.* B. *M. lumbricales.* C. *M. interossei interni.* D. *M. interossei externi.* E. *M. abductor pollicis brevis.* F. *M. flexor pollicis brevis.* G. *M. opponens pollicis.* H. *M. adductor pollicis.* I. *M. abductor digiti indicis.* K. *M. abductor digiti minimi.* L. *M. flexor digiti minimi.* M. *M. adductor digiti minimi.* A. *Ligamentum carpi volare proprium.* B. *Aponeurosis palmaris.* 9. 10. 11. 12. *Ligamenta annularia, vaginalia, cruciata et obliqua,* which enclose the tendons of the superficial and deep flexors.

Muscles of the Lower Extremities, *M. extremitatum inferiorum.*

Muscles of the Buttocks, *M. natium.*

I. *M. gluteus maximus.* II. *M. gluteus medius.* III. *M. gluteus minimus.* IV. *M. pyriformis.* V. *M. geminus superior.* VI. *M. geminus inferior.* VII. *M. obturatorius internus.* VIII. *M. quadratus femoris.*

Muscles of the Thigh, *M. femoris.*

IX. *M. biceps femoris.* X. *M. semitendinosus.* XI. *M. semimembranosus.* XII. *M. tensor fasciae latae.* XIII. *M. sartorius.* XIV. *M. rectus femoris.* XV.

M. vastus internus. XVI. *M. vastus medius.* XVII.
M. vastus internus. XVIII. *M. subcruralis.* XIX.
M. gracilis. XX. *M. pectineus.* XXI. *M. adductor
longus femoris.* XXII. *M. adductor brevis femoris.*
XXIII. *M. adductor magnus femoris.* * Aperture by
which the femoral vessels pass into the ham, *fossa poplitea*,
A. XXIV. *M. obturatorius externus.*

Muscles of the Leg, *M. cruris.*

A. *M. tibialis anticus.* B. *M. extensor digitorum pe-
dis.* C. *M. extensor hallucis longus.* * A peculiar por-
tion of tendon. D. *M. peroneus tertius.* E. *M. pero-
neus longus.* F. *M. peroneus brevis.* G. *M. gastrocne-
mius.* H. *M. soleus.* I. *M. plantaris.* K. *M. popli-
teus.* L. *M. flexor longus digitorum pedis.* M. *M. flexor
hallucis longus.* N. *M. tibialis posticus.*

Muscles of the Foot, *M. pedis.*

O. *M. extensor digitorum brevis.* P. *M. extensor hal-
lucis brevis.* Q. *M. interossei externi.* R. *M. flexor
digitorum pedis.* S. *M. lumbricales.* T. *M. abductor
hallucis.* U. *M. flexor hallucis brevis.* V. *M. adductor hal-
lucis.* V. a. *ejus pars tranversa seu transversalis pedis.*
W. *M. adductor digiti minimi.* X. *M. flexor digiti minimi.*
Y. *M. interossei interni.* Z. *Aponeurosis plantaris.* A.
Lig. cruciatum. B. Ligament from the *tibialis posticus.* C.
Ligamentum lancineatum. L. *Caro quadrata sylvii*,
which is attached to the tendons of the *flexor digitorum
longus.* 1. 2. 3. *Ligamenta tendinum peroneorum.*

SEVENTEENTH PLATE.

Supplement to the Four Muscular Bodies.

Fig. I. *U. M. Spinalis dorsi*. * The spinous process of ninth dorsal vertebra, whence arises the first ascending portion *b*.

Fig. II. *V. M. Semispinalis dorsi*.

Fig. III. *W. M. Semispinalis cervicis*.

Fig. IV. *T. a. b. M. Sacrolumbalis*. *S. T.* Common muscular belly of the *M. sacrolumbalis et M. longissimus dorsi*. —*a*. The ascending portions of the *M. sacrolumbalis*, which are attached to the back of the ribs, their insertions are cut through, so that the external slips *b*. may be distinctly seen. —*O. c. d. M. Cervicalis descendens*.

Fig. V. *S. a. b. M. Longissimus dorsi*. *a*. The outer portions affixed to the ribs. *b*. The two portions which attach themselves to the transverse processes of the fourth and fifth cervical vertebrae.

Fig. VI. *a. b.* The insertions of the common muscular belly of the *M. sacrolumbalis et M. longissimus dorsi*. *c*. The first portion of the *M. sacrolumbalis* on the twelfth rib. *d*. The inner portion of the *M. longissimus dorsi*, which goes to the tuberosity of the transverse process, and is sometimes single, sometimes double.

Fig. VIII. *G. M. triangularis sterni* and *C. M. transversus abdominis* in front; the costal cartilages being partly cut away.

Fig. IX. *v. M. transversus* seen laterally. *C²*. Its posterior aponeurosis.

Fig. X. *C. M. Transversus* seen from behind. *C²*. The

aponeurosis posterior. *a. b. c. d.* Tendinous slip, by which this *aponeurosis* is attached to the last rib, and to the transverse process of the four upper lumbar vertebrae. *e. f. g.* A part of the *aponeurosis communis* of the *M. latissimus dorsi*, *M. serratus posticus inferior*, of the *M. transversus* et *M. obliquus internus*.

Fig. XI. *E. M. Levator ani*, seen from behind after the *os sacrum* has been removed. *D. M. Sphincter ani internus.* *a. Orificium ani.*

Fig. XII. The same muscles in front after the *os pubis* and the *crus* of the *ischium* have been removed. *b. The Urethra.*

Fig. XIII. *E. M. Levator ani* from the outer side.

Fig. XIV. *E. M. Levator ani* from the inside.

Fig. XV. and XVI. *C. M. Sphincter ani externus* from behind and before.

Fig. XVII. XVIII. XIX. and XX. *A. M. Transversus perinaei superficialis* et *B. M. profundus.* *G. M. Ischio-cavernosi penis.* *H. M. Bulbo-cavernosus.*

EIGHTEENTH PLATE.

First Panel.

The Organ of Respiration.

See also Tab. II., III., and IV.

Fig. I. *Os hyoides*, *larynx* and *thyroid gland* in front. *a. b. Os hyoides.* *c. Cartilago thyreoidea.* *d. Processus superiores* and *e. inferiores cartilaginis thyreoideae.* *f. Cartilago cricoidea.* *g. Trachea.* *h. Glandula thyreoidea.* *i. k. l. Musculus glandulae thyreoideae*.*

Fig. II. *Os hyoides*, *larynx* and *trachea* in front. *a. Basis ossis hyoidei.* *b. b. Ejus cornua lateralia.* *c. c. Ossicula triticea.* *d. d. Cartilago thyreoida.* *e. e. Its superior processes*, which are connected with the *os hyoides* by the *ligamenta hyo-thyreoida lateralia.* *f. f. Its inferior processes*, which articulate with the *cartilago cricoidea.* *g. Epiglottis.* *h. Cartilago cricoidea.* *i. Cavum laryngis.* *k. k. Rings of the air tube.* *l. Separation of the rings.* *m. Pars bronchiorum*.*

Fig. III. † *Os hyoides*, *larynx* and *trachea* from behind. *1. Basis ossis hyoidei.* *2. 2. Cornua majora.* *3. 3. minora oss. h.* *5. Epiglottis.* *5. 5. The two plates of the thyroid cartilage.* *6. 6. Its upper horns.* *7. 7. Ligamenta hyo-thyreoida lateralia.* *8. Ossicula ovalia*, which sometimes occur in these ligaments. *g. g. Lower horns of the thyroid cartilage*, which are connected with

* From *Caldani*.

† From *Loders Anatomischen Tafeln*, and also the two following Figures.

the capsular ligaments to the cricoid cartilage. 10. *Cartilaginis cricoideae pars posterior*. 11. *Cartilagine arytaenoideae*. 12. 12. Hinder membranous wall of the air tube, *membrana musculo-glandulosa*.

Fig. IV. Front view of the *bronchiae* with their glands. 1. *Tracheae pars*. 2. *Bronchiorum ramus dexter*. 3. 3. *Ejus rami minores abscissi*. 4. *Bronchiorum ramus sinister*. 5. *Ejus ramus minores abscissi*. 6. 6. *Glandulae bronchiales*.

Fig. V. Posterior view of the same preparation. 1. 1. 1. *Membrana musculo-glandulosa*. 2. 2. *Glandulae bronchiales*.

Fig. VI. to XIII. The bone and muscles of the Tongue.*

Fig. VI. *a. to h.* *M. digastricus maxillae inferioris*.

Fig. VII. *a. to g.* *M. mylohyoideus*.

Fig. VIII. *a. to k.* *M. geniohyoideus*.

Fig. IX. *M. genioglossus*.

Fig. X. *M. stylohyoideus*.

Fig. XI. *a. b. c.* *M. styloglossus*; *d. e. f. g. h. i.* and

Fig. XII. *a. b.* *M. hyoglossus*. It consists of three portions. *g. h. i.* *M. Basioglossus*. *e. e. f. d.* *M. Ceratoglossus*; and in Fig. XII. *a. b.* *M. Chondroglossus*. *l. m.* Tongue.

Fig. XII. *a. b.* *M. Chondroglossus*; *c. d.* *M. Genioglossus*. *e. m.* *M. Lingualis*. *f.* *M. Styloglossus*. *g.* *Epi-glottis*. *h. i. k.* Lower jaw.

Fig. XIII. *a. b. c. d.* *M. lingualis*. *e. f. g.* *M. Styloglossus*. *h. i.* *M. Ceratoglossus* and *M. Basioglossus*. *k. l. m. n. o. p.* *M. Genioglossus*. *q.* Tongue.

Fig. XIV. to XXIII. The little muscles which move the cartilages of the *larynx*.†

Fig. XIV. *M. hyothyreoideus*.

* † From Albinus.

Fig. XV., XVI. and XVII. *M. cricothyreoideus*.
From before XV. From the side XVI. The hinder
part viewed laterally XVII.

Fig. XVIII. *M. arytaenoideus transversus*.

Fig. XIX. *a. b. c. M. arytaenoideus obliquus. d. d.*
d. e. M. crico-arytaenoideus posticus.

Fig. XX. *a. b. c. d. M. arytaenoideus obliquus. b.*
The one portion attached to the *M. thyreoarytaenoideus*,
and *c. d.* the other to the *epiglottis. e. M. thyreoary-*
taenoideus. f. g. h. M. thyreoepiglotticus major. i. k.
minor.

Fig. XXI. *a. a. b. c. d. M. thyreoarytaenoideus ma-*
ior. f. f. g. M. Cricoarytaenoideus posticus.

Fig. XXII. *M. cricoarytaenoideus lateralis.*

Fig. XXIII. *M. thyreoarytaenoideus alter seu mi-*
nor.

Second Panel.

The Organ of Smell.*

Fig. I. The left side of the nose of a man, the skin
having been removed to shew distinctly the pores in which
the roots of the hairs are fixed, and the orifices of the seba-
ceous follicles.

Fig. II. The left side of the nose, to shew the the con-
nexion of the cartilages and bones belonging to it.

* After Sömmering: *Abbildungen der menschlichen Organe*
des Geruches. Frankf. a. M. 1809.

a. a. The circumference and thickness of the membrane lining the nose, in outline. *b. Os nasi.* *c.* Lateral nasal cartilage. *d.* Alar cartilages with its three appendages *e. f. g.*, which are connected by the ligaments *h. i. k.*

Fig. III. The cartilages in connexion, seen in front. *a. b. Ossa nasi.* *c. d.* Lateral cartilages. *e.* Middle or septal cartilage, which is exhibited separately at Figs. VII. and VIII. Between *e. d. c. l. g.* are the three little cartilages which are shewn separately in Figs. XI. and XII. *g. l.* Alar cartilages, close to their three appendages *h. i. k. l. m. n. o.*

Fig. IV. Outline of a front view of the nose, in which the dotted lines point out the connexion of the cartilages, as in the last plate.

Fig. V. Underview of the nasal cartilages.

Fig. VI. The left lateral cartilage separated.

Fig. VII. and VIII. The septal cartilage separate, VII. a front view of it, VIII. its left side. This cartilage is seen in its natural connexion, with the bone in the first figure, Table VIII. R. R.

Fig. IX. Left alar cartilage, with its appendages, here separately engraved, viewed on its outer side.

Fig. X. The same on its inner side.

Fig. XI. and XII. The smallest cartilages of the nose, which are found in front between the other cartilages, as shewn in Fig. III. separately figured.

Fig. XIII. and XIV. View of the schneiderian membrane which lines the *septum nasi.* *a.* The left nasal cartilage cut through. *b.* The half of the left nostril. *c. d.* The exit of the schneiderian membrane through this nostril *c.* into the skin on the top of the nose, *d.* into the skin of the upper lip. *e.* Section of part of the schneiderian membrane which is found *e.* behind the ridge of the nose, *f.*

under the *os nasi*, *g.* under the *os ethmoides*, and *h. h.* under the occipital bone. *i. i.* Points at which the schneiderian membrane surrounding the vomer runs into the schneiderian membrane of the right side. *k. l.* Section of part of the olfactory membrane, which is attached both to the soft *k.* and hard *l.* palate. *m.* Hairs which beset the cavity of the entrance of the left nostril, between which are found *n.* the round pores or orifices of the sebaceous follicles. *p. p.* Roundish ridges, which mark the boundary between the proper skin in the nostril and the schneiderian membrane. *q.* Opening of a single mucous canal, into which a probe is introduced. *1. 2. 3. 4.* Square, which shews the schneiderian membrane in Fig. XIII. magnified nine times. *r. r.* Transparent edge of the vertical plate of the ethmoid bone. *u. u.* Points where the orifices of the mucous follicles appear arranged as it were in lines or stripes. *v. v.* Points where the largest mucous follicles are found. The mucous membrane appears spongy or villous throughout.

Fig. XV. A view of the external boundary of the right nostril, the *septum nasi* having been removed.

a. b. The nasal cartilage cut through, *c.* right nostril, *d.* cavity or hollow of the right wing of the nose, together with the little hairs and the orifices of the mucous follicles found in it. *e. e.* Roundish ridge, which defines the boundary between the dry common integument of the nose and the proper schneiderian membrane. *f. f.* Lower turbinated plate. *g. g.* Middle turbinated plate. *h. h.* Upper turbinated plate. *i. i.* The cavity in which, as it were, arises the trace of *k. k.* a fourth turbinated plate. Between the floor of the nose and the inferior turbinated plate. *f. f. l. l.* the inferior chamber, *meatus inferior.* *f. f. g. g.* The middle chamber, *meatus medius.* *g. g. h. h.* Superior chamber, *meatus superior.* *m.* Roundish ridge which de-

finer the boundary between the nostril and the throat. *m. n.* Right opening, *choana dextra*, of the nasal cavity into the throat. *o.* Orifice of the auditory tube, *tuba eustachiana*. *p.* Right half of the movable palate. *q. q.* Top of the throat in 1. 2. 3. 4. These lines mark the sections in Fig. XXII., XXIII., XXIV., XXV., and XXVI.

Fig. XVI. A view of the orifices of the adjoining cavities which communicate with the nostrils.

a. b. c. Cut edges of the turbinated plate. *a.* Thickness of the schneiderian membrane attached to the superior turbinated plate. *b. b.* Cartilaginous part of the ethmoid bone and middle turbinated plate. *c. c.* Mucous glands between the bony parts and the schneiderian membrane. *d. e. f.* Cut edge of the inferior turbinated plate. *g.* The prominence which is situated over the opening of the maxillary sinus, sometimes forming a half circle or ring, but rarely wanting. Above this is found the termination of the ethmoidal cells. *h. h.* A sound passed into the frontal sinus, shewing its termination above the prominence. *k. l.* A sound which marks the opening of the sphenoidal sinus behind the middle turbinated plate. *m. m. m.* Orifice of the maxillary cavity. *m.* Orifice of the lachrymal canal.

Fig. XVII. and XVIII. The arteries of the right side of the nasal septum from an adult man. *a.* Posterior. *b.* Anterior superior ethmoidal artery, from the ocular artery. *c.* Posterior ethmoidal artery from the internal maxillary artery. *f.* Small portions of the schneiderian membrane engraved in the XVIIth Fig. magnified twenty-five times; of which the arteries and veins are distinctly filled with injection. The greater part of this vascular net is venous, the lesser arterial. *a. b. c.* Mouths of the three mucous cavities, which are surrounded only by *d.* one arte-

rial, and *e.* one venous circle, but in the pit we also see the vascular net.

Fig. XIX. and XX. Delineation of the nerves which are distributed to that part of the schneiderian membrane covering the nasal septum. This distribution of the nerves is seen without further preparation than taking away the bone and cartilage of the septum. On the inner or naturally terminating surface these nerves cannot be properly exhibited.

a. b. c. d. d. Ramification of the olfactory nerve, *nervus olfactorius*, which forms the superior nasal branches of the septum. *e. e.* Nerve of the schneiderian membrane which comes from the ethmoidal branch, *r. ethmoidalis*, of the first branch of the fifth pair. *f. g.* Lower branches of the nasal septum, *rami nasales inferiores septi narium seu nervus nasopalatinus* of *Scarpa* from the *N. sphenopalatinus* of the second branch of the fifth pair. A branch *g.* which passes through the incisive duct to the skin of the palate. *h.* Lower front nasal nerve, *nasalis anterior inferior*, which comes from the infra orbital nerve, a branch of the second division of the fifth pair. *i. k.* Points of the schneiderian membrane where the filaments of the true olfactory nerve terminate. Fig. XIX. The pieces of Fig. XX. magnified nine times. *a. b.* A portion of the *dura mater a. a.* which is attached to the crybriform plate of the ethmoid bone. *b. b.* Part of the same turned back. *c. f.* Cut edge of the schneiderian membrane. *g. g.* Crybriform plate of the ethmoid bone at its cut edge. *h. h.* Canals and apertures in this plate for the transmission of the branches of the olfactory nerve. *i.* Divided branches of the olfactory nerve, in order to shew the following branch *k*, and especially the mode of its covering from the *dura mater l*, and the passage of the nerve through the bone itself *m.* more distinctly.

n. o. p. Arteries which expand on the schneiderian membrane in their proportional natural size to the nervous filaments.

Fig. XXI. Nervous branches expanded over the turbinated plates on the schneiderian membrane.

1—8. The first eight pairs of cerebral nerves *a. a—d.* Grey bulbous extremity of the olfactory nerve which penetrates through the *dura mater*, *b. b.* and the cribriform plate of the ethmoid bone, *c. c.* in twelve or thirteen little trunks, *d. d. d.* which divide like a plexus into branches, twigs, and fibres on the upper and middle turbinated plates, as *rami nasales superiores medii*. 9. Larger portion of the fifth cerebral nerve. 10. 10. Protuberance or plexus-like knot, which is formed by this larger portion. 11. Lesser portion of the same nerve, which, without mingling with the protuberance, is almost entirely given to the third branch, 12. of this fifth cerebral nerve. *e. f. g.* First branch of this fifth cerebral nerve, *f.* its *ram. ethmoidalis*, which, with the former, *b.* again makes its appearance, and expands itself on the anterior part of the schneiderian membrane, as the *rami nasales anteriores superiores*, *g. g.* *h. to z.* Second branch of the fifth cerebral nerve. *i. N. subcutaneus mallae* divided. *k. N. infraorbitalis*. *l.* Common root, or *ganglion spheno-palatinum*, whence arise the *nervus recurrens s. vidianus*, with its two branches, *m. r.*, the *N. spheno-palatinus p. q. q.*, and the *N. pterygo-palatinus n. u. u. u.*—*p. Rami nasales posteriores superiores*. *q. q.* are two branches of the *N. nasopalatinus Scarpae*, cut through and turned back. See Fig. XX. *s. t. t. Rami nasales posteriores inferiores*. *u. u. u. Rami palatini anteriores*. *v. w. x. and z. Rami palatini posteriores*.

Fig. XXII. XXIII. XXIV. Three perpendicular sections of the nose, as shewn on Fig. XV. by the lines 1. 1. 2. 2. 3. 3.

Fig. XXII. Posterior section. This gives a view from

behind into the nasal cavities, into the cells of the ethmoid and sphenoid bone and the palatinate arch. *a. b.* Frontal bone. *c. l.* Ethmoid bone. *c.* Cockscomb. *d. e.* Crybriform plate, *e.*, the left side still covered with *dura mater*. *f. f.* Vertical plate. *g. h.* Middle turbinated plate of the left and right side. Five *i. i.* left, and *k. k.* right cells, formed by the ethmoid bone. *l. l.* *Lamina papyracea*. *m. n.* Lower turbinated plate. *p.* Vomer. *q. to y.* Left *os maxillare superius*, *superficies orbitalis* and *periorbita*. *s.* *Superf. nasalis*. *t. Q.* Malar part of the superior maxillary bone. *u.* Palatine process. *v.* Alveolar process. *w.* M. maxillary sinus. *x.* *Periosteum*. *y.* Proper membrane of the maxillary sinus. *A. to F.* Olfactory or Schneiderian membrane, *membrana schneideriana*. Orifice on the left, *G. G.* and *H.* of the right lachrymal canal. *K. L.* Orifice of the maxillary sinus on the right side still distinguished by the introduction of a sound, *M. M.* *S.* Thickness of the palatine membrane. *T.* Palatine arch. *U.* Palatine artery cut through. *1. to 6.* Teeth.

Fig. XXIII. Middle section of the cavity of the nose. *a.—f.* Cut edges; *a.* of the frontal bone, *b.* of the nasal process of the left superior maxillary bone. *c.* The left inferior turbinated plate, *d.* the perpendicular plate of the ethmoid bone, *e.* the septal cartilage, and *f.* the palatine process of the superior maxillary bone. *g.* Left lachrymal sack unopened, and *h.* lachrymal canal, which running into the schneiderian membrane there terminates. *i. k. l. m.* Cut edges of the schneiderian membrane. *n.* Upper surface of the schneiderian membrane. *p. q.* The right side is similar to the left, except that upon it the lachrymal sac *p.* and the lachrymal canal *q.* are opened. *r.* Shews the inner bony wall of the maxillary sinus, which is found between the lachrymal canal and the superior maxillary sinus.

Fig. XXIV. Anterior section.

a. Cut surface of the left, and *b.* of the right alar cartilage. *c. c.* Of the septal cartilage. *d. d. e.* Schneiderian membrane beset with hairs and mouths of the mucous follicles. *f.* Left, and *g.* right nostril.

Fig. XXV. and XXVI. Horizontal section through the nostrils. The direction in which this incision of the nostrils, made horizontally above the lachrymal bones, is shewn through the line 44 Fig. XV. In the XXVth Fig. we look as it were vertically down into the nostrils; in the XXVIth Fig. on the contrary, as it were, into the roof, which closes these cavities above. *a.* Tip of the nose. *b. c.* Nasal bone. *d.* Frontal bone. Each half forms a cell. *x. x.* *f. g. h. i.* Ethmoid bone. *g. i. k. l.* Body of the sphenoid bone with its cells, *m. n.* Periosteum *p.*, and the proper membrane *q.* of the sphenoidal sinuses. *r. r.* Middle plate of the ethmoid bone. *s. s. t. t.* *Membrana schneideriana.* *u. u. v. v.* Length and breadth of the left *u. u.*, and of the right *v. v.*, nostril in this direction. *w. w.* Eleven from the left, and nine, some large, some small, cells from the right side; of which the anterior are formed by the frontal, and the others by the ethmoid bone. *y. z.* In the roof of the nostrils, Fig. XXVI., is, in the right half, the double membrane which lines these cells turned back; viz., *y.* the proper internal membrane, and *z.* the periosteum.

NINETEENTH PLATE.

The Organ of Vision.*

Fig. I. Well-formed eye of a man.

Fig. II. *Ib.* of a woman.

Fig. III. Eye of a girl of eleven years old who could not bear a strong light, or one of the so called White Negroes. I have given this delineation, because, in my opinion, it has a strong resemblance to the eye of an old person.

Fig. IV. *M. orbicularis palpebrarum.* *a. Ligamentum palpebrale internum.* *b. Stratum externum.* *c. Stratum internum.* *d. Musculus ciliaris Albini.* *e.* Fibres which, opposite the nose, *f.* fibres which, opposite the cheek, descend, and are lost in the skin.

Fig. V. Nerves of the eyelid.

The nerves of the upper eyelid belong to the *N. frontalis*, *a.* of the first branch of the fifth pair of nerves.

The nerves of the lower eyelid come from the *N. infra-orbitalis*, *b.* of the second branch of the fifth pair of nerves. *c. d. d.* Connecting branches of the *N. facialis*.

* The greater number of these Engravings are from Sömmerring: *Abbildungen des menschlichen Auges.* Frankf. a. M. 1801.—The Fig. 28. 29. 34. 35. 36. 37. 38. 39. I have made entirely new from nature. The Fig. 31. and 32. I have taken from my own treatise. *Ueber die wichtigsten Theile im menschlichen Auge.* Berlin, 1828. In v. Gräfe's and Walther's *Journal für Chirurgie und Arzneikunde*, 11r Bd. 3s. Heft. The Fig. 43. and 44. are also from my paper: *Ueber das Strahlenblättchen im menschlichen Auge.* Bonn, 1827, bei Habicht.

Fig. VI. Arteries of the eyelids.

These are supplied: above, from the *A. temporalis*, *a.* below, by the *A. infraorbitalis*, *b.* and in front by the *A. angularis nasi*. From within by the *A. ophthalmica*, *c.* From without by the *A. temporalis* and *A. transversa faciei*, *d. e. f. g. h. i.* A branch from the *A. coronaria labii*.

Fig. VII. Veins of the eyelids.

a. a. a. *Vena facialis*. *b. b.* *V. temporalis profunda*. *c. c.* *V. frontalis posterior*. *d. d.* *V. supraorbitalis*. *e.* *V. frontalis*. *f. g. h.* *V. nasales*. *i.* Anterior, *k.* posterior branches from the lower eyelid, which terminate in the *V. facialis*.

Fig. VIII. Eyelids of the left side widely separated from each other.

a. *Supercilium*. *b.* Fold of the eyelid, which is somewhat turned round. *c.* Little holes in the membrane after the eyelashes have been pulled out. *d.* *Puncta lachrymalia*. *e.* Upper and under crura of the inner angles of the eyelids. *f.* Orifices of the mucous follicles of the eyelids. *g.* *Caruncula lacrymalis*. *h.* *Plica semilunaris membranae conjunctivae*.

Fig. IX. An eyelid from the right side separated and seen posteriorly, with the lachrymal gland, which is somewhat turned back, and covered in front point by the *tunica conjunctiva*.

a. A part of the *orbicularis palpebrarum*. *b.* Fissure of the eyelids. *c. d.* *Glandula lacrymalis*. *d. d.* Its division into two principal lobes. *e.* Excretory ducts of the lachrymal gland. *f.* Orifices of these ducts. *g.* *Tunica conjunctiva*. *k. h.* Meibomian follicles of the eyelids. *i. l.* *Puncta*. *m.* Caruncle. *n.* *Plica semilunaris conjunctivae*.

Fig. X. The lachrymal gland from below.

Fig. XI. The lachrymal gland seen from its anterior or smaller gland.

Fig. XII. *Ib.* from above.

Fig. XIII. Internal surface of the *tunica conjunctiva*, which has been mostly removed from the eyelids, magnified two diameters in order to shew its villous or warty-like structure on the parts where it covers the cartilages. The Fig. IX. *h. k.* transparent meibomian follicles are purposely removed to prevent mistakes. The parts marked are the same as the preceding figure.

Fig. XIV. Internal surface of the eyelid magnified two diameters, in order to exhibit the structure of the meibomian follicles. *c.* *M. levator palpebrae superioris*; portions of the conjunctiva drawn back, to expose the meibomian follicles.

Fig. XV. Sequel to the VIIIth Fig. *d.* shewing the natural position of the lachrymal gland, and the true form of the lachrymal duct.

a. b. c. d. Superior and inferior *canaliculi lacrymales*. *a.* Vertical crus or primary portion, which commences at the *punctum lacrymale*. *b.* Blind portions of *ibid.* *c.* Process or transverse crus of the little canals. *d.* Termination of *ibid.* on the lachrymal sack. *e. f. g.* *Saccus lacrymalis*. *e.* Blind part of the lachrymal sack. *f.* Middle part of *ibid.* *g.* Termination of *ibid.* *h. i.* *Canalis lacrymalis membranaceus*, or nasal portion of the lachrymal duct. *i.* Termination of the lachrymal duct.

Fig. XVI. Lachrymal duct of the left side viewed from the side of the nostril, in order to observe its direction, extent, and orifice.

Fig. XVII. The lachrymal duct cut open and partly displayed, to shew its internal extent, and the thickness

and glandular state of its membrane. *d.* The doubling of the internal membrane which distinctly marks the inner half of the termination of the lachrymal sack. *f.* A second fold, which is sometimes seen.

Fig. XVIII. XIX. XX. The muscles of the left eyeball.*

1. 2. 3. Bottom of the left orbit. 4. Cartilaginous pulley for the tendon of the *M. obliquus superior*. 5. Eyeball, *bulbus oculi*. 6. 7. Optic nerve. *a.* to *e.* *M. levator palpebrae superioris*. *f. g.* *M. rectus superior*, which is almost completely covered by the preceding. *h. i. k.* *M. rectus externus*. *l.* *M. obliquus inferior*. *m.* *M. rectus inferior*. *n. o.* *M. rectus internus*. *p. q. r. s.* *M. obliquus superior*. *t.* Mucous bag within the pulley.

Fig. XXI. XXII. XXIII. The nerves of the Eye.*

1. *Nervus opticus*. 2. *N. trochlearis*. 3. *N. trigeminus*. 4. *N. oculomotorius*. 5. *N. abducens*. 6. *a. b. c. d. e. f. g. h. i. k. l. m. n. o.* First, 7. second, 8. third branch of the *N. trigeminus*. *a.* Connecting branch to the *N. trochlearis*. *b.* *N. lacrymalis*. *c.* Two of its branches which expand in the eyelid. *d.* Connexion with the *N. subcutaneus* of the second branch of the fifth pair. *e.* *N. frontalis*. *f.* Its outer, *g.* its inner branch. *h.* Twig which expands in the region of the pulley, *ramus supratrochlearis*, and not in its anastomoses with the *ramus infratrochlearis* (*l*). *i.* Ophthalmic ganglion and nasal branch. *k.* *Ram. nasalis*, and *l.* *N. infratrochlearis* of the ophthalmic ganglion and nasal branch. *m. m.* *Radix longa* to the *ganglion ophthalmicon*, +. *n.* Connecting branch to the upper branch of the *N. oculomotorius*. *o.* Two long ciliary nerves from the *ramus nasalis k.*—*p. q. r.* Upper branch of the *N. oculomotorius*. *s.* Its under

* The description applies to all three figures.

branch. *t.* Middle twig of this branch, which expands in the inferior straight muscle. *u.* Lower twig of the same branch, which divides *v.* into the *radix brevis* of the ophthalmic ganglion (+), and into *w.* the long branch for the inferior oblique muscle. From the ophthalmic ganglion + are given two bundles of ciliary nerves. *x. x. x.* The upper bundle divides into three little branches which pass closely along the optic nerve, proceed thence in several fibres *y.*, which dividing in the *tunica sclerotica*, penetrate the eyeball. *z.* in Fig. XXI. Inner twig of the lower branch (*s.*) of the *N. oculomotorius*.—5. $\beta.$ $\gamma.$ $\delta.$ *N. abducens.* $\gamma.$ Its expansion into the outer straight muscle. $\delta.$ Delicate fibres of this nerve, which form a net around the cerebral artery, are connected with the sympathetic nerve, and expand on the artery itself.

Fig. XXIV. XXV. The arteries of the eye.

Fig. XXIV. 1. *Arteria carotis cerebralis.* 2. *A. ophthalmica.* *a.* First, *b.* second long ciliary artery. *c.* Artery of the sac. This divides into the *d.* ciliary branch, which is distinctly seen in the next plate running upon the inner side of this artery. *e.* A less muscular branch to the outer straight muscle, and the *f.* branch which passes beneath the eyeball in order to supply the inferior oblique muscle, as seen in the following plate. *f. f.* Larger muscular branch for the outer straight muscle. *g. h. i.* Division of the root of the lachrymal artery into the branch (*h.*), which innosculates with *x.* a branch of the internal maxillary artery, and with the branch (*i.*), which expands in the lachrymal gland and the upper eyelid. *k.* Projection of the root of the ocular artery, which passes across under the optic nerve. *l.* Branch which divides into the twig for the upper oblique muscle (*m.*), and the branch for the elevator of the eyelid, as the following plate shews. *o. p. q.* One of its

branches which divides into a twig to the upper straight muscle and the *q.* ciliary twig. *r.* Double branch *p.* for the lower straight muscle. As the trunk of the ocular artery now takes a separate course, it produces *s.* the frontal artery. *t.* The artery for the inner straight muscle, which principally winds round its muscular part in order to get upon the ocular surface of the muscle, as the following figure distinctly shews. *u.* The anterior artery of the nostril, or anterior olfactory artery. *v.* Inferior trochlear artery. *w.* Anterior branch of the divided artery (*p.*), which expands in the upper straight muscle. *x.* A twig which arises from the deep temporal branch of the maxillary artery.

Fig. XXV. Continuation of the preceding figure so placed that, after the removal of the globe of the eye, the ramification of the ocular artery can be perfectly seen at a glance.

a. b. c. d. e. f. ff. g. h. i. k. o. r. s. t. u. v. x. Exhibit the same branches as in the preceding figure. *y.* Trunk of the internal maxillary artery, *A. maxillaris interna.* *z.* Infra orbital artery.

Fig. XXVI. XXVII. The ocular veins.

Fig. XXVI. *a.* Faci-ocular vein, which has a connexion with the internal facial vein (*r, s.*) has a double root, *c.* an external and *d.* an internal, or the proper infraorbital vein curves upwards and inwards, and gives off in its course the following branches: *e.* the branch which consists of the inferior and external ciliary veins, *s.* Fig. 27., and a connecting branch to the posterior branch of the ocular vein *t.* Fig. 27. *f.* The branch by which it anastomoses with the trunk of the faci-ocular vein. *g.* The anterior ciliary vein, which also unites with *h.* the twig on the external straight muscle. *i. k.* The branch which unites the twigs on the inferior straight muscle,

and with a twig *l.* runs into the cellular sinus. *m.* The external ciliary vein. *n. n.* Hence pass the faci-ocular veins with their trunk beneath the optic nerve, which terminates in the ocular vein as a particular trunk. *o. p.* The ocular vein consists principally of the union of the above-described faci-ocular vein, an anterior and a posterior *q.* in the following figure *a. b.* are shewn the trunk and the inner facial vein. *q. r. s.* This internal faci-ocular vein arises from the union of the frontal vein (*r.*) and vein of the eyebrow (*s.*), passes under the tendon of the superior oblique muscle, receive the veins of the interior of the globe, which are shewn in the following figure *r. e.*, pass under the superior straight muscle, and terminate in the cerebro-ocular vein. This cerebro-ocular vein gently winds over the optic nerve, and in its course receives the five following veins: *t. t.* the vein from the superior straight muscle and from the elevating muscle of the upper eyelid; *u. u.* the superior ciliary vein which receives the branches from the superior straight muscle; *v. v. w.* the vein of the lachrymal gland which *v. v.* receives branches partly from that gland, *w.* partly from the elevator of the upper eyelid, *x.* partly anastomoses by a similar transverse branch with the superior ciliary vein; *y. y.* another vein from the superior straight muscle. * * Posterior vein of the schneiderian membrane which passes across deeply under the optic nerve from the inner side of the orbit; it winds up in order to empty itself into the cellular sinus on the outer side of the optic nerve. *z. z.* The central vein of the spinal marrow, which receives the * veins from the membrane of the optic nerve and the fat in this region, and empties itself into the cellular sinus.

Fig. XXVII. View of the veins below the eyeball; or confluence of the roots of the cerebro-ocular vein in the under half of the orbit. In order to shew these distinctly

it is necessary, after cutting through the superior oblique muscle and the inferior straight muscle, to elevate gently and draw back the eyeball.

a. b. Under the eyeball are seen the anterior (*a.*) and (*b.*) posterior root of the cerebro-ocular vein. In the anterior root (*a.*), which is connected with the posterior facio-ocular vein *c.* unite in their course at *d.* the little branches from the region of the lachrymal sac, *c.* those from the conjunctive coat and fat of this region, *f. f. f.* the little branches from the periosteum of the under part of the orbit, *g. g.* a shorter and a longer ciliary vein. *h.* The little branches from the inferior straight muscle. *i.* The various anastomosing branches. *b. k.* In the posterior root (*b.*), which is connected with the branch of the facio-ocular vein, which is shewn in Fig. XXVI. by *n. n.* unite in their course at *l.* the single inferior ciliary vein. *m.* The branches from the inferior oblique muscle. *n.* Little branches from the fat and periosteum of the under part of the orbit, whereby they are connected at the front to a little branch *p.*, which soon also connects itself with *q.* the inner facio-ocular vein, which has received, besides the little branches, *r.* the anterior vein of the schneiderian membrane. *s.* Inferior and external ciliary vein, which, next the connecting branch *t.* to the posterior branch of the facio-ocular vein, connects itself with *e.* the branch of the facio-ocular vein already shewn in Fig. 26.

Fig. XXVIII. Inferior anterior half of a horizontal section of the eyeball of the left side, magnified about six diameters larger than natural.

I make this the principal figure, by which we easily obtain, in the first place, a general view of the anatomy of the eyeball; and whilst I shew this, I at the same time sketch out the anatomy of the eye.

I. The eyeball forms an unequally formed ball consisting

of segments of two spheres of different sizes. The posterior segment *a. 4.* is distinctly larger than the anterior. N. 1.

II. The eyeball consists of several membranes, which are placed in layers on each other, or enclose one another, and the secretion of the chambers, the chrystalline lenze, and the vitreous humour.

III. The layers of the posterior segment *a. 4.* follow thus on each other:

1. *T. sclerotica, a. * Lamina fusca*, (brown).
2. *T. chorioidea, b. c.* (brown). It consists of two layers: *b.* of the outer vascular layer, *T. chorioidea*, properly so called, *c.* of the inner *ib.*, the *membrana ruy-schiana*. The external vascular layer (*b.*) runs into the *ligamentum ciliare, d.*

The inner vascular layer (*c.*) into the *processus ciliares, e.*

The inner surface of the inner vascular layer (*c.*) is over-spread with a pigment, the *pigmentum nigrum, f.*, and forms in front *f. ¹ f. ¹* the *ora serrata*, (brown.)

3. Jacob's membrane, *membrana Jacobi seu serosa, g.* (yellow).

4. Nervous membrane, *tunica retina, h. i.* (blue). This also consists of two layers: *h. tunica retina*, properly so called; *i. tunica retinae vasculosa.*

5. *Zonula zinni, k.* (green). It forms with the *membrana hyaloidea* (*l.*) the canal of Petit, *canalis petitii, k. ¹*

6. Hyaloid membrane, *membrana hyaloidea, l.*

7. Capsule of the chrystalline lenze, *capsula lent. cryst., m.*

IV. Layers of the anterior lesser segment of the eyeball.

1. *T. cornea transparens, n.* (bluish).
2. *T. membrana humoris aquei s. tunica Wrisbergii, o.*
3. Demours' membrane *p.*

4. *Iris*, *q.* (blue).

5. *Uvea*, *r.* It consists of the *pigmentum nigrum* (*r.*), and the lining of Jacob's membrane.

V. Anterior chamber, 1.

VI. Posterior chamber, 2. 2.

VII. Chrystalline lenze, *lens crystallina*, 3.

VIII. Vitreous humour, *corpus vitreum*, 4. *n*¹. Connexion of the cornea with the sclerotic. *n*². Origin of the cornea within, where the *iris* and the *ligamentum ciliare* are attached.

Fig. XXIX. The whole horizontal half of the eyeball, in which the preceding figure is magnified; there are shewn merely the four principal membranes, *a. b. h. n.*, so as they may be exposed by the most simple dissection.

Fig. XXX. *b.* The injected *T. choroidea*. *d.* *Ligamentum ciliare*. *q.* *Iris*, after the removal of the *T. sclerotica* and *cornea*. The ciliary nerves.

Fig. XXXI. The two lamellae *b. c.* of the *T. choroidea* shewn divided.

Fig. XXXII. Anterior view of the manner in which the ciliary vessels and nerves divide in the *ligamentum ciliare d.* in order to expand in a peculiar manner, and then first to go to the ciliary processes and to the *Iris*.

Fig. XXXIII. A dried piece of injected choroid coat and *Iris*, very much enlarged, in order to understand the vascular system, I have discovered in the ciliary ligament.

a. a. b. b. c. c. *Iris*, consisting of two layers: *a. a.* Anterior layer. *b. b.* Posterior layer. *c. c.* Lesser circle of the *Iris*. *d. d. e. e.* *Ligamentum ciliare*. *d. d.* *Circulus major ligamenti ciliaris*, usually called the *circulus major iridis*. *e. e.* *Circulus minor ligamenti ciliaris*. *f. f.* *Arteriae ciliares longae*. *g. g.* *Ciliares anteriores*. *h. h.* *Ciliares breves*. *i. i.* *Ora serrata*.

Fig. XXXIV. XXXV. XXXVI. Anterior half of a perpendicular section of the eyeball, seen from within or behind.

Fig. XXXIV. In this the chrySTALLINE lenze and the vitreous humour are left, and we see shining through them the so called ciliary body, *corpus ciliare*, the iris, and the nervous coat.

Fig. XXXV. The lenze and the vitreous humour are here removed; we now see more distinctly the *uvea*, *r.*, the *iris*, *q.*, with the pupil, *q.*¹, the above-mentioned circle, *ora serrata*, *f.*¹, and the *processus ciliares e.* These two parts *f.*¹ *e.* were formerly considered as one and the same organ, and called the *corpus ciliare*. But the *ora* is merely a collection of the pigment between the *zonula zinni*, the anterior part of the *membrana ruyschiana*, and the anterior dentated edge of the nervous coat *h. i.*, so that we can remove this pigment with the finger, without the *processus ciliares* being in the least injured, as we see, in

Fig. XXXVI., in which the *ora serrata* is entirely deficient; as I have removed it, as well as the *uvea*. The nervous coat is here removed. I only here remark, that the arteries are injected in this preparation, and that the *cessus ciliares* are somewhat turned aside, so that they seem in part overlapping, like tiles, and in which we observe, that several *processus ciliares* are connected with each other.

Fig. XXXVII. The same preparations as Fig. XXXV. but viewed in front or on the outside, after the *cornea* and *sclerotica* have been removed, *b.* *Choroidea stricte sic dicta*; *f.*¹ the transparent *ora serrata*. *d.* *Ligamentum ciliare*, attached to its posterior edge *b.* *e.* The ciliary processes which project beyond the iris, and float on the chrySTALLINE lenze, which are distinctly shewn, as I have

removed one half of the iris *q*. The transverse and longitudinal fibres in the iris can be distinctly seen.

Fig. XXXVIII. Connexion of the *dura mater* and the transparent membrane in front and externally. The *cornea*, through which the *iris* and the *pupil* are seen, and the *sclerotic*, are here interwoven with each other.

Fig. XXXIX. Connexion of the *sclerotica* and *cornea* behind and within.

The *cornea* lies within the *sclerotica* like a scale, and forms thereby a peculiar process, *n.*², upon which the *ligamentum ciliare* is attached.

Fig. XL. XLI. XLII. The nervous coat, *retina*.

Fig. XL. The whole nervous coat *h. i.*, the mode in which it surrounds the vitreous humour, and extends from before to the *zonula zinni k*. 5. The optic nerve. 6. The yellowy spot, *macula flava*, and central hole, *foramen centrale retinae*.

Fig. XLI. The nervous coat seen posteriorly. 7. Point at which the optic nerve is removed, and the central vessels of the nervous coat enter, which can be seen distinctly without any mark.

Fig. XLII. The nervous coat seen in front through the *lenze* and vitreous humour after the *cornea* and *iris* have been removed.

Fig. XLIII. XLIV. *Zonula zinni*.

Fig. 43. The natural form and size of the *zonula zinni k*. This *zonula* is from a child 10—12 weeks old, and is remarkable, as it, with otherwise completely normal state of the vitreous humour and nervous coat, is abnormal, and exhibits an almost homogeneous medullary-like structure; by which the *zonula zinni* is decidedly proved to be a self-existing peculiar organ. See my observations thereon, &c.

TWENTIETH PLATE.

The Anatomy of the Heart.*

Fig. I. and II. The heart inclosed in its Pericardium, with the trunks of the large vessels which go to and come from the heart.

Fig. I. From before. *A.* Superior surface of the diaphragm. *B.* Pericardium distended with air. *C.* *Arteriae aortae*, from which *a.* *Arteria innominata*, *b.* *Carotis sinistra*, and *c.* *Subclavia sinistra*, originate. *D.* *Arteriae pulmonalis ramus dexter.* *E.* *Sinister.* *d.* Obliterated *ductus arteriosus botalli.* *F.* *Vena cava superior.* *G.* *Vena pulmonalis dextra inferior et superior.* *H.* *Superior vena pulmonalis sinistra* *I.* Part corresponding to the *apex* of the heart, *mucro cordis.*

Fig. II. From behind. *A.* *Diaphragma.* *B.* *Oesophagus.* *C.* *Vena cava inferior.* *D.* *Vena cava superior.* *d.* *Vena azygos.* *E.* *Arcus aortae.* *F.* *Ramus dexter arteriae pulmonalis.* *G.* *Sinister.* *H. I.* *Venae pulmonales.* *K. L. M. N. O. P.* *Superficies posterior pericardii.*

Fig. III. The heart from before and above, with its vessels. *a.* Right proper auricle, *atrium dextrum.* *b.* *Auricula dextra s. anterior.* *c.* Left proper auricle, *atrium venarum pulmonalium.* *d.* *Auricula sinistra.* *e.* *Vena pulmonalis sinistra superior.* *f.* *inferior.* *g.* *Vena cava superior.* *h.* At this part the *arteria pulmonalis* has been cut off, in order to shew the origin of the *arteriae coro-*

* After Caldani.

nariae n. o. of the heart. *i. Arteria aortae. n. Arteria coronaria cordis dextra. o. Coronaria cordis sinistra. p. Ramus circumflexus coronarius hujus arteriae. q. Venae coronariae magnae ramus anterior. r. Vena cordis miuor*, which opens into the proper auricle.

Fig. IV. The heart from behind and below, with its vessels. *a. Atrium dextrum. b. Vena cava inferior*, divided and tied. *c. Cava superior. d. Atrium sinistrum venarum pulmonalium. e. Auricula sinistra. f. g. h. Venae pulmonales. i. Arteria coronaria dextra. k. l. Sinistra. m. Venae coronariae magnae ramus superior major. n. n. Rami alii posteriores minores. o. Ramulus ab atrio dextro. p. Vena coronaria magna Galeni*, which opens into the right proper auricle or atriam.

Fig. V. The male heart in its natural position, and with the right atrium and right ventricle laid open.* *A. Vena cava superior. B. Vena cava inferior. C. The right proper auricle, atrium venarum cavarum*, laid open. *a. b. Auricula dextra. D. The fossa ovalis in the septum atriorum. E. Valvula Eustachii. Between D. and E. is the opening of the vena cava inferior. F. Valvula Thebesii. G. Valvula tricuspitalis at the ostium venosum of the right side of the heart. H. K. Septum ventriculorum*, seen from the right ventricle laid open. *I. Musculi papillares*, connected by the *filamenta tendinosa* with the *valvula tricuspitalis. K. Trabeculae carnae. L. Aditus ad conum arteriosum. M. Conus arteriosus ventriculi dextri. N. Arteria pulmonalis. O. Arteria aortae. P. Auricula sinistra. Q. Ventriculus sinister. c. d. Sulcus longitudinalis superior. e. Apex seu mucro cordis.*

* This excellent representation was prepared from nature by Prof. Tischbein.

Fig. VI. The *ventriculus dexter* (E.) and the *arteria pulmonalis* (D. b. c.) so laid open, that the *valvulae semilunares e. f. g.* at the *ostium arteriosum* are seen. A. *Superficies cordis superior*. B. *Ejus mucro*. C. *Arcus aortae*. a. *Ductus arteriosus Botalli*. F. G. K.* *Valvula tricuspidalis* projecting into the cavity of the ventricle.

Fig. VII. The four cavities of the heart laid open from below and behind.

A. *Aorta*. B. *Arteria pulmonalis*. C. *Vena cava superior et D. inferior*. E. *Atrium dextrum*. e. e. *Auricula dextra*. F. f. A portion of the *valvula Eustachii*. G. *Ostium venosum*. g. h. i. *Valvula tricuspidalis*. k. *Musculi papillares, seu carnae columnae*. m. *Trabeculae carnae et retiformis structura*. N. The passage leading to the *ostium arteriorum* of this ventricle. O. *Septum ventriculorum*. o. o. *Septum atriorum*. P. Transparent spot of the *septum atriorum*, answering to the *fossa ovalis*. p. *Plica semilunaris et sinus septi-atriorum*, which is the remains of the *fenestra ovalis* and aperture of the foetus. Q. *Sinus venarum pulmonalium*. R. *Ostia venarum pulmonalium*. q. *Ostium auriculae sinistrae*. r. s. *Valvula mitralis*. S. *Musculi papillares*. T. Passage of the blood to the *ostium arteriosum ventriculi sinistri*, and thus to the *arteria aorta*. t. *Trabeculae carnae*. V. V. V. V. *Crassities parietum utriusque ventriculi*.

Fig. VIII. The left ventricle and the aorta laid open from above and before.

A. *Superficies ventriculi posterioris seu aortici interior*. B. *Valvula mitralis*. a. *Musculi papillares*. b.

* Marked E. in the Plate by mistake. TRANSLATOR.

Fila tendinea. *c. Trabeculae carneae.* *C. Ostium arteriosum aortae.* *D. E. F. Valvulae semilunares.* *e. e. e. Sinus Valsalvae seu valvarum semilunarium,* in which are the openings of both the *arteriae coronariae*, *f.* the posterior, *g.* the anterior. *h. Noduli Arantii*, in the middle of the callous edge of the valves. *G. Aorta discisa.* *H. Arteria pulmonalis truncata.* *I. Auricula sinistra.* *K. Thickness of the parietes of the posterior ventricle.* *L. Vena cava superior, et M. inferior.*

TWENTY-FIRST PLATE.

Fig. I. to XXI. On the Circulation of the Blood in the Fœtus.*

Fig. I. *a.* Shews the *valvula Eustachii* in the right *atrium* (1.) in its greatest extent, as well as both its points of attachment, and its relation to the *valvula ovalis*, (*b.*) which is seen from the left *atrium* behind the *vena cava inferior*, through which a sound has been passed. For the sake of greater clearness, it was necessary and unavoidable to move the heart considerably sideways, on which account the valves, as well as the *foramen ovale*, appear somewhat stretched. We may also remark, that the drawing was taken from the heart, which is shewn in Fig. XXI. in its natural size. But, as sufficient clearness was not attainable in so small a space, the whole drawing was transferred in the exact proportions to a much older heart. Hearts of nearly perfect embryos were not chosen, because in them the *valvula Eustachii* has already undergone considerable change in form and position.—2. *Vena cava superior.*

Fig. II. Shews on the same preparation in the left *atrium* (1.) the *valvula foraminis ovalis* (2.).

Fig. III. The heart of a foetus of eight months, shewing a variety in the form and position of both the most important valves of the *Atrium* or Proper Auricle.

* After H. Fr. Kilian: On the circulation of the blood in the child which has not breathed. With ten Lithographed Plates. Karlsruhe, 1826.

a. Valvula Eustachii. b. Valvula foraminis ovalis. c. Valvula Thebesii. Compare Fig. I. with this. 1. Anterior surface of the liver.

Fig. IV. Is a view of the left half of the same heart. Compare this with Fig. II. This figure also shews the proportion of the *ductus venosus Arantii* to the *vena umbilicalis* and *vena portarum*.

a. Vena umbilicalis. b. Vena portarum. c. Ductus venosus Arantii. d. Ramus dexter venae umbilicalis. e. Vena cava inferior. 1. *Venae pulmonales.* 2. Posterior surface of the liver.

Fig. V. The aim of this delineation is to shew the mutual proportion of the *vena cava inferior* (1.) and *superior* (2.), and the manner in which the *vena umbilicalis* (3.), the *ductus venosus Arantii* (4.), and the *vena portarum* (5.), are dispersed in the liver. The foetus is opened from behind, and the vertebral column removed.

Fig. VI. View of the posterior surface of the heart of the foetus of a sheep at nearly the full time.

The *vena cava inferior* is cut open at its entrance into the heart, and both the orifices are seen, namely, a larger one (*a.*) leading into the left *atrium*, and a smaller one (*b.*) into the right *atrium*. Both orifices have a septum between them, and have no communication.

Fig. VII. The right *atrium* of the same heart laid open.

No trace of a *valvula Eustachii* is seen, but the *vena cava inferior* (through which a sound has been carried), after forming a short straight canal, opens with a plainly observable perfectly formed orifice into the right *atrium*. Under this right orifice of the *vena cava inferior* is seen a smaller one, which is the opening of the *vena magna Galeni*, which appeared altogether without protection.

Fig. VIII. Shews the left *atrium* of the same foetus of the sheep.

We here find no *foramen ovale* in the sense in which we are wont to find it in Man, and consequently no valve of this aperture. In its stead, however, is seen a vessel with excessively thin parietes, entirely closed all around, and connected with the wall of the *atrium* on one side by means of very tender and easily detached cellular tissue. It has exactly the length here represented, and its free edge is pierced with beautiful reticular work, shewing a well-formed orifice, and is a continuation of the *tunica intima venae cavae*.

Fig. IX. Heart of the foetus of a calf of the size of a rat.

It is in so far remarkable, that the branch of the *vena cava inferior* continued into the left *atrium*, which we have become acquainted with in the former figure, is here entirely closed anteriorly, and looks exactly like the finger of a glove; merely at the free end of this vessel are several small orifices through which the blood escaped, as through a sieve.

Fig. X. and XI. Are two views of the large arterial vessels proceeding from the heart of the perfectly formed foetus.

In both are seen how the *arteria pulmonalis* (1.) and *aorta abdominalis* (2.) form one continued vessel; and in both is marked the spot (*a.*) where the one proceeding upwards from the left ventricle divides from that proceeding downwards from the right ventricle, and at which part the *aorta* is contracted. 3. *Ductus arteriosus Botalli*.

Fig. XII. Shews the *valvula foraminis ovalis* of the full-timed foetus in its natural position, as it appears in the

usual state of the heart during the passage of a fluid through the *foramen ovale*.

Fig. XIII. Is the heart of a child, which has lived five days.

The *ductus arteriosus Botalli* is still not closed, but, at the spot where it dips into the *aorta*, is become somewhat contracted; but, on the contrary, the *art. pulmonalis* has proportionally gained in extent, and the *aorta* in its whole course no longer shews the contracted spot marked (a.), seen in Fig. X. and XI.

Fig. XIV. Gives a general idea of the whole circulation in the foetus.

1. *Vena cava superior*, 2. *inferior*. 3. *Vena umbilicalis*, with its ramifications on the placenta. 4. *Ductus venosus Arantii*. 5. *Vena portarum*. 6. *Arteria pulmonalis*. 7. *Ramus sinister. a. p.* 8. *Ductus arteriosus Botalli*. 9. *Arcus aortae*, from which arise three branches, namely, 9¹. *Arteria anonyma*. 9². *Carotis sinistra*. 9³. *Subclavia sinistra*. 10. *Aorta thoracica*. 11. *Aorta abdominalis*. 12. *A. caeliaca*. 13. *A. meseraica superior*, 14. *inferior*. 15. *A. iliaca communis*. 16. *Cru-ralis*. 17. *A. hypogastrica*. 18. *A. umbilicalis. a. Cor. b.* Posterior surface of the liver. *c. d.* Kidneys and *cap-sulae renales. e. Placenta*.

Fig. XV. to XXI. Are a series of delineations appertaining to the progressive formation of the heart.

Fig. XV. shews the heart in the form the earliest observable in the human foetus. It is in proportion exceedingly large, fills the whole cavity of the chest, and has a perpendicular position.

Fig. XVI. and XVII. are two drawings taken from Pander's work. They shew the heart of the chick *in ovo*,

about the third day after hatching. The 16th fig. is a view from above, while in fig. 17. it is seen from the side. *a. a.* Branches of veins. *b.* Part where these enter the heart. *c.* *Apex cordis.* *d.* The *bulbus*, from which the three arterial branches (*e.*) have their origin. *f.* *Aorta adscendens.* *g.* The two principal branches which pass along the vertebral column.

Fig. XVIII. and XIX. Are drawings after Meckel, but with some variation, and are hearts of a not very far proceeded growth.

Fig. 18. is the heart of a four week, and fig. 19. of a five week embryo. We observe how much the former has outstripped the latter in developement. *a.* The right, *b.* the left ventricle. *c.* *Aorta.* *d.* The right, *e.* the left proper auricle or atrium.

Fig. XX. Is the heart of a foetus of two months and a half, in which the forked apex of the heart and the great proportional size of the Atria are observed.

Fig. XXI. The heart of a foetus at the commencement of the fourth month.

This has already attained its perfect external growth, and the *valvula Eustachii*, as well as the *valvula foraminis ovalis*, are now perfectly and beautifully formed. The two first figures are prepared from this heart.

Fig. XXII. Shews, after Sömmering,* a five month foetus with the *placenta* and its membranes.

a. *Placenta.* *b.* *Tunica externa seu chorion fungosum*

* S. Th. Sömmering. *Icones Embryonum humanorum.* F. ad M. 1799.

seu membrana decidua Hunteri. c. Tunica secunda s. chorion proprie sic dictum. d. Tunica tertia s. intima s. amnios.

Fig. XXIII. to XXVIII. Upon the nerves of the *Placenta* and *Corda umbilicalis* in animals.

From the Philosophical Transactions, &c., for the year 1825. Part I., and belong to the Croonian Lecture on the Existence of Nerves in the *Placenta*. By Sir E. Home, Bart., from page 66—86.

Fig. XXIII. A small portion of the *Placenta* of a seal. The *Chorion* still covers the embryo, and through it shine the injected arterial and venous vessels: in the folds of the vascular tissue are found the minute branches of the nerves. The magnifying power is four-fold.

Fig. XXIV. A transverse section of the *Placenta* ten times magnified. The structure is plainly seen, and we easily distinguish the nervous fibrilli 11. *a. a. b. b. c. d.*

Fig. XXV. Shews the method in which the arteries of the *Corda umbilicalis* begin to branch off on the *Chorion*, and then to dip into the net-work of the *Placenta*. The nerves are uncommonly clear. Magnified two-fold.

Fig. XXVI. and XXVII. A single isolated flocculus shewn ten times magnified. We plainly discover the terminating branch of the *Arteria umbilicalis*, and the nervous filaments running with it.—*A.* are the percilli, and *B.* the surface of the chorion.

Fig. XXVIII. Shews a portion of the *Chorion* of the Tapir from Sumatra, seen from the surface of the Uterus, and in its natural size. The nervous filaments are uncommonly clear.

Fig. XXIX. to XLI. Delineations of the vascular connexion between Mother and Offspring in Mammalia. By B. C. von Baer. Leipsig. 1828.

Von Baer says, page 27. § 37. in his treatise: Since towards the latter period the vessels of the Chorion are partly applied closely to the vessels of the mother, partly to those forms of the Ovum, in which the maternal and infantile portion of the Placenta grow together and grasp each other, might one believe that, in this latter period, an immediate inosculation takes place, and it is in fact this connexion which has been a disputed point. With respect to this aim of the whole inquiry, I have the following to remark:

1. That I could nowhere find an inosculation of the vessels. 2. That in Mammalia, where the membrane of the offspring merely hangs together with the membrane of the mother, and is band-shaped, it is impossible. 3. That also there, where the maternal and infantile portion of the Placenta grow together, the vessels pass by, so that the maternal vessels spread themselves in that portion of the Placenta which is directly connected with the Chorion, the infantile vessels, on the contrary, are distributed to the mass which lies next to the uterus, without the passage of one vessel into the other. And § 38. Lastly, I believe myself to be able to shew, that not only there is no necessity for the inosculation of the vessels, but rather that an impediment to it exists. If one observe a fully-formed Vil-lus from the Placenta of a sheep, with the enormous mass of vessels which lie immediately on the surface, and the as richly supplied plexus of vessels in the Placenta of the same animal; and if one recollect that at this period no separated mass longer lies between them, it must be striking how the immense mass of vascular vessels lie close upon each other, only separated by two thin lamellae, which together do not amount to the eighth of a line, without communicating one with the other. If a disposition to inoscula-

tion were present, the intervening mass must be overcome. (I am so much the more of this opinion, as I have had frequent opportunities of seeing that the blood-vessels pass out of the organized mass, in order to enter into one barely separated, and by these means to attract this into the sphere of the organic circulation.) Nevertheless, the body of the mother attracts the blood of the Embryo. The rapid disposition of the umbilical vessels on the Exchorion points plainly to this. But the nearly approached vascular masses must again retire, and mutually force each other to turn back. On this account we have plexus at all parts where the Uterus and Chorion are applied close on each other. This is thus remarkable, that the plexus immediately disappear at the part where both portions separate. Thus there are no plexus, but merely single vessels upon the smooth extremity of the Ovum of the bitch; no plexus upon the *append. allantoides* of animals with hoofs. Moreover, the plexus vanish on the Ovum of the pig in the vicinity of the cicatrix, just where the Placenta had already begun to be formed, when these extremities lose their immediate connexion with the Uterus, and the vessels now wind singly over the surface. The commencement of this transformation is observable in Fig. XXIX. What in fact do we learn from the series of plexus every where constant where Uterus and Ovum are in contact, other than that all blood, mutually attracted, no sooner arrives near to the neighbouring portion than it must retrocede by the most direct route; and thus the true meaning is, that we have here a change and interchange which we must liken to Respiration; namely, an alteration in the nature of the blood.

These preliminary lines were necessary, in order to comprehend the following figures.

N. B. The times of magnified power are given for each particular figure by an enclosed number. Where this is wanting the figure is of the natural size.

Fig. XXIX. A portion of the Ovum of a Pig, of five weeks.

a. b. Chorion. *a. e.* Portion of it, which afterwards forms the Placenta. *b. e.* External portion, from which the Villi or tufts of vessels are separated at a later period. *b. c.* Apex of the protuded Vesica. *b.* Cicatrix at the point of rupture. *d.* A vessel passing over the cicatrix-

Fig. XXX. A Caruncula or Cotyledon, with its neighbouring parts, from the former drawing.

a. Venous branch belonging to it. *b.* Plexus in the tufts of vessels which are filled by the veins. *c.* A plexus evolving in a communicating Plica. *d.* Edge of a Caruncula.

Fig. XXXI. A portion of the Placenta of the Embryo of a Pig of nearly the full time, so placed, that the rows of the conical Villi have a direction from above to below. These are filled partly by means of the arteries, partly by the veins.

a. A tuft of vessels, the plexus of which is filled by the arteries, the returning canals by the veins. *b. c.* Tufts of vessels connected together, the plexus of which are partly filled by the arteries, partly by the veins. *d.* A Villus, the plexus of which is half filled by the arteries, half by the veins.

Fig. XXXII. Apex of a Villus from the Placenta of a sheep of a later period.

Fig. XXXIII. The same of an earlier period.

Fig. XXXIV. Portion of the plexus of vessels covering the surface of the Placenta of a cow.

Fig. XXXV. and XXXVI. Villi from the Placenta of the sheep in the first third of its developement.

a. An arterial branch of the Uterus, which dips into the tufts of vessels.

Fig. XXXVII. Vascular plexus from the smooth portion of the Chorion of a sheep.

a. A mass of Plicae. *b. c. d.* Passage of the Plexus into the veins.

Fig. XXXVIII. A pair of unfilled Villi from the Placenta of a bitch, surrounded by uterine vessels.

Fig. XXXIX. Portion of the Placenta of a bitch, after filling the uterine vessels, seen from the internal surface.

a. Branch of the *Arter. umbilicalis*. *b.* A portion from which the internal covering has been removed.

Fig. XL. Ovum of the bitch separated in part from the Uterus.

a. Muscular coat of the Uterus laid bare by separation. *b. c.* End of the incision in the Uterus. *d. e.* Extremity of the Ovum. *f.* Placenta. *g. g.* Green mass at the end of the Placenta. *g. c. g. d.* Smooth portion of the Chorion.

Fig. XLI. Villus from the Placenta of a bitch at the middle of the foetal period.

TWENTY-SECOND PLATE.

Anatomy of the Organs supplying Nourishment.

Fig. I. *Ex historia systematis salivalis, Auctore Jo. Barth. Siebold.*

A. The lobe of the ear thrown forward. B. *Os Malae*. C. *Maxilla inferior*. D. *Os hyoideum*. E. *Glandula parotis*. F. *Ductus Stenonianus*. G. *Glandula submaxillaris*. H. *Glandulae labiales superiores, et I. inferiores*. K. A portion of the *Glandula thyreoidea*. M. *Musculus masseter*. L. *Buccinator*. N. *Zygomaticus major*. O. *Orbicularis palpebrarum*. P. *Levator anguli oris*. Q. *Orbicularis oris*. R. *Depressor anguli oris discissus*. S. *Quadratus menti*. T. *Temporalis*. U. *Attollens auriculae*. V. *Retrahentes auriculae*. W. *Occipitalis*. X. *Platysmamyoides cuti recliatae insertus*. Y. *Sternocleidomastoideus*. Z. Z. *Omohyoideus*. a. *Hyothyreoideus*. b. *Sternothyreoideus*. c. *Sternohyoideus*. d. d. *Biventer cervicis*. e. *Splenicus capitis*. f. *Levator scapulae*. g. *Scaleni*. h. h. *Truncus carotidum communis*. i. *Carotis externa*, k. *interna*. l. *Arteria thyreoidea superior*. m. *A. maxillaris externa*. 1. *Ramus ad M. triangularem menti et platysma myoideum*. 2. 2. *Rami masseterici*. 3. *Arter. submentalis*. 4. *A. labii inferioris*. 5. *A. coronaria labii inferioris*. 6. *Coronaria labii superioris*. 7. *Nasalis lateralis*. 7. *Inferior et media*. 8. *Ramus anastomoticus cum arter. infraorbitali*. n. *A. occipitalis*. o. *Auricularis posterior*. q. *Auricularis inferior ex posteriori*. p. *Ram. massete-*

ricus trunco carotidis externae. *r.* *A. transversa faciei.*
 10. *Ram. massetericus.* 11. 11. *Rami ad laminam apo-*
neuroticam M. temporalis. *r.* *A. temporalis superficia-*
lis. *r*¹. *Temporalis media.* *r*². *Auricularis superior.*
*r*³. *Temporalis superficialis posterior.* *r*⁴. *Temporalis*
superficialis anterior. 5. *A. infraorbitalis.* *t.* *Ram.*
arter. palpebralis inferioris. *u.* *A. mentalis.* *v.* *A. cer-*
vicalis adscendens. *w.* *A. thyreoidea inferior.* *x.* *Ner-*
vus occipitalis major, from the second cervical pair. *y.*
Fasciculus nervorum cervicalis paris tertii. 12. *Nerv.*
occipito-auricularis recurrens. 13. *N. subcutaneus colli-*
medius superficialis minor. 14. *N. auriculae medius.*
 15. *N. subcutaneus colli magnus profundus.* 16. *Ramus*
ejus superior et adscendens. 17. *Ramulus ejusdem exter-*
nus. 18. *Ramulus internus.* 19. *Filamenta nervea,*
quae substantiam parotidis intrant. 20. *Nervus ramuli*
interni cum duri ramo anastomotico colli superiori com-
municans. 21. *Ramulus superior adscendens rami infe-*
riores ex subcutaneo colli magno profundo. 22. *Fasci-*
culus nervorum cervicalis quintus. 24. *N. temporalis*
superficialis ex ramo tertio quinti pavis. 25. *Rami au-*
riculares anteriores ex eodem. 26. *Ramus temporalis ex*
nervo duro parotidem perforans. 27. *Ramulus anasto-*
moticus cum ramo temporali superficiali. 28. *Ram. zy-*
gomaticus ex duro. 29. *Facialis superior ex eodem.* 30.
Facialis medius ex eodem. 31. *Tres rami ex ramo fa-*
ciali inferiori nervi duri. 32. *Ram. duri anastomoticus*
colli superior. 33. *Ramus ejusdem superior cum ramo*
facialis inferioris ex duro communicans. 34. *Ramus in-*
ferior. 35. *Ramulus ex eodem nervos exhibens ad mus-*
culum triangularem, quadratum, platysmamyoideum et
cutem. 36. *Ramulus alter cum ramo adscendente et de-*
scendente nervi subcutanei colli medii profundi per anasto-

mosim confluens. 37. *Nervi duri ram. occipitalis.* 38. *Ramus nervor. temporalium cutaneorum, qui exit per incisuram aponeuroseos musculi temporalis, et cum ramo zygomatico ex duro communicat.* 39. *N. infraorbitalis una cum ramis glandulas labiales superiores versus tendentibus.* 40. *N. mentalis s. alveolaris inferior*, which passes through the *Foramen mentale*, and divides into four branches, of which three pass to the inferior glands of the lips, while the fourth anastomoses with the inferior facial branch of the *N. facialis s. durus*.

Fig. II. *a. Meatus auditorius cartilagineus.* *b. Processus styloideus, et c. mastoideus.* *d. Cornu majus ossis hyoidei.* *e. f. Maxilla inferior*, of which the greater part was removed. *g. Aspera arteria.* *h.* The tongue drawn towards the left side. *i. Frenulum linguae.* *k.* A part of the *Glandula parotis.* *l. Ductus stenonianus cum radiculis majoribus.* *m.* The manner in which this *Duct* pierces the fat of the *Musc. buccinator*, and thus opens into the cavity of the mouth. *n. Glandula parotis accessoria.* *a.* Its excretory duct which opens into the *Duct. stenonianus.* *o. Glandula submaxillaris cum sublinguali cohaerens.* *p. p. Ductus Whartonianus*, which originates from the *Glandula submaxillaris* with four roots. β . Its extremity, through which a hair-sound has been passed. *q. q. Glandula sublingualis.* $\gamma. \gamma. \gamma.$ New bristles, shewing the openings of the excretory ducts of the *Glandula lingualis.* *r. Glandula thyreoidea.* *s. Musculus zygomaticus major.* *t. t. Masseter.* *u. u. Sternocleido.* *v. Styloglossus.* *w. Stylohyoideus.* *x.* Anterior, and *y.* posterior belly of the *M. digastricus maxillae.* *z. Rectus capitis anterior major.* *A. Levatoris anguli scapulae pars superior.* *B. Scaleni anterioris pars.* $\Gamma.$ *Obliquus capitis superior.* $\Delta.$ *Obliquus capitis inferior.* *E. E. My-*

lohyoideus. Z. Geniohyoideus. H. Hyothyreoideus.
 Θ. Sternothyreoideus. K. Sternohyoideus. Λ. Omo-
 hyoideus dextri et sinistri lateris. M. Truncus caroti-
 dum communis dexter, et N. sinister. Ξ. Carotis in-
 terna. T. Carotis externa. P. Arteria thyreoidea su-
 perior. Σ. Truncus arter. maxillaris externae. δ. Ram.
 communicans cum arter. alveolar. inferiori. ε. Ram. ad-
 styloglossum. ρ. Ad glandulam sublingualem. τ. The
 Art. maxillaris externa has been here divided. φ. A.
 submentalis. η. η. Rami ad glandulam submaxillarem.
 θ. θ. θ. Ad sublingualem. ψ. A. occipitalis. κ. Ramus
 auricularis posterior. λ. A. styломastoidea. μ. Rami
 ad M. sternocleidomastoideum. ν. Auricularis anterior.
 ξ. Auricularis superior. π. Temporalis superficialis. ρ.
 Temporalis media. s. Temporalis superficialis posterior,
 τ. anterior. υ. A. transversa faciei. φ. Ramus ad mas-
 seterem. χ. Ad temporalem et orbicularem palpebrarum.
 ψ. Ad parotidem accessoriam. ω. ω. ω. Rami ex carotide
 externa ad parotidem. 1. Nervus temporalis superficia-
 lis ex ramo tertio quinti paris retro arteriam tempora-
 lem progrediens. 2. N. auricularis ex eodem. 1. N. du-
 rus seu communicans faciei. 3. Ejusdem ram. tempora-
 lis. 4. 5. Ramuli, qui temporalem nervi duri cum tem-
 porali ex tertio quinti paris conjungunt. 6. Zygomati-
 cus. 7. Facialis medius. 8. N. ex faciali superiori duri
 ad glandulam parotidem accessoriam. 9. N. facialis su-
 perior. 10. N. facialis inferior. 11. R. auriculares
 posteriores ex duro. 12. R. ex duro ad musc. digastrici
 ventrem posteriorem. II. Par cervicale primum. III.
 Par cervicale secundum. 13. Anastomoticus inter par
 cervicale secundum et accessorii ramum externorem. 14.
 R. anastomoticus cum ramo descendente ex hypoglosso.
 IV. Par cervicale tertium. 15. R. anastomoticus cum

ramo descendente ex hypoglosso. V. Par cervicale quartum. VI. Par cervicale quintum. VII. N. intercostalis seu sympatheticus maximus. VIII. N. vagus. IX. N. hypoglossus. X. Ejusdem ramus descendens. XI. Ramus laryngeus n. vagi. XII. Nervi accessorii filamenta, which spread themselves in the Sternocleidomastoideus. XIII. N. lingualis quinti paris. 16. Rami ad glandulam submaxillar ex eodem. 17. Ram. mylohyoideus ex ramo descendente alveolaris inferioris. 18. Nervi molles carotidem externam concomitantes. 19. 19. N. molles arteriam maxillarem externam et submentalem obducentes. XIV. Ram. superior s. adscendens subcutanei colli magni profundi. 20. Ramulus ejusdem externus. 21. Internus et cum duro anastomoticus. 22. N. auriculæ medius. XV. Ram. inferior s. descendens subcutanei colli magni profundi. 23. Ejusdem ramulus superior cum nervo duro anastomoticus. 24. Ramulus anastomoticus.

Fig. III. Position of the *Glandula Submaxillaris et Lingualis*.

A. B. *Limbus maxillae inferior*. C. *Os hyoideum*. D. *Cartilago thyreoidea*. E. *Cartilago cricoidea*. F. Commencement of the *Trachea*. G. *Masseter*. H. H. *Geniohyoidei*. I. *Genioglossi*. K. *Sternocleidomastoidei*. L. *Truncus carotidum communis*. M. *Venae jugulares*. N. *Portio parotidum inferior*. O. *Hyoglossus*. P. *Glandulae sublinguales*. a. a. *Nerv. hypoglossus*. b. b. *Nerv. gustatorius ex tertio ramo quinti pavis*.

Fig. IV. The cavity of the Mouth, and particularly the Velum.

A. *Labium superius*, B. *inferius*. C. *Anguli oris dissecti*. D. *Frenulum labii inferioris*, E. *superioris*. F. *Lingua*. G. *Arcus glossopalatini s. columnae anteriores*

veli palatini. H. *Pharyngopalatini s. columnae posteriores.* I. *Uvula.* K. *Linea alba s. raphe.* L. *Tonsillae.* m. *Glandulae labiales.*

Fig. V. The muscles of the Velum dissected from the cavity of the Mouth.

A. a. b. c. d. *Linguae dorsum.* e. f. *Glandula sublingualis.* g. *Epiglottis.* B. h. h. *Velum palatinum.* i. i. k. *Tonsillae.* C. D. The *rami* of the *Maxilla inferior* sawn through. E. *Musc. styloglossus.* F. *Pterygoidei interni.* G. *Mylopharyngei.* H. *Pars membranae oris.* m. *Hamuli pterygoidei*, from which the *musculi n. n. pterygopharyngei* chiefly arise. I. *Musculi circumflexi veli palatini.* K. l. *Pharyngostaphylini. seu palatopharyngei.* L. *Salpingostaphylini s. levatores veli palatini.* o. o. o. *Glossopalatini.* * * The fibres which are attached to the *os palati.* p. The part of the *M. buccinatorius*, which arises from the *hamulus pterygoideus.* M. N. O. *Palatum stabile.* M. *Ossa palatina.*

Fig. VI. The muscles of the Velum dissected from the Fauces.

A. The posterior wall of the fauces has been divided through the central line, and the half turned to one side. B. *Septum nasi.* C. *Choanae.* D. Beginning of the cartilaginous Eustachian Tube. E. *Levatores veli palatini.* F. *Musc. azygos uvulae.* G. H. d. e. *Pharyngopalatinus.* f. *Salpingopharyngeus.* I. *Lingua.* g. *Tonsillae s. amygdalae.* K. *Epiglottis* and entrance into the cavity of the Larynx. L. *Rima glottidis*, or middle aperture of the cavity of the Larynx. h. Antichamber, or *atrium laryngis.* M. N. Continuation of the Pharynx. O. *Stylopharyngeus.* P. *Styloglossus.* Q. *Stylohyoideus.*

Fig. VII. VIII. IX. X. Muscles of the Pharynx.—
Constrictores pharyngis inferiores, medii et superiores.

Fig. VII. The upper part of the Pharynx.

B. On the right side this part has been divided and reflected, by which means the *Extremitas cartilaginea a. tubae Eustachianae*, in which the sound *b.* is, and the right Choana, *d.* become visible. *c.* *Septum narium.* C. C. *Musculi pterygopharyngei fibrae*: *e. e.* the remaining ascending fibres of the same muscle which arise from the *hamuli processuum pterygoideorum.* *f.* *Linea alba seu media.* D. D. *Mylopharyngei.* *g.* *Processus styloideus ossis temporum.* E. *Stylopharyngei.* F. *Styloglossus.* G. *Glossopharyngei,* *h.* an unusual muscle. H. *Stylohyoideus.* I. *Biventer.* K. *Cornua ossishyoidei.* L. *Hyopharyngei.* M. *Thyreopharyngei.* N. *i. i. k. l.* *Cricopharyngei.* O. *Æsophagus.* *n.* *aspera arteria.* P. *Lobuli glandulae thyreoideae.* *o.* *Circumflexus palati.* *p.* *Salpingostaphylinus.* Q. *Glandula maxillaris.* R. *Inferioris maxillae. angulus posterior.* S. *Pterygoideus internus.* T. *Masseter.* U. *Parotis glandula.*

Fig. VIII. *a. a. b. c.* *Constrictores pharyngis medii*, which first become visible when the *constrictor. inferiores* have been removed. *d. e. f.* *Constrictores superiores.* *g. h. i.* *Membrana pharyngis nuda.* *k. k.* *Levatores veli palatini.* *l. l.* *Circumflexi palati mollis.* *m. n.* *Processus styloidei ossium temporum.* *o. p. q. r.* *Stylopharyngei.* *s. s. t. u. v. w. x. y.* Bundles of muscular fibres of the common extremities of the *musculi stylopharyngei* and *palatopharyngei*, which partly unite together *t. u.*; partly are lost in the cutis of the Pharynx *u. v.*; partly are attached to the *Cartilago thyreoidea.* *z.* The bare cutis of the lowest part of the Pharynx. A. *Cornua extrema ossis hyoidis.* B. *Ligamenta hyothyreoidea lateralia.*

C. D. E. F. *Cartilago thyreoidea*. G. *Cartilago cricoidea*. H. *Arteria aspera*.

Fig. IX. The *Constrictores medii* have been here removed, in order to shew the whole of the *constrictores superiores* a. b. c. d. e. f. g. *Pars inferior* a., which covers *pars superior* b. c. The portion separated from the *buccinator*, and d. that divided from the Lower Maxilla. e. The muscular fibres which are dispersed between the muscular fibres of the *stylopharyngeus*. f. *Mucro superior*. h. *Membrana nuda pharyngis*. The remaining parts are already known from the former figure.

Fig. X. In this figure the *constrictores superiores* have been removed, in order to give a perfect view of the endings of the *musculi stylopharyngei* and *palatopharyngei*. 1. 1. *Palatopharyngei*. All the remaining parts are already known from the two preceding figures.

TWENTY-THIRD PLATE.

Anatomy of the Organs supplying Nourishment.*

Fig. I. Shews the direction of the muscular fibres of the stomach. The stomach has been filled with air, and the Peritoneum raised and reflected.

A. *Œsophagus*. B. *Saccus coecus ventriculi*. C. Part where the *pylorus* is seated. D. *Intestinum duodenum*. E. *Peritoneum*. F. *Fibrae longitudinales*, which lie immediately under the *peritoneum*. G. *Circulares fibrae*, which lie beneath the preceding. H. The innermost fibres, which run obliquely. I. *Portio duodeni*.

Fig. II. *Cavum ventriculi*.

A. B. As in Fig. I. C. *Arcus major seu fundus ventriculi*. D. *Duodenum*. E. Opening of the *oesophagus*. a. a. Part where the *omentum* leaves the stomach. b. *Curvatura minor*. c. d. *Valvula pylori*. e. e. The *rugae* and mucous glands between these.

Fig. III. A portion of the *intestinum ileum* laid open, in order to shew the *plicae seu valvulae conniventes Kerkringii* of the mucous membrane.

Fig. IV. V. VI. VII. Villi of the mucous membrane of the Ileum.

Fig. IV. 0,25". Natural size of the single villi, which, having been measured by the micrometer, is also given in a similar manner for the remainder. The leaf and tongue-

* The 4. 5. 6. and 7. fig. are from Meckel's Archiv: *Upon the Villosa of Man and some Animals*. By A. Meckel. The remaining figures are from Caldani.

shaped villi of a man forty years of age. The portion of the Jejunum, from which they were taken, was about three feet from the pylorus.

Fig. V. 0,25''' . A portion of the Villosa of the Jejunum near to the end of the Duodenum, from a seven years old female child who died of a lingering nervous fever.

Fig. VI. 0,25''' . Several Villi of an adult separated by means of fine cataract needles, highly magnified, in order to shew the manner of their position on the membrane of the intestine and their usual curves (*a. b. c. f. g.*) isolated.

The pulpy mass of which they consist is always placed somewhat in rows. At *d.* and *e. e. e.*, a villus torn by chance into two, the fine cellular web appeared here exactly as in a torn leaf.

Fig. VII. 0,25''' . Single injected villi of a new-born child.

(*a. b. c. d. e. f. g.*) The most were generally as (*g.*) quite full and red. At *e.* and *f.* a vascular-like cellular plexus is seen, the remainder are injected at the edge or the base; at *a.* is the only exception, merely the apex was reddened without it being possible to remark a communication between it and the mucous membrane.

Fig. VIII. The end of the Ileum and commencement of the Colon divided in half, and seen from within under water.

Fig. IX. The same parts as Fig. VIII., but previously filled with air, then dried, and afterwards laid open.

A. End of the *Intestinum ileum*. B. Colon. C. *Valvulae intestini coli*. *a. b. c. d. e. f.* *Valvula coli seu Bauhini*. *a.* *Ostium valvulae coli*. *b. e. d. f.* *Labium superius valvulae coli*. *g.* *Appendicula vermiformis*. *h.* *Ostium, et i.* *Valvulae appendiculae vermiformis*.

Fig. X. A portion of the *Intestinum rectum* in part laid open, and viewed under water.

A. A part of the longitudinal fibres, and the cross or circular fibres of the muscular coat of the Rectum from without. *d. d.* The circular fibres from within, the mucous and cellular coat *c. c.* having been previously raised and reflected. B. *Anus ejusque rugae.* C. C. *Ostium ani discissum.* D. *Anulus valvulosus* of the mucous membrane. *a. b.* Openings of the mucous follicles.

Fig. XI. The Liver, *hepar*, from behind.

A. *Lobus sinister.* B. *Dexter hepatis.* C. *Ligamentum hepatis triangulare sinistrum.* D. *Diaphragma.* E. *Lobus Spigelii.* F. *Ligamentum coronarium hepatis* G. *Vena portarum in portis.* *a. Ejus ramus sinister.* *b. Dexter.* *c. c. Vena umbilicalis.* *d. Ductus venosus Arantii.* *e. e. Vena cava inferior.* *f. g. Arteria hepatica.* *h. Ram. arteriosus ad cystidem fellis.* *i. k. Ductus hepatici.* *l. Ductus choledocus.* H. *Vesicula fellis.* *m. n. Ductus cysticus.* I. The Pons which passes from the left lobe of the liver to the *lobulus quadratus*, and under which the *Vena umbilicalis* passes. K. *Lobulus quadratus hepatis.*

Fig. XII. Shews the membranes of the Gall-bladder separated from each other.

a. Tunica externa seu peritoneum. *b. Tunica secunda seu nervea*, the vessels of which are divided in consequence of the separation. *c. Tunica interna seu vasculosa*, in which the Arteries, Veins, and Nerves terminate. *d. d. Valvulae* found in the *Ductus cysticus.* The openings of the mucous follicles, which are here found, are evident without drawing.

Fig. XIII. The *Pancreas, Duodenum, et Lien*, with their vessels viewed from before.

A. *Superficies externa s. convexa lienis.* B. *Extremitas superior.* C. *Extremitas inferior.* D. D. *Super-*

ficies interna seu concava et hilus lienis. E. F. *a. Pancreas.* *a. Extremum sinistrum.* F. The portion called the *Pancreas parvum seu caput pancreatis.* G. *Intestinum duodenum.* H. *Arteria hepatica.* I. *Arter. coronaria ventriculi sinistra.* L. *Vena splenica.*

Fig. XIV. *Ductus pancreaticus seu Wirsunghianus* is here filled with yellow wax and dissected; also the *Duodenum* laid open longitudinally, in order to shew the *Papillae* at the point where this duct enters between the folds of the intestine.

A. The isolated smaller lobe of the *Pancreas.* *a. Ductus pancreaticus seu Wirsunghianus.* *b.* The several canals which form the duct. *c. Ductus minor pancreatis.* *d. Truncus communis ductuum (a. et c.).* *e. Papilla,* where the *Pancreas* opens in common with the *Ductus choledocus.* *f. f. Duodenum.*

Fig. XLIV. A portion of this *zonula zinni* 220 times magnified. 8. External dentated circle. 9. Internal radiated circle, of which the rays lie or project between the *processus ciliares* of the *membrana ruyschiana*. 10. Pigment, which remains after the removal of the *corpus ciliare*.

Fig. XLV. The chrySTALLINE lenze seen on different side, and *d.* in a section.

Fig. XLVI to LV. Microscopic observations on several parts of the eye.

Fig. XLVI. Anterior portion of the *conjunctiva* and *cornea*, from a six months child, magnified two diameters to shew the expansion of the vessels.

Fig. XLVII. Anterior surface of the anterior portion of the vascular coat, *iris*, and membrane of the pupil from a seven months child.

1. Inner long artery of the iris. 3. Iris. 4. Membrane of the pupil, *membrana pupillaris*. 5. Various venous whirls.

Fig. XLVIII. Segment of an injected iris, and vascular coat of the eye from a new-born girl, magnified twenty-five diameters.

a. Natural size. *b. c. g. e. f. g.* Iris. *b. c. d. e.* Situation of the little ring. *d. e. f. g.* Situation of the great ring of the iris. *i. k. l.* Three particularly large arteries, which arise from the *circulus arteriosus major ligamenti ciliaris*. *m. n. o. p. q. r. s.* *Processus ciliares*. *r. s. t. u.* Situation of the vascular coat, which answers to the *ora serrata*. *v. w.* Part of the vascular coat, on which the nervous coat passes. 1. 2. 3. 4. Little trunks of blood vessels which appear to be overlaid internally for the most part by a net of their own most delicate vessels. 5. 6. 7. Points of this part of the vascular membrane,

which may be compared with Fig. L., which is from an adult.

Fig. XLIX. Anterior surface of the segment of the iris seen through the cornea, which the preceding figure shews from within, between *b. c. f. g.* 1. 2. *Circulus iridis major.* 3. 4. *Circulus iridis minor.*

Fig. L. A piece of the inner surface of the vascular coat from an adult man, magnified twenty-five diameters.

Fig. LI. A. B. Anterior part of the vascular coat with the iris and pupillary membrane, from the left eye of a seven months ~~child~~, ~~four~~ times magnified. Compare this with Fig. 47.

Fig. LII, ~~Posterior~~ rounded surface of the chrystalline lenz enclosed in its capsule, from a seven months child, of which the blood vessels have been well-filled with cinabar, magnified four diameters. *a.* Natural size. *b.* Magnified.

Fig. LIII. Internal concave surface of the nervous or medullary coat of the left eye, after a good injection of the arteries, from a child, figured double the natural size.

Fig. LIV. A piece of injected medullary or nervous coat of the eyeball of a child, magnified twenty-five diameters.

Fig. LV. Upper segment of the orbit, to see the inferior ligament.

1. The lachrymal gland. 2. The lunar ligament. 3. The pulley of the superior oblique muscle, the pulley 4. for the tendon 5. of the same muscle and the cartilage 6. of the pulley.—*a.* Cerebral artery. *b.* Ocular artery. *c.* Lachrymal artery. *d.* Frontal artery. *e.* Artery of the nostril. *f.* Optic nerve. The bony parts do not require explanation.