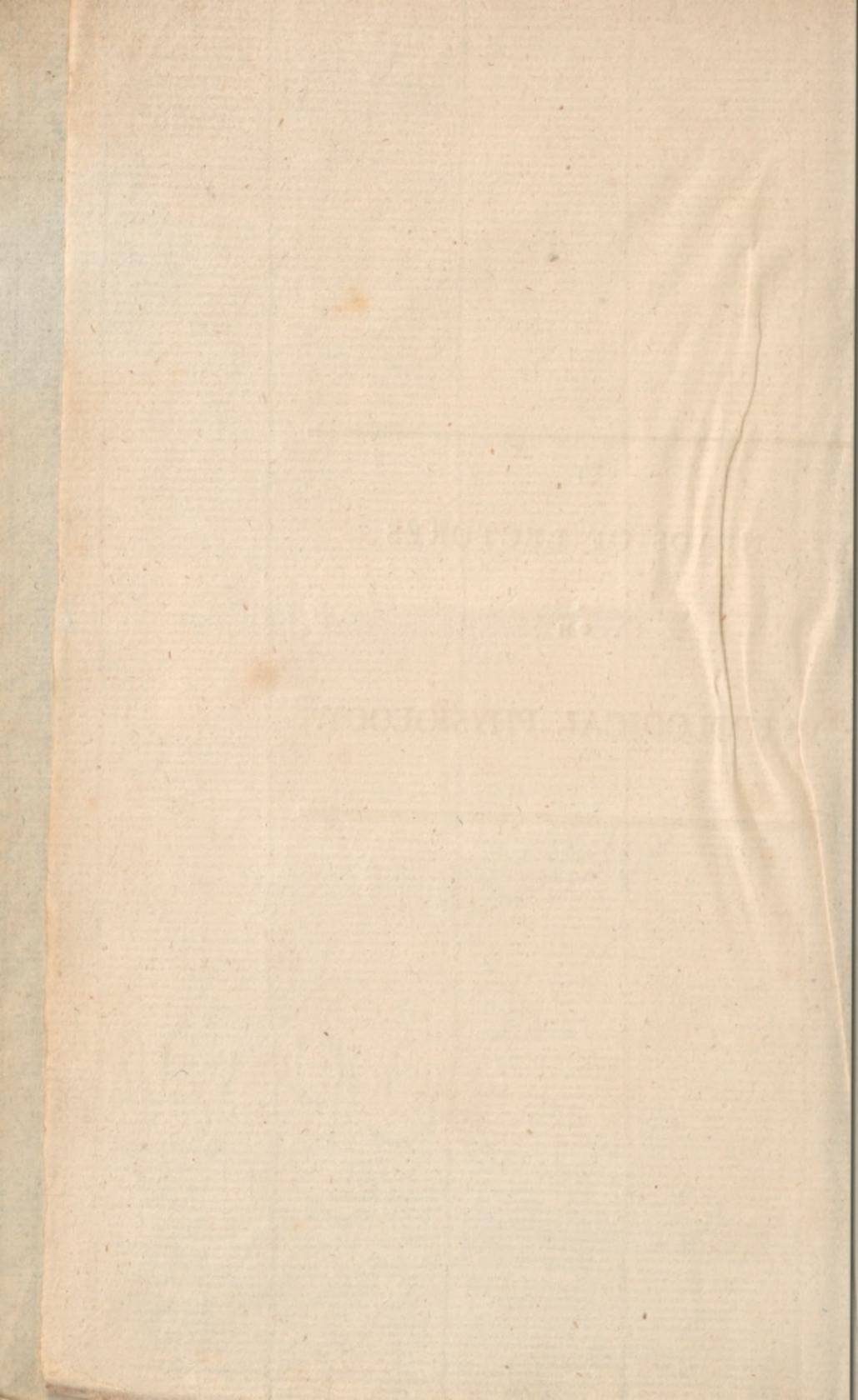

HEADS OF LECTURES

ON

PATHOLOGICAL PHYSIOLOGY.



H E A D S

O F

L E C T U R E S

O N

PATHOLOGICAL PHYSIOLOGY.

By ANDREW DUNCAN, M. D.

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THE UNIVERSITY OF EDINBURGH.

EDINBURGH:

PRINTED FOR G. MUDIE & SON, SOUTH BRIDGE.

1796.

H. F. A. D. S.

J. F. C. U. N. T.

WAT FOLIOGAL HES FOI OUY

AN RABBIT HUNTING

IN THE MOUNTAINS OF SWITZERLAND

A HISTORY

BY EDWARD G. MORTON

Wm. Dawson 12. MAR. 1859

P R E F A C E.

ALTHOUGH the following Heads of Lectures, have already been repeatedly presented to the Public, yet they now appear, with considerable alterations. To these alterations, I have chiefly been led, from the important discoveries which have lately been made in the Science of Chemistry. From the New Chemistry, as it has been called, an explanation of the Nature and Properties of the Constituent Parts of the Human Body, as well as some of its most important Functions, can now be given on a different, and, I trust, a more satisfactory footing, than when these Heads of Lectures were first published, upwards of twenty

ty

ty years ago. Still, however, much remains to be discovered, much to be ascertained; and, as far as future exertions on my part, can tend to improve the knowledge of the animal economy, the great basis of rational practice in Medicine, I trust they shall never be wanting.

I NEED not observe, that the following pages are meant principally for the use of those who attend my Lectures on the Institutions of Medicine. And if they shall have the effect, of increasing the benefit which my hearers may derive from what is delivered, the principal intention of this publication will be fully answered.

EDINBURGH, 8th Oct. }
1796. }

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*Concerning the Nature and Properties of the
different Fluids and Solids of the Animal
Body, and the chief Morbid Affections to
which they are subjected.*

A. Of the FLUIDS.

I. Chyle.

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A. From quantity.

a. Superabundance.

b. Deficiency.

a. a. From want of proper aliment.

Atrophia lactantium.

b. b. From want of proper assimilation.

tion. *Dyspepsia—Vomitus—Emetotrophia.*

c. c. From a diseased state of the lacteal vessels. *Tabes mesenterica.*

B. From quality.

a. Depending on the natural constituents of chyle:

a. a. Watery part.

b. b. Saccharine part.

c. c. Coagulable.

d. d. Oleaginous.

b. Depending on the introduction of foreign matter.

a, a. Matter introduced with the aliment.

b. b. Matter furnished by the system.

2. *Blood.*

CONSTITUENT parts of the blood discovered by spontaneous separation—Halitus—Crassamentum—Serum.

Sensible qualities of the halitus—varieties in different animals—varieties in disease—Conjectures respecting the active impregnation

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Of the quantity of the blood.—Varieties in different animals of the same species—Ground on which calculations have been attempted to be instituted as to the medium quantity—Proportion which it has been supposed to bear to the solids—Conjectures of different Physiologists with regard to the medium quantity in the human species—Proportion which the quantity in the arteries has been supposed to bear to that in the veins—differences between arterial and venous blood.

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I. Morbid affections from changes in quantity.

A. Plethora.

a. From

- a. From an increase of the real quantity of the blood.

Plethora vera.

- b. From an increase of the volume of the blood.

Plethora apparens.

- c. From a diminution of the capacity of the blood-vessels.

Plethora relativa.

- d. From an increase of the quantity of blood in the arteries.

Plethora arteriosa.

- e. From an increase of the quantity of blood in the veins.

Plethora venosa.

- f. From an increase of the quantity of blood in a particular part.

Plethora partialis.

B, Inanition.

- a. From a deficiency of blood in the system in general.

Inopia sanguinis vera.

- b. From a deficiency of blood in the arterial system.

- c. From a deficiency in the venous system.

- d. From a deficiency at particular parts.

II. Morbid

II. Morbid affections from changes in quality.

A. From changes in the natural contents.

a. Red particles.

Melanæma.

b. Watery part.

Aquosa tenuitas.

d. Saline impregnation.

Scorbutus.

e. Glutinous.

Hæmorrhæa petechialis.

B. From the introduction of foreign matters.

a. By the lacteal vessels.

b. By the lymphatics of the surface and other parts.

c. By the blood-vessels of the lungs, through their coats.

d. By blood-vessels at other parts, from wounds.

e. Foreign matters generated or increased in the blood.

General conclusions respecting the importance of attending to morbid affections of the blood in the cure of diseases.

3. *Milk.*

OF the organs furnishing milk—circumstances under which this secretion takes place—general appearance of milk—fluids from different parts of the body resembling it—properties of milk in general—its constituent parts—butyraceous part, or cream—coagulable part, or cheese—watery part, or whey—saccharine or saline part.

Of the butyraceous part—its sensible qualities—its general properties—varieties with respect to quantity and quality—in different genera of animals—in different individuals of the same genus—in the same individual at different times—varieties connected with the period elapsed from the time of delivery—with the particular time of the discharge during the drawing of milk—causes of these varieties.

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Analogy between blood and milk—The peculiarities of the human milk.

View of different morbid affections of the milk, illustrated by remarks on particular diseases.

A. From changes with respect to quantity.

a. Defective secretion.

The coagulable part of milk.

b. Separation

b. Superabundant secretion.

Tabes nutricum.

c. Obstruction to the discharge after secretion.

B. From changes with respect to quality.

a. By alterations in the natural constituent parts.

b. By the introduction of foreign matters.

a. a. Furnished by the system itself.

a. a. a. Salts of the blood.

b. b. b. Sebaceous matter from the glands about the nipple.

b. b. Introduced by the alimentary canal, or by the absorbents of other parts.

4. *Mucus.*

EXTENT of this secretion over the animal system—its sensible qualities—its constituent parts—water—coagulable matter—saline matter. Effects produced on mucus by the action of different substances—water—ardent spirit—oil—acids—alkalies—neutrals—metallic salts—Chemical analysis of mucus.

Pathology

Pathology of mucus.

A. Diminished secretion.

B. Augmented secretion.

Catarrhus fenilis. Gonorrhœa.

C. Vitiated secretion.

*Coryza. Scarlatina anginosa.*5. *Saliva.*

ORGANS by which it is secreted—
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Pathology

Pathology of Saliva.

A. Defective secretion.

Febris.

B. Augmented secretion.

Ptyalismus.

C. Depraved secretion.

*Icterus. Rabies.*6. *Succus Gastricus.*

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A. Augmented secretion.

Bulima.

B. Diminished secretion.

Anorexia. Dyspepsia.

C. Depraved secretion.

Pica. Malacia.

7. Succus Pancreaticus.

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matter

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Pathology of the bile.

A. Defective secretion.

B. Obstructed excretion.

Icterus.

C. Biliary concretions.

D. Superabundant secretion.

Cholera.

E. Secretion morbidly acrid.

Typhus icterodes.

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A. Morbid increase of the discharge.

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Diarhœa. Diabetes.

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Sensible qualities of this secretion, in what may be considered as its most natural state—colour—smell—taste—specific gravity

vity—heat—consistence—spontaneous separation.

Constituent parts of the urine—water—saline impregnation—Lithic acid—Phosphate of ammonia—phosphate of soda—Articles obtained from the urine by chemical analysis, in the way of distillation.—Purposes for which the urinary discharge is intended.

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A. Defective secretion.

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B. Excessive secretion.

Diabetes.

C. Depraved secretion.

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A. Morbid increase of the secretion.

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C. Depraved secretion.

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B. OF

B. OF THE SOLIDS.

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APPARENT diversity of the solids—
 Properties in common to all the
 solids—General constituent parts of the
 solids—Water—Earth—Gluten—Saline
 matters—Aerial matters—Metallic mat-
 ters found in some of the solids.

Pathology of the Simple Solids.

I.

*Morbi partium solidarum simplicissimi ex in-
 stitutionibus Pathologiæ, auctore H. D. Gaubio.*

I. Debilitas.

A. *Salva cohæsione.*

*a. Laxum, flaccidum in partibus mol-
 libus.*

b. Iners in partibus natura elasticis.

c. Flexile in ossibus.

B. *Dissoluta cohæsione.*

*a. Tenerum, Gracile, in mollibus par-
 tibus.*

b. Tabidum

- b.* Tabidum itidem in mollibus.
- c.* Fiffile in partibus natura tenacioribus.
- d.* Fragile in offibus.

II. Rigiditas.

A. Firmitas infuperabilis.

- a.* Tenax, in partibus mollibus.
- b.* Durum, in mollibus quoque.
- c.* Fragile, Vitreum, in offibus.

B. Fragilitas flecti nefcia.

- a.* Tenax, in partibus mollibus.
- b.* Durum, in mollibus quoque.
- c.* Fragile, Vitreum, in offibus.

II.

A Table of the Diseases of the Simple Solids,
by DR CULLEN.

The Diseases of the Simple Solids are,

I. Those of the naturally foft parts.

1. Mobility of the parts too great.

Debile Gaub. 157. 159.

A, With refpect to the force of cohesion.

a. Debility with flexibility.

Debile tenerum gracile Gaub. 161. 1.

Debile tabidum Gaub. 161. 2.

A. from an overplus of water,

from original stamina,

from weak aliment,

from want of aliment,

from weak concoction,

from increased excretion,

from imperfect application.

B. from weak cohesion of the con-

creting matter,

from heat,

from vitiated nutritious fluid,

from matter externally applied,

water, mucilage, oil, &c.

C. from extension near to rupture.

D. from extension of cellular tex-

ture,

from erosion of cellular tex-

ture,

from cutting through some

layers of a compound mem-

brane,

from taking away external

compression.

E. Emptiness of vessels.

b. Debility with fragility.

Debile fissile Gaub. 161. 3. from

from want of humidity,
 from cold,
 from changes in the concreting
 matter.

B. With respect to flexibility, cohesion
 remaining.

a. Laxity with elasticity.

Debile laxum flaccidum Gaub. 160. 1.

from all the causes of I. 1. A. a.
 except c.

from want of tension.

b. Laxity without elasticity or flaccidity.

Debile iners Gaub. 160. 2.

from an overplus of water,
 from long rest in an extended
 state,

from a certain over-stretching.

2. Mobility of the parts too little, or
 rigidity.

Rigidum Gaub. 164.

A. Rigidity diminishing flexibility.

Rigidum tenax Gaub. 165. 1.

a. from an overplus of concreting
 matter,

from original stamina,

- from much or very nourishing aliment,
 from vigorous concoction,
 from vigorous application.
- b.* from increased cohesion of the concreting matter,
 from cold,
 from external application of coagulants, astringents, &c.
- c.* from considerable extension.
- d.* from long rest in a contracted state.
- e.* from the condensation of cellular texture.
- f.* from a new growth of cellular texture.
- g.* from the shortening of cellular texture.
- h.* from a new growth of cellular texture joining parts naturally separate.
- i.* from full vessels.
- k.* from vessels becoming solid.
- B. Rigidity destroying flexibility.
Rigidum durum Gaub. 165. 2.
 from ossification,

from

- from petrefaction.
- II. Those of the naturally hard parts.
1. Flexibility.

Debile flexile Gaub. 160. 3.

 - A. from deficiency of hardening matter.
 - B. from the softening and washing out of hardened matter.
 2. Fragility.
 - A. Spongeous.

Debile fragile spongiosum Gaub. 160. 4.

 - a. from erosion of gluten and oil.
 - b. from putrefaction of the same.
 - B. Vitreous.

Rigidum fragile vitreum Gaub.
165. 3.

 - a. from too great drying by age.
 - b. from deficiency of oil.

III.

GENERAL HEADS of the OBSERVATIONS to be offered on the DISEASED STATE of the SIMPLE SOLIDS.

- A. Diseased state depending on the composition of the solids.
 - a. Morbid

- a.* Morbid increase of firmness.
- b.* Morbid diminution of firmness.
- c.* Morbid increase of cohesion.
- d.* Morbid diminution of cohesion.
- e.* Morbid increase of flexibility.
- f.* Morbid diminution of flexibility.
- g.* Morbid increase of elasticity.
- b.* Morbid diminution of elasticity.
- B. Diseased states depending on the figure of the solids.
 - a.* Alterations in the shape of natural parts.
 - b.* The growth of preternatural parts.

2. *Muscular Fibre.*

GENERAL characterising properties of the muscular fibre—Sensible qualities—Colour—Weight—Smell—Taste—Cohesion—Structure—Figure—Elasticity—Flexibility—Examination of the opinion which supposes, that muscular fibres are a continuation of nerves—Objections to this opinion—Principles detected in muscular fibres by chemical analysis—Observations on the pathology of the muscular fibre in its simple state—Morbid weakness—Morbid strength.

C

3. *Cellular*

3. *Cellular Membrane.*

OPINIONS at first entertained respecting cellular membrane—Its extent over the system—its general qualities—Colour—Texture—Cohesion Communication of cells—Disputes respecting its sensibility—Different opinions of its origin—Arguments for supposing it to be produced from the gluten of the blood—Use of the cellular membrane—Differences between the cellular or simple and complex membranes of the body—Pathology of the cellular membrane—Firmness morbidly increased—Elasticity morbidly diminished.

4. *Vessels.*

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I —Proportion

—Proportion which the area of a trunk bears to that of all its branches—Different calculations on this subject—Angles at which branches come off from trunks—Anastomosis of arteries—Terminations of arteries—into veins—into secretory extremities—into exhalent extremities—different kinds of exhalents—Disputes respecting the irritability of arteries—View of an opinion which supposes, that a peculiar set of nerves are appropriated to the vascular system—Pathology of the arteries—morbid dilatation—morbid contraction—ossification.

VEINS. Analogy between the veins and the arteries—comparison of the strength of the veins with that of the arteries—Proportion between the strength of the vena cava and aorta—Proportion between the diameters of the veins and arteries—Valves of the veins—Beginnings of the veins—View of the controversy, whether they ever arise from cavities—Pathology of the veins.

LYMPHATICS. Observations on the dif-

covery of the valvular lymphatic absorbent vessels—General appearance of these vessels—Strength—Valves—Course—Termination—Observations on the lymphatic glands—Examination of the opinion which supposes, that the lymphatics and blood-vessels anastomose in these glands—Examination of Mr Hewson's opinion respecting the use and structure of the lymphatic glands—Use of the lymphatic system in general—Extent of this system of vessels over the human body—Extent over animal bodies in general—Pathology of the lymphatics.

5. *Fat.*

CONDITION of the fat, in the human species in the living body—Places in which it is principally found—The manner in which it is deposited in cells—General properties of fat—changes to which it is subjected in the progress of life—Chemical analysis—Conversion of some other animal substances into fat—Conjectures respecting the composition of Fat—
Varieties

Varieties in the quantity of fat—Causes of these varieties—Causes producing the removal of fat after it has been deposited—Different opinions as to the channels by which it is conveyed from the cells of the membrana adiposa—Uses of the fat—Arguments brought to prove, that on re-absorption it serves for the nutrition of the system—Doubts respecting that opinion—Pathology of fat—Polyfarcia.

6. *Bone.*

GENERAL appearance and qualities of bone in the adult—Account of the progress to this state—Appearance of the first rudiments of bone in the embryo—Gradual changes which these undergo—Different opinions as to the process by which these changes are effected—Observations on the opinion, that bone is formed by the ossification of arteries—Account of different opinions respecting the growth of bones—Opinion which supposes the circulation of an osseous juice—Opinion which supposes the ossification of succes-

five layers of the periostium—Observations on the structure of bones—Observations on the component parts of bones—Chemical analysis of bones—Observations respecting the gluten of the bones, and the universality of the same matter over the animal system—Pathology of the bones—Osteomalacia—Caries—Necrosis.

Concerning

*Concerning the Principal Functions of the most
important Organs of the Human Body.*

Of the FUNCTIONS IN GENERAL.

OBSERVATIONS on animal life—on the distinction between the sentient and vital principles—on the powers of living animals more immediately dependent on the sentient principle—on those dependent on the vital principle—on the powers depending on their combined influence—Sensation—Causes exciting sensation—Circumstances by which changes are effected in sensations, independently of their causes—from difference in the condition of the sentient principle—a state of excitement—a state of collapse—from differences in the condition

dition of the nervous fluid—a state of mobility—a state of torpor—Muscular action—general causes of action—Volition—Stimulus—Diversity of actions in living animals—voluntary actions—actions with propensity—involuntary actions—actions without consciousness.

Of PARTICULAR FUNCTIONS.

1. *Digestion.*

OBSERVATIONS on the nature of the function of digestion—Different opinions respecting the general principle on which this function is to be explained—Antecedent circumstances to the process of digestion—The appetite for aliment of a fluid nature—Causes inducing it—Appetite for solid aliment—Different opinions respecting the causes of hunger—Variety in the substances used as food—Conditions necessary in all alimentary matters—Steps in the process of digesting these—Solution—Chylification.

Circumstances tending to solution, to
which

which the aliment is subjected before entering the stomach—Circumstances to which it is subjected after it enters the stomach—Trituration—The action of different menstua—Arguments corroborating the opinion, that a peculiar active menstruum is furnished by the stomach—Observations on the diversity of this menstruum in different animals—The fermentation taking place in the stomach—its influence in dissolving solid food—in correcting putridity—general conclusion respecting the means of solution in the stomach.

Chylification or assimilation—Inquiry whether all matters nourishing the system assume the form of chyle—Examination of different opinions respecting the formation of chyle—Inquiry whether chyle is to be considered as a new product, or as a mixture of parts previously existing in alimentary matters—Arguments by which the latter supposition is rendered probable—Causes by which an intimate combination may be supposed to be effected.

Morbid affection of the Functions of Digestion.

I. Defective solution of aliment.

1. From the state of action exerted by the stomach.
2. From the state of the menstruum acting upon the aliment.
 - a. As not being supplied in sufficient proportion.
 - b. As being defective in solvent power.
 - c. As undergoing morbid changes, counteracting this power.

II. Improper assimilation.

1. From the state of the ingesta.
2. From the degree of heat in the stomach.
3. From the muscular action of the stomach itself.
4. From different matters acting as assimilating ferments in the stomach.

2. *Circulation.*

2. *Circulation.*

DISCOVERY of the circulation—Course of the blood in the human body:

Powers by which the blood is moved in the course of circulation—The action of the heart—Calculations respecting the force of that action—Reasons why it is neither attended with volition nor consciousness—The action of the arteries—Controversy, whether the arteries act from a muscular power, or from simple elasticity—Examination of the evidence brought respecting the existence of a muscular coat in the arteries—Examination of the evidence respecting the irritability of arteries—Comparison of the power of the heart, with the causes retarding the motion of the blood—Inquiry, how far a proof of the natural action of arteries can be drawn from diseased states.

The vibratory or oscillatory motion of the capillary vessels—Observations on the arguments brought in proof of such a motion—from the insufficiency of other causes for moving the blood through these vessels

vessels—from phenomena, particularly in morbid cases—Inquiry, how far this action can be considered as peculiar to the capillaries.

Observations on the vis a tergo, as it has been called, or the impulse given by one portion of blood to another—The extent of this action as a cause of the blood's motion.

Effects of the pressure on the blood-vessels from voluntary action of muscles—The means by which this is rendered a cause of the progressive motion of the blood—The extent to which it operates in the human system.

Varieties taking place with respect to the course of the circulation—in the fœtus—in the liver—in the brain.

Morbid affections of Circulation.

I. Affections with respect to the state of motion of the blood.

1. Preternatural increase of the celerity of motion.

a. From the stimulus exciting the action,

action, of the heart and arteries being augmented.

b. From the irritability of the heart and arteries being augmented.

2. Preternatural diminution of the celerity of motion.

a. From the stimulus acting on the heart and arteries being diminished.

b. From the want of due irritability in these organs.

3. Preternatural increase of the momentum of the blood.

a. From a peculiar irritability in the organs producing the motion of the blood.

b. From a determined quantity of blood in motion.

c. From a certain degree of tonic power in the moving organs.

4. Preternatural diminution of the momentum of the blood.

a. From the want of a proper quantity of blood in motion.

b. From the want of due irritability in the moving organs.

c. From

3. *Of Nutrition.*

THE sense in which the term nutrition is here to be adopted—View of the controversy, whether the nutritious fluid be conveyed by the blood-vessels, or by the nerves.

Examination of the arguments brought to support the hypothesis, that the nutritious fluid is conveyed by the nerves—Arguments in support of this opinion, drawn from the primary existence of the nervous system—from changes which the solids undergo when communication by the nerves is intercepted—from the size of the head in infancy—from the quantity of blood carried to the brain—from the method of nutrition in the vegetable kingdom—Answers to these arguments—Objections to the hypothesis—from the qualities of the only fluid that can be supposed to be conveyed by the nerves—from the diminution of nutrition while the nervous functions remain entire—from the growth and nourishment of parts

parts of the system not furnished with nerves.

Examination of the opinion which supposes, that the nutritious fluid is conveyed by the blood-vessels—Arguments in support of the probability of this opinion—from analogy—from the fitness of the fluid which they convey for the purposes of nutrition—from the universality of the sanguiferous system—from the gradual evolution of the different solids—from the effects arising from the interruption of blood-vessels—from the nutrition of organs by the inosculation of blood-vessels, although they be unconnected by any other means.

The application of nutritious matter—Growth—from elongation of vessels—from extension of fibres—from accretion of cellular texture—from deposition of earth, fat, or other matter—Reparation of waste—Circumstances counteracting nutrition, or causes of the *decrementum corporis*.

Morbid Affections of the Function of
Nutrition.

- I. Preternatural diminution of nutrition.
- a.* From the want of a due quantity of nutritious matter.
 - b.* From the want of necessary qualities in the nutritious matter.
 - c.* From an improper application of the nutritious matter.
- II. Preternatural increase of nutrition.
- a.* From an unusual supply of nutritious matter.
 - b.* From a strong disposition to coagulation in the nutritious fluid.
 - c.* From accidents promoting the application of the nutritious fluid to the staminal solids,
- III. Imperfect nutrition.
- a.* From peculiarities in the nature of the nutritious matter.
 - b.* From peculiarities in the mode of application.

4. *Of Secretion.*

ACCOUNT of the different organs by which the function of secretion is performed—glands—vessels—pores—Controversy, whether follicles exist in glands or not—Examination of different hypotheses respecting secretion—The supposition, that secreted fluids are pre-existent in the blood, and that glands act as filters—The supposition, that secretion depends upon a peculiar fermentation—The supposition, that it depends on a peculiar action of the vessels—The supposition, that it depends on absorption from follicles.

General view of the different causes which may be supposed to operate in secretion—Circumstances which may have effect previous to the action of the secreting organ—Circumstances operating in the secreting organ itself—Circumstances which may have effect posterior to the action of the secreting organ—fermentation—absorption—mixture—General use of secretion.

Morbid

Morbid Affections of Secretion.

1. From increase.
2. From diminution.
3. From depravation.

Causes of Morbid Affections of Secretion.

1. The state of the pabulum furnished for secretion.
2. The state of action of the secreting vessels.

5. *Of Absorption.*

OBSERVATIONS on the vessels by which absorption is performed—Question, whether the veins of the sanguiferous system ever act as absorbents—View of the arguments brought in proof of absorption by veins—from what is observed to happen with respect to the mesenteric veins—from what happens with respect to the veins of the penis—from œdematous swellings being produced by ligatures on veins—from the supposition that lymphatic absorbents are wanting in many parts of the body, and in some animals—Objections

to the hypothesis, that the veins ever act as absorbents—General conclusion.

Arguments proving that the valvular lymphatics are entirely a set of absorbent vessels—from the analogy of the lacteals—from the progress of virus in the system, whether venereal, cancerous, or the like—from the similarity between the contents of the lymphatics and those of the cavities from which they arise.

Causes producing the motion of fluids in the absorbent system—The means by which fluids enter absorbents—The necessity of the continuance of life for their admission—Different opinions respecting the manner in which the mouths of the lymphatics may be supposed to be affected by life—The supposition of ampullæ or bags—The supposition of the erection of villi similar to the papillæ of the tongue—General conclusion—The means by which fluids are moved in the lymphatics after having entered them.

Morbid Affections of Absorption.

I. Preternatural increase of absorption.

a. From

- a.* From causes forwarding the admission of fluids into the mouths of the lymphatics.
 - b.* From causes forwarding the motion of fluids through the lymphatics.
- II. Preternatural diminution of absorption.
- a.* From a diminution of the action of the lymphatic vessels.
 - b.* From causes obstructing the passage of fluids through the lymphatics.

6. *Of Excretion.*

REMARKS on the function of excretion in general—Causes most commonly producing excretion—Muscular action of the excretory—The action of the vessels of the secreting organ—Accidental causes of excretion—Remarks on the excretion of the feces and urine in particular.

Morbid Affections of Excretion.

- I. Excretion morbidly increased.
- a.* From unusual stimuli applied to the excreting organ.

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b. From

- b.* From an augmentation of the sensibility of the excreting organ.
- a. a.* Arising from increased mobility of the nervous power.
- b. b.* Arising from a diminution of the natural coverings of parts.
- II. Excretion morbidly diminished.
- a.* From the want of a due stimulus to the excreting organ.
- b.* From uncommon insensibility of that organ.
- III. Depraved excretion.
- a.* From a peculiar state of sensibility in the excretories.
- b.* From preternatural stimuli being applied to excretories.

7. *Of Respiration.*

OBSERVATIONS on different conditions in the function of respiration—Respiration as a voluntary action—as an action with propensity—as an involuntary action—as an action without consciousness.

Actions by which the enlargements and
diminution

diminution of the cavity of the thorax are produced—Circumstances commonly considered as giving rise to the enlargement of the thorax—the contraction of the diaphragm—the elevation of the ribs—the rarefaction of the air after its admission into the cavity of the thorax—Circumstances commonly considered as producing a diminution of the cavity of the thorax—relaxation of the muscles producing enlargement—the elasticity of the mediastinum—the contraction of the abdominal muscles—the elasticity of the cartilages and ligaments of the ribs—the contraction of muscles attached by one extremity to the ribs, and by the other to parts below—the weight of the ribs—the elasticity of the lungs—the contraction of the muscular fibres of the bronchiæ—Remarks on the opinion which supposes an expansive power of the lungs.

A view of different theories of respiration—Examination of the opinion which accounts for the alternate actions of respiration—from obstruction to circulation—from the compression of the phrenic

nerves—from an uneasy sensation at the end of expiration—Different accounts of the cause of the first inspiration, by those who have adopted this last hypothesis—Inquiry how far this hypothesis explains all the different states of respiration—Reasons for believing that in the ordinary state of respiration the power of the mind has no influence—Arguments shewing that in this state respiration is exactly similar to other spontaneous actions.

Explanation of ordinary respiration from an alternate contraction and relaxation of the diaphragm, independently of the influence of the will—Arguments showing that the diaphragm, may be considered as being in a situation analogous to the heart—Cause of the first contraction of the diaphragm in the newborn infant—cause of the first relaxation—cause of subsequent contractions and relaxations—Principles upon which respiration may at pleasure be subjected to the influence of the will, although in its ordinary state it may be considered as an action without sensation or consciousness—Account

—Account of some objections which have been urged against this hypothesis—Answers to these objections.

Observations on the use of respiration—View of different opinions respecting the use for which it is intended—to promote circulation through the lungs—to introduce air into the blood—to introduce nitre into the blood—to promote the intimate mixture of different parts of the blood—to condense the blood—to cool the blood—to generate heat—to draw something useful from the air—to allow the escape of a particular matter from the lungs—Arguments in proof of this supposition—from the qualities of the air expired—from the change which the blood undergoes in point of colour by passing through the lungs—Answers to objections which have been brought against this opinion respecting the use of respiration—from the fœtus in utero existing without respiration—from want of respiration in fishes—Farther proof of the hypothesis from this last circumstance—and from the connection which univer-

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ally subsists between the degree of respiration necessary for life and the colour of the blood in different animals.

Morbid Affections of Respiration.

- I. Those respecting the repetition of action.
 - a. Respiration preternaturally quickened.
 - b. Respiration preternaturally slow.
- II. Those respecting the sensation excited.
 - a. Painful respiration.
 - b. Difficult respiration.
- III. Those respecting the manner in which respiration is performed.
 - a. Respiration with uncommon noise.
 - b. Respiration with less noise than in the natural state.

CAUSES of difficult RESPIRATION, from the INSTITUTIONES PATHOLOGICÆ of Dr GAUBIUS, arranged by Dr CULLEN.

Respiratio fit difficilis,

I. Ob conditionem aëris,

1. Nimis rari,

2. Nimis

2. Nimis calidi,
 3. Nimis denfi.
- II. Ob angustiam viarum per quas aër tran-
sit in pulmones.
1. Faucium,
 2. Glottidis,
 3. Tracheæ.
- III. Ob conditionem pulmonis minus apti
ad admittendum vel expellendum aërem,
propter.
1. Vitium in potentiis motricibus, affec-
tis,
 - A. Spasmo vel constrictione, ab
 - a. Aëre nimis frigido,
 - b. Aëre inquinato,
 - c. Causis variis internis quæ agunt
mediate vel immediate.
 - B. Rigiditate ab offectis bronchiis.
 - C. Paralyfi.
 - D. Actione propter dolorem inhibita.
 2. Capacitatem pulmonum imminutam.
 - A. Obstructionem vel obstipationem.
 - a. Humoribus, muco, fero, fan-
guine, pure, in bronchiis effusis.
 - b. Humoribus, præsertim muco,
vel

vel calculo folliculis membranæ
mucosæ infarctis.

- c.* Humoribus intra vasa congestis.
A. Plethora.
B. Inflammatione.
C. Scirrhus.

B. Compressionem externam.

- a.* Tumore pulmonibus innato.
b. Tumore partium vicinarum intra thoracem.
c. Obesitate partium intra thoracem.
d. Humoribus in thoracem effusis.
e. Cavitate thoracis imminuta.
a. a. Ab ipsius mala formatione.
b. b. Ab aucta mole abdominis.
A. Ob aquam vel aërem ibi accumulatum.
B. Ob viscus quoddam mole auctum.

HEADS of the OBSERVATIONS to be offered
on the Causes of MORBID RESPIRATION.

I. Causes depending on the condition of
the air.

- a.* Density. *b.* Rarefaction.

- b.* Rarefaction.
 - c.* Heat.
 - d.* Coldness.
 - e.* Mephitic impregnations.
- II. Causes depending on the state of the passages or cavities into which the air enters.
- a.* Contraction of passages.
 - b.* Rigidity of cavities.
 - c.* Compression of cavities.
 - d.* Cavities being filled with other matters.
- III. Causes depending on the state of the organs enlarging or diminishing those cavities.
- a.* Spasmodic affections.
 - b.* Paralytic affections.
 - c.* Inflammatory affections.

8. *Of Animal Heat.*

A SHORT state of the principal facts respecting animal heat—Universality of the power of generating heat over the animal creation—Extent of heat in different species of animals—Uniformity in the same

same species—Heat of the human species—its stability in different temperatures of the atmosphere—Connection between the degree of heat peculiar to different animals, and the colour of the blood—Varieties in heat occurring from disease—Connection which these varieties, when occurring over the system in general, have with the state of circulation and respiration—Exceptions to this general rule—Morbid varieties in the heat of particular parts—Connection of these with the state of circulation at the part.

View of different theories respecting the cause of animal heat—Examination of the opinion which supposes, that animal heat is to be accounted for from mixture—from putrefaction—from friction—from respiration—from the nervous energy—An attempt to refute all these opinions.

Account of the theory of heat in general, and of animal heat in particular, proposed by Dr Crawford—Account of the opinion of Mr Rigby—of Mr John Hunter—of M. Lavoisier, Seguin, &c.

Account of the hypothesis, that the sensible heat, generated by living animals, is produced by the caloric in the blood passing from a latent to an active state; that this transition is the consequence of a chemical change in the blood, from its hydrocarbonous impregnation being evolved; and that this evolution is effected chiefly by the action of the vessels to which the blood is subjected—Explanation of some particulars which may occur as objections to this hypothesis—Attempt to render it probable from endeavouring to prove the following propositions—1. That the blood contains both caloric and carbonated hydrogen. 2. That the carbonated hydrogen evolved in consequence of the action of the vessels, to which the blood is subjected in the course of circulation, produces the transition of caloric from a latent to an active state. 3. That as much sensible heat may be produced by this means as any animal is ever observed to generate. 4. That this hypothesis affords a satisfactory explanation of the principal phenomena of animal heat, particularly the most

intricate

intricate and apparently contradictory phenomena.—Explanation of the general connection of the heat of the body with the state of the blood's motion—of the exceptions which occur to this rule—of the equality of heat over the system—of the exceptions to this rule in morbid cases—of the uniformity of heat in the same animal while in health, although exposed to great diversity of temperature—of the connection of animal heat with respiration—of its connection with the colour of the blood in different animals,

Observations on the use of the power of generating heat, possessed by living animals—its influence as preserving the fluids of the system in a proper condition—its influence on the solids—its influence on the nervous power.

Morbid Affections of Animal Heat.

I. Preternatural increase of the heat of the body.

a. From an increased action of the blood-vessels.

b. From an increase of the hydrocarbonous impregnation of the blood.

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c. From

c. From an increase of caloric in the blood.

d. From a diminution of those excretions, which preserve the stability of the fluids.

II. Preternatural diminution of the heat of the body.

a. From a diminished action of the blood-vessels.

b. From a diminution of the hydrocarbonous impregnation of the blood.

c. From the want of a due supply of caloric to the blood.

d. From an increase of particular excretions.

9. *Of Muscular Motion.*

OBSERVATIONS on the phenomena of muscular motion—Manifest changes which muscles undergo in action—in length—in thickness—in bulk—in hardness—in colour—Causes inducing the action of muscles—stimuli—volition—Circumstances in muscles with which their action is connected—peculiar configuration—contractile power—free communication with the sensorium by the inter-

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vention of nerves—Different theories of muscular action—Account of the hypothesis which supposes muscular action to proceed from the immediate influence of the mind—from the figure of muscular fibres—from fermentation in muscles—from blood rushing into muscles—from motions of the nervous fluid.

Use of muscular action—Primary use—Secondary consequences—in giving figure to parts—in giving texture—in exciting the motion of fluids in the body—in preserving the general health of the system—in giving greater facility in motion to the moving fibres.

Morbid Affections of Voluntary Motion.

I. Those in which the influence of the will is counteracted.

1. Spasmodic affections.

2. Convulsive affections.

a. From uncommon stimuli.

b. From peculiar sensibility.

II. Those in which the influence of the will is impaired or lost.

a. From causes impeding the course, or altering the condition, of the nervous power.

b. From

b. From accidents giving uncommon rigidity to the moving fibres.

10. *Of the External Senses.*

REMARKS on the external senses in general—Observations respecting the variety in the external senses—Inquiry how far it may be accounted for from a difference in the nerves themselves—from a difference in the state of the extremities of the nerves—from the modification of impressions by the apparatus at their extremities—Observations on particular senses—Sense of touching—organs employed in touching—the external objects from which these organs are fitted to receive impressions—the use of this sense to the system—Remarks on the principal morbid affections of the sense of touching—Sense of tasting—organs employed—objects from which these organs are fitted to receive impressions—use of tasting—Remarks on the principle morbid affections of the sense of tasting—Sense of smelling—organs employed—external objects from

which these organs are fitted to receive impressions—use of smelling—Remarks on the principal morbid affections of the sense of smelling—Sense of hearing—organs employed—external objects from which these organs are fitted to receive impressions—use of hearing—Remarks on the principal morbid affections of the sense of hearing—Sense of seeing—organs employed—external objects from which these organs are fitted to receive impressions—use of vision—Remarks on the principal morbid affections of the sense of vision.

II. *Of the Internal Senses.*

REMARKS on the functions to be considered under the general title of internal senses—Observations on the general agency of the mind over the body—Inquiry respecting the seat of connection between the mental and corporeal parts of the system—Inquiry how far a particular configuration of the brain is necessary for this connection—Conjectures respecting the

the causes on which the diversity in the mental faculties depends—Conjectures respecting the causes of the differences which occur in the mental faculties of the same individual at different times—Observations with regard to particular internal senses—imagination—judgment—memory—volition.

Morbid Affections of the Internal Senses.

I. Those depending on imperfect exertion of the mental faculties.

II. Those depending on erroneous exertion.

a. From increased impetus of the circulation at the brain.

b. From diminished impetus there.

c. From compression of the brain.

d. From irritation of the brain.

Observations on different modifications of delirium—Delirium ferox—Delirium mite.

12. *Of Sleep.*

ACCOUNT of the phenomena of sleep—Inquiry respecting its nature—Examination of the opinion which supposes sleep to depend on the exhaustion of the nervous fluid—Examination of the opinion which supposes it to depend upon compression of the brain—Examination of the opinion which ascribes sleep to exhausted irritability.—Objections to these hypotheses—Inquiry how far sleep may not be referred to a law of the mind, by which, during its connection with the body, it has a constitutional disposition to alternate states of activity and rest—Conjectures respecting the manner in which those circumstances act, which either produce sleep, or protract watchfulness—Observations respecting the animals which remain in a torpid state during the winter-season—Circumstances in which winter torpor differs from natural sleep—Conjectures as to the difference of the causes on which they depend—Inquiry how far torpor from cold may be ascribed

to

to a change induced on the state of the nervous fluid—Observations on the principal morbid affections of sleep—Pervigilium—Immodica dormitio—Somnia—Somnambulatio—Incubus,

13. *Of Death.*

GENERAL observations on the nature of death—Observations on different causes of death—injuries to the brain—lesion of vital functions—affections of nerves—age—Marks indicating death—cessation of the vital functions—insensibility and coldness—stiffness—putrefaction—General observations on other marks, as collapse of the eye, and the like—General conclusion respecting the characteristics of death.

Observations on resuscitation in cases of apparent death—General principles on which a recovery is to be attempted—Remarks on different practices which have been recommended—Account of the plan of procedure which should in general be adopted.

14. *Of the Peculiarities of the Male.*

OBSERVATIONS on the secretion of semen by the testicles—The state of the semen as it is discharged—Observations on the use of the semen in generation—effects which it produces in the system by which it is secreted—Observations on the influence which it has on the passions of the mind—on the state of the muscular fibres in general—on the state of the voice—on the growth of the beard in men—on the stature and fatness of the body in different animals—Observations on morbid affections resulting from alterations in the condition of the semen.

Remarks on the erection of the penis—Circumstances on which it immediately depends—View of different theories on which it has been accounted for—Inquiry whether it proceeds from obstruction to the return of the blood from the cells of the penis, or from an increased flow of the blood into these cells—Examination of the opinion, which supposes
that

that it proceeds from the action of nervous filaments surrounding the veins of the penis—from an action of the vena ipsius penis—from an increased action of the small vessels of the penis—Remarks on some circumstances which have been supposed to assist the erection of the penis—full state of the bladder—action of the levatores ani muscles—the stimulus of the semen—the distension of the vesiculæ feminales—Observations on different morbid affections from the condition of erection—Defective erection—Violent erection—Painful erection—Impotence in the discharge of semen—Want of due retention of semen.

15. *Of the Peculiarities of the Female.*

OBSERVATIONS on the menstrual flux—
An account of the phenomena commonly attending menstruation—A view of different theories on which the menstrual discharge has been attempted to be accounted for.

A view of the arguments brought in favour

vour of the supposition, that the menses depend on general plethora—Conclusions drawn from the position and structure of the uterus—from the necessity of a constant disposition to plethora in female habits—from a state analogous to the menses being induced in men by habitual blood-lettings—from the increase and acceleration of the menstrual discharge by high and plentiful feeding, sedentary life, the amputation of a limb, or similar circumstances—from the diminution of the menses by activity, spare diet, and the like—Answers to the different arguments drawn from these facts—Objections to the hypothesis—from the appearance of the menses with females when they are not in a plethoric state, and when there is even manifest proof of a high degree of inanition—from the frequent existence of a plethoric state in females, without any menstruation, when there is no reason to suspect any cause producing obstruction—from plethora not being removed by menstruation, when that discharge occurs with such a state of the system.

Examination

Examination of the opinion which supposes menstruation to depend on partial plethora—proof that the vessels of the uterus, at different times, contain very different quantities of blood—Evidence of the existence of partial plethora in the vessels of the uterus previous to menstruation—from symptoms preceding the discharge—from dissections near the menstrual period—Inquiry how far the existence of partial plethora is sufficient to explain all the phenomena of menstruation—Reasons for believing that it is not a cause fully adequate to the effect—from the regularity of the discharge in point of time—from the relief afforded by vicarious evacuations happening at the menstrual period, when the menses are obstructed.

Examination of the opinion which supposes, that on partial plethora there occurs an hæmorrhagic effort, regulated by the laws of the nervous system—Objections to this hypothesis—from circumstances attending those evacuations which supply the place of the menses—from different causes which obstruct menstruation—from
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the suspension of the menses during pregnancy and nursing.

Some account of a conjecture which supposes, that, with partial plethora, there occurs, at the time of menstruation, a peculiar action of the uterus itself, somewhat similar to that which happens in the impregnated state, occasioning delivery at the end of a determined period—Arguments in favour of this supposition—from the analogy of the impregnated uterus—from the regularity of the menstrual discharge—from the relief in cases of obstructed menses when evacuations of blood occur naturally—from the explanation which this hypothesis affords for many of the most intricate phenomena of menstruation—for the first appearance of the menses—for the periodical return of that discharge—for the limitation of it to a certain age—for the obstruction of it during pregnancy and nursing,

Remarks on the use of menstruation in the female economy—The influence which it has in generation—Objections to the supposition, that it is intended for the
 nutrition

nutrition of the fœtus—Account of a conjecture that the menstrual discharge may serve to give a condition to the vessels of the uterus necessary for impregnation—Arguments in favour of this opinion—from the effects which hæmorrhage has on other parts—from the method in which women commonly reckon their pregnancy—from the existence of a state analogous to the menses in many other animals previous to conception.

Morbid Affections of Menstruation.

- I. Obstruction of the menstrual discharge.
 - a.* From the want of proper accumulation in the uterus.
 - b.* From the want of due periodical contraction.
 - c.* From obstruction to the passage of blood into the cavity of the uterus.
- II. Preternatural increase of the menstrual discharge.
 - a.* From uncommon determination to the uterus.
 - b.* From increased action of that viscus.
 - c.* From

c. From the want of due resistance to the impetus of blood at the uterus.

16. *Of Generation.*

VIEW of the different stages to which this function may be referred.

Coition—Inquiry whether the semen of the male be thrown into the uterus of the female—Inquiry respecting the existence of ova in the ovaria of females.

Conception—View of different opinions on this subject—Account of the supposition of the mixture of male and female semen—of the mixture of the male semen with the menstrual blood—of a peculiar sensation excited by the stimulus of the male semen on the os tinæ—of the introduction of an animalcule from the male semen into an ovum from the female—of the conjunction of organic particles from the male and female semen—Observations on the experiments and hypothesis of the Count de Buffon on this subject.

Pregnancy—Observations on the growth

growth of the fœtus—on the nutrition of the fœtus—on parts lodged in the uterus connected with the fœtus—on the changes which the uterus itself undergoes in pregnancy.

Delivery—Remarks on the signs of approaching delivery—account of the actions by which delivery is effected—conjectures respecting the causes inducing these actions—Observations on the principal morbid affections occurring in the various stages of generations—Monsters—Extra-uterine conceptions—Super-fœtation—Mola or false conception—Abortion.

growth of the fetus—on the nutrition of
 the fetus—on parts lodged in the uterus
 connected with the fetus—on the changes
 which the uterus itself undergoes in preg-

nancy—
 Section IV—Remarks on the fetus in utero
 from an oblique—account of the an-
 tiquities by which delivery is effected—con-
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 these actions—attention on the various
 and morbid affections occurring in these
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