HEADS OF LECTURES

ON

PATHOLOGICAL PHYSIOLOGY.

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ON

PATHOLOGICAL PHYSIOLOGY.

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PREFACE.

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 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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II. Morbid

II. Morbid affections from changes in quality.

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Pathology of the Simple Solids.

I.

Morbi partium ſolidarum ſimpliciſſimi ex inſtitutionibus Pathologiæ, auctore H. D. Gaubio.

I. Debilitas.
  A. Sal·a cohæſione.
    a. Laxum, flaccidum in partibus mollibus.
    b. Iners in partibus natura elaſticis.
    c. Flexile n oſſibus.
  B. Diſſoluta cohæſione.
    a. Tenerum, Gracile, in mollibus partibus.
    b. Tabidum

b. Tabidum itidem in mollibus.

c. Fiſſile in partibus natura tenacioribus.

d. Fragile in oſſibus.

II. Rigiditas.

A. Firmitas inſuperabilis.

a. Tenax, in partibus mollibus.

b. Durum, in mollibus quoque.

c. Fragile, Vitreum, in oſſibus.

B. Fragilitas flecti neſcia.

a. Tenax, in partibus mollibus.

b. Durum, in mollibus quoque.

c. Fragile, Vitreum, in oſſibus.

II.

A Table of the Diſeaſes of the Simple Solids, by Dr Cullen.

The Diſeaſes of the Simple Solids are,

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1. Mobility of the parts too great. *Debile Gaub.* 157. 159.

A. With reſpect 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 concreting 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 texture,
from eroſion of cellular texture,
from cutting through ſome layers of a compound membrane,
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.

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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.
h. 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.

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 encreaſed—Elaſticity morbidly diminiſhed.

4. *Veſſels.*

ARTERIES. Coheſion and ſtrength of arteries—Changes which gradually take place in the proportional ſtrength of the arteries to that of the veins—Elaſticity of the arteries—Flexibility—Diviſion into ramifications—Different views of the diviſion of arteries—Trunks—Branches—Capillaries

—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 diſ-

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 reabſorption it ſerves for the nutrition of the ſyſtem—Doubts reſpecting that opinion—Pathology of fat—Polyſarcia.

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-

ſive 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 con-

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 menſtrua—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.

Chylificaion or aſſimulation—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

Mobid 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 aſſimulation.
   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 aſſimulating 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

c. From the want of due tonic power in theſe organs.

5. Irregularity in the motion of the blood.

a. From circumſtances producing an irregular ſupply of blood at the heart.

b. From circumſtances affecting the condition of irritability in the vaſcular ſyſtem.

II. Affections with reſpect to the diſtribution of the blood.

1. Increaſed determination to any particular part.

a. From cauſes increaſing the irritability of the veſſels in the part.

b. From cauſes augmenting the flow of blood in theſe veſſels.

2. Preternatural diminution of the flow of blood to particular parts.

a. From cauſes diminiſhing the irritabilty or tonic power of the veſſels leading to the part.

b. From accidents diminiſhing the flow of blood to the veſſels leading into the part.

3. *Of*

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 increaſeof 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 œdamatous 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.

1. 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 encreaſed.

a. From unuſual ſtimuli applied to the excreting organ.

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 diapragm, may be conſidered as being in a ſituation analogous to the heart—Cauſe of the firſt contraction of the diaphragm in the new-born 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-

ſally

ſally 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 Pathologiæ of Dr Gaubius, arranged by Dr Cullen.

Reſpiratio fit difficilis,
I. Ob conditionem aëris.
   1. Nimis rari,

2. Nimis

2. Nimis calidi,
3. Nimis denſi.

II. Ob anguſtiam viarum per quas aër tranſit 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, affectis,
A. Spaſmo vel conſtrictione, ab
a. Aëre nimis frigido,
b. Aëre inquinato,
c. Cauſis variis internis quæ agunt mediate vel immediate.
B. Rigiditate ab offefactis bronchiis.
C. Paralyſi.
D. Actione propter dolorem inhibita.
2. Capacitatem pulmonum imminutam.
A. Obſtructionem vel obſtipationem.
a. Humoribus, muco, ſero, ſanguine, 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. Scirrho.

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 reſpiraration—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 hydrogene. 2. That the carbonated hydrogene 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.

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-

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.

11. *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—Inquiquiry 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 ſeminales—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 bloodlettings—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 the

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 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 tincæ—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 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.