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1. CORPUS humanum, arte prorsus divina fabricatum, multis et miris fungitur muneribus; quorum alia ad res externas, alia ad seipsum tantum, pertinent.

2. Ad alterum genus referuntur sensus omnis motusque voluntarius; quibus, quantumvis simplici-

1. Humanum corpus, fabricatum arte prorsùs divinâ, fungitur multis et miris muneribus; alia quorum pertinent ad externas res, alia ad seipsum tantùm.

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1. The human body, framed by skill altogether divine, performs many and wonderful functions: some of which relate to external objects, others to itself only.

2. All sensation and voluntary motion are referred to one kind; by which powers, however simple, we become acquainted with the globe, (and) are masters of the earth. These are called Animal Functions by medical men.

simplicibus cognoscimus mundum, potimur terrarum. Hæ dicuntur Animales Functiones apud medicos.

3. Verò minimè valemus ad has functiones omni tempore; enim longâ aut validâ exercitatione sive animi, sive corporis, insitæ vires utriusque exhauriuntur. Autem in hoc statu brevi monemur et tandem cogimur dulci necessitate, pariter intermittere omnes labores et voluptates que deponere curas, et committere nosmetipsosdefessos et hebescentes amplexibus somni: gremio cujus foti et refecti, resurgamus denuò vegeti et alacres, et aptissimi ad omnia munera vitæ.

4. Ad alterum genus cunctæ actiones solent referri ope quarum corpus vivit que exhaustum reficitur, que corruptum purgatur. Verò hæ sunt vel vitales vel naturales.

5. Illæ functiones dicuntur vitales, quæ sunt

bus, viribus, mundum cognoscimus, terrarum potimur. Hæ Functiones Animales apud medicos dicuntur.

3. Minime vero omni tempore ad has functiones valemus: longa enim aut valida sive animi sive corporis exercitatione utriusque vires insitæ exhauriuntur. In hoc autem statu brevi monemur, et tandem dulci necessitate cogimur, labores omnes et voluptates pariter intermittere, curasque deponere, et nosmetipsos defessos et hebescentes somni amplexibus committere; cujus gremio foti et refecti, resurgamus denuo vegeti et alacres, et ad omnia vitæ munera aptissimi.

4. Ad alterum genus referri solent actiones cunctæ, quarum ope corpus vivit exhaustumque reficitur corruptumque purgatur. Hæ vero sunt vel vitales vel naturales.

5. Vitales dicuntur functiones illæ quæ ad vitam adeo necessariæ

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3. But we are by no means competent to these functions on every occasion; for, by long or powerful exercise either of the mind or the body, the innate powers of each are exhausted. But in this state we are early admonished, and at length are obliged by grateful necessity, equally to intermit all labours and pleasures, and to lay aside cares, and to commit ourselves, fatigued and languid, to the embraces of sleep, from whose bosom, cherished and refreshed, we may rise again lively and alert, and best fitted for all the duties of life.

4. To the other description (of functions) all those actions are wont to be referred, by the aid of which the body lives, (when) exhausted is repaired, and corrupted is purified. But these are either vital or natural.

5. Those functions are called vital which are so necessary to life, that they cannot be suspended or interrupted even for a little space of time, without

sunt, ut sine vitæ discrimine, ne quidem per exiguum tempus, suspendi aut interrumpi queant; cerebri, nimirum, nervorumque actio, sanguinis circuitus, et respiratio.

6. Machina vero animalis sic constituta statim defluit, cito etiam periret; nam omni motu partes solidæ teruntur, fluidæ dissipantur, corpus, debile, macrum exhaustumque relicturæ; quinetiam utræque sponte putrescunt et corrumpuntur; sic etiam brevi ipse sibi homo acerrimum venenum compararet.

7. Sed nusquam alma rerum parens prolem deserit. Contra, non modo his malis, quæ semper et ubique necem minitantur et inopi sine dubio inferrent, remedium suggerit, verum insuper mirabili artificio efficit, ut ex hac ipsa homo necessitudine novum ferat et perennem vigorem.

8. Attrito enim corpore parteque

adeò necessariæ ad vitam ut ne queant suspendi aut interrumpi quidem per exiguum tempus, sine discrimine vitæ; nimirùm actio cerebri, que nervorum, circuitus sanguinis, et respiratio.

6. Verò animalis machina sic constituta statim defluit, etiam citò periret; nam omni motû solidæ partes teruntur, fluidæ dissipantur, relicturæ corpus debile macrum que exhaustum; quinetiam utræque putrescunt et corrumpuntur sponte; etiam sic brevì ipse homo compararet sibi venenum acerrimum.

7. Sed alma parens rerum nusquam deserit prolem. Contrà non modo suggerit remedium his malis, quæ semper et ubique minitantur necem, et sine dubio inferrent inopi, verùm insuper efficit mirabili artificio, ut homo ferat novum et perennem vigorem ex hâc necessitudine ipsâ.

8. Enim corpore attrito,

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peril to life; namely, the action of the brain and nerves, the circulation of the blood, and respiration.

6. But the animal machine thus constituted immediately decays, (and) likewise would speedily perish; for by every motion the solid parts are worn away, the fluid parts are dispersed, about to leave the body weak, emaciated, and exhausted; moreover they both putrefy and are decomposed spontaneously, so that in a short time man himself would be preparing for himself a most deleterious poison.

7. But the kind parent of nature nowhere deserts her offspring; on the contrary, she not only supplies a remedy for those evils which always and everywhere threaten death, and would indubitably inflict upon it unprepared, but moreover she manages, by wonderful contrivance, that man may receive renewed and lasting vigour from this very necessity.

8. For the body being worn away, and a portion of the humours being

que parte humorum absumptâ, egemus nutrimento et potû; itaque appetimus, sumimus, concoquimus cibum que potum; uterque concoctus diffunditur per totum corpus, apponitur quà opus est; quod superest utriusque ejicitur. Quoque humores putrescentes vel aliter corrupti, secreti a reliquis, excernuntur e corpore idoneâ viâ. Denique plurimi succi, assiduè secernuntur a generali massâ, diversi ab illâ et diversi inter se, que accommodati variis usibus intra corpus.

humorum absumpta, nutrimento et potu egemus; cibum itaque potumque appetimus, sumimus, concoquimus: concoctus uterque per totum corpus diffunditur, qua opus est apponitur; quod superest utriusque ejicitur. Putrescentes quoque vel aliter corrupti humores, a reliquis secreti, idonea via e corpore excernuntur. Plurimi denique a massa generali succi, diversi ab illa et diversi inter se, variisque intra corpus usibus accommodati, assidue secernuntur.

9. Hæ functiones vocantur naturales, necessariæ quidem ad vitam, sed quæ possunt suspendi paulisper facilè et sine periculo; scilicet, concoctio, secretio et excretio.

9. Hæ vocantur functiones naturales, ad vitam quidem necessariæ, sed quæ paulisper facile, et sine periculo suspendi possunt: concoctio, scilicet, secretio et excretio.

10. Igitur homo vivit, viget, reficitur, purgatur vitalibus et naturalibus functionibus, evadit idoneus ad exercendas ani-

10. Vitalibus, igitur, et naturalibus functionibus homo vivit, viget, reficitur, purgatur, ad animales exercendas idoneus evadit: nobile

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removed, we stand in need of nourishment and drink; therefore we seek, take, and digest food and drink; each of them, when digested, is distributed through the whole body, and deposited where there is need of it; what remains of each is thrown out. Also humours putrefying or otherwise corrupted, secreted by the rest, are excreted from the body by a proper channel. Lastly many juices are constantly being secreted from the general mass, differing from it, and differing between themselves, and adapted to various uses within the body.

9. These functions are called natural, necessary indeed to life, but which may be suspended for a short time, easily and without danger,—namely, digestion, secretion, and excretion.

10. Therefore man lives, thrives, is replenished, and cleansed, by the vital and natural functions (and) becomes fitted for exercising the animal (functions): a noble work, nor to have been contemplated but by the Supreme

opus, nec nisi Uni excogitandum; certe omne humanum ingenium tantum excedens, ut mente quamvis sagace, toties exploratum, non capiatur; neque singularum partium functiones, neque universarum nexus, neque fons et origo virium quibus machina movetur, hactenus detegantur.

11. Nulla enim præter animalem machina proprio motu cietur; nulla alia, pericula sibimet imminentia sua sponte summovet, nec res quibus eget sibi ministrat.

12. Primo statim aspectu, talis machina, nisi forte causa aliqua externa corrupta vel læsa, in omne ævum durabilis videtur: et quidem sola experientia contrarium docemur. Homo enim, quamvis sanus et robustus et vegetus, labentibus annis, et ipse dilabitur, senescit, moritur, in pristina elementa solvitur, aliis animantibus pabulum futurus.

males; nobile opus, nec excogitandum nisi Uni; certè tantùm excedens omne humanum ingenium ut toties exploratum non capiatur mente quamvis sagace: neque functiones singularum partium, neque nexus universarum neque fons et origo virium, quibus machina movetur, hactenùs detegantur.

11. Enim nulla machina præter animalem cietur proprio motu; nulla alia suâ sponte summovet sibimet imminentia pericula, nec ministrat sibi res, quibus eget.

12. Statim primo aspectû talis machina videtur durabilis in omne ævum nisi fortè corrupta vel læsa aliquâ externâ causâ; et quidèm docemur contrarum experientiâ solâ. Enim homo, quamvis sanus et robustus et vegetus, annis labentibus et ipse dilabitur, senescit, moritur, solvitur in pristina elementa, futurus pabulum aliis animantibus.

Being alone; certainly so much exceeding human understanding, that (although) explored so many times, it cannot be comprehended by a mind however intuitive; nor can the functions of individual parts, nor the connexion of the whole, nor can the source and origin of the powers by which the machine is moved, up to the present time be discovered.

11. For no machine besides the animal (one) is propelled by its own motion; no other of its own accord removes from itself impending dangers, or furnishes to itself the supplies which it stands in need of.

12. Immediately, at first sight, such a machine appears lasting to every age, unless by chance destroyed or injured by some external cause; but, indeed, we are taught the contrary by experience alone. For man, though healthy, robust, and active, the years gliding on, also himself sinks down, becomes old, and dies, and is resolved into his pristine elements, about to become food for other animals.

13. Autem hæc lex Naturæ, hoc consilium, ut singuli homines pereant, humana gens floreat. Hinc sexus, hinc generatio et proles, et quicquid suavis, quicquid amari alma Venus habet.

14. Sed ipse dominus terrarum et animalium quæ incolunt eas, nascitur parvus, debilis, fatuus, inops omnium rerum; diù conservatur, fovetur, alitur solâ curâ parentum, paulatim crescit, pubescit, adolescit, sapit; æquat parentes et formâ animi et viribus corporis, gaudet exercere eadem munera; tandem annis ingravescentibus subiturus communem sortem.

15. Omnia hæc communia universo generi; nec multa propria singulis hominibus desunt. Enim constitutiones corporis variant non secus ac vultus. Quidèm hæ varietates nullo modo sunt exequendæ, tamen solent non inepte referri ad certa capita quæ dicuntur tem-

13. Hæc autem Naturæ lex, hoc consilium; ut singuli pereant homines, gens humana floreat. Hinc sexus, hinc generatio et proles, et quicquid suavis, quicquid amari, alma Venus habet.

14. Sed ipse terrarum et quæ eas incolunt animalium dominus, parvus, debilis, fatuus, omnium rerum inops, nascitur: sola parentum cura diu conservatur, fovetur, alitur: paulatim crescit, pubescit, adolescit, sapit: forma et animi et corporis viribus parentes æquat; eadem gaudet exercere munera; tandem, ingravescentibus annis, communem sortem subiturus.

15. Hæc omnia universo generi communia; nec desunt multa singulis hominibus propria. Non secus enim ac vultus, corporis constitutiones variant. Hæ quidem varietates nullo modo exequendæ sunt, tamen ad certa capita non inepte referri solent, quæ tempe-

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13. But this is the law of nature, this is the design; that individuals may perish, the human race may thrive. Hence sex, hence generation, and offspring, and whatever of sweet, whatever of bitter fond Venus imparts.

14. But (man) himself, lord of the earth and of the animals which inhabit it, is born diminutive, weak, feeble in mind, in want of all things; he is for a long time preserved, cherished, and nourished by the sole care of his parents; by degrees he grows, arrives at puberty, to manhood, and becomes wise; he equals his parents both in the frame of his mind and strength of his body; he rejoices to exercise the same functions, at length, years weighing upon him, he is about to undergo the common lot.

15. All these are common to the whole race; nor are many things peculiar to individuals wanting. For constitutions of body vary, like the countenance. Indeed, these varieties are by no means to be defined, but are wont not inaptly to be referred to certain heads, which are called temperaments,

ramenta κατ' εξοχην dicuntur; quorum scientia medico haud parùm proderit.

16. Hujusmodi varietates non corporis modo, verum et animi quoque, plerumque congenitæ, nonnunquam hæreditariæ, observantur. Hoc modo parentes sæpe in prole reviviscunt: certe parentibus liberi similes sunt, non vultum modo et corporis formam, sed animi indolem, et virtutes, et vitia. Imperiosa gens Claudia diu Romæ floruit, impigra, ferox, superba; eadem illachrymabilem Tiberium, tristissimum tyrannum, produxit; tandem in immanem Caligulam et Claudium, et Agrippinam, ipsumque demum Neronem, post sexcentos annos, desitura.

17. Quin et ab aliis causis, firma adhuc valetudine, corpus humanum multas et graves subit mutationes; et imprimis a vitæ genere et victu quo utimur, ab ipso

peramenta κατ' εξοχην; scientia quorum haud parùm proderit medico.

16. Varietates hujusmodi non modo corporis, verum et animi quoque observantur, plerumque congenitæ, nonnunquam hæreditariæ. Hoc modo parentes sæpe reviviscunt in prole; certè liberi sunt similes parentibus non modo vultum et formam corporis sed indolem animi et virtutes et vitia. Imperiosa Claudia gens, diù floruit Romæ, impigra, ferox, superba: eadem produxit illachrymabilem Tiberium, tristissimum tyrannum; tandem desitura in immanem Caligulam et Claudium, et Agrippinam, que demùm Neronem ipsum post sexcentos annos.

17. Quin humanum corpus subit multas et graves mutationes et ab aliis causis, valetudine adhuc firmâ, et imprimis a genere vitæ et victû quo

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for the sake of distinction; a knowledge of which will be of no trifling use to the medical man.

16. Varieties of this kind, not only of the body but of the mind also, are observed, generally congenital, sometimes hereditary. In this manner, parents frequently revive in their offspring; certainly children are like their parents, not only as to the countenance and frame of the body, but the disposition of the mind, virtues, and vices. The imperious Claudian family for a long time flourished at Rome, restless, ferocious, and haughty. The same produced the pitiless Tiberius, a most dreadful tyrant, at length about to close its existence by the outrageous Caligula, Claudius, and Agrippina, and lastly Nero himself, after six hundred years.

17. Moreover the human body undergoes many and important changes also from other causes, the health being still unimpaired; in the first place from the mode of life and kind of food we make use of, from the atmos-

utimur, ab ipso cœlo sub quo degimus et ab immensâ vi consuetudinis. Oportet quoque medicum novisse hæc.

18. Igitur secunda valetudo est definienda nullis verbis, neque profectò facilè describenda ; quippe quam natura ipsa fecerit variam non sine sapiente consilio. Tamen juvabit scire, perfectissimam sanitatem florentis ætatis contingere homini, cui sana mens, optimum donum Dei, data est; qualis non modò sufficiat ad solita munera vitæ, sed quoque facile accommodet se variis casibus, et studiis et negotiis ; quæ probè sentiens, et perspicax, et tenax, percipit, et intelligit, et retinet, ut decet ; quæ firma et serena sive fuerit gravior sive hilarior, que semper compos sui, est ludibrio neque suis inordinatis motibus neque externis casibus ; sed imperat non paret propriis affectibus, que modestè fruitur secundis rebus, tolerat ad-

sub quo degimus cœlo, et ab immensa vi consuetudinis. Hæc quoque medicum oportet novisse.

18. Secunda, igitur, valetudo nullis est definienda verbis, neque profecto facile describenda; quippe quam Natura ipsa non sine sapiente consilio, variam fecerit. Scire tamen juvabit, perfectissimam florentis ætatis homini contingere sanitatem, cui mens sana, optimum Dei donum, data est; qualis non modo ad solita vitæ munera sufficiat, sed variis quoque casibus et studiis et negotiis facile se accommodet; quæ probe sentiens, et perspicax, et tenax, et percipit, et intelligit, et retinet, ut decet; quæ firma et serena, sive gravior fuerit sive hilarior, suique semper compos, neque suis inordinatis motibus neque externis casibus ludibrio est; sed propriis affectibus imperat, non paret, rebusque secundis modeste fruitur, adversas fortiter

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phere itself under which we live, and from the unbounded sway of habit. It is necessary also that the physician should be acquainted with these things.

18. Therefore good health is to be defined by no terms, nor indeed easily to be described; as being which nature herself has made varied, not without wise intention. However, it will be useful to know that the most perfect health of the flower of age falls to the lot of him, to whom a sound mind, the best gift of God has been given, such as may not only suffice for the usual functions of life, but can also easily accommodate itself to the various accidents, and studies, and affairs, which correctly feeling, and discerning and tenacious, perceives, understands, and retains as it should do; which is firm and calm, whether it be more oppressed or more lively, and always master of itself, and which is a laughing-stock neither to its unmeasured emotions nor external accidents; but governs, not obeys, its own affections, and modestly enjoys prosperity, and bears adversity with fortitude, and is

tolerat, et gravioribus, siqui acciderint, casibus, excitatur, non convellitur. Hæc, quidem, non modo sunt signa et indicia sanæ mentis, sed sani corporis quoque; et profecto ad hujus sanitatem haud parum conferunt: scilicet donec in compage sua corporea inclusa est, mens, et corpus multum afficit et ab eo afficitur vicissim.

19. Quod ad hoc vero attinet, validissimum et fere sanissimum est corpus justæ magnitudinis et bene formatum, neque procerum nimis, neque breve, neque macrum, neque multa pinguedine grave; sed quadratum potius quam gracile, et amplo imprimis thorace latisque humeris instructum; cui ossa grandiora sunt, et musculi torosi, bene expressi, et firmi, et fortes, nunquam tremuli; et cutis mollis quasi humida, nunquam arida: et color, præsertim vultus, bonus et constans, sive is pulchrior

versas fortiter et excitatur non convellitur gravioribus casibus siqui acciderint. Hæc quidem sunt non modo signa et indicia sanæ mentis, sed quoque sani corporis et profecto conferunt haud parum ad sanitatem hujus; scilicet donec mens, inclusa est in suâ corporeâ compage et multum afficit corpus, et vicissim afficitur ab eo.

19. Verò quod attinet ad hoc, corpus ferè est validissimum et sanissimum justæ magnitudinis et benè formatum, neque nimis procerum, neque breve, neque macrum neque grave multâ pinguedine; sed potius quadratum quam gracile, et imprimis instructum amplo thorace, que latis humeris, cui ossa sunt grandiora et musculi torosi, benè expressi et firmi, et fortes, nunquam tremuli: et cutis mollis quasi humida, nunquam arida; et color presertim vultûs bonus et constans, sive is fuerit pulchrior sive fuscior, dum-

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excited, not distracted by the severer accidents, if any befall it. These indeed are not only the characters and evidences of a sound mind, but also of a sound body, and, truly, they contribute no little to the health of it; for, as long as the mind is confined in its corporeal frame, it both greatly affects the body, and is in turn affected by it.

19. But, as regards the latter, the body is commonly most powerful and healthy, of average size and well formed, neither too tall, nor too short, nor thin, nor oppressed with much fat; but rather square-built than slender, and especially furnished with a full chest and broad shoulders, to which the bones are rather large, and the muscles fleshy, well marked, firm, and strong, never tremulous; the skin soft as if moist, never dry; and the colour, especially of the countenance, good and constant, whether it be more fair or dark, provided that it neither inclines to yellow nor pale, a countenance

modo neque vergat ad flavum neque pallidum; et vultus vegetus et hilaris, et oculi nitentes et vividi; et dentes integri et fortes; et gressus firmus, artubus benè sustinentibus corpus; et incessus erectus et omnis exercitatio facilis, et labor tolerabilis, quamvis diuturnus et gravis et omnia organa externorum sensuum probè valentia ad sua munera neque torpida neque nimis acriter sentientia; et somni leves et diuturni, haud faciles ruptu, qui reficiunt corpus multùm, et vel prorsùs carent somniis, vel saltem horrificis et (vel) penitùs sopiunt placidâ quiete et jucundis obliviis vitæ vel recreant animum suaviter gratis imaginibus.—Porrò indicia sani corporis (sunt) temperatus motus sanguinis, et pulsus arteriarum validi, pleni, molles, æquales, neque nimis frequentes, neque tardi, neque facilè incitandi præter solitum;

fuerit sive fuscior, dummodo neque ad flavum neque pallidum vergat; et vultus vegetus et hilaris, et oculi nitentes et vividi; et dentes integri et fortes; et gressus firmus, artubus corpus bene sustinentibus; et incessus erectus, et exercitatio omnis facilis, et labor tolerabilis, quamvis diuturnus et gravis; et omnia sensuum externorum organa ad sua munera probe valentia, neque torpida neque nimis acriter sentientia; et somni leves et diuturni, haud faciles ruptu, qui corpus multum reficiunt, et somniis vel prorsus carent vel saltem horrificis; et vel placida quiete et jucundis vitæ obliviis penitus sopiunt, vel gratis imaginibus animum suaviter recreant.—Sani porro corporis indicia sunt, sanguinis motus temperatus, et pulsus arteriarum validi, pleni, molles, æquales, neque nimis frequentes, neque tardi, neque facile præter solitum inci-

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cheerful and lively, and the eyes bright and sparkling; teeth sound and strong; the step firm, with limbs well supporting the body; and the gait upright, and every exercise easy and labour supportable, although long continued and oppressive; and all the organs of the external senses properly competent to their functions, neither dull nor too acutely sensitive; and the periods of sleep light, long continued, not easily broken, which refresh the body considerably, are either entirely free from dreams, or at least frightful ones, and either completely lull in placid rest and sweet oblivion of life, or refresh the mind sweetly with pleasing images.—Moreover the signs of a healthy body are, moderate motion of the blood, the pulsations of the arteries strong, full, soft, regular, neither too quick, nor too slow, nor easily excited beyond the usual (rate); and the respiration full, easy, slow,

tandi; et respiratio plena, facilis, lenta, parum perspecta, neque multum ab exercitatione quivis accelerata, et vox fortis et sonora, et in viris gravis, haud facile rauca facta; et halitus oris gratus, saltem omni fœtore carens, et os humidum, et lingua nitida, non vero nimis rubra; et cibi appetitus magnus, nulla condimentorum ope egens, et sitis modica, et concoctio omnis escæ facilis et bona, sine ructu aut ventriculo ullo modo gravato; et excretio per alvum naturalis, quotidiana, et urīna justum tempus facile retenta, et cum tempus demum sit facile reddita; et quamvis varii coloris et crassitudinis et copiæ (pro ratione cibi potusque) sedimentum idoneum suo tempore deponens; quo tardius, eo fere melius; et exhalatio per cutem libera et constans, citra vero sudorem nisi validæ causæ concurrant; et secretiones internæ pariter con-

et respiratio, plena, facilis, lenta, parùm perspecta, neque multum accelerata ab quivis exercitatione, et vox fortis et sonora, et gravis in viris, haud facilè facta rauca; et gratus halitus oris, saltem carens omni fœtore, et os humidum, et lingua nitida, verò non nimis rubra et magnus appetitus cibi, egens nullâ ope condimentorum, et sitis modica, et facilis et bona concoctio omnis escæ, sine ructû aut ventriculo gravato ullo modo; et quotidiana naturalis excretio per alvum, et urina facilè retenta justum tempus et facile reddita cum sit demùm tempus; et deponens suo tempore idoneum sedimentum, quamvis varii coloris et crassitudinis et copiæ (pro ratione cibi que potûs); quo tardiùs, ferè eo meliùs; et libera et constans exhalatio per cutem verò citra sudorem, nisi validæ causæ concurrant; et internæ secretiones pariter

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slightly evident, nor much accelerated by any exercise; and the voice strong and sonorous, deep in men, not easily made hoarse; an agreeable exhalation of the mouth, free at least from all kind of fœtor, mouth moist, tongue clean, but not too red; a great appetite for food, requiring no aid of condiments, thirst moderate, easy and good digestion of every kind of food, without flatulence, or the stomach oppressed in any degree; a daily and natural evacuation from the bowels, and urine easily retained a proper time, and as easily expelled, when at length there is time for it: depositing in due time its proper sediment, although of varied colour and thickness and quantity, according to the nature of the food and drink, the slower generally the better; a free and constant exhalation from the skin, but not to sweating, unless powerful causes concur; the internal secretions equally constant and free, neither in excess nor too scanty. It is finally the (province) of a

constantes et liberæ, neque nimiæ, neque nimis parcæ.—Denique est sani hominis appetere Venerem et valere ad eam, et procreare sobolem:—Vero est quædam sanitas singularis et propria fœminis, quippe quæ habeant quasdam partes que fungantur muneribus multum diversis a virilibus. Igitur inter signa sanitatis harum oportet notare æquabilem et liberum fluxum mensium neque nimium neque nimis parcum; et felicem graviditatem et partum facilem et copiosam secretionem boni lactis, tempore quo decet.—Prætereà est sani et validi corporis utriusque sexus non modo probè functum esse suis muneribus, nihil impediente sed suæ tenacis prosperæ valetudinis accommodasse semet multis varietatibus, cœli, victûs, generis vitæ, et sic tolerasse impunè plurimas causas morborum, quales vel prorsùs fregissent corpus minus firmum

stantes et liberæ, neque nimiæ neque nimis parcæ.—Sani denique hominis est Venerem appetere, et ad eam valere et sobolem procreare.—Fœminis vero sanitas quædam singularis et propria est, quippe quæ partes quasdam habeant, muneribusque fungantur a virilibus multum diversis. Harum, igitur, inter sanitatis signa notare oportet, æquabilem et liberum mensium fluxum, neque nimium neque nimis parcum; et graviditatem felicem, et partum facilem, et, quo decet tempore, copiosam boni lactis secretionem. —Præterea sani et validi corporis utriusque sexus est, non modo suis, nihil impediente, probe functum esse muneribus, sed, tenacis prosperæ suæ valetudinis, multis, cœli, victus, vitæ generis, varietatibns semet accommodasse, et sic plurimas morborum causas impune tolerasse, quales minus firmum aut sanum

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healthy man to desire sexual intercourse, and to be competent to it, and to procreate offspring. But there is a certain kind of health peculiar and belonging to women, inasmuch as they have certain parts, and perform functions differing considerably from those of men. Therefore, amongst the characters of health of these, it is necessary to observe a regular and free discharge of the menses, neither excessive nor too scanty, also a favorable state of pregnancy, and easy labour, and a plentiful secretion of good milk at the season in which it is required. Moreover, it is (a character) of a healthy and strong body of each sex, that it has not only well performed its functions, nothing impeding it, but tenacious of its good health, that it has accommodated itself to the different varieties of the atmosphere, food, and mode of life, and has thus borne with impunity many causes of diseases, such as either would have entirely broken down a body less firm or healthy,

corpus vel prorsus fregissent, vel saltem in grave valetudinis discrimen perduxissent.—Postremo, sanitas eidem homini quamvis semper sanissimo, non prorsus eadem est. Plurimæ enim et gravissimæ varietates corporis ab ætate omnino pendent: nec quisquam hominum ab aliis ejusdem ætatis tantum differt, quantum variis vitæ temporibus a se ipso discrepat; sive formam spectemus, sive corporis vires, sive animi dotes, sive demum intima corporis penetralia muneraque ab iis pendentia perscrutemur. Quo fit, ut valetudo quam perfectissima, quæ corpus parvum et tenerum ad suum vigorem et perfectionem primo perduxit, et diu in hoc statu sustinuit, idem paulatim minuat, et tandem ad finem perducat; nam

"Nascentes morimur, finisque ab origine pendet."

20. Harum rerum, quæ omnes

aut sanum vel saltem perduxissent in grave discrimen valetudinis. — Postremò sanitas non est prorsus eadem eidem homini quamvis semper sanissimo. Enim plurimæ et gravissimæ varietates corporis pendent omninò ab ætate; nec quisquam hominum differt tantum ab aliis ejusdem ætatis, quantùm discrepat a se ipso variis temporibus vitæ; sive spectemus formam, sive vires corporis, sive dotes animi, sive demùm perscrutemur intima penetralia corporis que munera pendentia ab iis. Quo fit, ut valetudo quam perfectissima quæ primò perduxit corpus parvum et tenerum ad suum vigorem et perfectionem, et diù sustinuit in hoc statu, idem minuat paulatim et tandem perducat ad finem; nam

"Nascentes morimur, que finis pendet ab origine."

20. Cognitio harum re-

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or would at least have brought it into great danger of health. Lastly, health is not entirely uniform to the same person, although very healthy. For many, and most important varieties of the body, depend entirely upon the age; nor does any man differ so much from other individuals of the same age, as he differs from himself at the different periods of his life, whether we look to his figure, the powers of the body, the energies of the mind, or lastly, we inquire into the inmost recesses of his body, and the functions depending upon them. Whence it occurs, that the most perfect health, which first conducted the small and tender body to its vigour and perfection, and long supported it in this state, the same by degrees reduces it, and at last conducts it to its termination, for at our birth we die, and the end is suspended on the beginning.

20. The knowledge of these things, all which have reference to the healthy body, is called the Physiology of the human body.

rum, quæ omnes pertinent ad sanum corpus, vocatur Physiologia humani corporis.

21. Verùm enimverò, homo non modo nascitur, crescit, viget, senescit, moritur certo tempore secundum leges Naturæ; sed quoque fit obnoxius variis prope innumeris morbis qui corrumpant formam quamvis pulchram, frangant vires, impediant singulas actiones corporis, sæpe excrucient corpus gravibus doloribus neque pepercerint "particulæ Divinæ auræ ipsi."

22. Alii horum adoriuntur infantem ferè nascentem, nec rarò extinguunt. Alii potiùs invadunt juvenem fidentem viribus, nunc rapiunt cita morte, nunc consumunt lentâ tabe; dum alii magis obsident semitam labentis ætatis, quâ facilius opprimant corpus, debile, exhaustum, impar prælio: vel si non statim oppres-

ad sanum corpus pertinent, cognitio, Physiologia corporis humani vocatur.

21. Verum enimvero, homo, non modo certo, secundum Naturæ leges, tempore nascitur, crescit, viget, senescit, moritur; sed variis quoque, prope innumeris, morbis obnoxius fit, qui formam quamvis pulchram corrumpant, vires frangant, singulas corporis actiones impediant, corpus sæpe gravibus doloribus excrucient, neque ipsi pepercerint "Divinæ particulæ auræ."

22. Horum alii infantem, fere nascentem, adoriuntur, nec raro extinguunt. Alii juvenem viribus fidentem potius invadunt, nunc cita morte rapiunt, nunc lenta tabe consumunt; dum alii labentis ætatis semitam magis obsident, qua corpus, debile, exhaustum, prælio impar, facilius opprimant, vel, si non statim oppresserint,

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21. But indeed, man not only is born, grows up, is vigorous, becomes old, and dies, at a certain time, according to the laws of Nature; but also becomes liable to various and nearly numberless diseases, which may destroy his form, though beautiful, may break down his strength, may impede the separate actions of the body, may often torment the body with excruciating pains, nor will spare "the particle of divine essence itself."

22. Some of these assault the infant almost at birth, nor unfrequently destroy it; others rather attack the youth, confiding in his strength; at one time they snatch him away by sudden death, at another time they destroy him by slow consumption; whilst others rather beset the path of declining age, in which they can more easily weigh down the body, weak, exhausted, and unequal to the contest; or if they have not immediately overcome it,

longa valetudine macerent, donec tandem vita prorsus inops et miseranda cum optanda morte commutetur.

23. Tot tamque variorum graviumque morborum multas oportet esse causas; quarum naturæ et sedis et effectuum et modi, quo corpus humanum afficiant, scientia, Pathologia vocatur. Hæc vero est vel generalis vel specialis; quarum prioris tantum hic traduntur principia.

24. Morbus adest, quum corpus tantum a statu sano deflexerit, ut solitæ actiones vel prorsus impediantur vel ægre aut cum dolore perficiantur. Tunc dicitur homo ægrotare. Unicuique corporis parti, tam fluidæ quam solidæ, unicuique functioni, sua accidere possunt vitia. Hæc vero vel singula occurrunt vel plura simul juncta. Hinc morbi simplices vel compositi.

serint, macerent longâ valetudine donec tandem vita prorsùs inops et miseranda commutetur cum optandâ morte.

23. Oportet causas tot que tam variorum que gravium morborum esse multas: scientia naturæ et sedis et effectuum quarum et modi quo afficiant humanum corpus, vocatur Pathologia. Vero hæc est vel generalis vel specialis: principia prioris quarum tantùm hic traduntur.

24. Morbus adest, quum corpus tantum deflexerit a sano statu, ut solitæ actiones vel prorsus impediantur, vel perficiantur ægrè aut cum dolore.— Homo tunc dicitur ægrotare. Sua vitia possunt accidere unicuique parti corporis, tam fluidæ quam solidæ, unicuique functioni. Verò hæc occurrunt vel singula, vel plura juncta simul. Hinc simplices vel compositi morbi.

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they waste it away by tedious illness, until at length, life, quite helpless and wretched, is exchanged for a hoped-for death.

23. It is necessary that the causes of so many, so various and severe diseases should be numerous; a knowledge of the nature and situation and effects of which, and of the mode in which they affect the human body, is called Pathology. But this is either general or special: the principles of the former of which only, are here treated of.

24. Disease is present when the body has so far deviated from the healthy state, that its customary actions are either entirely impeded, or performed with difficulty or with pain. Man is then said to be ill. Its own disorders may happen to every part of the body as well fluid as solid, and to every function. But these occur single, or many united together. Hence there are simple or compound diseases.

25. Erit exemplum simplicissimi si quælibet partes corporis ruptæ, vel læsæ quîvis alio modo fuerint factæ minùs idoneæ propriis muneribus; aut si, fabricâ singularum partium omnino salvâ, ipsæ sive solidæ sive fluidæ aberraverint a sano statu; veluti si, propriis dotibus amissis vel corruptis, adeptæ sint sibi alias et fortasse noxias: vel denique si moventes vires fuerint aut nimiæ aut nimis parvæ, aut directæ contra normam Naturæ.

26. Verò rarissimè spectamus morbos hujusmodi, ferè attingimus acie solâ mentis; quippe nimirùm etiam simplicissimi, sive gignant alios morbos, sive indicia seu symptomata morborum, et dignoscantur his solis. Symptomata vel indicia morbi, sunt singulæ res quæ observantur in ægro præter naturam; verò præcipua, evidentissima, constantissima illorum faciunt, defi-

25. Simplicissimi exemplum erit, si quælibet corporis partes ruptæ, vel quivis alio modo læsæ, propriis muneribus minus idoneæ factæ fuerint: aut si, salva omnino singularum partium fabrica, ipsæ, sive solidæ sive fluidæ, a statu sano aberraverint: veluti si, propriis amissis vel corruptis dotibus, alias et fortasse noxias sibi adeptæ sint; vel denique si vires moventes, aut nimiæ, aut nimis parvæ fuerint, aut contra Naturæ normam directæ.

26. Hujusmodi vero morbos rarissime spectamus, fere sola mentis acie attingimus; quippe nimirum simplicissimi etiam, alios sive morbos, sive morborum indicia seu symptomata gignant, et his solis dignoscantur. Symptomata vel morbi indicia sunt singulæ quæ in ægro præter naturam observantur res; illorum vero præcipua, evidentissima, constantissima, morbum faciunt, definiunt; alia alia pro-

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25. There will be a specimen of a most simple (one,) if any parts of the body, being torn or injured in any other way, have been rendered less fitted for their proper functions; or if, the structure of individual parts being quite sound, the solids or fluids themselves have deviated from the healthy state; for example, if their own qualities being lost or corrupted, they have acquired to themselves others, perhaps, injurious ones; or lastly, if the moving powers be either too great, or too feeble, or directed contrary to the rule of Nature.

26. But we very rarely see diseases of this kind, we generally reach them by the acuteness alone of the mind; for, indeed, even the most simple give rise either to other diseases or signs or symptoms of diseases, and are distinguished by these alone. The symptoms or signs of disease are the several circumstances which are observed in the sick man, contrary to nature; but the principal, most evident, and most constant of them, form and define a

ducentia, prima ab ipsa morbi causa provenientia.

27. Varia profecto et prope innumera in ægris observantur morborum signa, quorum notitia, tum ad cognoscendos, tum quoque ad sanandos vel levandos morbos, medicinam facientibus imprimis utilis erit. Immensa vero talium signorum varietas haud inepte ad tria genera seu capita referri solet; functiones, scilicet, impeditas; sensus sive perceptiones molestas; et speciem aliasque corporis qualitates manifestas, vel quæ sensibus percipiuntur, mutatas aut vitiatas. Omnis nimirum morbus in læsa aliqua functione maxime consistit (24): harum vero nulla fere lædi vel impediri potest, quin brevi molestiam quandam ægro facessat, qua sciat se male habere. Nec quisquam fere diu ægrotare potest, quin species et forma corporis, et vultus color decens, quæ prosperæ

niunt morbum; alia producentia alia, prima provenientia a causâ ipsâ morbi.

27. Profectò varia et propè innumera signa morborum observantur in ægris, notitia quorum erit imprimis utilis facientibus medicinam, tum ad cognoscendos, tum quoque ad sanandos vel levandos morbos. Verò immensa varietas talium signorum solet referri haud ineptè ad tria genera seu capita; scilicet impeditas functiones; sensus sive perceptiones molestas; et speciem que alias qualitates corporis manifestas, vel quæ percipiuntur sensibus, mutatas aut vitiatas. Nimirùm omnis morbus maximè consistit in aliquâ læsâ functione. Verò nulla harum ferè potest lædi vel impediri, quin brevi facessat quandam molestiam ægro; quâ sciat habere se malè. Nec ferè quisquam potest ægrotare diu, quin species et forma corporis, et decens color vultûs, quæ

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disease; some giving rise to others, the first arising from the cause itself of disease.

27. Indeed, various and nearly numberless signs of diseases are observed in sick people; a knowledge of which will be especially useful to those practising medicine, both for discovering as well as for curing or relieving diseases. But the immense variety of such symptoms is accustomed to be referred, not improperly, to three genera or heads, namely, impeded functions, troublesome sensations or perceptions, and the appearance, and other evident qualities of the body, or such as are perceived by the senses, changed or disordered. Indeed every disease principally consists in some injured function; but none of these can commonly be injured or impeded, but that in a short time it produces some uneasiness to the sick man, by which he knows that he is unwell; nor commonly can any one be long ill, but that the appearance and form of body, and the comely colour of the countenance,

solent contingere prosperæ valetudini que depingere eandem tam pulchrè, plus minùsve corrumpantur.

28. Igitur signa læsarum animalium functionum imprimis sunt notanda medico inter indicia adversæ valetudinis; scilicet, indicia sensûs que voluntarii motûs habentium se malè. Enim singuli externi sensus possunt vitiari variis modis et revera sæpe vitiantur; nempè aut deficiunt et torpent, aut fiunt nimis acuti, nec exercendi sine molestiâ, aut fiunt abnormes et depravantur. Porro interni sensus sæpe afficiuntur a morbis. Vero affectiones omnium sensuum hujusmodi, vindicant sibi optimo jure attentionem medici, quatenùs non modo ipsæ interdum fiant morbi haud levis momenti, sed quantum sæpè, ostendant quam optimè naturam, et augmentum, vel remissionem aliorum que graviorum morborum.

valetudini contingere solent, eandemque tam pulchre depingere (19) plus minusve corrumpantur.

28. Medico, igitur, inter adversæ valetudinis indicia imprimis notanda sunt læsarum functionum animalium signa; sensus, scilicet, motusque voluntarii male se habentium indicia. Singuli enim sensus externi variis possunt vitiari modis, et revera sæpe vitiantur; nempe aut deficiunt et torpent, aut nimis acuti fiunt, nec sine molestia exercendi, aut abnormes fiunt et depravantur. Sensus porro interni sæpe a morbis afficiuntur. Hujusmodi vero omnium sensuum affectiones medici attentionem optimo jure sibi vindicant, quatenus non modo ipsæ haud levis momenti morbi interdum fiant, sed quantum naturam et augmentum vel remissionem aliorum graviorumque morborum sæpe quam optime ostendant.

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which are accustomed to occur to good health, and depict it so beautifully, are more or less impaired.

28. Therefore, the characters of impaired animal functions are especially to be observed by the physician, amongst the symptoms of bad health; namely, indications of sensation and voluntary motion being disordered. For all the external senses may be disordered in various ways, and are in truth often vitiated; that is, they are either defective and torpid, or become too acute, nor to be exercised without uneasiness, or become irregular and are depraved. Moreover, the internal senses are often affected by diseases. But the affections of all the senses of this description claim to themselves, by the greatest right, the attention of the physician, inasmuch as they themselves not only sometimes become diseases of no slight importance, but inasmuch as they frequently point out in the best possible manner the nature and increase or remission of other and more severe diseases.

29. Par ratio est cur ad conditionem et læsiones facultatis movendi semper sit respiciendum; sive illa defecerit, ut in omnibus fere morbis solet, quod debilitas vocatur; vel perdita fuerit, ut in paralysi; vel præter naturam intensa, quod in quibusdam cerebri affectionibus nonnunquam accidit; sive demum abnormis fuerit, veluti in convulsionibus aliisque similibus morbis.

30. Neque sane ægri conditio quod ad somnum negligi debet: qui, sive ipse pro functione corporis, sive tantum pro vacatione ab aliis functionibus habendus sit, modum suum naturalem et sanitatis legibus consentaneum habet, qui modus in plerisque morbis haud parum turbari solet; ita ut somnus vel nullus sit vel nimius vel interruptus vel diris somniis terrificus; neque somnus qui fuerit, ægrum ut decet, recreet.

29. Est par ratio, cur semper respiciendum sit ad conditionem et læsiones facultatis movendi; sive illa defecerit, ut solet fere in omnibus morbis, quod vocatur debilitas vel fuerit perdita ut in paralysi; vel intensa præter naturam, quod nonnunquam accidit in quibusdam affectionibus cerebri; sive demùm fuerit abnormis, veluti in convulsionibus que aliis similibus morbis.

30. Neque sanè conditio ægri debet negligi quod ad somnum; qui sive ipse habendus sit pro functione corporis sive tantùm pro vacatione ab aliis functionibus, habet suum naturalem modum et consentaneum legibus sanitatis, qui modus solet turbari haud parùm in plerisque morbis; ita ut somnus sit vel nullus vel nimius vel interruptus vel terrificus diris somniis, neque somnus qui fuerit, recreet ægrum ut decet.

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29. There is equal reason why we must always look to the condition and injuries of the faculty of moving, whether it be defective, as is usual in nearly all diseases, which is called debility, or has been lost, as in paralysis, or extended preternaturally, which sometimes occurs in certain cerebral affections, or lastly, has been irregular, as in convulsions and other like diseases.

30. Nor indeed the state of the patient ought to be neglected in reference to sleep, which, whether it is to be considered as a function of the body, or as a cessation from the other functions, has its own natural mode, and according with the laws of health; which mode is wont to be deranged considerably in many diseases. So that sleep may be either wanting, or excessive, or interrupted, or alarming from frightful dreams; nor can sleep which may have occurred, refresh the patient as it ought.

31. Autem signa læsarum vel habentium se malè vitalium functionum sunt adhuc majoris momenti; scilicet quæ non modò benè ostendant naturam morbi et statum ægri, sed quoque non careant suo periculo, saltem si fuerint vehementiora. Hujusmodi sunt omnes varietates pulsuum, nimirum quæ ostendant aut motum sanguinis deficere, aut esse nimium aut abnormem, veluti in febribus, inflammationibus, defectionibus animi.

32. Morbidæ affectiones spiritûs non immeritò tenent proximum locum his, veluti omnis insolita velocitas vel tarditas spirandi, aut quævis difficultas, aut tussis, sternutatio, suspirium et similia; quibus fortasse licet adjicere varias affectiones vocis, quamvis profectò hæ potius pertineant ad primum genus. (29.)

33. Porrò signa læsarum naturalium actionum (9)

31. Signa autem læsarum vel male se habentium functionum vitalium majoris adhuc momenti sunt; scilicet quæ non modo morbi naturam et ægri statum bene ostendant, sed suo quoque periculo, vehementiora saltem si fuerint, non careant. Hujusmodi sunt omnes pulsuum varietates, nimirum quæ ostendant aut deficere sanguinis motum, aut nimium, aut abnormem esse, veluti in febribus, inflammationibus, animi defectionibus.

32. Proximum his locum tenent non immerito spiritus affectiones morbidæ, veluti omnis spirandi velocitas aut tarditas insolita, aut difficultas quævis, aut tussis, sternutatio, suspirium et similia; quibus fortasse adjicere licet varias vocis affectiones, quamvis profecto hæ potius ad primum (29) genus pertineant.

33. Porro signa læsarum actionum naturalium (9) sedulo obser-

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31. But the signs of injured or deranged vital functions are of still greater importance: for they not only can point out the nature of the disease and state of the patient, but also are not free from their own danger, at least if they have been more violent. Of this description are all the varieties of pulses; namely, which shew either that the circulation of the blood is languid, or too rapid, or irregular, as in fevers, inflammations, and faintings.

32. The morbid affections of respiration not undeservedly occupy the next place to these, as every unusual velocity, or slowness of breathing, or any difficulty, or cough, sneezing, sighing, and the like; to which, perhaps, it is proper to add various affections of the voice, although, indeed, these may rather appertain to the first kind (29).

33. Moreover the signs of injured natural actions are carefully to be observed: for instance, deficiency, excess, depravation, or any unusual con-

vanda sunt; famis, scilicet, aut sitis defectus, excessus, depravatio, conditio quævis insolita; actionis mandendi et devorandi et concoctionis varia vitia; et alvi status vel astrictæ præter naturam vel nimis solutæ; et secretionum, et quæ magis sub nostris sensibus cadunt, excretionum, præsertim urinæ et sudoris, excessus, defectus, difficultas, depravatio.—Neque sane negligendæ sunt læsiones functionum utrique sexui, muliebri imprimis, propriarum.

34. Quod ad sensus ingratos vel molestos (27) pertinet; frequentissimi morborum comites et signa observantur; quorum pauci aliqua saltem molestia carent. Non aliter enim ac sanus suis facile, nec sine voluptate quadam, plerisque fungitur muneribus; sic æger, his impeditis, dolet, angitur variisque molestiis afficitur. Igitur ad hoc

sunt sedulò observanda; scilicet, defectus, excessus, depravatio, quævis insolita conditio famis aut sitis; varia vitia actionis mandendi et devorandi, et concoctionis; et status alvi, vel astrictæ præter naturam, vel nimis solutæ; et excessus, defectus, difficultas, depravatio secretionum, et excretionum præsertim urinæ et sudoris, quæ magis cadunt sub nostris sensibus. —Neque sanè læsiones functionum propriarum utrique sexui, imprimis muliebri, sunt negligendæ.

34. Quod pertinet ad ingratos vel molestos sensus; observantur frequentissimi comites et signa morborum, pauci quorum carent aliquâ molestiâ saltem. Enim non aliter ac sanus fungitur suis plerisque muneribus facilè, nec sine quâdam voluptate; sic æger his impeditis, dolet, angitur, que afficitur variis mo-

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dition of hunger or thirst; the various disorders of the action of masticating and swallowing, and digestion; and the state of the bowels, whether confined more than natural or too relaxed; and excess or deficiency, difficulty, or depravation, of the secretions and excretions, particularly of the urine and sweat, which fall more under our senses. Nor indeed the injuries of the functions peculiar to each sex, especially the female, are to be overlooked.

34. As to what relates to troublesome and uneasy sensations, they are observed as very frequent attendants and symptoms of diseases, few of which are free from some degree of uneasiness at least. For not otherwise than healthy (man) performs his numerous functions with ease, and not without some pleasure; so the sick man, these functions being impeded, is in pain, is fretted and affected with various annoyances. Therefore, to this head

lestiis. Igitur at hoc caput pertinent dolor anxietas, pruritus, que sensus lassitudinis, torporis, stuporis, caloris, frigoris, ponderis, et forsitàn benè multi alii ingrati sensus nausea, vertigo, tinnitus, &c. quos placuit medicis relegare aliò; omnium quorum tanta est vis et molestia ut sæpè efficiant magnam partem morbi et miserrimè agitent, fatigent, torqueant, terreant, ægros, tandem evasuri terribiliores morte ipsâ. Neque profectò tales molesti sensus semper carent aliquo periculo, qualescunque fuerint causæ eorum.

caput pertinent, dolor, anxietas, pruritus, sensusque lassitudinis, torporis, stuporis, caloris, frigoris, ponderis, et alii forsitan bene multi sensus ingrati, nausea, vertigo, tinnitus, &c. quos medicis alio relegare placuit: quorum omnium tanta vis et molestia est, ut magnam sæpe morbi partem efficiant, et ægros miserrime agitent, fatigent, torqueant, terreant, tandem morte ipsa terribiliores evasuri. Neque profecto periculo aliquo semper carent tales sensus molesti, qualescunque fuerint eorum causæ.

35. Ad tertium genus signorum morbidorum (27), corporis nimirum qualitates manifestas vitiatas, referuntur res omnes in ægro præter naturam observandæ, neque ad alia genera pertinentes, de quibus nostris sensibus, non ægri dictis aut querelis, certiores fimus. Cujusmodi sunt, color corporis et

35. Ad tertium genus morbidorum signorum nimirùm manifestas vitiatas qualitates corporis, omnes res referuntur, observandæ in ægro præter naturam, neque pertinentes ad alia genera de quibus fimus certiores nostris sensibus, non dictis aut querelis ægri. Cujusmodi sunt, color corporis et

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belong pain, anxiety, itching, a sensation of weariness, languor, stupor, heat, cold, weight, and perhaps very many other unpleasant sensations, such as nausea, vertigo, ringing of the ears, &c., which it has pleased medical men to place elsewhere; of all which, such is the influence and trouble, that they often form a great part of the disease, and most frightfully agitate, fatigue, torment, and frighten those who are ill, at length about to become more terrible than death itself. Nor, indeed, such uneasy sensations are always free from some danger, whatever may have been the causes of them.

35. To the third kind of morbid signs, namely, the visible vitiated qualities of the body, all those circumstances are referred to be observed in a sick man, as unnatural, nor belonging to the other genera, of which we are informed by our senses, not by the words and lamentations of the patient. Which description are of a vitiated colour of the body, and especially of the

præsertim vultus vitiatus, et præter solitum pallidus, ruber, flavus, fuscus, lividus, varians; peculiaris quoque vultus aspectus, ab actione musculorum, aut motu sanguinis, et sæpe a statu animi pendens, nullisque describendus verbis, qui tamen ægri conditionem, quod ad vires vitæ, et morbi levamen aut augmentum, omni sermone melius et certius depingit, nunquam negligendus: Variæ imprimis oculorum conditiones, languor et hebetudo, aut rubor, aut splendor, aut ferocitas insolita, eorumque præter solitum distortio, et aliæ species morbidæ, veluti si excavati sunt vel alter vel uterque clauditur, vel alter altero major apparet non ita solitus. Sedulo quoque observandæ sunt oris et præsertim linguæ conditiones, rubræ, albidæ, sordidæ, nigricantis, aridæ, quæ præsentes morbum demonstrant; decedentes aut in melius versæ, eun-

præsertim vultûs vitiatus, et præter solitum pallidus, ruber, flavus, fuscus, lividus, varians; quoque peculiaris aspectus vultûs, pendens ab actione musculorum, aut motû sanguinis, et sæpe a statû animi, que describendus nullis verbis, nunquam negligendus tamen qui depingit meliùs et certiùs omni sermone conditionem ægri quod ad vires vitæ et levamen aut augmentum morbi: Imprimis variæ conditiones oculorum, languor et hebetudo, aut rubor aut splendor, aut insolita ferocitas que præter solitum distortio eorum; et aliæ morbidæ species, veluti si sunt excavati, vel alter vel uterque clauditur, vel alter apparet major altero non ita solitus. Quoque conditiones oris et præsertim linguæ sunt sedulò observandæ, rubræ, albidæ, sordidæ, nigricantis, aridæ, quæ præsentes demonstrant morbum; decedentes aut versæ in me-

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countenance, unusually pale, red, yellow, brown, livid, or changeable; also a peculiar appearance of the countenance, depending upon the action of the muscles, or circulation of the blood, and often upon a state of mind, and to be described by no terms, never to be neglected, but which depicts better and more truly than all language, the state of the sick man as to the powers of life, and the decrease or increase of the disease: particularly different states of the eyes, heaviness and dulness, redness or brightness, or unusual ferocity or distortion of them beyond what is customary; and other morbid appearances, as if they are sunk, or one or both are closed, or one appears larger than the other, not as usual. Also the states of the mouth, and especially of the tongue, are carefully to be examined, (whether) red, white, furred, blackish, or dry, which, when present, indicate disease, disappearing or changed for the better, show that the disease is yielding. Besides, also

lius sæpè ostendunt eundem decedentem. Quin et varii morbidi odores aliquando detegunt naturam morbi, et ideò merentur observari; scilicet insolitus odor sive fætor halitus pulmonis vel cutis, vel singularum excretionum, vel universi corporis, vel cujusvis partis ejus, veluti in carcinomate, variolâ morbis putridis. Quòque multæ vitiatæ qualitates corporis, quæ maximè percipiuntur tactu, calor, frigus, durities vel rigiditas, mollities, humiditas, siccitas, crassitudo, tenuitas, tumor, macies, vel universi corporis vel singularum partium debent observari omni curâ. Autem eo magis decet attendere ad vitia manifestarum qualitatum corporis hujusmodi, quia facilè observentur et sint minimè fallacia, neque æger possit celare ea medicum, neque, ut medicus intelligat rem, opus sit multis interrogationibus, quæ sunt sæpè admodùm ingratæ.

dem decedentem sæpe ostendunt. Quin et odores varii morbidi naturam morbi aliquando detegunt, et ideo observari merentur: odor, scilicet, sive fætor insolitus halitus pulmonis vel cutis, vel excretionum singularum, vel universi corporis, vel partis ejus cujusvis, veluti in carcinomate, variola, morbis putridis. Multæ quoque, quæ tactu maxime percipiuntur, qualitates corporis vitiatæ, calor, frigus, durities vel rigiditas, mollities, humiditas, siccitas, crassitudo, tenuitas, tumor, macies, vel universi corporis vel partium singularum, omni cura observari debent. Ad hujusmodi autem qualitatum manifestarum corporis vitia eo magis attendere decet, quia facile observentur, et minime fallacia sint, neque æger ea medicum celare possit, neque, ut rem intelligat medicus, multis, quæ sæpe admodum ingratæ sunt, opus sit interrogationibus.

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various morbid odours sometimes detect the nature of the disease, and on that account are worth being observed; for instance, an unusual odour, or fætor of the exhalation of the lungs or skin, or of the several excretions, either of the whole body, or of any part of it, as in carcinoma, small-pox, and in putrid diseases. Also many vitiated qualities of the body, which are principally perceived by the touch; (such as) heat, cold, hardness, or stiffness, softness, moisture, dryness, thickness, thinness, swelling, emaciation, either of the whole body or of the separate parts, ought to be observed with all care. But it is so much the more proper to attend to the disorders of the evident qualities of the body of this kind, because they may be easily seen, and are by no means fallacious, nor can the patient conceal them from the medical man; neither, in order that the physician may understand the subject, is there need of many questions, which are frequently very unpleasant.

36. Causa multifariam dicitur apud medicos cum de morbis disserunt; et sensu profecto aliquantum diverso ab eo quo hoc vocabulum usurpari solet, vel in scriptis philosophorum, vel in communi hominum sermone. Varios, igitur, medicos sensus vocabuli causæ, vel usitatissimos saltem, unumquemque medicinæ studio incumbentem scire oportet.

37. Distinguunt imprimis medici morbi causas in proximam et remotas; remotas iterum in prædisponentes et occasionales vel excitantes vel potentias nocentes.

38. Causa proxima, ut definiunt scriptores medici, est illa quæ præsens morbum facit, sublata tollit, mutata mutat.

39. Causa prædisponens est illa quæ corpus tantum morbo opportunum reddit; scilicet ut admota causa excitante in morbum incidat.

40. Causa demum occasionalis

36. Causa dicitur multifariàm, apud medicos, cùm disserunt de morbis; et profectò sensu aliquantùm diverso ab eo, quo hoc vocabulum solet usurpari, vel in scriptis philosophorum, vel in communi sermone hominum. Igitur oportet unumquemque incumbentem studio medicinæ scire varios medicos sensus vocabuli causæ, vel saltem usitatissimos.

37. Imprimis medici distinguunt causas morbi in proximam et remotas; iterum remotas in prædisponentes et occasionales, vel excitantes vel nocentes potentias.

38. Proxima causa, ut medici scriptores definiunt est illa quæ præsens facit morbum, sublata tollit, mutata mutat.

39. Prædisponens causa est illa quæ tantùm reddit corpus opportunum morbo; scilicet ut, causâ excitante admotâ, incidat in morbum.

40. Demùm occasionalis

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36. The word cause is mentioned multifariously by medical men when they treat of diseases; and, indeed, in a sense somewhat different from that in which this term is wont to be used either in the writings of philosophers, or in common discourse. Therefore it is necessary that every one applying himself to the study of medicine should know the various medical meanings of the word Cause, or at least those most in use.

37. In the first place, physicians distinguish the causes of disease into proximate and remote; again the remote into predisposing and occasional, or exciting or noxious powers.

38. The proximate cause, as medical writers define it, is that which when present constitutes disease, removed takes it away, altered changes it.

39. The predisposing cause is that which only renders the body liable to disease; namely that, an exciting cause being applied, it may fall into disease.

vel excitans causa est ea quæ excitat morbum in corpore jam facto proclivi (39).

41. Igitur conditio corporis quæ facit obnoxium morbo, est corrigenda: remotæ causæ, quæ excitant morbum, evitandæ; proxima causa morbi tollenda; et singula indicia ejusdem, quæ sunt maximè molesta, mitiganda. Sic morbi præcaventur, sanantur, levantur.

42. Remotior causa, quæ facit tantùm proclivitatem ad morbos, semper hæret in corpore ipso, licet sæpè duxerit primam originem extrinsecus; verò excitans potest esse vel intùs vel extrinsecus. Utrâque concurrente morbus fit, quem neutra sola potest efficere. Enim neque in omni homine omnis excitans causa morbi facit morbum; neque omnes qui jam sunt facti proclives ad morbos, incidunt in morbos nullâ excitante causâ admotâ.

vel excitans est ea quæ in corpore jam proclivi facto (39) morbum excitat.

41. Corrigenda, igitur, est corporis conditio quæ morbo obnoxium facit; evitandæ causæ remotæ quæ morbum excitant; tollenda proxima morbi causa; et mitiganda singula ejusdem indicia quæ maxime molesta sunt. Sic morbi præcaventur, sanantur, levantur.

42. Causa remotior, quæ proclivitatem tantum ad morbos facit, in ipso corpore semper hæret, licet sæpe extrinsecus primam originem duxerit: causa vero excitans vel i tus vel extrinsecus esse potest. Concurrente utraque fit morbus, quem neutra sola efficere potest. Neque enim in omni homine omnis causa morbi excitans morbum facit; neque omnes qui jam ad morbos proclives facti sunt, nulla admota causa excitante, in morbos incidunt.

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40. Lastly, the occasional or exciting cause is that which excites disease in a body already rendered liable to it.

41. Therefore the state of the body, which renders it liable to disease, is to be corrected; the remote causes, which excite disease, are to be avoided; the proximate cause of disease is to be removed; and the several symptoms of the same, which are most troublesome, are to be mitigated. Thus diseases are prevented, cured, and relieved.

42. The more remote cause, which produces only a tendency to disease, always is inherent in the body itself, although it has frequently derived its first origin from without; but the exciting cause can be either within or without. Both of them concurring, disease is established, which neither of them alone can produce. For neither, in every person, does every exciting cause produce disease, nor do all men, who are already become predisposed to diseases, fall into diseases, no exciting cause being applied.

43. Corpus itaque morbo jam factum opportunum, a statu sano et perfectissimo nonnihil deflexisse videtur, licet nondum actiones ejus adeo impediantur, ut verus morbus recte dicatur adesse (24). Nonnunquam vero talis corporis conditio diu perstans eo usque ingravescit, ut sola, nulla adjecta causa excitante, justum et manifestum morbum faciat; vel, ut quidam loqui amant, causa quoque excitans fiat. Solidarum partium debilitas generalis, partiumque solidarum, quæ, distinctionis causa, vivæ dicuntur, mobilitas nimia, corporis plenitudo, a nimia sanguinis abundantia hujusmodi exempla sunt.

44. Nec quisquam hominum tam firmam valetudinem, tantumque corporis robur habet, quin, causis quibusdam excitantibus admotis, in gravissimos morbos incidat. Variola semel, lues venerea sæpe,

43. Itaque corpus jam factum opportunum morbo, videtur deflexisse nonnihil a sano et perfectissimo statu, licet actiones ejus nondum adeò impediantur, ut verus morbus rectè dicatur adesse (24). Vero nonnunquam talis conditio corporis diù perstans ingravescit eo usque, ut sola, nullâ excitante causâ adjectâ, faciat justum et manifestum morbum; vel, ut quidam amant loqui, fiat quoque excitans causa. Generalis debilitas solidarum partium, que nimia mobilitas solidarum partium quæ, causâ distinctionis, dicuntur vivæ, plenitudo corporis a nimiâ abundantiâ sanguinis, sunt exempla hujusmodi.

44. Nec habet quisquam hominum tam firmam valetudinem, que tantum robur corporis, quin quibusdam excitantibus causis admotis, incidat in gravissimos morbos. Variola semèl, lues venerea

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43. Therefore, the body already rendered liable to disease, appears to have declined somewhat from its healthy and most perfect state, although its actions are not yet so much impeded, that a real disease may be properly said to be present. But sometimes such a state of body, long continuing, increases to such a degree, that it alone, no exciting cause being added, may form a real and evident disease; or, as some like to express themselves, it may become also an exciting cause. General weakness of the solids, and excessive mobility of the solid parts, which, for the sake of distinction, are called living, a full habit of body from too great abundance of blood, are instances of this description.

44. Nor has any one such firm health and such strength of body, but that certain exciting causes being applied, he may fall into very severe diseases. Smallpox once, lues venerea, frequently, infect even the most healthy per-

sæpe, inficiunt etiam sanissimos; venena necant; nimium caloris vel frigoris nocet multimodis.

45. Quoque excitans causa quanqnam non statim induxerit morbum, si perstiterit diù, paulatim corrumpet constitutionem corporis quamvis validissimam, et reddet obnoxiam variis morbis; scilicet, gignit alteram remotam causam, nempe quæ facit corpus opportunum morbo vel convertitur in eam. Igitur eadem res nunc potest esse excitans causa, nunc rursus remotior causa.— Intemperies cœli, desidia, luxus, sunt exempla hujusmodi.

46. Porrò, de his tribus generibus causarum morbi, juvabit scire, notionem remotarum causarum utriusque generis (37) esse justam, et magni momenti in medicâ re.— Enim quamvis medici sæpè erraverint haud parùm de remotis causis variorum morborum, cùm

etiam sanissimos inficiunt; venena necant; caloris vel frigoris nimium multimodis nocet.

45. Causa quoque excitans quanquam non statim morbum induxerit, si diu perstiterit, constitutionem corporis, quamvis validissimam, paulatim corrumpet, et variis morbis obnoxiam reddet; scilicet alteram causam remotam, nempe quæ corpus morbo opportunum facit, gignit, vel in eam convertitur. Eadem igitur res nunc causa excitans, nunc rursus causa remotior, esse potest. Cœli intemperies, desidia, luxus hujusmodi exempla sunt.

46. De his porro tribus generibus causarum morbi, scire juvabit, notionem causarum remotarum utriusque generis (37) justam esse, et magni momenti in re medica. Quamvis enim medici haud parum sæpe erraverint de causis remotis variorum morborum, cum temere

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sons. Poisons destroy; and excess of heat or cold is injurious in many ways.

45. Also an exciting cause, although it may not directly have produced disease, if it has long continued, will gradually destroy the constitution of the body, although very strong, and will render it liable to various diseases; that is to say, it generates another remote cause, namely, such as renders the body liable to disease, or is converted into it. Therefore the same circumstance at one time can be an exciting cause, at another time again a more remote cause. Inclemency of weather, idleness, and luxury, are instances of this kind.

46. But concerning these three kinds of causes of disease, it will be useful to know, that the idea of remote causes of each kind (38) is proper, and of great importance in the practice of medicine. For although medical men

de iis statuere ausi sunt; tamen notiones generales de iis quæ ipsis in animo versarentur sanæ fuerunt: multorumque sane morborum causæ remotæ, tam prædisponentes quam excitantes, vel observando, vel experiendo, et caute ratiocinando, jam satis cognitæ sunt et exploratæ: earumque notitia medicis utilissima est.

47. Causam vero proximam quod attinet, ipsa ejus notio generalis, si non prorsus falsa, saltem confusa admodum est, et obscura, et temere a rebus abstracta. Quærunt enim medici, et non facile invenientes, sibimet fingunt aliquid causæ omnis morbi, unde iste morbus oriatur, eodem fere modo ac variæ mutationes vel effectus, quæ in rebus inanimatis observantur, a suis causis proveniunt. In plerisque autem affectionum, quas morbos vocare solemus, nihil istiusmodi existere videtur, neque pro-

ausi sunt temerè statuere de iis; tamen generales notiones de iis, quæ versarentur in animo ipsis, fuerunt sanæ; que sanè remotæ causæ, tam prædisponentes quam excitantes multorum morborum jam satis cognitæ et exploratæ sunt, vel observando, vel experiendo et caute ratiocinando; que notitia earum est utilissima medicis.

47. Verò quod attinet proximam causam, generalis notio ipsa ejus, si non prorsùs falsa, saltem est admodum confusa et obscura, et temerè abstracta a rebus. Enim medici quærunt, et non facilè invenientes, fingunt sibimet aliquid causæ omnis morbi, unde iste morbus oriatur, ferè eodem modo ac variæ mutationes vel effectus quæ observantur in inanimatis rebus, proveniunt a suis causis. Autem nihil istiusmodi videtur existere in plerisque affectionum, quas solemus vocare mor-

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have frequently erred considerably concerning the remote causes of various diseases, when they rashly ventured to determine upon them; nevertheless, the general ideas concerning them, which were turned over by them in their mind, were correct: and, in truth, the remote causes, both predisposing as well as exciting, of many diseases, are already well known and ascertained, either by observing, or experimenting, and careful reasoning; and a knowledge of them is most useful to medical men.

47. But, as to what relates to the proximate cause, the general notion of it, if not entirely erroneous, is at least very confused and obscure, and injudiciously deduced from facts. For medical men seek, and not easily finding it, imagine to themselves some cause of every disease, whence that disease may arise, almost in the same way as the various changes or effects which are observed in inanimate objects, proceed from their causes. But nothing of that description appears to exist in many of the affections, which

bos, neque profectò potest existere; et talis notio planè oritur, a malè intellectâ naturâ, tum corporis ipsius, tum morborum qui fiunt in eo. Enim morbus non est unus et simplex eventus vel mutatio, qualem solemus contemplari in inanimatis rebus et vocare effectum; sed series sæpè longa talium eventuum vel mutationum; quarum aliæ videntur esse causæ aliis (26). Quidem potest fieri, ut unâ alterâve harum sublatâ, tota series vel abrumpatur, vel desinat brevi; et sic morbus mutetur in sanitatem. Sed hoc est minimè perpetuum, neque in omni morbo, neque ferè in quolibet morbo omni tempore. Prætereà corpus ipsum habet se longe aliter ac res inanimata, quod ad mutationes quæ fiunt in eo, et causas, sive externas sive internas unde hæ proveniant. Enim aliquod principium mutationis inest corpori

fecto existere potest; et talis notio plane oritur a male intellecta natura, tum corporis ipsius, tum quoque morborum qui in eo fiunt. Morbus enim non est unus et simplex eventus vel mutatio, qualem in rebus inanimatis contemplari solemus et effectum vocare; sed series, sæpe longa, talium eventuum vel mutationum; quarum aliæ aliis causæ videntur esse (26). Fieri quidem potest, ut, sublata una alterave harum, tota series vel abrumpatur, vel brevi desinat; et sic morbus in sanitatem mutetur. Sed hoc minime perpetuum est, neque in omni morbo, neque in quolibet fere morbo omni tempore. Præterea, corpus ipsum longe aliter se habet ac res inanimata, quod ad mutationes quæ in eo fiunt, et causas, sive externas sive internas, unde hæ proveniant. Inest enim corpori vivo principium aliquod mutationis, simile quo-

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we are wont to call diseases, nor, indeed, can exist; and such an idea evidently arises from the slightly understood nature, as well of the body itself, as of the diseases which take place within it. For disease is not a single and simple event or change, such as we are accustomed to observe in inanimate objects, and to call an effect; but a series frequently long of such occurrences and changes, some of which appear to be causes to the others. It can indeed happen, that one or a second of these being removed, the whole series may either be disconnected or shortly cease; and thus disease may be changed into health. But this is by no means a constant occurrence, neither in every disease, nor scarcely in any disease, on every occasion. Moreover the body itself is constituted far otherwise than an inanimate object, as to the changes which take place in it, and as to the causes whether external or internal whence these proceed. For some principle of change

dammodo illi quod in herbis observatur, et longe alienum a natura materiæ inanimatæ, ægre definiendum, nondum ea qua par esset diligentia et accuratione exploratum, vitale principium haud inepte nominandum, cui vix minus quam causis vulgo observatis tribuendæ sunt plurimæ mutationes, tam morbosæ quam salutares, quæ corpori eveniunt. Hæc quum ita sint, non mirum esse poterit multa medicorum commenta de causis proximis variorum morborum prorsus futilia esse, et non modo falsa, sed adeo confusa et obscura, ut vix possint intelligi, neque fortasse ab ipsis eorum auctoribus unquam satis intellecta fuerint.

48. Unde vero morbi, vel morborum causæ? Certe ab ipsa imprimis machinæ animalis constitutione. Ut vitrum ex officina prodit fragile, sic homines debiles,

vivo, quodammodo simile illi quod observatur in herbis et longe alienum a naturâ inanimatæ materiæ, ægrè definiendum, nondum exploratum eâ diligentiâ et accuratione quâ par esset, haud ineptè nominandum vitale principium, cui plurimæ mutationes, tam morbosæ quam salutares quæ eveniunt corpori, sunt tribuendæ vix minùs quam causis vulgò observatis. Quum hæc sint ita, non poterit esse mirum, multa commenta medicorum de proximis causis variorum morborum, esse prorsùs futilia, et non modo falsa, sed adeò confusa et obscura, ut vix possint intelligi neque fortasse unquam fuerint satis intellecta ab auctoribus ipsis eorum.

48. Vero unde morbi, vel causæ morborum? Certè imprimis a constitutione ipsâ animalis machinæ. Ut vitrum prodit fragile ex officinâ, sic homines nascuntur debiles,

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exists in the living body, in some degree like to that which is observed in plants, and widely different from the nature of inanimate matter, with difficulty to be defined, not yet examined with that diligence and accuracy, which might be proper, not inaptly designated the vital principle: to which, many of the changes, both morbid and healthy, which occur to the body, are to be attributed scarcely less, than to the causes commonly observed. Since these things are so, it cannot be surprising, that many theories of medical men on the proximate causes of various diseases are entirely futile, and not only erroneous, but so confused and obscure, that they can scarcely be understood, nor perhaps have they ever been satisfactorily understood by the authors of them themselves.

48. But whence are diseases, or the causes of diseases? In truth, especially from the constitution itself of the animal machine. As glass issues brittle from the manufactory, so men are born weak, falling away, and liable to

caduci, opportuni morbis. Hinc multi morbi communes omnibus, idoneâ excitante causâ modò admotâ. Sed quidam homines præ cæteris plectuntur aliis atque aliis morbis. Ratio hujus rei multiplex.

caduci, morbis opportuni, nascuntur. Hinc multi morbi, causa modo excitante idonea admota, omnibus communes. Sed quidam præ cæteris homines aliis atque aliis plectuntur morbis. Hujus rei ratio multiplex.

49. Ut sanus gignit sanam prolem, sic morbosus morbosam. Hinc sunt hæreditarii morbi transituri in seros nepotes. Hoc modo sæpe immeriti luimus delicta majorum. Sunt quidam ex his morbis, qui produnt sese apertè primâ ætate; sunt qui invadunt pariter omnem ætatem; nec desunt qui occulti delitescunt usque ad summam senectutem, neque suspecti, que nacti vires paulatim, demùm erumpunt graviùs, quisque suo tempore.

49. Ut sanus sanam prolem, sic morbosus morbosam gignit. Hinc morbi hæreditarii in seros nepotes transituri. Hoc modo sæpe delicta majorum immeriti luimus. Sunt quidam ex his morbis qui prima ætate sese aperte produnt; sunt qui omnem ætatem invadunt pariter; nec desunt qui ad summam usque senectutem occulti delitescunt, neque suspecti, viresque paulatim nacti, suo quisque demum tempore, gravius erumpunt.

50. Sunt morbi vel vitia qui nascuntur nobiscum, neque tamen congenita; nempe, si fœtus donec lateret in utero, matre forsan incolumi,

50. Sunt qui nobiscum nascuntur morbi vel vitia, neque tamen congenita: nempe, si donec in utero lateret, matre fortan incolu-

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diseases. Hence many diseases common to all mankind, a proper exciting cause only being applied. But some men, compared with others, are afflicted with some or other diseases: the reason of this circumstance is manifold.

49. As a healthy man begets healthy offspring, so a sickly man begets a sickly one; hence there are hereditary diseases about to pass down to remote descendants; in this way we often, undeserving it, pay for the vices of our ancestors. There are some of these diseases which show themselves openly in infancy; there are some which attack indiscriminately every age, nor are there wanting those which hidden lie dormant even to extreme old age, nor suspected, and gaining strength by degrees, at length burst forth with greater severity, each in its season.

50. There are diseases or disorders which are born with us, not however congenital; for instance, if the fœtus, whilst it lay hid in the womb, with the mother perchance uninjured, has received some injury only from some

mi, fœtus tantum a casu quovis aliquid detrimenti acceperit. Sunt forsitan neque simul nati neque congeniti morbi, quos cum primo nutricis lacte infans suxisse videtur.

51. Porro, sunt qui varios ætatis gradus sequuntur, et suum quisque solum comitantur; nempe, qui ex iis quas corpus, variis ætatibus mutationibus subit, originem ducunt. Hinc varii infantum, juvenum, senum, morbi.

52. Quin et uterque sexus, præsertim muliebris, suos morbos habet, cum a generali corporis habitu provenientes, tum quoque a fabrica speciali, et statu, et usu, quæ generationi inserviunt, partium. Sunt igitur et virorum et fœminarum morbi; sunt virginum, gravidarum, parturientium, lactantium, vetularum.

53. Cœlum ipsum, sub quo degunt homines, nonnunquam ægros facit. Unicuique nimirum regioni

acceperit aliquid detrimenti tantùm ab aliquo casû. Sunt morbi forsitan neque simùl nati neque congeniti, quos infans videtur suxisse cum primo lacte nutricis.

51. Porro sunt, qui sequuntur varios gradus ætatis et comitantur, quisque suum solum; nempe qui ducunt originem ex iis mutationibus, quas corpus subit, variis ætatibus. Hinc varii morbi infantum, juvenum, et senum.

52. Quin et uterque sexus præsertim muliebris, habet suos morbos, cùm provenientes à generali habitû corporis, tum quoque a speciali fabricâ et statu, et usu partium, quæ inserviunt generationi. Sunt igitur morbi virorum et fœminarum; sunt virginum, gravidarum, parturientium, lactantium et vetularum.

53. Cœlum ipsum, sub quo homines degunt, nonnunquam facit ægros; nimirum suum vitium inest

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accident: there are diseases perhaps, neither born with us nor congenital, which the infant appears to have imbibed with the first milk of the nurse.

51. Moreover, there are some which attend the different stages of age, and accompany, each its peculiar one alone; namely, those which derive their origin from the various changes which the body undergoes at different periods. Hence the various diseases of children, young and old men.

52. Moreover, also, each sex, especially the female, has its own diseases, both arising from the general habit of body, as well as also from the special structure and condition and use of the parts which are subservient to generation. There are, therefore, diseases of men and women, there are some of virgins, of the pregnant, the parturient, of those suckling, and of old women.

53. The sky itself under which men live, sometimes makes them sick; forsooth its own disorder exists in every region, whether it be hotter or colder

unicuique regioni: sive fuerit calidior sive frigidior justo, sive varia, que obnoxia multis et subitis mutationibus tempestatis.

54. Aer ipse quoque, qui purus alit sacram flammam vitæ, factus impurus, potest vel statim extinguere eandem, vel onustus multis vaporibus, aut corruptus quibusdam nocivis effluviis, inducere magnam cohortem morborum.

55. Etiam cibi que potus, quibus utimur, sæpe corrumpuntur, que interdum inquinantur rebus infestissimis sanitati et vitæ; vero iidem, quamvis optimi suâ naturâ, sumpti nimiâ copiâ, nocebunt corpori seriùs vel ocyùs.

56. Porrò venena existunt prædita vi adeo lethali, ut recepta in corpus, vel minimâ quantitate, que detegenda sensibus vix ac ne quidem vix, induxerint dirissimos morbos, vel fortasse inevitabilem mortem.

suum inest vitium: sive calidior justo, sive frigidior fuerit, sive varia, multisque et subitis tempestatis mutationibus obnoxia.

54. Aer quoque ipse, qui purus sacram vitæ flammam alit, impurus factus, eandem vel statim extinguere potest, vel multis vaporibus onustus, aut nocivis quibusdam effluviis corruptus, ingentem morborum cohortem inducere.

55. Cibi etiam potusque quibus utimur sæpe corrumpuntur, rebusque interdum inquinantur sanitati et vitæ infestissimis: iidem vero, quamvis sua natura optimi, nimia copia sumpti, serius vel ocyus corpori nocebunt.

56. Existunt porro venena vi adeo lethali prædita, ut vel minima quantitate, sensibusque vix ac ne vix quidem detegenda, in corpus recepta, dirissimos morbos, vel fortasse inevitabilem mortem, induxerint.

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than proper, or variable, and subject to many and sudden changes of the weather.

54. The atmosphere itself also, which when pure keeps up the sacred flame of life, rendered impure, is enabled either in an instant to destroy it, or loaded with many vapours, or corrupted with certain noxious effluvia, to induce a long train of diseases.

55. Also the food and drink which we use, are frequently corrupted, and sometimes tainted with things most injurious to health and life; but the same, although the best in their nature, taken in excess, will injure the body later or sooner.

56 Moreover, poisons exist, endowed with a power so deadly, that received into the body even in the minutest quantity, and to be scarcely and not possibly detected by our senses, have brought on most deleterious diseases, or perhaps inevitable death.

57. Denique, innumeris casibus, nec raro maximis periculis, homo objicitur, plerumque quidem incolumis evasurus: sæpe tamen infelix succumbit; sæpe saucius, contusus, membra fractus aut luxatus, ægre evadit; nonnunquam prorsus insanabilis. Casusque hujusmodi, quanquam primam a causa externa originem trahant, haud raro in internos morbos desinunt.

58. Hæc omnia extrinsecus; nec minora intus pericula imminent.

59. Dum spirat homo lethale sibi aliisque spirantibus venenum fundit. Neque solus pulmonis halitus adeo nocet; manat et ab omni cutis foramine materia subtilissima, venenata, fortasse putrescens, quæ diu collecta, neque per auras diffusa, et corpori denuo admota, aut iterum in id ipsum recepta, gravissimis morbis inficit; nec sistit gradum, sed veluti vires per pabulum

57. Denique homo objicitur innumeris casibus, nec rarò maximis periculis, plerumque quidem evasurus incolumis; tamen sæpè infelix succumbit: sæpè saucius, contusus, fractus aut luxatus membra, evadit ægre; nonnunquam prorsus insanabilis. Que casus hujusmodi, quanquam trahant primam originem ab externâ causâ, haud raro desinunt in internos morbos.

58. Omnia hæc extrinsecus; nec minora pericula imminent intus.

59. Dum homo spirat, fundit venenum lethale sibi que aliis spirantibus. Neque halitus solus pulmonis adeò nocet: et subtilissima venenata materia fortasse putrescens, manat ab omni foramine cutis quæ diù collecta, neque diffusa per auras et denuo admota corpori, aut iterum recepta in id ipsum inficit gravissimis morbis; nec sistit gradum, sed veluti nacta vires per pa-

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57. Lastly, man is exposed to innumerable accidents, nor unfrequently to very great dangers, generally, indeed, likely to escape uninjured; but frequently he unfortunately succumbs; often bloody, bruised, with limbs fractured and dislocated, he escapes with difficulty, sometimes entirely incurable; and accidents of this kind, although they take their first origin from an external cause, not unfrequently terminate in internal diseases.

58. All these things are from without; nor less dangers are threatening within.

59. Whilst man breathes, he pours forth a poison, deleterious to himself and to other animals. Nor is the exhalation of the lungs alone so injurious: also a very subtile and poisonous matter, perhaps putrid, flows from every pore of the skin, which having been long collected, nor scattered through the air, and again applied to the body, or again received into it, infects with most severe diseases. Neither does it stop its progress, but having, as it

bulum, grassatur longe que latè per populos.

60. Quoque animales functiones quas regimus nostro arbitrio, aut sæpe negliguntur, aut nimis exercentur. Periculum ex utroque. Desidiâ, sive animi sive corporis, vires utriusque languescunt; haud minùs læduntur nimiâ exercitatione. Enim provida Parens rerum statuit, ut vires singularum partium, et universi corporis que animi roborentur et acuantur usû; et iterum posuit fines huic; ita ut neque usus quem natura voluit omittatur impunè, neque intendatur ultra modum. Hinc athletæ, et otiosi, et desides pariter obnoxii morbis, sed singuli suis; hinc quoque damnum a nullâ aut nimiâ exercitatione mentis; hinc quoque multi morbi, quibus varii artifices sunt obnoxii, fere morbosi et degeneres homines; scilicet qui semper occupati eâdem

nacta, longe lateque per populos grassatur.

60. Functiones quoque animales, quas nostro arbitrio regimus, sæpe aut negliguntur, aut nimis exercentur. Ex utroque periculum. Desidia, sive animi sive corporis, utriusque vires languescunt: nimia exercitatione, haud minus læduntur. Statuit enim provida rerum Parens, ut singularum partium, et universi corporis animique vires usu roborentur et acuantur; et huic iterum certos fines posuit: ita ut neque quem voluit natura usus impune omittatur, neque ultra modum intendatur. Hinc athletæ, et otiosi et desides, pariter morbis, sed singuli suis, obnoxii: hinc quoque damnum a nulla aut nimia mentis exercitatione: hinc quoque multi morbi, quibus varii obnoxii sunt artifices, morbosi fere et degeneres homines; scilicet qui eadem semper arte, ipsaque forsi-

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were, gained strength with its aliment, it ranges far and wide amongst the people.

60. Also the animal functions which we control by our will, either are frequently neglected, or too much exercised. There is danger from both. By indolence either of the mind or body, the powers of both become weakened. They are not less injured by too much exercise. For the provident Parent of nature has ordained that the powers of individual parts, and of the whole body and of the mind should be strengthened and rendered acute by use: and she has again assigned limits to this; so that neither the exercise which nature intended should be omitted with impunity, nor extended beyond moderation. Hence, athletics, and the idle, and the indolent, are equally liable to diseases, but each to their own. Hence also there is mischief from not any, or excessive exercise of the mind; hence also there are many diseases to which various artisans are liable, generally sickly

tan parum salubri, occupati, partes quasdam corporis plurimum, sæpe nimis, exercent, dum multis aliis partibus parum utuntur; vel fortasse pravo corporis situ, aut malo vitæ genere, earundem functiones multum impediunt; et sic, dum mirum quarundam partium adipiscuntur usum et robur, generalem corporis vigorem, et, quæ ab illo pendet, prosperam valetudinem, male perdunt.

61. Cæterum et ab iis quas nullo nostro arbitrio regimus, tam animi quam corporis functionibus, valetudinis discrimen non leve esse potest. Animi imprimis affectus, qui modici grate excitant, vehementes, aut graves et diuturni, hujus pariter ac corporis vires frangunt; hominem interdum statim extinguunt, sæpius longa valetudine macerant. Somni etiam, quo ad exhaustas vires reficiendas ege-

arte que ipsâ forsan parùm salubri, exercent plurimùm sæpe nimis quasdam partes corporis, dum parùm utuntur multis aliis partibus; vel fortasse multum impediunt functiones earundem, pravo sitû corporis aut malo genere vitæ, et sic, dum adipiscuntur mirum usum et robur quarundam partium, male perdunt generalem vigorem corporis, et prosperam valetudinem, quæ pendet ab illo.

61. Cæterùm discrimen valetudinis non potest esse leve, et ab iis functionibus tam animi quam corporis, quas regimus nullo nostro arbitrio. Imprimis affectus animi qui modici excitant gratè, vehementes, aut graves et diuturni, frangunt pariter vires hujus ac corporis; interdum extinguunt hominem statim, sæpius macerant longâ valetudine. Etiam excessus vel defectus somni quo egemus ad refici-

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and degenerate men; for they being always occupied in the same employment, and that perhaps a slightly wholesome one, exercise to a great degree, often too much, certain parts of the body, whilst they make little use of many other parts; or perhaps they considerably obstruct the functions of the same, either by a bad position of the body, or by a bad mode of living; and in this way, whilst they acquire wonderful use and strength of certain parts, they sadly lose their general vigour of body, and the flourishing health which depends upon it.

61. Moreover, the danger of health cannot be slight, also from these functions as well of the mind and body which we control by no will of our own. In particular, the affections of the mind, which, moderate excite agreeably, violent or depressing, or long continued, break down equally the powers of this as of the body: sometimes they destroy a person instantaneously, more frequently they waste away by tedious illness. Also excess or

endas exhaustas vires, nocent et animo et corpori.

62. Sunt multa semper excernenda e corpore, in sanissimo statû. Si hæc retinentur, est malum: si excernuntur plus justo, quòque malum; si retinenda naturâ, excernuntur sponte vel casû vel arte, iterum malum. Quoque facillimè intelligetur ex his, sæpe gravisssimum periculum posse oriri ab inepto aut intempestivo usû remediorum; quippe quæ aut excitent et præter naturam intendant varias functiones proprias et necessarias corpori aut sopiant et reprimant que demum sæpe minuant secretiones et excretiones, sæpe augeant ultra modum vel denique efficiant novas excretiones et detractiones humorum, quales natura neque unquam instituerat in sano statû, neque potest ferre sine damno.

mus, excessus vel defectus, et animo et corpori nocent.

62. Sunt multa in statu sanissimo e corpore semper excernenda. Hæc si retinentur, malum est: si plus justo excernuntur, malum quoque: si natura retinenda, sponte, vel casu, vel arte excernuntur, malum iterum. Ex his quoque (61, 62) facillime intelligetur, gravissimum sæpe oriri posse periculum ab inepto aut intempestivo remediorum usu: quippe quæ varias functiones, corpori proprias et necessarias, aut excitent et intendant præter naturam, aut sopiant et reprimant, secretionesque demum et excretiones sæpe minuant, sæpe ultra modum augeant, vel denique novas efficiant excretiones et detractiones humorum, quales natura neque instituerat unquam in statu sano, neque sine damno ferre potest.

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want of sleep, which we stand in need of to repair the wasted powers, are injurious both to the mind and body.

62. There are many things always to be excreted from the body in its most healthy state. If these are retained, there is mischief; if they are excreted more than proper, there is also mischief: if those to be retained by nature are excreted spontaneously, or by accident, or by art, there is again mischief. Also it will be easily understood from these, that frequently the greatest danger may arise from an undue and unseasonable use of remedies; namely, which either excite and preternaturally force the various functions, proper and necessary to the body, or allay and repress them, and, at length, frequently diminish both the secretions and excretions, often increase them immoderately, or lastly, produce new excretions and discharges of humors, such as nature neither would ever have established in a healthy state, nor can support without injury.

63. Ut solidæ partes interdum flaccescunt, molliuntur, fere solvuntur, propriis muneribus impares factæ; sic fluidæ nonnunquam spissantur, et in massas solidas etiam durissimas formantur, unde organorum actiones impeditæ, dolor insignis, et varii et graves morbi.

64. Postremo, animantia quædam inter morborum causas recensenda sunt: nimirum quæ suam vitam aliorum malo tolerant. Ipse animalium dominus hujusmodi animantibus prædæ est et domicilio, quæ vel extrinsecus invadunt, vel intus habitant, et viscera adhuc vivi rodunt, sæpe cum insigni malo et vitæ discrimine, nec raro ipsius jactura.

65. Verum neque tot tantisque periculis homo inermis objicitur; neque, simul ac morbus invaserit, nulla superest salutis spes. Inest enim corpori vis prorsus mirabilis,

63. Ut solidæ partes interdum flaccescunt, molliuntur, ferè solvuntur, factæ impares propriis muneribus; sic fluidæ nonnunquam spissantur, et formantur in solidas etiam durissimas massas; unde impeditæ actiones organorum, insignis dolor et varii et graves morbi.

64. Postremò quædam animantia sunt recensenda inter causas morborum; nimirum quæ tolerant suam vitam malo aliorum. Ipse dominus animalium est prædæ et domicilio animantibus hujusmodi, quæ vel invadunt extrinsecus, vel habitant intus, et rodunt viscera adhuc vivi sæpe cum insigni malo et discrimine vitæ, nec rarò jacturâ ipsius.

65. Verum homo neque objicitur inermis tot tantisque periculis; neque, nulla spes salutis superest, simul ac morbus invaserit. Enim vis prorsus mirabilis inest cor-

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63. As the solid parts sometimes become flaccid, are softened and nearly dissolved, rendered unfit for their proper functions; so the fluid (parts) are sometimes thickened and formed into solid, even hard masses; whence the impeded actions of organs, remarkable pain, and various and severe diseases.

64. Lastly, certain animals are to be enumerated amongst the causes of diseases, namely those which support their life by the disease of others. The lord himself of the animals is a prey and habitation to animals of this kind, which either attack from without or inhabit within, and corrode the viscera of him still living, frequently with great mischief and danger to life, and not unfrequently with loss of it.

65. But man is not exposed defenceless to so many and great dangers, nor is no hope of health remaining, as soon as a disease has attacked him. For a power altogether astonishing exists in the body, by which it can protect

pori, quâ tueatur se contra morbos, arceat multos, solvat multos jam inchoatos, quam optimè et citissimè, que perducat alios lentiùs suo modo ad felicem exitum.

66. Hæc vocatur autocrateia seu vis medicatrix naturæ; notissima medicis atque philosophis et multum neque immeritò celebrata. Hæc sola sufficit ad sanandos multos morbos, ferè juvat in omnibus; quin et medicamenta optima suâ naturâ, solummodo tantùm valent, quantum excitent, dirigant, gubernent insitas vires hujus. Enim medicina neque prodest cadaveri, neque proficit quicquam, naturâ repugnante. Hic planè est aliquid similis et communis inter salutares vires remediorum, et nocentes causarum morborum, de quibus jam dictum est (47).

67. His viribus naturæ vulnera sanantur, fluxus sanguinis compescitur,

qua contra morbos se tueatur, multos arceat, multos jam inchoatos quam optime et citissime solvat, aliosque suo modo, ad felicem exitum lentius perducat.

66. Hæc autocrateia seu vis naturæ medicatrix vocatur; medicis atque philosophis notissima, et multum neque immerito celebrata. Hæc sola ad multos morbos sanandos sufficit, in omnibus fere juvat: quin et medicamenta sua natura optima tantum solummodo valent, quantum hujus vires insitas excitent, dirigant, gubernent. Medicina enim neque prodest cadaveri, neque repugnante natura quicquam proficit. Hic plane est aliquid similis et communis inter salutares vires remediorum, et nocentes causarum morborum, de quibus jam (47) dictum est.

67. His naturæ viribus vulnera sanantur, sanguinis fluxus compescitur, ossa diffracta coalescunt,

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itself against diseases, can drive off many others, can relieve many already commenced, in the speediest and best manner, and conduct others by a slower process, in its own way, to a favorable termination.

66. This is called autocrateia, or vis medicatrix naturæ, well known to medical men and philosophers, and much nor undeservedly celebrated. This alone is sufficient for curing many diseases, is generally useful in all; moreover, even medicines, the best in their nature, only are so far useful inasmuch as they excite, direct, and govern the innate powers of this. For medicine neither is of use to a dead body, nor is it of any avail, nature being opposed to it: here evidently there is something alike and in common, between the salutary powers of remedies and the injurious ones of the causes of diseases, of which we have already spoken.

67. By these powers of nature wounds are healed, hæmorrhage is stopped, fractured bones unite, and many noxious things are thrown out of the body,

multa noxia e corpore ejiciuntur, et sic, quæ nulla ars attingere potuisset mala, sine ope externa sua sponte evanescunt.

68. Merito igitur his viribus Medici confidunt, easque conantur languentes excitare, aut si plane defecerint, tum solitas earum actiones arte imitari. Non tamen iis solis semper fidendum est; quippe quæ in quibusdam morbis nullæ sint, in multis vero nimiæ et adeo vehementes, ut sint quam ipse morbus magis metuendæ.

69. Leviores morbi naturæ viribus satis tuto relinquuntur; sed nemo sanus hydropem, vel luem veneream, vel visceris cujusvis inflammationem, iisdem commiserit: scilicet quæ in illis morbis nullæ sint; in his autem vehementissimæ, verum ineptæ, et valde periculosæ, et gangrænam, vel suppurationem fere haud minus exitialem, effecturæ.

diffracta ossa coalescunt, multa noxia ejiciuntur e corpore, et sic mala quæ nulla ars potuisset attingere, evanescunt suâ sponte sine externâ ope.

68. Igitur medici meritò confidunt his viribus, que conantur excitare eas languentes, aut si planè defecerint, tum imitari solitas actiones earum arte. Tamen non semper fidendum est iis solis; quippe, quæ sint nullæ in quibusdam morbis, vero nimiæ et adeo vehementes in multis, ut sint metuendæ magis quàm ipse morbus.

69. Leviores morbi satis tutò relinquuntur viribus naturæ; sed nemo sanus, commiserit hydropem, vel luem veneream vel inflammationem cujusvis visceris iisdem; scilicet, quæ sint nullæ in illis morbis; autem in his, vehementissimæ, verùm ineptæ, et valde periculosæ, et effecturæ gangrænam, vel suppurationem ferè haud minus exitialem.

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and thus maladies, which no art could reach, disappear spontaneously without external aid.

68. Therefore medical men properly trust to these powers, and endeavour to excite them (when) languid, or if they have evidently failed, to imitate the usual actions of them by art. However, we must not always trust to them alone, for they are of no avail in some diseases, but excessive and so violent in many, that they are to be feared more than the disease itself.

69. The more slight diseases are very safely left to the powers of nature; but no sensible man would have trusted dropsy, or Lues Venerea, or inflammation of any viscus to the same; for they are of no avail in the former diseases; but in the latter most potent, but inappropriate and very dangerous, and likely to produce gangrene or suppuration, generally not less destructive.

70. Igitur oportet cavere a duplice errore;—neque spernere vires Naturæ, neque colere nimis religiosè. Enim tantum abest, ut semper conveniat premere vestigia illius, ut sit sæpe necesse tenere iter prorsus contrarium, que niti contra conatus ejus summâ ope.

71. Neque natura ipsa docet officium medici cohiberi tam arcto limite; enim prodiga suggerit innumera remedia quæ pollent maximis viribus in humano corpore, et valent efficere varias et saluberrimas mutationes in eo. Hoc modo etiam plurimæ causæ morborum queant converti a solerte medico in præstantissima auxilia; scilicet quicquid afficit corpus vehementer, nunc potest esse neci eidem, nunc iterum remedio.

72. Verò est medici, naturâ et causâ morbi cognitâ, judicare quid mutationis requiratur, ut morbus mutetur in sanitatem.

70. A duplice errore igitur cavere oportet; neque vires naturæ spernere, neque nimis religiose colere. Tantum enim abest ut semper illius vestigia premere conveniat, ut sæpe necesse sit contrarium prorsus iter tenere, contraque ejus conatus summa ope niti.

71. Neque medici officium tam arcto limite cohiberi ipsa natura docet; suggerit enim prodiga, innumera remedia quæ maximis viribus in corpore humano pollent, et varias et saluberrimas mutationes in eo efficere valent. Hoc modo etiam plurimæ morborum causæ a solerte medico in præstantissima auxilia converti queant; scilicet, quicquid corpus vehementer afficit, eidem nunc neci (53, 62), nunc iterum remedio, esse potest.

72. Medici vero est, cognita natura et causa morbi, judicare quid mutationis requiratur, ut morbus in sanitatem mutetur. Hæc

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70. Therefore it is necessary to beware of the twofold error—neither to despise the powers of nature, nor to respect them too scrupulously. For so much is wanting, that it may always be proper to follow her steps, that it is frequently necessary to take a course directly opposite, and to strive against her efforts with all our power.

71. Neither does nature herself shew that the office of the medical man is confined within such a narrow limit; for she, bountiful, suggests innumerable remedies, which are endowed with very great powers on the human body, and are able to effect many and very salutary changes in it. In this way, also, many causes of diseases may be converted, by a skilful physician, into most powerful auxiliaries; that is to say, whatever affects the body powerfully, at one time may be its death, at another time again its cure.

72. But it is the duty of the physician, the nature and cause of disease being known, to decide what change may be required, that disease may be

quidem est medicina rationalis sive dogmatica. Est et altera, empirica nimirum, quæ, missis hujusmodi ambagibus, sola remedia quærit et profert certa et definita vi prædita ad certos morbos delendos.

73. Hujusmodi remedia omnis circumforaneus medicus jactat, omnis anus se credit possidere; populusque, qui fere decipi quam sapere mavult, talibus remediis semper fidit; neque profecto, postquam sanitatem cum re amiserit, facile sinit gratissimum menti errorem eripi; scilicet quem nolit intueri, adeo blanda est sperandi pro se cuique dulcedo. Quam pauca vero istiusmodi remedia adhuc reperta fuerint, peritissimi medici fatentur et dolent. Quod si remedia quædam fuerint quæ vi nondum explorata aut intellecta in corpore humano pollent, id minime mirum; quippe quia tot existant

Hæc medicina quidem est rationalis sive dogmatica. Et est altera nimirum empirica, quæ, ambagibus hujusmodi missis, quærit sola remedia et profert prædita vi certâ et definitâ ad delendos certos morbos.

73. Omnis circumforaneus medicus jactat remedia hujusmodi, omnis anus credit se possidere, que populus qui fere mavult decipi quam sapere, semper fidit talibus remediis; neque profecto, postquam amiserit sanitatem cum re, facilè sinit gratissimum errorem eripi menti; scilicet quem nolit intueri, adeo blanda est cuique dulcedo sperandi pro se. Vero peritissimi medici fatentur et dolent quam pauca remedia istiusmodi adhuc fuerint reperta. Quod si fuerint quædam remedia, quæ pollent vi nondum exploratâ aut intellectâ in humano corpore, id est minimè mirum quippe quia tot morbi existant, na-

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converted into health. This medical practice is rational, or dogmatic. Also there is another kind, namely, the empirical, which, doubts of this description being laid aside, seeks for single remedies, and brings them forward as endowed with a power certain and specific, for eradicating certain diseases.

73. Every wandering quack boasts of remedies of this description; every old woman thinks that she possesses them; and the multitude, who would rather be deceived than instructed, always put confidence in such remedies; nor even after they have lost their health, together with their money, do they easily permit that most grateful delusion to be eradicated from the mind, namely which, they are unwilling to see, so sweet to every one is the pleasure of hoping for himself. But the most skilful medical men confess and lament, how few remedies of this description have been discovered. But if there should be some remedies which are endowed with a power not yet discovered or understood on the human body, it is by no means surprising,

tura et causæ quorum prorsùs lateant. Cæterum, quo perfectior medica scientia fuerit, eò facilius erit reddere rationem virium medicamentorum et modi quò afficiant corpus, que prosint in variis morbis.

74. Igitur remedia solent ordinari, secundum manifestos effectus, quos præstant in humano corpore. Afficiunt vel solidas vel fluidas partes. Alunt, consumunt, firmant, laxant, excitant, sopiunt illas. Corrigunt atque evacuant has, vitiatas quantitate, vel qualitate; que id vel naturalibus viis vel aliis insolitis vel factis arte. Nec auxilia desunt adversus concretiones formatas intra corpus, aut animalia hospitantia in eodem (63, 64).—Vero scientia effectuum medicamentorum et modi quo afficiunt corpus, vocatur Therapeia.

morbi quorum natura et causæ prorsus lateant. Cæterum, quo perfectior fuerit scientia medica. eo facilius erit medicamentorum virium, et modi quo corpus afficiant, variisque in morbis prosint, rationem reddere.

74. Remedia igitur ordinari solent, secundum effectus manifestos quos in corpore humano præstant. Afficiunt vel partes solidas vel fluidas. Illas alunt, consumunt, firmant, laxant, excitant, sopiunt. Has vel quantitate vel qualitate vitiatas, corrigunt, atque evacuant; idque vel viis naturalibus, vel aliis insolitis et arte factis. Nec desunt auxilia adversus concretiones intra corpus formatas, aut animalia in eodem hospitantia (63, 64). Medicamentorum vero effectuum et modi quo corpus afficiunt, scientia, Therapeia vocatur.

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inasmuch as so many diseases exist, the nature and causes of which are entirely concealed. But the more perfect medical science shall become, so much more easy it will be to give an explanation of the powers of remedies, of the manner in which they influence the body, and are beneficial in various diseases.

74. Therefore remedies are accustomed to be classed according to the evident effects which they produce in the human body; they affect either the solid or fluid parts. They nourish, consume, strengthen, relax, excite, or depress the former. They correct and evacuate the latter when vitiated in quantity or quality; and they do this either by the natural passages, or by others unusual, or produced by art. Nor are remedies wanting against concretions formed within the body, or against animals lodging in the same, (63, 64.) But the knowledge of the effects of medicines, and the mode in which they affect the body, is called Therapeutics.

Cap. II.—*De solida materia ex qua corpora animalium fiunt, variisque ejus dotibus, tum chemicis tum mechanicis; de conjecturis circa ejus ultimam et minutissimam fabricam, de tela reticulata; necnon de adipis origine, natura, et usu.*

75. Corpus humanum constat ex partibus solidis et fluidis; quarum mutua actione functiones vivi hominis (quatenus corporeæ sunt) peraguntur. Utræque assidue mutantur et renovantur; solidæ vero lentius. Ab his igitur incipiendum est; quippe quæ universo corpori formam et firmitatem dent.

76. Solidam materiam ex qua corpora animalium constant, solidum animale brevitatis causa, vocamus. Hoc autem varias habet dotes, chemicas, mechanicas, vita-

Cap. II.—*De solidâ materiâ ex quâ corpora animalium fiunt, que de variis dotibus ejus, tum chemicis tum mechanicis; de conjecturis circa ultimam et minutissimam fabricam ejus; de reticulatâ telâ; necnon de origine, naturâ et usû adipis.*

75. Humanum corpus constat ex solidis et fluidis partibus, mutuâ actione, quarum functiones vivi hominis (quatenus sunt corporeæ) peraguntur. Utræque assidue mutantur et renovantur; verò solidæ lentius. Igitur incipiendum est ab his; quippe quæ dent formam et firmitatem universo corpori.

76. Vocamus solidam materiam, ex quâ corpora animalium constant, animale solidum, causâ brevitatis. Autem hoc habet varias dotes, chemicas, mechanicas, vita-

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Chap. II.—*On the solid substance of which animal bodies are formed, the various properties of it, both chemical and mechanical: on the conjectures respecting its ultimate and most minute structure: on the cellular substance; also on the origin, nature, and use of the fat.*

75. The human body consists of solid and fluid parts, by the mutual action of which the functions of living man (as far as they are corporeal) are performed. Both are constantly changed and renewed; but the solid ones more slowly. Therefore we must begin with the latter; as being those which give form and strength to the whole body.

76. We call the solid material of which the bodies of animals consist, the animal solid, for the sake of brevity. But this has different properties,

les; nulla quarum non meretur attentionem medici.

77. Exquisita chemia hujus ævi detexit diversas substantias, sive principia ut dicuntur, in variis solidis partibus humani corporis; que docuit exhibere eas substantias separatim. Imprimis ostendit in ossibus præcipuè plurimam terram, nimirum calcem, non quidèm puram, sed conjunctam cum quibusdam acidis, præsertim phosphorico. Hic phosphas calcis, cum pauxillo carbonatis calcis, dat firmitatem ossibus: et cum cartilagine, et multâ gelatinâ, et crasso oleo fere efficit tota ossa. Quoque plurima gelatina, et parum terræ pro rata parte, inest cellulosæ telæ, et cuti, que aliis membranis quæ fiunt ex eâ telâ, et demum musculis. Verò alia animalis substantia reperitur in his; scilicet plurima fibrina. Albumen quoque detectum est planè neque parcè, in quibusdam soli-

les; quarum nulla non medici attentionem meretur.

77. Exquisita hujus ævi chemia diversas substantias, sive principia ut dicuntur, in variis solidis partibus humani corporis detexit; easque substantias seorsim exhibere docuit. Ostendit imprimis, in ossibus præcique, plurimam terram; calcem nimirum, non quidem puram, sed cum acidis quibusdam, phosphorico præsertim, conjunctam. Hic phosphas calcis, cum pauxillo carbonatis calcis, firmitatem dat ossibus; et cum cartilagine, et multa gelatina, et oleo crasso, ossa fere tota efficit. Plurima quoque gelatina, et pro rata parte parum terræ, inest telæ cellulosæ, et cuti, aliisque membranis quæ ex ea tela fiunt, et demum musculis. In his vero alia reperitur substantia animalis; plurima scilicet fibrina. Albumen quoque id quibusdam partibus solidis cor-

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chemical, mechanical, and vital; none of which is undeserving the attention of the medical man.

77. The refined chemistry of this age has discovered different substances, or principles, as they are called, in the various solid parts of the human body; and has taught us how to show these substances separately. In the first place, it has shown that there is, in the bones particularly, much earthy matter, namely, lime, not indeed pure, but combined with certain acids, especially the phosphoric. This phosphate of lime, with a little carbonate of lime, gives strength to the bones, and together with cartilage, and much gelatine, and thick oil, almost forms the entire bones. Also much gelatine and little earthy matter, compared with the part mentioned, is present in the cellular substance and skin, and the other membranes which are formed from that network; and, lastly, in muscles. But another animal substance is found in these, namely, much fibrine. Albumen, likewise, has

poris humani plane neque parce detectum est; maxime in cartilaginibus, et tendinibus, et ligamentis. Præter hæc multum oleum crassum in omnibus fere solidis animalibus reperitur; et sales quidam tam acidi quam alcalini; et interdum, ut videtur, sed multo parcius, aliæ quædam minoris momenti substantiæ. Sed de his nondum satis constitit; quæ scilicet neque semper reperiuntur, nec unquam tanta copia adsunt ut facile explorentnr.

78. Ulterius arte chemica exploratæ partes solidæ humani corporis, vel putredine, quam sponte subeunt modico calore, cum humore, et admisso aëre; vel magno calore, qualis priores elementorum compositiones destruat, novas ipsorum efficiat, facile in pauca elementa resolvuntur; duriores in calcem et phosphorum; molliores vero in carbonem, nitrogenium (vel

dis partibus humani corporis, maximè in cartilaginibus, et tendinibus, et ligamentis. Præter hæc multum crassum oleum reperitur ferè in omnibus solidis partibus: et quidam sales tam acidi quam alcalini: et interdum ut videtur sed multo parciùs, quædam aliæ substantiæ minoris momenti. Sed de his nondum satis constitit; scilicet quæ neque semper reperiuntur, nec unquam adsunt tantâ copiâ, ut facilè explorentur.

78. Solidæ partes humani corporis exploratæ ulteriùs chemicâ arte facilè resolvuntur in pauca elementa, vel putredine, quam subeunt sponte modico calore, cum humore, et aere admisso vel magno calore, qualis destruat priores compositiones elementorum, efficiat novas ipsorum: duriores in calcem et phosphorum; verò molliores in carbonem, nitrogenium (vel azotium)

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been discovered evidently, and not sparingly, in some solid parts of the human body; particularly in the cartilages, tendons, and ligaments. Besides these, much thick oil is found in nearly all the solid parts, also some acid salts as well as alkaline; and sometimes, as it appears, though more sparingly, some other substances of less import. But concerning the latter, it is not yet quite agreed upon: for they are neither always found, nor are ever present in such quantity that they can easily be examined.

78. The solid parts of the human body, examined further by chemical art, are easily resolved into a few elements, either by the putrefaction which they undergo spontaneously, by means of moderate heat, by moisture, by air admitted, or by great heat, such as destroys the primary compositions of the elements, or gives rise to new ones: the harder into lime and phosphorus, but the softer ones into carbon, nitrogen (or azote), hydrogen, and oxygen,

hydrogenium, et oxygenium, quæ igitur creduntur esse simplicissima elementa animalis solidi; si quid dicatur rectè simplex in severiore chemiâ. Vero hæc elementa separata et conjuncta aliter atque aliter, vel igne vel putredine interim efficiunt novas substantias, quales sunt ammonia, carbonicum acidum, empyreumaticum oleum, et multi fœtidi vapores, quæ nequeunt detegi in recente et integro animali solido, autem facile et ferè semper observantur, dum hoc resolvitur in sua elementa.

79. Mechanicæ dotes, quibus animale solidum aptatur ad usus vitæ, sunt tres; scilicet adhæsio satis magna, quædam flexilis mollities, et insignis vis resiliendi.—Pleraque munera vitæ consistunt in variis motibus; validissimi motus requiruntur ad multa eorum. Igitur opus est tantâ adhæsione partium, ut hi perfician-

azotium), hydrogenium, et oxygenium: quæ igitur creduntur esse solidi animalis simplicissima elementa; siquid in severiore chemia recte simplex dicatur. Hæc vero elementa, vel igne, vel putredine, aliter atque aliter separata et conjuncta, novas interim efficiunt substantias, quales sunt ammonia, acidum carbonicum, oleum empyreumaticum, et multi vapores fœtidi, quæ in recente et integro solido animali detegi nequeunt, facile autem et fere semper observantur dum hoc in sua elementa resolvitur.

79. Dotes mechanicæ, quibus solidum animale ad vitæ usus aptatur, sunt tres; adhæsio scilicet satis magna, mollities quædam flexilis, et insignis vis resiliendi.—Munera vitæ in variis motibus pleraque consistunt: ad multa eorum validissimi motus requiruntur. Tanta igitur adhæsione partium opus est, ut hi sine lacerationis

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which are therefore considered to be the most simple elements of the animal solid; if any thing may be properly called simple in more strict chemistry. But these elements, separated and combined in various ways, either by heat or putrefaction, in the meantime form new substances; such as are ammonia, carbonic acid, empyreumatic oil, and many fœtid vapors, which cannot be detected in the recent and sound animal solid, but readily and nearly always are observed, whilst this is resolved into its elements.

79. The mechanical properties, by which the animal solid is adapted to the purposes of life, are three; namely, adhesion sufficiently powerful, some flexible softness, and remarkable power of rebounding. Most of the functions of life consist in various motions; the most powerful motions are required for many of them. Therefore, there is need of such a degree of adhesion of parts, that these may be executed without danger of laceration;

periculo perficiantur: oportet quoque, ob eandem causam, partes solidæ, aliæ magis, aliæ minus, se flecti sinant: denique, necesse est, ut partes ita flexæ, vel loco dimotæ, figuram et situm pristinum sua sponte recuperent, quam primum vis dimovens sublata fuerit.

80. Variant multum hæ dotes, non modo variis partibus, sed et iisdem partibus in variis hominibus, et sæpe in eodem homine diversis temporibus. Hujusmodi varietates, quamvis satis insignes, valetudinem sæpe parum afficiunt. Nonnunquam vero, sanitatis limites transeuntes, manifestos et sane haud leves morbos faciunt.

81. Duplice modo variari aut vitiari potest, quod ad dotes mechanicas, omnis pars solida; scilicet, aut nimia aut nimis parva adhæsione, aut mollitie, aut vi resiliendi. Aucta adhæsione seu firtur sine periculo lacerationis; quoque oportet, ob eandem causam, solidæ partes, aliæ magis aliæ minùs, sinant se flecti: denique necesse est, ut partes ita flexæ, vel dimotæ loco, recuperent suâ sponte pristinum figuram et situm, quam primùm dimovens vis sublata fuerit.

80. Hæ dotes variant multùm non modo in variis partibus, sed et in iisdem partibus in variis hominibus, et sæpe diversis temporibus in eodem homine. Varietates hujusmodi, quamvis satis insignes sæpe parùm afficiunt valetudinem. Verò nonnunquam, transeuntes limites sanitatis, faciunt manifestos, et sanè haud leves morbos.

81. Omnis solida pars potest variari, aut vitiari duplice modo quod ad mechanicas dotes; scilicet aut nimiâ aut nimis parvâ adhæsione aut mollitie, aut vi resiliendi. Adhæsione seu firmitate cu-

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likewise it is necessary, for the same reason, that the solid parts, some more, some less, should allow themselves to be flexed; lastly, it is necessary that the parts so bent, or removed from their situation, should recover spontaneously their primary shape and position, as soon as the displacing power has been taken away.

80. These properties vary considerably, not only in the different parts, but also in the same parts in different persons, and frequently at different times in the same individual. Varieties of this description, although very remarkable, frequently little affect the health. But sometimes, exceeding the limits of health, they produce evident and indeed not slight diseases.

81. Every solid part may be altered, or be disordered in a twofold manner, as to its mechanical properties; namely, either by excessive or too slight adhesion, or softness, or elasticity. The adhesion or firmness of any solid part

jusvis sòlidæ partis auctâ, plerumque vis resiliendi ejus augetur; autem mollities necessariò minuitur. Verò adhæsione imminutâ, major mollities fit, et vicissim minor vis resiliendi.

82. Certè causæ horum effectuum sunt multiplices; tamen possunt reduci ad certa capita. Aut chemica compositio ipsa materiæ vitiatur, aut compositione omnino salvâ, particulæ ita disponuntur, ut attrahant semet invicem plus minusve fortiter. Quod attinet ad chemicam compositionem ejus, fortasse omnia elementa (77, 78), possunt inesse animali solido, variâ quantitate et efficere quodque suum peculiare vitium. Sed novimus nihil certi de multis horum; vero satis constat, humidam materiam, quæ est ferè aqua, et siccam, quæ constat ex diversis elementis, variare multùm; quo plus humidæ, cò minus adhæsionis aut

mitate partis cujusvis solidæ, augetur plerumque ejus resiliendi vis; mollities autem necessario minuitur. Imminuta vero adhæsione, mollities major fit et vicissim vis resiliendi minor.

82. Causæ horum effectuum certe multiplices sunt: tamen ad certa capita reduci possunt. Aut ipsa materiæ compositio chemica vitiatur, aut, salva omnino compositione, particulæ ita disponuntur, ut plus minusve fortiter semet invicem attrahant. Quod compositionem ejus chemicam attinet, omnia fortasse elementa (77, 78), varia quantitate, solido animali inesse possunt, et suum quodque peculiare vitium efficere. Sed de multis horum nihil certi novimus: satis vero constat, materiam humidam, quæ fere aqua est, et siccam, quæ ex diversis elementis constat, multum variare: quo plus humidæ, eo minus adhæsionis aut vis resi-

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being increased, generally its elasticity is increased; but the softness is necessarily diminished. But the adhesion being diminished, a greater softness is produced, and in exchange less elasticity.

82. Truly the causes of these effects are manifold, however they may be reduced to certain heads. Either the chemical composition itself of the substance is disordered, or the composition being entirely in a sound state, the particles are so arranged, that they attract themselves mutually more or less forcibly. As relates to chemical composition of it, perhaps all the elements may be present in the animal solid, in different quantities, and produce each its own peculiar disorder. But we have known nothing certain of many of these; yet it is very evident, that the moist substance, which is almost water, and that the dry substance, which consists of the different elements, vary much; the more moisture there is, the less cohesion or elas-

liendi, plus vero mollitiei; et contra omnino, si nimium siccæ materiæ in compositione fuerit.

83. Variæ sunt causæ remotæ (37 et seq.) alterutrius materiæ vel abundantis vel deficientis. Ipsa imprimis constitutio corporis congenita multum huc confert. Quidam, præ cæteris, homines et viri præ fœminis in universum, duriorem et sicciorem corporis compaginem habent, vix, ac ne vix quidem, ullo vitæ genere penitus mutandam.

84. Ætas vero majus adhuc discrimen facit; a prima enim ad ultimam usque siccius et durius evadit quotidie corpus: a fluido, nempe, et crudo fœtu, ad rigidum et exsuccum senem, cui vita, propter hanc ipsam causam, fere deficit.

85. Victus porro, quo homines utuntur, prout plus minusve aquosus fuerit, similem solidarum par-

vis resiliendi, vero plus mollitiei; et omnino contra, si fuerit nimium siccæ materiæ in compositione.

83. Sunt variæ remotæ causæ alterutrius materiæ abundantis vel deficientis. Imprimis congenita constitutio ipsa corporis confert multum huc. Quidam homines præ cæteris, et viri præ fœminis in universum habent duriorem et sicciorem compaginem corporis, vix, ac ne quidem vix, penitùs mutandam ullo genere vitæ.

84. Verò ætas facit adhuc majus discrimen: enim corpus evadit quotidie siccius et durius a primâ usque ad ultimam; nempe a fluido et crudo fœtû, ad rigidum et exsuccum senem; cui vita ferè deficit, propter hanc causam ipsam.

85. Porrò victus, quo homines utuntur, prout fuerit plus minùsve aquosus, efficit similem con-

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ticity, but more softness; and altogether the reverse, if there be too much dry matter in the composition.

83. There are various remote causes of either substance being excessive or deficient. The congenital constitution of the body especially contributes much to this. Some men, compared with others, and males compared with females in general, possess a harder and drier frame of body, scarcely, and not indeed scarcely to be entirely altered by any mode of life.

84. But age makes a still greater difference; for the body becomes daily drier and harder, from first to last; namely, from the fluid and ill-formed fœtus, to the rigid and sapless old man, to whom life commonly fails on account of this cause itself.

85. Moreover, the food which men use, according as it has been more or less watery, produces a similar condition of the solid parts. This, already

ditionem solidarum partium. Hoc dudum observatum in aliis animalibus, quoque videtur accidere, in homine saltem aliquatenùs. Neque deest ratio gravissima cur credamus, non modo conditionem et vires corporis, sed et indolem animi pendere quodammodo a genere victûs.

tium conditionem efficit. Hoc, in aliis animalibus dudum observatum, in homine quoque, aliquatenus saltem accidere videtur. Neque ratio gravissima deest cur credamus, non corporis modo conditionem et vires, sed et animi indolem, a victus genere quodammodo pendere.

86. Quoque multum pendet a bonâ vel pravâ concoctione ejusdem cibi, et ab appositione nutrimenti parati ex eo.

86. Multum quoque pendet a bona vel prava ejusdem cibi concoctione, et ab appositione nutrimenti ex eo parati.

87. Denique status aeris scilicet quod ad humorem vel siccitatem, afficit corpus haud parum. Hinc monticolæ vel qui habitant siccas regiones multum diversi ab incolis humidarum et paludosarum.

87. Denique, status aëris, scilicet, quod ad humorem vel siccitatem, corpus haud parum afficit. Hinc monticolæ, vel qui siccas regiones habitant, ab incolis humidarum et paludosarum multum diversi.

88. Postremò genus vitæ confert nonnihil ad eundem effectum. Exercitatio corporis, exprimit et exhalat, quod humoris fuisset nimium. Ignavia habet prorsus contrarium

88. Postremo, vitæ genus ad eundem effectum nonnihil confert. Exercitatio corporis, quod nimium humoris fuisset, exprimit atque exhalat. Ignavia contrarium prorsus

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observed in other animals, likewise appears to occur in man, at least to a certain extent. Nor is there wanting a very cogent reason why we should believe, not only that the condition and strength of the body, but also the disposition of the mind, depend in some degree on the kind of food.

86. Also much depends upon the good or bad digestion of the same food, and upon the disposal of the nutriment obtained from it.

87. Lastly, the state of the air, in reference to moisture, or dryness, affects the body considerably. Hence mountaineers, or those who inhabit dry districts, are very different from the inhabitants of damp and marshy countries.

88. Lastly, mode of life contributes somewhat to the same effect. Exercise of the body presses out and exhales what portion of fluid had been in

effectum habet, partesque humidiores abundare facit.

89. Verum, salva omnino compositione chemica solidarum partium, harum conditio ab aliis causis multum affici potest. Densatio nimirum particularum, sive a causis mechanicis, sive a calore et frigore, variam efficiet partis cujuslibet firmitatem et vim resiliendi.

90. Quantum hic valeat compressio mechanica, clar. Clifton Wintringham experimenta lucu-lenter docent. Distentio quoque solidi animalis dotes ejus jam memoratas haud parum afficit. Quo plus tenditur, eo durius, et firmius, et magis resiliens evadit, eoque difficilius ulteriorem patitur distentionem, donec tandem, amplius distendi impatiens, nova admota vi, distrahitur et dirumpitur, superata nimirum particularum adhæsione, qua hæc debilior fuerit. Hinc ratio, non plene quidem (nam mul-

effectum, que facit humidiores partes abundare.

89. Verum, chemicâ compositione solidarum partium omnino salvâ, conditio harum potest multùm affici ab aliis causis. Nimirum densatio particularum, sive a causis mechanicis, sive a calore et frigore, efficiet variam firmitatem et vim resiliendi cujuslibet partis.

90. Experimenta clarissimi Clifton Wintringham luculentèr docent quantum, mechanica compressio hic valeat. Quoque distentio animalis solidi afficit haud parum dotes ejus jam memoratas. Quò plus tenditur, eò durius, et firmius, et magis resiliens evadit, que eò difficiliùs patitur ulteriorem distentionem donec tandem, impatiens ampliùs distendi, novâ vi admotâ, distrahitur et dirumpitur, nimirum adhæsione particularum superatâ, quâ hæc fuerit debilior. Hinc ratio non plenè quidem (nam mul-

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excess; indolence has entirely a contrary influence, and causes the more moist parts to be abundant.

89. But the chemical composition of the solid parts being quite entire, the condition of these may be much affected by other causes; for instance, a thickening of the particles, whether from mechanical causes, or from heat and cold, will produce a different firmness and elasticity of any part.

90. The experiments of the very illustrious Clifton Wintringham lucidly demonstrate how far mechanical pressure avails here; likewise distention of the animal solid, affects in no slight degree properties of it already mentioned. The more it is stretched, the harder and firmer and more elastic it becomes; and with so much more difficulty it admits of further distention, until at length, impatient of being further distended, and a fresh force being applied, it is torn asunder and ruptured; that is to say, the cohesion of the particles being overcome where it was weaker. Hence a reason, not evidently indeed,

tum pendet a vitali principio, que primâ fabricâ corporis) sed aliquatenus saltem deducenda est multarum rerum quæ sunt summi momenti; incrementi corporis, statûs, imminutionis, indiès crescentis firmitatis, et inevitabilis mortis senilis.

91. Fortasse varia densitas solidarum partium derivatur ab naturâ ipsâ. Sed magis constat de viribus exercitationis, aut ignaviæ, in mutando statû earundem; generales effectus quarum tam boni quam mali, in solidis partibus, igitur facilè intelligentur.

92. Porrò, quælibet pars mobilis naturâ, veluti junctura artûs, paulatim rigescit, diuturnâ quiete, recuperatura pristinam mobilitatem tardè fortasse nunquam penitùs: et contrà, fere omnes partes corporis sæpe adipiscuntur miram mobilitatem valido et crebro usû, modo hic non fuerit nimius. Neque profectò melius

tum pendet a principio vitali, primaque corporis fabrica) sed aliquatenus saltem, deducenda est multarum rerum quæ summi momenti sunt; corporis incrementi, status, imminutionis, firmitatis indies crescentis, et mortis senilis inevitabilis.

91. Varia fortasse solidarum partium densitas ab ipsa natura derivatur. Sed magis constat de viribus exercitationis, aut ignaviæ, in statu earundem mutando. Quarum igitur effectus generales, tam boni quam mali, in partibus solidis, facile intelligentur.

92. Porro, diuturna quiete, pars quælibet natura mobilis, veluti junctura artus, paulatim rigescit, pristinam mobilitatem tarde, fortasse nunquam penitus, recuperatura: et contra, valido et crebro usu, modo hic non nimius fuerit, omnes fere corporis partes miram sæpe adipiscuntur mobilitatem. Neque profecto melius datur aut

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(for much depends upon the vital principle, and the primary fabric of the body,) but to some extent at least is to be deduced, of many things which are of the greatest importance; (namely,) the increase of the body, the stature, decay, the daily increasing firmness, and the inevitable death of old age.

91. Perhaps the varied density of the solid parts is derived from nature herself. But there is greater evidence of the influence of exercise, or indolence in changing the condition of the same; the general effects of which, both good as well as bad, upon the solid parts, will therefore be easily understood.

92. Moreover, any part moveable by its nature, as the joint of a limb, gradually becomes rigid by long continued rest, about to recover its former mobility slowly, perhaps never completely: and on the other hand, nearly all parts of the body often acquire a surprising mobility, by active and frequent use, provided this be not in excess. Nor, indeed, a better or more

certius remedium ad superandam illam rigiditatem artuum quæ longa quiete induci solet, quam frequens exercitatio, quæ primo difficillima, et diu exigua, fere indies facilior, liberior, et perfectior evadit.

93. Calor corpora omnia laxat atque expandit; frigus vero densat et durat. Utrumque effectum homines probè experiri solent. Quamvis corpus suum ferè semper calorem conservet, fieri nequit quin ejus superficies saltem ab aëre ambiente externo afficiatur. Neque exigua vis est, quâ calor hoc modo in universo corpore polleat. Quam longè aliter se habet, qui, fervido Austro spirante, hebes et languidus factus, membra sua ægrè trahit, ac ille, qui, sub frigido Aquilone, cursu glaciali se exercet, universum corpus firmus, mobilis, expeditus.

94. Variæ causæ, quæ singulæ

aut certius remedium datur, ad superandam illam rigiditatem artuum, quæ solet induci longâ quiete, quam frequens exercitatio, quæ primò difficillima, et diù exigua, ferè evadit indies facilior, liberior et perfectior.

93. Calor laxat, atque expandit omnia corpora: vero frigus densat, et durat. Homines probè solent experiri utrumque effectum. Quamvis corpus ferè semper conservet suum calorem, nequit fieri quin superficies ejus saltem afficiatur ab externo ambiente aëre. Neque est vis exigua, quâ calor polleat hoc modo, in universo corpore. Quam longè aliter habet se, qui factus hebes et languidus fervido Austro spirante trahit sua membra ægrè, ac ille, qui, sub frigido Aquilone, exercet se glaciali cursu, firmus, mobilis, expeditus totum corpus.

94. Variæ causæ, quæ

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sure remedy is given to overcome the rigidity of the limbs, which is apt to be brought on by long rest, than frequent exercise; which, at first very difficult and for a long time limited, commonly becomes daily more practicable, more free, and more perfect.

93. Heat relaxes and expands all bodies; but cold thickens and hardens them. Men, indeed, are accustomed to experience both effects. Although the body may nearly always preserve its temperature, it cannot happen but that the surface of it at least should be affected by the external ambient air. Nor is that influence slight by which heat prevails in this way in the whole system. How far differently he feels himself, who, rendered dull and languid by the hot southern wind blowing, drags his limbs along with difficulty, and he who, under the cold north wind, exercises himself on the icy track, strong, active, and nimble in his entire frame.

94. Various causes which, being separate, are wont to affect the properties

singulæ solent afficere dotes animalis solidi tot modis; conjunctæ præstant adhuc majores effectus: experimenta instituta à Bryan Robinson docent; effectus calidi balnei docent; quotidiana experientia docet.

95. Variæ partes corporis, aptæ variis muniis, fiunt ex hâc materiâ. Nondum constat certâ fide, quænam sit ultima et minutissima fabrica animalis solidi: Sive constet ex fibris, scilicet longis filis, parum latis, textis variè inter se, ut Boerhaavius docet; sive ex serpentinis fibris, convolutis in mirum modum, ut quædam observationes nuper factæ suadent; sive cellulosa tela fiat ex fibris que laminis, et maxima pars omnium partium corporis fiat ex hâc, ut celeberrimus Hallerus conatus est ostendere.

96. Erit alibi locus dicendi de fibris que dotibus earum (109 et seq.) Cellulosa tela observatur

tot modis dotes solidi animalis afficere solent, conjunctæ majores adhuc effectus præstant: docent experimenta a Bryan Robinson instituta; docent effectus balnei calidi; docet quotidiana experientia.

95. Ex hac materia variæ corporis partes, variis muniis aptæ, fiunt. Nondum certa fide constat, quænam sit solidi animalis ultima et minutissima fabrica: Sive ex fibris, filis scilicet longis, parum latis, varie inter se textis, constet, ut docet Boerhaavius; sive ex fibris serpentinis, mirum in modum convolutis, ut quædam observationes nuper factæ suadent; sive ex fibris laminisque tela cellulosa fiat, et ex hac maxima pars omnium partium corporis, ut celeb. Hallerus ostendere conatus est.

96. De fibris earumque dotibus, alibi locus erit dicendi (109 et seq.) Tela cellulosa ubique in

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of the animal solid in so many ways, when combined, produce still greater effects. The experiments made by Bryan Robinson show it; the effects of the warm bath prove it,—daily experience teaches it.

95. Various parts of the body, adapted to different functions, are formed from this substance. It does not yet appear with any certainty, what is the ultimate and most minute structure of the animal solid; whether it consists of fibres, that is, long threads of little breadth, interwoven variously together, as Boerhaave teaches; or of serpentine fibres convoluted in a wonderful manner, as some observations lately made persuade us; or whether the cellular substance is composed of fibres and laminæ (or plates), and the chief portion of all parts of the body is formed from this, as the very celebrated Haller has endeavoured to demonstrate.

96. There will be elsewhere a place for treating of fibres and the properties of them. Cellular tissue is observed everywhere in the body; it surrounds

corpore observatur; fibras ipsas, quæ in multis partibus satis manifeste apparent, circundat et nectit, et varias partes, quæ motum aliquem in vicinas habere debent, leviter conjungit. Eadem probè densata, firmissimas, et quæ videntur tenuissimæ, membranas facit: Quarum quæ simplicissimæ apparent, accuratiùs exploratæ, hanc structuram ostendunt.

97. Crescit sæpe mirum in modum, tela cellulosa, partesque ex ea factæ, membranæ, vasa, &c. imprimis lenta distensione; subita autem distentio eam vel rumpit, vel tenuiorem facit. Crescit quoque nonnunquam inter partes vicinas, easque jungit quas Natura liberas fecerat. Hujusmodi concretiones præter naturam sæpe observantur, post inflammationem pulmonis vel viscerum abdominis: —Et novæ istæ membranæ vere cellulosæ sunt.

ubique in corpore; circundat et nectit fibras ipsas, quæ apparent satis manifestè in multis partibus, et leviter conjungit varias partes quæ debent habere aliquem motum in vicinas. Eadem probe densata facit firmissimas membranas, et quæ videntur tenuissimæ; quarum quæ apparent simplicissimæ, exploratæ accuratiùs ostendunt hanc structuram.

97. Cellulosa tela sæpè crescit in mirum modum, que partes factæ ex eâ membranæ, vasa, &c. imprimis lentâ distensione; autem subita distensio vel rumpit eam, vel facit tenuiorem. Quoque nonnunquam crescit inter vicinas partes, que jungit eas quas Natura fecerat liberas. Concretiones hujusmodi præter naturam sæpe observantur, post inflammationem pulmonis vel viscerum abdominis; Et istæ novæ membranæ sunt verè cellulosæ.

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and connects the fibres themselves, which appear very evidently in many parts, and loosely unites various parts, which ought to exert some motion on adjacent ones. The same properly condensed forms the firmest membranes and those which appear the thinnest; of which those that appear most simple, examined more accurately, show this structure.

97. The cellular tissue frequently increases to a wonderful extent, and parts composed of it, (such as) membranes, vessels, &c. principally by slow distention; but sudden distention either ruptures it or renders it thinner. Also it sometimes increases between neighbouring parts, and unites those which nature had made free. Concretions of this description contrary to nature are often observed, after the inflammation of the lungs or viscera of the abdomen. And those new membranes are truly cellular.

98. Etiam concrescit suâ sponte, si secta fuerit vel separata alio modo. Quod si magna pars cellulosæ telæ destructa fuerit ingente inflammatione, et suppuratione factâ, tunc non renovatur, et fœda cicatrix relinquitur.

98. Concrescit etiam sua sponte, si secta vel alio modo separata fuerit. Quod si ingente inflammatione, et suppuratione facta, magna pars telæ cellulosæ destructa fuerit, tunc non renovatur, et fœda cicatrix relinquitur.

99. Quin et pars vel ejusdem vel alieni corporis, ut fertur, interdum potest jungi alii concretione hujusmodi. Ars Taliacotii nitebatur hoc, si ullo fundamento; et alia nupera multùm jactata transponendi dentes.

99. Quin et pars, ut fertur, vel ejusdem, vel alieni corporis, alii interdum jungi potest hujusmodi concretione. Hoc, si ullo fundamento, nitebatur ars Taliacotii; et alia nupera multum jactata, dentes transponendi.

100. Aliis partibus cellulosa tela est reticulata, aliis referta adipe. Scilicet, ubicunque, magna moles aut compressio, fuissent periculo aut incommodo, veluti in capite, pulmone, oculis, palpebris, pene, scroto, ibi colligit nullum adipem, sed est laxa et purè reticulata. At plurimus adeps, secernitur et colligitur inter musculos corporis et artuum, sub

100. Tela cellulosa est aliis partibus reticulata, aliis adipe referta. Scilicet, ubicunque magna moles, aut compressio, periculo aut incommodo fuissent, veluti in capite, pulmone, oculis, palpebris, pene, scroto, ibi nullum adipem colligit, sed laxa et pure reticulata est. At, inter musculos corporis et artuum, sub cute et in abdomine, imprimis in omento et circa

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98. Also it likewise grows together spontaneously, if it has been cut or separated in any other manner; but if a considerable portion of the cellular tissue has been destroyed by high inflammation and by suppuration established, then it is not renewed, and an ugly cicatrix is left.

99. Moreover, even a part either of the same, or another body, as it is related, may sometimes be united to another, by a growing together of this description. The art of Taliacotius rested on this, if on any foundation; likewise another modern art much boasted of, that of transplanting teeth.

100. In some parts the cellular tissue is reticulated, in others filled with fat; that is to say, wherever a great mass or compression would have been a danger or inconvenience, as in the head, lungs, eyes, and eyelids, penis, and scrotum, there it collects no fat, but is loose and purely reticulated. But much fat is secreted and collected between the muscles of the body and limbs,

renes, plurimus adeps secernitur et colligitur.

101. Adeps purum oleum animale est, ab oleis herbarum crassis et mitibus parum diversus; in vita fluidus; sed variis partibus crassior aut tenuior. A sanguine secernitur, in ipsum facile, et sæpe subito, resorbetur, quamvis rarissime sincerum oleum vel adeps in sanguine conspiciatur.

102. Verisimile est oleum per digestionem, partim in ventriculo et intestinis, partim in pulmone, in fibrinam, gelatinam, et albumen converti; et hæc iterum per secretionem in oleum revertere. Nulla profecto adipis organa secernentia ostenduntur. Oportet tamen istiusmodi sint, et fabrica quoque specialis telæ cellulosæ earum partium, quæ debent habere adipem, ut oleum jam secretum contineant neque ad alias transire sinant. Nam in partes pure reticute et in abdomine, imprimis in omento et circa renes.

101. Adeps est purum animale oleum parùm diversus ab crassis et mitibus oleis herbarum; fluidus in vitâ; sed crassior aut tenuior variis partibus. Secernitur a sanguine, facilè, et sæpe subitò resorbetur in ipsum, quamvis rarissimè sincerum oleum vel adeps conspiciatur in sanguine.

102. Verisimile est oleum converti per digestionem in fibrinam, gelatinam, et albumen, partim in ventriculo et intestinis, partim in pulmone; et hæc iterum revertere per secretionem in oleum. Profectò nulla secernentia organa adipis ostenduntur. Tamen oportet sint istiusmodo et quoque specialis fabrica cellulosæ telæ earum partium, quæ debent habere adipem, ut contineant oleum jam secretum, neque sinant transire ad alias. Nam nunquam aperit viam sibi

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under the skin, and in the abdomen, especially in the omentum and about the kidneys.

101. Fat is a pure animal oil, slightly differing from the thick and bland oils of plants; fluid during life, but thicker or thinner in the different parts. It is secreted from the blood; is easily and often suddenly is reabsorbed into it; although very rarely real oil or fat can be seen in the blood.

102. It is probable that oil is converted by digestion into fibrine, gelatine, and albumen, partly in the stomach and intestines, partly in the lungs, and that these again revert by secretion into oil. In truth, no secerning organs of fat are shown; still it is necessary that there should be some of that kind, and a particular structure of the cellular tissue of those parts, which ought to contain fat, that they may retain the oil when secreted, nor allow it to pass to others; for it never opens a passage for itself into parts purely reti-

in partes purè reticulatas, quamvis sit facilis via per telam cellulosam aëri aut aquæ per totum corpus a capite ad calcem.

103. Nihil adipis reperitur in tenero fœtu, parum in maturo. Verò infantes, modò sint bene aliti, ferè solent pinguescere, donec incipiant ambulare et exercere semet propriis viribus, tum fiunt graciles, et manent sic usque ad virilem ætatem, quâ solent uti minùs crebrâ et validâ exercitatione. Tum fiunt quadrati et sæpè obesissimi: denuò paulatim marcescunt maturâ senectute. Verò puellæ quodammodo pinguescunt circa puberem ætatem; unde nitida, teres forma, adeo amabilis, et apta premi; et ferè omni ætate, fœminæ pinguescunt plus quam viri. Quoque viri laxi et flaccidi habitum corporis, fiunt obesiores firmioribus.

104. Adeps colligitur usû multi oleosi, nutri-

culatas viam sibi nunquam aperit, quamvis per telam cellulosam facilis via sit aëri aut aquæ per totum corpus a capite ad calcem.

103. In tenero fœtu nihil adipis, in maturo parum reperitur. Infantes vero, modo bene aliti sint, fere solent pinguescere, donec ambulare et propriis viribus semet exercere incipiant; tum graciles fiunt, et sic manent ad virilem usque ætatem, qua minus crebra et valida uti solent exercitatione. Tum quadrati fiunt et sæpe obesissimi: matura senectute, paulatim denuo marcescunt. Puellæ vero quodammodo pinguescunt circa ætatem puberem; unde forma nitida, teres, amabilis adeo, et apta premi: et fere omni ætate, fœminæ plus quam viri pinguescunt. Viri quoque habitum corporis laxi et flaccidi firmioribus obesiores fiunt.

104. Colligitur adeps usu multi

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culated, although there is a free channel through the cellular tissue for air or water through the whole body, from the head to the heel.

103. No fat is found in the tender fœtus, little in the mature one. But infants, provided they have been well nourished, usually are wont to become fat, until they begin to walk and exercise themselves by their own powers; they then become thin, and remain so until manhood, in which they are accustomed to use less frequent and active exercise: then they become square built, and often very corpulent; gradually they again become emaciated in mature old age. But girls in some degree become fat about puberty, whence their smooth, rounded form, so lovely, and suited for embraces; and generally at every age, females become corpulent more than men. Also men lax and flaccid as to their habit of body become more corpulent than those of firmer fibre.

104. Fat is accumulated by the use of much oily, nutritious food, par-

cibi, oleosi, nutrientis, ex carnibus præsertim (modo concoctio bona sit) et potus validi, cerevisiæ imprimis, et animi et corporis quiete et tranquillitate, multo somno et torpore, castratione, frigore, sanguinis detractione repetita, multisque aliis exinanitionibus; quicquid scilicet, salva sanitate, vires vitales et animales, et imprimis solitas excretiones, eminuit, huic favet. Multum vero pendet ab ipsius corporis habitu: neque homo, ut bos ad libitum saginari potest.

105. Certa, secundum ætatem hominis, obesitas, prosperæ valetudinis signum est et effectus. Nimia vero, ipsa morbus est, et aliorum morborum causa. Semper vero et certissime debellanda, si modo fuerint bona voluntas et vis animi, valida corporis exercitatione, brevi somno, parca et sicca diæta. Nec facile miles

entis cibi, præsertim ex carnibus (modo sit bona concoctio) et validi potûs, imprimis cerevisiæ, et quiete et tranquillitate animi et corporis, multo somno et torpore, castratione, frigore, repetitâ detractione sanguinis, que multis aliis exinanitionibus; scilicet sanitate salvâ, quicquid minuit vitales et animales vires, et imprimis solitas excretiones, favet huic. Verò multum pendet ab habitû corporis ipsius neque potest homo, ut bos, saginari ad libitum.

105. Certa obesitas, secundum ætatem hominis, est signum et effectus prosperæ valetudinis. Vero nimia est ipsa morbus, et causa aliorum morborum. Verò semper et certissimè debellanda (modo si fuerint bona voluntas et vis animi), validâ exercitatione corporis, brevi somno, parcâ et siccâ diætâ. Nec gregarius miles facile

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ticularly from flesh (provided the digestion be good), also strong drink, especially beer, by rest and tranquillity of the mind and body, by much sleep and torpor, castration, cold, repeated bloodletting, and many other evacuations; for, in a sound state of health, whatever diminishes the vital and animal powers, and especially the usual excretions, is favorable to this; but a great deal depends on the habit of the body itself, nor can man, like an ox, be fattened at pleasure.

105. A certain degree of fatness, in proportion to the age of man, is an indication and effect of good health. But too much is itself a disease, and a cause of other diseases. But always and very certainly it is to be overcome, (if only there have been intention and resolution,) by powerful exercise of the body, short sleep, by sparing and dry diet. Nor could a common soldier easily be found who can complain of such a disease.

repertus fuerit, qui conqueratur de tali morbo.

106. Adeps semper facit haud exiguam partem corporis, aliquando maximam. Igitur non dubitandum est quin habeat suos usus. Reddit motum faciliorem, et liberiorem oblinendo partes movendas, et sic minuendo frictionem. Hoc modo, impedit, ne solidæ partes abradantur, quod aliter fieret; nec sinit vicinas partes concrescere, quod aliquando fit, si aliqua pars telæ, quæ continebat adipem, destructa fuerit ulcere vel alio casû.

107. Quin confert haud parum et ad formam et pulchritudinem corporis, implendo magna interstitia inter musculos, quæ redderent corpus deforme et horrendum. Autem justâ pinguedine, hoc fit nitidum, teres atque rotundum. Porrò, adeps dat candidum, cereum, colorem, qui mixtus ro-

gregarius repertus fuerit, qui de tali morbo conqueratur.

106. Adeps semper partem haud exiguam corporis facit, aliquando maximam. Non est igitur dubitandum, quin suos usus habeat. Motum faciliorem et liberiorem reddit, partes movendas oblinendo, et sic frictionem minuendo. Hoc modo, ne abradantur solidæ partes, quod aliter fieret, impedit; nec sinit partes vicinas concrescere, quod aliquando fit si ulcere vel alio casu, pars aliqua telæ quæ adipem continebat destructa fuerit.

107. Quin, et ad corporis formam et pulchritudinem haud parum confert, magna interstitia inter musculos implendo, quæ corpus deforme et horrendum redderent. Justa autem pinguedine, hoc, nitidum, teres, atque rotundum fit. Porro adeps colorem dat candidum, cereum, qui,

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106. Fat always forms no little part of the body, sometimes the greatest. Therefore it is not to be doubted but that it has its uses. It renders motion more easy and more free, by oiling the parts to be moved, and in this way diminishing friction. In this manner it prevents, lest the solid parts be abraded, which would otherwise take place; nor does it allow the neighbouring parts to grow together, which sometimes occurs, if some part of the tissue which contained the fat, has been destroyed by ulceration or other accident.

107. Moreover it contributes not a little to the form and beauty of the body, by filling up the great interstices between the muscles, which would render the body deformed and unsightly; but by means of a due degree of corpulency, this becomes smooth, sleek, and rounded. Moreover the fat gives that fair waxy colour, which, mixed with the rosy tint, forms the very

roseo mixtus, venustissimum oris colorem efficit. Hinc fit, ut puellæ, male metuentes ne nimis pinguescant, et medicamentis, diæta, vitæ genere, marcescere conantes, cum nitido corporis habitu, oris quoque venustatem perdere soleant.

seo, efficit venustissimum colorem oris. Hinc fit, ut puellæ male metuentes, ne nimis pinguescant, et conantes marcescere medicamentis, diætâ, et genere vitæ, soleant perdere cum nitido habitû corporis, quoque venustatem oris.

108. Nutrire creditur adeps ex suis cellulis in sanguinem resumptus. Sed hoc minus certum est. A frigore quodammodo defendit; animalibus regionum frigidarum magna copia datus.

108. Adeps resumptus ex suis cellulis in sanguinem creditur nutrire. Sed hoc est minus certum. Quodammodo defendit a frigore: datus magnâ copiâ animalibus frigidarum regionum.

Cap. III.—*De solido vivo, seu genere nervoso, ejusque dotibus, fabrica, et usibus; nec non de conjecturis quæ circa ejus naturam et functiones prolatæ sunt.*

Cap. III.—*De vivo solido, seu nervoso genere, que dotibus, fabricâ et usibus ejus; nec non de conjecturis quæ prolatæ sunt circa naturam et functiones ejus.*

109. Solida viva, vel vitalia, dicuntur partes solidæ quæ sen-

109. Solidæ partes quæ habent sensum et mobili-

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beautiful colour of the countenance. Hence it occurs, that girls, foolishly fearing lest they become too corpulent, and endeavouring to reduce themselves by medicines, diet, and mode of life, are accustomed to lose, together with their comely habit of body, also the beauty of the countenance.

108. Fat, reabsorbed from its cells into the blood, is thought to nourish. But this is less certain. In some manner it protects from cold, being supplied in great abundance to the animals of cold regions.

Chap. III.—*On the living solid, or nervous system, on the properties, structure, and uses of it; also on the conjectures which have been promulgated concerning the nature and functions of it.*

109 The solid parts which enjoy sensation and motion are called living or

tatem, dicuntur viva, vel vitalia solida. Hæ dotes, pendentes a vitâ, incipiunt et desinunt cum eâ. Verò dotes solidarum partium, de quibus dictum fuit (75, et sequentibus) supersunt etiam post mortem.

110. Autem partes, quæ habent vel sensum vel mobilitatem vel utrumque, sunt cerebrum, cerebellum, medulla oblongata, medulla spinalis, et nervi oriundi ex his, diffusi ferè per totum corpus, impensi in varia organa singulorum sensuum et musculos, et demum musculi ipsi.

111. Sensus est multò magis generalis quam mobilitas, quippe qui sit communis omnibus partibus jam recensitis, quamvis fiat planè per nervos solos. Verò mobilitas est propria musculosis fibris solis. Igitur ubicunque est sensus, ibi sunt nervi; verò ubicunque mobilitas observatur, ibi musculosæ fibræ videntur esse.

sum et mobilitatem habent. Hæ dotes, a vita pendentes, cum ea incipiunt et desinunt. Dotes vero partium solidarum, de quibus (75, et seq.) dictum fuit, etiam post mortem supersunt.

110. Partes autem, quæ vel sensum, vel mobilitatem, vel utrumque habent, sunt cerebrum, cerebellum, medulla oblongata, medulla spinalis, nervi ex his oriundi, per totum fere corpus diffusi, in varia singulorum sensuum organa et musculos impensi, et demum musculi ipsi.

111. Sensus multo magis generalis est quam mobilitas, quippe qui omnibus partibus jam recensitis communis sit, quamvis plane per nervos solos fiat. Mobilitas vero solis fibris musculosis est propria. Ubicunque igitur sensus est, ibi nervi; ubicunque vero mobilitas observatur, ibi fibræ musculosæ videntur esse.

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vital solids. These properties, depending upon life, begin and terminate with it. But the properties of the solid parts, concerning which we have spoken, remain even after death.

110. But the parts which enjoy either sensation or motion, or both, are the cerebrum, cerebellum, medulla oblongata, medulla spinalis, and nerves arising from these, spread generally through the whole body, expended upon the various organs of the several senses and muscles, and lastly the muscles themselves.

111. Sensation is much more general than motion, for it is common to all the parts above mentioned, although it takes place evidently by means of the nerves alone. Mobility is proper to the muscular fibres alone. Therefore, wherever there is sensation, there are nerves; but wherever motion is observed, there muscular fibres are seen to exist.

112. Quin et mobilitas ipsa a nexu, quem musculi cum nervis,&c. habent pendere videtur: nam resecto, vel compresso, vel ligato nervo, musculi quibus impendebatur, mobilitatem suam, seu vim propriam contrahendi, brevi amittunt; nec aliter res se habet, si cerebrum ipsum, vel origo nervorum, male affecta fuerint.

113. Sunt qui credunt musculos a nervis oriri et formari, et ex eadem materia constare. Utrique sane similem structuram habent, quatenus ex fibris valde minutis constent; utrique albi sunt, dummodo musculi probe eloti, et a sanguine, quem multum continent, purgati fuerint: Neque ope microscopii ullo modo distingui possunt fibræ nervosæ quæ bene multæ musculos subeunt, ab ipsis fibris musculosis. Porro, idem sensus utrisque est, et stimulantia et sedantia medicamenta eosdem plane

112. Quin et mobilitas ipsa videtur pendere a nexû, quem musculi habent cum nervis, &c.: nam, nervo resecto vel compresso vel ligato, musculi quibus impendebatur, brevi amittunt suam mobilitatem, seu propriam vim contrahendi; nec res habet se aliter, si cerebrum ipsum vel origo nervorum, fuerint male affecta.

113. Sunt, qui credunt musculos oriri et formari a nervis, et constare ex eâdem materiâ. Sanè utrique habent similem structuram, quatenùs constent ex valdè minutis fibris; utrique sunt albi, dummodo musculi fuerint bene eloti, et purgati a sanguine quem continent multum: Neque nervosæ fibræ quæ benè multæ subeunt musculos possunt distingui ab musculosis fibris ipsis ullo modo, ope microscopii. Porro est idem sensus utrisque; et stimulantia et sedantia medicamenta

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112. Moreover also mobility itself seems to depend upon the connexion which the muscles have with the nerves, for a nerve being cut, compressed, or tied, the muscles upon which it was distributed, in a short time lose their mobility or peculiar power of contracting. Nor is the case different, if the brain itself, or the origin of the nerves, shall have been disordered.

113. There are some who consider that the muscles arise and are formed from the nerves, and consist of the same substance. Indeed both have a similar structure, inasmuch as they consist of very minute fibres; both are white, provided the muscles have been well washed and cleansed from the blood, which they contain in considerable quantity; nor can the very numerous nervous fibres which in great number enter the muscles be in any degree distinguished from the muscular fibres themselves, by the assistance of a microscope. Moreover there is the same sensation in both; and stimu-

edunt planè eosdem effectus in musculis, sive admota fuerint musculo ipsi, sive nervo, qui adeat eum.

114. Erit alibi locus dicendi, quantis difficultatibus scientia originis multarum partium corporis prematur; sive credamus omnes produci eodem tempore, sive alias post alias certo ordine. Interea tamen non dissimulandum est, quasdam musculosas partes conspici perquam maturè in fœtû, et jam adeptas esse insignem vim et robur, quum cerebrum ipsum reperitur adhuc molle et fere fluidum; que actionem earum requiri ad functionem et augmen ejus; et musculos semper esse multo firmiores partibus vere nervosis, et habere propriam vim, nimirum irritabilem, quam nervi nunquam participant.

115. Igitur oportet, vel musculi constituti fuerint ex materiâ diversâ ab eâ, ex quâ nervi fiunt, vel,

effectus in musculis edunt, sive ipsi musculo, sive nervo qui eum adeat, admota fuerint.

114. Quantis difficultatibus prematur scientia originis multarum corporis partium, alibi locus erit dicendi; sive omnes eodem tempore, sive alias post alias, certo ordine produci credamus. Interea tamen non dissimulandum est, partes quasdam musculosas perquam mature in fœtu conspici, et insignem vim et robur jam adeptas esse, quum cerebrum ipsum adhuc molle et fere fluidum reperitur; earumque actionem ad hujus functionem et augmeu requiri; et musculos semper partibus vere nervosis multo firmiores esse, et vim propriam, irritabilem nimirum, habere, quam nervi nunquam participant.

115. Oportet, igitur, vel ex diversa musculi constituti fuerint materia, ab ea ex qua nervi fiunt, vel,

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lants and sedative medicines evidently produce the same effects in the muscles, whether they have been applied to the muscle itself, or to the nerve which enters it.

114. There will be elsewhere an opportunity of mentioning by how great difficulties the knowledge of the origin of many parts of the body is obstructed, whether we should consider them all to be produced at the same time, or some after others, in certain succession. In the mean while, however, it cannot be dissembled that certain muscular parts are observed very early in the fœtus, and have already acquired considerable power and strength, whilst the brain itself is found still soft and nearly fluid; and that the action of them is required for the functions and increase of it; and that muscles are always much firmer than parts truly nervous, and have a peculiar property, namely, irritable, which the nerves never partake of.

115. Therefore it is necessary, either that the muscles should be constituted

si ex eadem utrique constent, hæc fabricæ prorsus diversæ sit in his, ac in illis, ut vires adeo dissimiles habeat. Quod si, igitur, diversa sit musculorum ac nervorum substantia, tum facile patebit multam substantiam nervosam cum musculosa semper misceri. Nam acicula tenuissima non potest in musculum adigi, quin inde simul multi ramuli nervosi pungantur vel lacerentur; ut dolor clare testatur (111)

116. Igitur tam arctus inter musculos nervosque intercedit nexus, tum quod ad officium attinet quo funguntur, tum quod ad fabricam quam habent, ut merito omnia solida viva pro partibus ejusdem generis habeantur, cui nomen genus nervosum a medicis imponi solet.

117. Miræ quas hæ partes possident dotes medicorum et philosophorum attentionem optimo jure si-

si utrique constent ex eâdem, hæc sit prorsùs diversæ fabricæ in his ac in illis, ut habeat vires adeò dissimiles. Quod si, igitur, substantia musculorum ac nervorum sit diversa, tum facilè patebit multam nervosam substantiam semper misceri cum musculosâ. Nam tenuissima acicula non potest adigi in musculum, quin inde multi nervosi ramuli simul pungantur vel lacerentur; ut dolor clarè testatur (111).

116. Igitur tam arctus nexus intercedit inter musculos que nervos, tum quod attinet ad officium quo funguntur, tum quod ad fabricam, quam habent, ut meritò omnia viva solida habeantur pro partibus ejusdem generis, cui nomen nervosum genus solet imponi a medicis.

117. Miræ dotes, quas hæ partes possident, vindicarunt sibi optimo jure

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of matter different from that from which the nerves are formed, or if both consist of the same, this is altogether of a different fabric in the latter to what it is in the former, that it should have properties so dissimilar. But if, therefore, the substance of the muscles and nerves be different, then it will easily be evident that much nervous substance is always mixed up with the muscular; for the finest needle cannot be inserted into a muscle, but that thence many nervous ramifications are at the same time pricked or lacerated; as pain evtdently testifies (111).

116. Therefore, so close a connexion exists between the muscles and nerves, both as relates to the function they perform, as well as to the structure which they possess, that properly all the living solids may be considered as parts of the same kind, to which the name nervous system is accustomed to be applied by medical men.

117. The wonderful properties which these parts possess, claimed to them-

attentionem medicorum et philosophorum: que plurimi et ingeniosissimi viri (inter quos oportet numerare summum Neutonum) collocarunt haud exiguam operam in investigandis causis earundem, que perscrutando modo, quo variæ functiones ipsarum fierent; que protulerunt in medium varias conjecturas de his rebus quæ placebant singulis. Vero nondum ulla ratio explorandi rem per experimenta proposita est; et experientia bis mille annorum demonstravit satis superque, etiam sapientissimos homines rarissime detegere arcana naturæ conjectando. Nonnulli scriptores omnino male abusi sunt nomine Neutoni, nunquam non venerando, qui rejecerunt totam opinionem quam cuperent tueri in auctoritatem ejus; quamvis ille, solitâ modestiâ et prudentiâ (quas plerique auctores maluere laudare quam imitari)

bi vindicarunt: plurimique et ingeniosissimi viri (inter quos summum Neutonum numerare oportet) operam haud exiguam collocarunt in causis earundem investigandis, modoque perscrutando quo variæ ipsarum functiones fierent; variasque quæ singulis placebant de his rebus conjecturas in medium protulerunt. Nondum vero ratio ulla proposita est rem per experimenta explorandi; et experientia bis mille annorum satis superque demonstravit sapientissimos etiam hominum naturæ arcana conjectando rarissime detegere. Male omnino Neutoni nomine, nunquam non venerando, abusi sunt scriptores nonnulli, qui opinionem quam tueri cuperent in ejus auctoritatem rejecerunt totam: quamvis ille, solita modestia et prudentia (quas laudare quam imitari plerique auctores maluere) suam de hac re sententiam, pro conjec-

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selves the attention of medical men and philosophers; and many and very ingenious men (amongst whom it is necessary to enumerate the great Newton) bestowed no little pains in investigating the causes of them, and inquiring into the manner in which the different functions of them were performed; and brought before the public the various conjectures upon these matters which pleased them individually. But not yet any rational mode of investigating the subject by experiment has been proposed; and the experience of two thousand years has shown amply and more than adequately, that the most learned very rarely discover the arcana of nature by conjecturing. Some writers have altogether wrongly abused the name of Newton, ever to be venerated, who referred the entire opinion which they were anxious to defend to his authority; although he, with his usual modesty and caution, (which many authors would rather commend than imitate,) gave his opinion on this subject, as conjecture only or a query, either to be refuted or esta-

tura tantum seu quæstione proposuerit, idoneis experimentis et argumentis aut refellenda aut confirmanda. Sed ne quidem Neutoni conjecturas pro veris sumere licet: non sic ille imitandus; non sic scientia promovenda.

118. Variæ profecto sententiæ, de modo quo sensus motusque in corpore animali fiunt, prolatæ sunt; omnibus vero hoc fundamentum commune est, fortasse et vitium quoque, nempe, quod rationem utriusque petant a motibus quibusdam generi nervoso propriis et peculiaribus, ab organo sensus incipientibus, et per nervos ad cerebrum propagatis, dum sentimus; et a cerebro incipientibus, perque nervos (sive eosdem qui sensui inserviunt, sive alios omnino diversos et distinctos, quamvis in eundem fasciculum cum illis colligatos) ad

proposuerit suam sententiam de hâc re, pro conjecturâ tantùm seu quæstione, aut refellendâ aut confirmandâ idoneis experimentis et argumentis. Sed ne licet sumere conjecturas quidem Neutoni pro veris: ille non sic imitandus; sic scientia non promovenda.

118. Profecto variæ sententiæ prolatæ sunt de modo, quo sensus que voluntarius motus fiunt in animali corpore; verò hoc est commune fundamentum, fortasse et vitium quoque omnibus, nempe quod petant rationem utriusque a quibusdam motibus propriis et peculiaribus nervoso generi, incipientibus ab organo sensûs, et propagatis per nervos ad cerebrum, dum sentimus; et incipientibus a cerebro, que delatis ad musculos per nervos (sive eosdem qui inserviunt sensui, sive alios omnino diversos et distinctos, quamvis colligatos in eundem fasiculum

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blished by proper experiments and arguments. But it is not proper to receive the conjectures even of a Newton as truths: he is not in this way to be imitated; in this way science is not to be advanced.

118. Indeed, various opinions have been advanced, concerning the manner in which sensation and voluntary motion take place in the animal body, but this is the common foundation, and, perhaps, also error in all, namely, that they seek for an explanation of both from certain motions, proper and peculiar to the nervous system, beginning from the organ of sense, and propagated by means of the nerves, to the brain, whilst we have sensation; and those beginning from the brain, and conveyed to the muscles by the nerves, (either the same which are subservient to sensation, or others quite different and distinct, although bound up into the same fasciculus with them,) whilst we move the muscles at our will.

cum illis) dum movemus nostros musculos ad arbitrium.

119. Alii crediderunt hos motus fieri, per substantiam ipsam nervorum, trementium vel vibrantium, ut vocabant, non secus ac chordæ lyræ tremunt percussæ plectro.

120. Alii, quibus erat bene perspectum quam malè nervi et cerebrum essent accommodati ad perficiendos et propagandos tales tremores et motus (quippe qui toti existant mollissimi, et sint multum impediti tactû vicinarum partium vel sæpe etiam alligati sint ad vicinas partes) rejecerunt motus, quos contendebant fieri et essè necessarios, in tenuem et valdè mobilem humorem, quem fingebant inesse nervis, que moveri in iis suis legibus, que possidere multas et miras dotes et excellentias.

121. Demùm alii potiùs confugerunt ad universalem ætherem, qualem et nuper et olim persuasum

musculos delatis, dum musculos nostros ad arbitrium movemus.

119. Hos motus alii crediderunt per ipsam substantiam nervorum fieri, trementium vel vibrantium, ut vocabant, non secus ac lyræ chordæ tremunt plectro percussæ.

120. Alii, quibus bene perspectum erat quam male accommodati essent nervi et cerebrum ad tales perficiendos et propagandos tremores vel motus (quippe qui toti mollissimi existant, et vicinarum partium tactu multum impediti, vel sæpe etiam ad vicinas partes alligati sint) motus, quos fieri et necessarios esse contendebant, in humorem tenuem et valde mobilem rejecerunt, quem nervis inesse fingebant, inque iis suis legibus moveri, multasque et miras dotes et excellentias possidere.

121. Alii demum ad ætherem universalem potius confugerunt, qualem et nuper et olim multis

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119. Some have considered, that these motions take place by the substance itself of the nerves, trembling, or vibrating, as they termed it, in the same way as the strings of the lyre tremble when struck by the plectrum.

120. Others, by whom it was well perceived how badly the nerves and brain were fitted for perfecting and propagating such tremors and motions, (inasmuch as they all are very soft, and are much obstructed by contact of neighbouring parts, or often bound to neighbouring parts,) referred the motions, which they contended to take place, and to be necessary, to a subtile and very active fluid, which they imagined to be in the nerves, and to be moved in them by its own certain laws, and to possess many and wonderful properties and virtues.

121. Lastly, others rather had recourse to an universal æther, such as both lately and formerly many philosophers were persuaded, pervades, fills, and

philosophis persuasum est totum mundum pervadere, implere, variisque legibus temperare; cujus ope et ministerio sidera mearent, sol fulgeret, mare cresceret decresceretque, flumina laberentur, venti spirarent, plantæ pullularent, Jupiter ipse tonaret. — Utilissimus certe et strenuissimus æther, sed nusquam prehensus, nusquam ad quæstionem deductus, ut sui rationem redderet, Proteo ipso mutabilior et fugacior, diu multumque jam frustra agitatus, tandem requiescat in pace. Nam quæ spes prehendendi "cui in plures jus est transire figuras?"

"Nam modo te juvenem, modo te videre leonem,
Nunc violentus aper; nunc quem tetigisse timerent
Anguis eras; modo te faciebant cornua taurum:
Sæpe lapis poteras, arbor quoque sæpe videri.
Interdum, faciem liquidarum imitatus aquarum,
Flumen eras; interdum, undis contrarius ignis."

est multis philosophis pervadere, implere, que temperare totum mundum variis legibus, ope et ministerio cujus, sidera mearent, sol fulgeret, mare cresceret que decresceret, flumina laberentur, venti spirarent, plantæ pullularent, Jupiter ipse tonaret. Certè æther est utilissimus et strenuissimus, sed nusquam prehensus, nusquam deductus ad quæstionem, ut redderet rationem sui, mutabilior et fugacior Proteo ipso, multum agitatus jam frustra que diu, tandem requiescat in pace. Nam quæ spes prehendendi "cui est jus transire in plures figuras?" Nam modo vidére te juvenem, modo leonem; nunc violentus aper; nunc eras anguis, quem timerent tetigisse: modo cornua faciebant te taurum: sæpè poteras videri lapis, quoque sæpe arbor; interdum, eras flumen imitatus faciem limpidarum aquarum; interdum eras ignis contrarius undis.

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governs the whole universe by various laws; by the aid and attendance of which, the stars moved, the sun shone, the sea rose and fell, the rivers glided along, the winds blew, the plants shot forth, and Jupiter himself thundered. Truly æther is very useful and powerful, but on no occasion laid hold of, never been brought to the inquiry that it might give an account of itself; more changeable and more fleeting than Proteus himself, much agitated now long, and to no purpose, at length let it rest in peace: for what hope is there of catching, "that to which it is permitted to pass into so many forms?"

For sometimes they saw thee as a young man, sometimes a lion; at one time you were a fierce boar, at another time a snake, which they feared to have touched; sometimes horns made you a bull; often you were able to appear a stone; also oftentimes a tree; sometimes you were a river, having assumed the appearance of the limpid waters; sometimes you were a flame, opposed to the waves.

122. Autem medici, male disputaverint de his aut similibus commentis prius quam demonstratum fuerit, vel observando vel experiendo, talem æthera existere, que tales motus fieri in nervoso genere; vel saltem fuerit factum credibile, nodum solutum iri talibus conjecturis. Enim omnibus concessis de æthere et motibus postulatis in nervoso genere, omninò parum efficitur; nam tremores nervorum vel motus ætheris, qualescunque amantissimi commentorum hujusmodi potuerint fingere sibimet, nusquam erunt aut sensus, aut similes sensui, aut unquam mutabiles in sensum secundum notas leges naturæ.

123. Nec quisquam facilè ostenderit quo pacto voluntas animi (cui voluntati inest nihil corporei) afficeret tenuissimum, et subtilissimum que mobilissimum ætherem faci-

122. Male vero de his aut similibus commentis medici prius disputaverint, quam vel observando vel experiendo, demonstratum fuerit, talem æthera existere, talesque in genere nervoso motus fieri: vel saltem credibile factum fuerit, talibus conjecturis nodum solutum iri. Concessis enim omnibus de æthere et motibus in genere nervoso postulatis, parum omnino proficitur; nam tremores nervorum vel motus ætheris, qualescunque commentorum hujusmodi amantissimi sibimet fingere potuerint, nusquam aut sensus erunt, aut sensui similes, aut in sensum, secundum notas naturæ leges, unquam mutabiles.

123. Nec facile quisquam ostenderit quo pacto voluntas animi, cui voluntati nihil inest corporei, tenuissimum, et subtilissimum, mobilissimumque æthera, facilius

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122. But medical men idly disputed on these and similar conjectures, before that it was demonstrated either by observing or experimenting that such æther exists, and that such motions take place in the nervous system, or it was at least made probable, that the difficulty would be solved by such conjectures. For all things being admitted concerning æther, and the motions required in the nervous system, on the whole little is gained, for the tremors of the nerves, or motions of the æther, of whatever description the warmest admirers of conjectures of this kind could imagine to themselves will never be sensation, or like sensation, or ever changeable into sensation, according to the known laws of nature.

123. Nor could any one easily show, in what way volition of the mind, (in which volition there is nothing corporeal,) could affect that finest, most subtile, and most active æther, more easily or better than a stone, and could throw it into motion.

aut melius quam saxum afficeret, eumque in motus conjiceret.

124. Nec melior hoc modo aut magis perspicua ratio redditur sensuum qui dicuntur interni: memoriæ scilicet, imaginationis, et judicii. Vix credibile erit motus ullos in genere nervoso retineri et condi, nostro arbitrio denuo erupturos et renovandos; neque impressiones, aut vestigia, aut imagines ullas eorum motuum in cerebro imprimi veluti sigilli in cera, quas ad arbitrium nostrum iterum iterumque contemplemur, motusque qui eas primo effecissent denuo integremus. Tamen validissima sæpe est sensuum præteritorum renovatio, recordantibus, imaginantibus, somniantibus.

125. Quod si tales motus ad internorum æque ac externorum sensuum actionem necessarii sunt, tum plane oportebit, vel motus,

liùs aut melius quam saxum, que conjiceret eum in motus.

124. Nec hoc modo melior aut magis perspicua ratio redditur sensuum, qui dicuntur interni; scilicet memoriæ, imaginationis et judicii. Erit vix credibile ullos motus retineri et condi in genere nervoso, denuò erupturos et renovandos nostro arbitrio; neque impressiones aut vestigia, aut ullas imagines eorum motuum imprimi in cerebro, veluti sigilli in cerâ, quas contemplemur iterum iterumque ad nostrum arbitrium, que denuò integremus motus, qui primò effecissent eas. Tamen est sæpe validissima renovatio præteritorum, sensuum, recordantibus, imaginantibus somniantibus.

125. Quòd si tales motus sunt æque necessarii ad actionem internorum ac externorum sensuum, tum planè oportebit vel

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124. Nor in this manner a better or more evident explanation is given of the sensations which are called internal, namely, of memory, imagination, and judgment. It will scarcely be credible, that any motions are retained and accumulated in the nervous system, again to burst forth and be renewed at our pleasure; nor that impressions, or traces, or any images of those motions are impressed upon the brain, like seals in wax, which we may contemplate again and again at our pleasure, and may again renew the motions which primarily had produced them. Nevertheless, there is frequently a very powerful renovation of past sensations, to persons recollecting, thinking, and dreaming.

125. But if such motions are equally necessary to the action of the internal as of the external senses, then plainly it must be necessary, that either mo-

motus præcedant sensum, vel hic illos, vel denique utrique fiant uno que eodem puncto temporis. Si sensus est prior, nequit oriri a quovis motû fluidi nervorum, et igitur debet habere aliam causam.—Si ille motus est prior, causa ejus erit quærenda, scilicet qui possit minime pendere a sensû aut voluntate quæ sequuntur. Si demum uterque nimirum motus et sensus, fit simul, oportet fingere aliam causam utriusque; enim neuter potest esse causa alterius, prius quam ipse existit.

sensum præcedant, vel hic illos, vel denique uno eodemque temporis puncto utrique fiant. Si prior est sensus, a motu quovis fluidi nervorum oriri nequit, et aliam igitur debet habere causam. Si prior est motus ille, causa ejus quærenda erit, scilicet qui minime pendere possit a sensu aut voluntate quæ sequuntur. Si demum uterque, motus nimirum et sensus, simul fit, utriusque aliam fingere oportet causam; neuter enim alterius causa esse potest, prius quam ipse existit.

126. Vix sane, aut ne vix quidem, animo concipere possumus mutationem ullam in rebus corporeis fieri, quæ a motu quodam non pendeat, vel saltem cum motu aliquo modo conjungatur. Res vero de quibus hic agitur, sensus nimirum, tum externus tum internus, et voluntas, et conatus demum ad musculos vel artus movendos, non

126. Vix sane, aut ne quidem vix, possumus concipere animo, ullam mutationem fieri in corporeis rebus quæ non pendeat a quodam motû, vel saltem conjungatur cum motû aliquo modo. Vero res, de quibus hic agitur, nimirum sensus tum externus tum internus, et voluntas, et demùm conatus ad movendos mus-

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tions precede sensation, or the latter the former, or, lastly, that both take place in one and the same point of time. If sensation is first, it cannot arise from any motion of the fluid of the nerves, and therefore ought to have some other cause. If the motion is prior, the cause of it must be sought for, namely, which can by no means depend upon the sensation or volition which follows. Lastly, if both of them, namely, motion and sensation, occur simultaneously, it is necessary to imagine some other cause of both, for neither can be the cause of the other, before itself exists.

126. Scarcely indeed, or not indeed can we possibly conceive in the mind, that any change can take place in corporeal objects, which does not depend upon some motion, or at least be connected with motion in some degree. But the subjects of which it is here treated, namely sensation, as well external as internal, and volition, and lastly the efforts to move the muscles or

sunt corporeæ, neque iisdem ac tales res principiis explanandæ.

127. Missis igitur hujusmodi commentis de rebus quas natura forsitan visibus humanis negaverit, tanquam ad inutilia, et incomprehensibilia, vel absurda fortasse, ducentibus, magis e re sua erit, si medici ad singulas res factas et veras de hoc argumento investigandas semet gnaviter accinxerint.

culos vel artus, non sunt corporeæ, neque explanandæ iisdem principiis ac tales res.

127. Igitur commentis hujusmodi missis, de rebus, quas natura forsitan negaverit humanis visibus, tanquam ducentibus ad inutilia, et incomprehensibilia, vel fortasse absurda, erit magis e suâ re, si medici gnaviter accinxerint semet ad investigandas singulas res factas et veras de hoc argumento.

Cap. IV.—*De Sensu generatim, ejusque varietatibus, usibus, voluptatibus, molestiis, et vitiis.*

Cap. IV.—*De Sensû generatim, quæ varietatibus, voluptatibus molestiis, et vitiis ejus.*

128. Sensus nulla definitione eget, neque revera facile definiri

128. Sensus eget nullâ definitione, neque reverà potest facilè definiri;

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limbs, are not corporeal, nor to be explained on the same principles as such things.

127. Therefore, theories of this kind being laid aside concerning things which nature perhaps has hidden from men's eyes, as if conducing to useless, and incomprehensible, and perhaps absurd things, it will be more to the purpose, if medical men will vigorously apply themselves to investigate the several truths and facts concerning this subject.

Chap. IV.—*On Sensation generally, and the varieties, uses, pleasures, troubles, and disorders of it.*

128. Sensation requires no definition, nor indeed can it be easily defined; namely, than which, there is scarcely any thing more simple, or better un-

quippe quo, sit fere nihil simplicius, aut melius intellectum. Tamen solet describi, autem vix explanari, longo et parum accurato et quidem satis inepto circuitû verborum hujusmodi;—Mutatio in statû animi, cujus sumus conscii effecta aliquâ mutatione in statû corporis.

129. Verò utcunque simplex sensus videatur primo aspectû, philosophi perscrutati rem accuratiùs crediderunt se detexisse duplicem naturam ejus, et ideo monent probe distinguendum esse inter duas res pertinentes ad sensum, quæ vulgo solent comprehendi sub uno que eodem nomine; quamvis profectò nemo sanus existat tam stupidus qui confuderit res ipsas; et sanè philosophi omnino perperam objecerunt talem errorem vulgo hominum.

130. Altera harum rerum (nimirum mutatio

potest; quippe quo nihil fere simplicius sit, aut melius intellectum. Describi tamen, vix autem explanari solet, hujusmodi verborum circuitu, longo et parum accurato, et quidem satis inepto;—Mutatio cujus conscii sumus in statu animi, mutatione aliqua in statu corporis effecta.

129. Utcunque vero simplex primo aspectu sensus videatur, philosophi, rem accuratius perscrutati, duplicem ejus naturam se detexisse crediderunt, et ideo monent probe esse distinguendum inter duas res ad sensum pertinentes, quæ vulgo sub uno eodemque nomine comprehendi solent; quamvis profecto nemo sanus existat tam stupidus qui res ipsas confuderit; et sane perperam omnino talem vulgo hominum errorem objecerunt philosophi.

130. Harum rerum altera (mutatio nimirum quæ in animi statu

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derstood. However it is accustomed to be described, but hardly explained, by a long, and little accurate, and indeed very inappropriate circumlocution of this description; "A change in the state of mind, of which we are conscious, produced by some change in the state of the body."

129. But, however simple sensation may appear at first sight, philosophers, having inquired into the subject more minutely, have thought that they have discovered a twofold nature of it, and therefore teach us, that properly distinction is to be made between the two things relating to sensation, which commonly are wont to be comprehended under one and the same name; although, in truth, no man in a sane state can exist so stupid who would confound the things themselves: and, indeed, philosophers have very rashly imputed such an error to the bulk of mankind.

130. One of these things, (namely, the change which is made in the state of

efficitur) ad animum solum spectat, et huic propria est, sua natura fugax et peritura, et simul simplicissima, nullisque aut definienda aut describenda verbis, rei externæ quæ sensum excitat dissimillima, ab omni corporea conditione atque natura alienissima, ita ut neque ipsa, nec quicquam ipsi simile, in re externa quam percipimus inesse possit.

131. Altera vero res quæ vulgo sub nomine sensus comprehenditur, qualitas nimirum quævis rei externæ quam contemplamur, quam sensus (mutatio scilicet in animi statu) nobis representat vel suggerit, longe diversæ videtur esse naturæ. Qualitates enim rerum externarum, quas sensus ope percipimus, ad illas res solas pertinent; neque animo ullo pacto inesse possunt, nec quicquam cum animo, variisque ejus statibus, simile aut

quæ efficitur in statû animi) spectat ad animum solum, et est propria huic, fugax et peritura suâ naturâ, et simul simplicissima, que aut definienda aut describenda nullis verbis, dissimillima rei externæ quæ excitat sensum, alienissima ab omni corporeâ conditione atque naturâ, ita ut neque ipsa, nec quicquam simile ipsi, possit inesse in externâ re, quam percipimus.

131. Verò altera res quæ vulgò comprehenditur sub nomine sensûs nimirum quævis qualitas externæ rei quam contemplamur, quam sensus (scilicet mutatio in statû animi) representat vel suggerit nobis videtur esse longè diversæ naturæ. Enim qualitates externarum rerum, quas percipimus ope sensûs, pertinent ad illas res solas; neque possunt inesse animo ullo pacto, nec habent quicquam simile aut

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the mind,) refers to the mind only, and is peculiar to this, fleeting and perishable in its nature, and at the same time most simple, and to be either defined or described by no terms, most unlike the external object which excites sensation, very different from every corporeal state and nature, so that neither itself, nor any thing like it, can exist in the external object, which we perceive.

131. But the other thing which is commonly comprehended under the name of sensation, that is, any quality of an external object which we contemplate, which the sensation (namely, the change in the state of mind), represents or suggests to us, appears to be of a very different nature. For the qualities of external things, which we perceive by the aid of sensation, relate to those things alone, nor can exist in the mind in any degree, nor have they any thing alike or in common with the mind or the different

commune cum animo que variis statibus ejus, constantes et durabiles suâ naturâ, sive fuerint perceptæ a nobis sive ignotæ aut neglectæ, neque adeo simplices, quin saltem multæ earum possint facilè et accuratè definiri aut describi, et invicem comparari inter se.

132. Profectò acquirimus plurimam et utilissimam scientiam de externis rebus, facillimo et simplicissimo modo, per varios sensus, præsertim visum et tactum sine ullo studio aut labore; ita ut sit bene perspicuum (saltem ex quadam parte), istas facultates sentiendi datas esse nobis a Supremo Opifice, hoc consilio. Vero non omnes sensus præstant hunc usum; neque tam facilis via patet ad scientiam totius naturæ; et sane multa ostendunt, varios sensus, quibus instruimur, sæpe inservire aliis et eximiis usibus.

133. Sensus fit in ho-

commune habent, sua natura constantes et durabiles, sive perceptæ a nobis fuerint, sive ignotæ aut neglectæ, neque adeo simplices quin multæ saltem earum, facile et accurate definiri aut describi, et inter se invicem comparari possint.

132. Plurimam profecto et utilissimam de rebus externis scientiam, facillimo et simplicissimo modo, per varios sensus, visum præsertim et tactum, sine ullo studio aut labore acquirimus; ita ut bene perspicuum sit, hoc (quadam saltem ex parte) consilio, istas sentiendi facultates a Supremo Opifice nobis esse datas. Non omnes vero sensus hunc usum præstant; neque tam facilis ad totius naturæ scientiam patet via: et sane multa ostendunt, varios quibus instruimur sensus, aliis sæpe et eximiis usibus inservire.

133. Fit sensus in homine sano

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states of it; constant and lasting in their nature, whether they have been perceived by us, or unknown or neglected, nor so simple, but that at least many of them may readily and accurately be defined or described, and mutually be compared together.

132. Truly, we acquire much and most useful knowledge concerning external objects, in a most easy and most simple manner, by means of the various senses, particularly sight and touch, without any study or difficulty; so that it can be very evident, (at least to some extent,) that these faculties of perceiving were given by the Supreme Maker with this design. But not all the senses exhibit this use, nor so clear a path lies open to the knowledge of all nature; and indeed many things show that the various senses with which we are supplied, are frequently subservient to other and important uses.

133. Sensation takes place in a man, healthy and awake, whenever the

et vigili, quandocunque status partis cujusvis generis nervosi aliquantum mutatus fuerit, sive ista mutatio ab externa causa, sive ab interna, facta sit. Qui a priore causa fiunt sensus, ab impressione vel impulsu; qui a posteriore causa fiunt, a conscientia, apud medicos, dicuntur esse.

134. Neque ab omni sane impulsu in genus nervosum fit sensus. Ut sentiamus, oportet certa vi aut impetu in partem sensu præditam impulsus factus sit. A leviore enim impulsu, sensus obscurus aut plane nullus est; ab impulsu autem multo vehementiore, dolor fit, sine ullo distincto sensu; quod si impulsus demum vehementissimus fuerit, tantaque vis parti sentienti illata fuerit, ut organi ipsius fabrica lædatur, tum stupor fere oritur.

135. Neque perbrevis impulsus

mine sano et vigili, quandocunque status cujusvis partis nervosi generis fuerit aliquantùm mutatus, sive ista mutatio facta sit ab externâ causâ, sive ab internâ. Sensus qui fiunt a priore causâ dicuntur apud medicos esse ab impressione vel impulsû; qui fiunt a posteriore causâ, a conscientia.

134. Neque sane sensus fit ab omni impulsû in genus nervosum. Ut sentiamus, oportet, impulsus sit factus certâ vi aut impetû in partem prædítam sensû. Enim sensus est obscurus aut planè nullus a leviore impulsû; autem dolor fit, ab impulsû multò vehementiore, sine ullo distincto sensû; quod si impulsus demùm fuerit vehementissimus, que tanta vis fuerit illata sentienti parti, ut fabrica organi ipsius lædatur, tum ferè stupor oritur.

135. Neque perbrevis impulsus sive impressio,

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state of any part of the nervous system has been in some degree changed, whether that change has been produced by an external cause or from an internal cause. Sensations which occur from the former cause, are said by medical men, to be from impression or impulse; those which arise from the latter cause, from consciousness.

134. Nor, indeed, is sensation produced by every impulse upon the nervous system. In order that we may have sensation, it is necessary that the impulse should be made with a certain force or impetus on the part endowed with sensation. For sensation is dull, or quite unperceived from a slighter impulse; but pain is produced by an impulse much more violent, without any distinct sensation; but if, lastly, the impulse has been very violent, and so much violence has been applied to the sentient part, that the structure of the organ itself is injured, then stupor generally arises.

135. Nor does a very rapid impulse or impression, although otherwise suf-

quamvis alioquin satis vehemens, efficit distinctum sensum; nimirum ad quem, aliquod temporis, et quædam diuturnitas impressionis requirantur. — Corpora docent, et quidem molis satis magnæ mota tantâ velocitate, ut nequeant conspici.— Quoque est par ratio multorum dolorum, quos præstigiatores solent exhibere; quibus hominibus, solet esse, axioma, et quasi fundamentum totius artis, motum esse multo velociorem visû.

sive impressio, quamvis alioquin satis vehemens, distinctum sensum efficit; nimirum ad quem temporis aliquod, et diuturnitas quædam impressionis, requirantur.—Docent corpora, et quidem satis magnæ molis, tanta velocitate mota, ut conspici nequeant.—Par quoque ratio est multorum dolorum, quos præstigiatores solent exhibere; quibus hominibus, axioma et quasi artis totius fundamentum, esse solet, motum visu multo esse velociorem.

136. Verò impulsû cessante, que ideo externâ causâ sensûs sublatâ, ipse sensus qui excitatur, solet durare per aliquod, quamvis exiguum spatium temporis. Flammeus circulus docet, quem conspicimus a rapidâ rotatione ardentis baculi.

136. Cessante vero impulsu, sublataque ideo externa sensus causa, ipse qui excitatur sensus, per aliquod, quamvis exiguum, temporis spatium, durare solet.—Docet circulus flammeus, quem conspicimus a rapida rotatione baculi ardentis.

137. Autem sensus non est adèo corporeus, quin pendeat multum a statû mentis. Enim hâc occu-

137. Sensus autem non adeo est corporeus quin multum pendeat a statu mentis. Hac enim aliis

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ficiently powerful, produce distinct sensation; namely, for which some time and a certain continuance of impression are required. Bodies shew it, and indeed of a sufficiently large size, moved with such velocity that they cannot be seen. Also there is the same explanation of the numerous tricks which jugglers are accustomed to exhibit, with which men it is wont to be an axiom, and as it were the foundation of their whole art, that motion is much more rapid than vision.

136. But the impulse ceasing, and consequently the external cause of sensation being withdrawn, the sensation itself, which is excited, is accustomed to last for some, although for a short space of time. The fiery ring proves it, which we see from the rapid rotation of a burning stick.

137. But sensation is not so corporeal but that it may depend considerably on the state of mind. For this being employed on other things, impulses,

rebus occupata, impulsus satis validi in organa sensuum facti, vix, aut ne vix quidem, percipiuntur. Contra, si probe animum attendimus, neglectis vixque perceptis gravioribus, levissimos sæpe impulsus facile percipere possumus.

138. Hoc ut videtur fundamento, magna saltem ex parte, nititur mirum illud et fere incredibile singulorum sensuum externorum acumen et perfectio, quæ varii homines, variis occupati negotiis, multo usu solent adipisci: quamvis satis sit verisimile perfectionis hujusmodi nonnihil tribuendum esse conditioni organorum, quæ variis modis acui possint crebra exercitatione, et ad propria munera melius aptari. Bene notum est organa motus hoc modo haud parum proficere.

139. Attentio a voluntate quodammodo pendet; tamen plerumque datur sensibus validis, novis,

patâ aliis rebus, impulsus satis validi facti in organa sensuum, vix aut ne quidem vix percipiuntur. Contrà si probe attendimus animum, gravioribus neglectis que vix perceptis, sæpe possumus facilè percipere levissimos impulsus.

138. Illud mirum et fere incredibile acumen et perfectio singulorum externorum sensuûm quæ varii homines occupati variis negotiis solent adipisci multo usû, nititur hoc fundamento, ut videtur, saltem ex magnâ parte: quamvis sit verisimile, nonnihil perfectionis hujusmodi esse tribuendum conditioni organorum, quæ possint acui crebrâ exercitatione variis modis, et melius aptari ad propria munera. Bene notum est organa motûs hoc modo proficere haud parùm.

139. Attentio pendet quodammodo a voluntate: tamen plerumque datur validis, novis, ju-

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sufficiently powerful, exerted upon the organs of the senses, scarcely, or not even scarcely are perceived. On the other hand, if we properly apply the mind, more powerful ones being neglected and scarcely perceived, we are often able easily to perceive the slightest impressions.

138. That surprising and almost incredible acuteness and perfection of the several external senses, which various men, occupied in different branches of business, are accustomed to acquire by much use, rests on this principle, as it appears, at least in a great degree; although it is probable, that somewhat of the perfection of this kind, is to be attributed to the condition of the organs, which may be rendered acute, by frequent exercise in different ways, and better fitted to their proper functions. It is well known that the organs of motion, in this manner, profit in no little degree.

139. The attention depends in some manner upon the will; yet, it is generally directed to powerful, new, pleasant, and disagreeable sensations, and

cundis, ingratis sensibus, que demum iis qui afficiunt vel commovent mentem quovis modo præter solitum.

jucundis, ingratis, iisque demum qui mentem quivis modo præter solitum afficiunt vel commovent.

140. Hinc tot res vix et ne quidem vix perceptæ, statim traditæ oblivioni, quamvis idonei impulsus facti sint ab iis in organa sensuum, vel si quodammodo perceptæ fuerint quamvis minus accurate. Hinc semper novæ res, cæteris paribus, maximè observatæ, que novi sensus validissimi. Hinc sensus sæpe repetiti, quamvis validi, fiunt familiares brevi et fere negliguntur; vero debiliores impulsus, qui tamen solebant dare satis validum sensum, sæpe repetiti, neque omnino percipiuntur, neque relinquunt ulla vestigia sui in animo.

140. Hinc tot res vix ac ne vix quidem perceptæ, quamvis idonei in organa sensuum impulsus ab iis facti sint, vel si quodammodo, quamvis minus accurate, perceptæ fuerint, statim oblivioni traditæ. Hinc novæ semper res, cæteris paribus, maxime observatæ, novique sensus validissimi. Hinc sæpe repetiti sensus, quamvis validi, brevi familiares fiunt, et fere negliguntur; debiliores vero impulsus, qui tamen sensum satis validum dare solebant, sæpe repetiti neque omnino percipiuntur, neque ulla sui vestigia in animo relinquunt.

141. Sunt, qui strenuè contendunt inter sentiendum, hominem semper contemplari tantùm unicum sensum vel perceptionem externæ rei; sed

141. Sunt qui strenue contendunt hominem inter sentiendum unicum tantum sensum vel rei externæ perceptionem semper contemplari; sed tam facile tamque

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lastly, to those which affect or excite the mind in any manner beyond what is usual.

140. Hence so many things, scarcely and not indeed scarcely perceived, are immediately committed to oblivion, although proper impulses have been made by them upon the organs of the senses, or if in some degree they have been perceived, although less accurately. Hence always new things, other circumstances being equal, are most noticed, and new sensations are the most powerful. Hence sensations, often repeated, although powerful, become familiar in a short time, and are commonly neglected; but weaker impulses, which, however, were accustomed to afford a sufficiently strong sensation, frequently repeated, are neither at all perceived, nor leave any traces of them in the mind.

141. There are some persons who strenuously contend that, during a sensation, man always contemplates only one sensation or perception of an ex-

subito ad suum quodammodo arbitrium ab uno ad alium sensum ire atque redire, ut primo intuitu multos simul capere sibi videatur. Sed hoc minus certum est.

142. Certissimum vero est hominem sæpe plures sensus ejusdem generis simul percipere, dummodo hi ita conjungi et quasi misceri possint, ut unam perceptionem, a singulis diversam, et ex iis compositam, efficiant. Hæc conjunctio fieri potest vel singulis impulsibus simul factis, vel novis impulsibus prioribus tam subito succedentibus, ut prior sensus nondum desiverit, cum posterior jam inceperit. Sensus enim sæpe diutius quam ipse impulsus durat, præsertim si idonea adhibita fuerit animi attentio (136, 137.) Docet sonorum compositio musica; docet charta variis coloribus tincta, quæ rapide in circulum acta, eundem colorem medium vel mixtum,

ire atque redire tam facile atque subitò, ab uno ad alium sensum quodammodo ad suum arbitrium, ut primo intuitû videatur sibi capere multos simul. —Sed hoc est minùs certum.

142. Vero est certissimum hominem sæpe percipere plures sensus ejusdem generis simul, dummodo hi possint ita conjungi et quasi misceri, ut efficiant unam perceptionem, diversam a singulis, et compositam ex iis. Hæc conjunctio potest fieri vel singulis impulsibus factis simul, vel novis impulsibus tam subitò succedentibus prioribus ut prior sensus nondum desiverit, cum posterior jam inceperit. Enim sensus sæpe durat diutiùs quam impulsus ipse, præsertim si idonea attentio animi adhibita fuerit (136, 137.) Musica compositio sonorum docet; charta tincta variis coloribus docet, quæ rapidè acta in circulum, exhibit eundem medium

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ternal object; but, that he goes and returns so easily and suddenly from one to another sensation, in some way, at his pleasure, that at first glance, he seems to himself to comprehend many at the same time. But this is less certain.

142. But it is very certain, that man often perceives several sensations of the same description at the same time, provided they may be so combined, and, as it were, mixed, that they effect one perception, differing from the single ones, and composed of them. This union may be produced, either by separate impulses, made simultaneously, or by fresh impulses, so suddenly succeeding the former, that the prior sensation has not subsided, when the latter sensation has commenced. For sensation often lasts longer than the impulse itself, particularly if proper attention of the mind has been applied (136, 137). The musical combination of sounds, shows it; paper tinged with various colours proves it, which, rapidly moved in a circle, shows the same mean or mixed colour, compounded of the others, as the

vel mixtum calorem compositum ex aliis, ac positum ex aliis, ac ipsi colores mixti efficerent. Quoque odores et sapores ut videtur, accipiunt pares compositiones, singuli suo genere, aliæ quarum reperiuntur gratæ, aliæ ingratissimæ. Ars coqui et unguentarii nititur hoc fundamento, saltem ex magnâ parte. Vero perceptiones sive sensus quos tactus dat, sunt tot que tam diversi, ut queant vix ita conjungi, ut efficiant unum medium vel compositum sensum.

ex aliis compositum, exhibet, ac ipsi colores mixti efficerent. Odores quoque et sapores, singuli, ut videtur, suo genere, pares compositiones accipiunt; quarum aliæ gratæ, aliæ ingratissimæ reperiuntur. Hoc fundamento, magna saltem ex parte, nititur ars coqui et unguentarii. Perceptiones vero sive sensus quos tactus dat, tot tamque diversi sunt, ut vix ita conjungi queant, ut unum, quasi medium vel compositum, sensum efficiant.

143. Sensus poterit esse varius ex quâvis externâ causâ, nimirum impulsû facto in organum sensûs certâ vi, et durante certum tempus, propter multas internas res, proprias sentienti corpori, que multas partes, quæ sunt necessariæ ad efficiendum sensum. Imprimis ratio habenda est animi quod ad attentionem, tum quoque cerebri quod ad delerium,

143. Ex causa quavis externa, impulsu nimirum in organum sensus certa vi facto, et certum tempus durante, varius esse poterit sensus, propter multas res internas corpori sentienti proprias, multasque partes quæ ad sensum efficiendum necessariæ sunt, Animi imprimis ratio habenda est, quod ad attentionem; tum quoque cerebri, quod ad delirium, torporem, som-

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colours themselves, mixed, would produce. Also odours and tastes, as it appears, admit of like combinations, each in its kind: some of which are fouud agreeable, others most disagreeable. The art of the cook and perfumer is dependent upon this foundation, at least in a great degree. But the perceptions or sensations which touch affords, are so numerous and so diversified, that they can scarcely be combined, so as to produce one mean or compound sensation.

143. Sensation will be able to be various, from any external cause, that is to say, an impulse produced on an organ of sense, with a certain degree of force, and continuing a certain time, on account of many internal things, peculiar to the sentient body, and the numerous parts which are necessary to produce sensation. In the first place account is to be taken of the mind, as to attention; then also of the brain, as to delirium, torpor, sleep, watchful-

num, vigiliam, &c.; tum nervorum qui organum sentiens adeunt, prout integri, liberi, sani, vel prout compressi, aliterve læsi fuerint; tum finium nervorum, ipsius organi, prout magis minusve sentientes fuerint, vel a prima corporis fabricatione, vel ab aliis impulsibus antea factis, vel a calore aut frigore, vel a statu vasorum sanguinem vehentium, quæ minutas nervosas fibras comitantur inseparabilia, quæque vel præter solitum laxari vel distendi, vel demum inflammari possunt; tum denique partium qualescunque fuerint, rationem habere oportet, quæ fines nervorum tenuissimos et acerrime sentientes tegunt et defendunt, et vim impressionum vel augent vel temperant. Quales sunt cuticula ubique corporis, auris tum externa tum interna, ejusque meatus uterque; et varii demum oculi humores.

torporem, somnum, vigiliam, &c.; tum nervorum qui adeunt sentiens organum, prout fuerint integri, liberi sani, vel prout compressi vel aliter læsi; tum finium nervorum organi ipsius, prout fuerint magis vel minus sentientes, vel a primâ fabricatione corporis, vel aliis impulsibus anteà factis vel a calore aut frigore, vel a statû vasorum vehentium sanguinem, quæ inseparabilia comitantur minutas nervosas fibras, que quæ possunt vel laxari vel distendi præter solitum vel demum inflammari: tum denique oportet habere rationem partium qualescunque fuerint, quæ tegunt et defendunt tenuissimos et acerrimè sentientes fines nervorum, et vel augent, vel temperant vim impressionum. Quales sunt cuticula ubique cordoris, tum externa tum interna auris, que uterque meatus ejus; et demùm varii humores oculi.

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ness, and then of the nerves which enter the sentient organ, according as they may be sound, free, healthy, or as compressed, or otherwise injured: then of the extremities of the nerves of the organ itself, according as they shall be more or less sentient, either from the primary structure of the body, or from other impulses previously made, or from heat, or cold, or the vessels carrying blood, which, inseparable, accompany the minute nervous fibres, and which may be either relaxed, or distended unusually, or at length, inflamed: then, lastly, it is proper to take an account of the parts, whatever they be, which cover and protect the very minute and very acutely sentient extremities of the nerves, and either increase or moderate the force of impressions. Such are, the cuticle of every part of the body, both the external and internal ear, and each passage of it, and lastly, the different humors of the eye.

144. Moreover some sensations arise from many internal causes, no exter-

144. Porro nonnulli sensus oriuntur a multis internis causis, nullâ externâ aut juvante aut concurrente. Ipsa mens conscia sui, et varii status ejus, cogitatio, memoria, imaginatio, voluntas, omnes affectus, possunt referri huc. Tum quoque varii status corporis, scilicet, vigor, debilitas, alacritas, torpor, lassitudo, dolor, anxietas, pruritus, appetitus, veluti fames et sitis, demum multæ propensiones, quales impellunt ad tussim, vomitum, (ad) alvum evacuandum et similia. Verò solemus referre, plerosque horum sensuum, quatenùs sunt corporei ad sensum tactûs.

144. Porro a multis causis internis, nulla aut juvante aut concurrente externa, sensus nonnulli oriuntur. Ipsa mens sui conscia, et varii ejus status, cogitatio, memoria, imaginatio, voluntas, affectus omnes, huc referri possunt. Tum quoque varii corporis status, vigor, debilitas, alacritas, torpor, lassitudo, dolor, anxietas, pruritus, appetitus, veluti fames et sitis, propensiones demum multæ, quales ad tussim, vomitum, alvum evacuandam, et similia, impellunt. Plerosque vero horum sensuum, quatenus corporei sunt, ad sensum tactus referre solemus.

145. Sensus, tum externi tum interni, nunquam relati sunt accuratè ad classes vel genera. Verò externi semper et ubique referuntur ad quinque genera, nempe, visum, auditum, olfactum, gustum et tactum. Quod spectat quatuor pri-

145. Sensus, tum externi, tum interni, nunquam accurate ad classes vel genera relati sunt. Externi vero, semper et ubique ad quinque genera referuntur, nempe visum auditum, olfactum, gustum et tactum. Quod priores quatuor

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nal (cause) either assisting or concurring. The mind, conscious of itself, and the various states of it, thought, memory, imagination, will, and all affections, may be referred to this. Then likewise the various states of the body; (namely) vigour, debility, cheerfulness, torpor, weariness, pain, anxiety, itching, appetite, as hunger and thirst; lastly, many inclinations such as urge us to cough, vomit, evacuating the bowels, and the like. But we are accustomed to refer many of these sensations, as far as they are corporeal, to the sense of touch.

145. Both the external and internal sensations have never been referred accurately to classes or genera. But the external ones are always and universally referred to five genera; namely, sight, hearing, smell, taste, and touch. As regards the four former, the few qualities of external bodies

spectat, paucæ corporum externorum qualitates, quas unusquisque eorum percipit, facile in classes a se invicem diversas reducuntur, et ad unum et proprium sensum referuntur. Imprimis, quia sensus ipse singulare et proprium organum habet, neque alibi in corpore insidet, aut quivis modo excitari potest; tum quoque quia sensus organum ab uno genere impulsus afficitur, veluti lucis, tremorum aëris, particularum volatilium; tum denique quia perceptiones ex singulis istorum sensuum, quantumvis inter se differre videantur, aliquid semper commune habent, ita ut comparari possint earumque similitudines et differentiæ detegi.

146. Hoc verissimum est de rebus quas aures, nares, vel lingua percipiunt. Oculi vero plures res capiunt, easque satis dissimiles; colorem scilicet, figuram, magnitudinem et motum. Omnes tamen

ores, paucæ qualitates externorum corporum, quas unusquisque eorum percipit, facilè reducuntur in classes invicem diversas a se, et referuntur ad unum et proprium sensum. Imprimis, quia sensus ipse habet singulare et proprium organum, neque insidet alibi in corpore, aut potest excitari quivis modo; tum quoque quia organum sensûs afficitur ab uno genere impulsûs veluti lucis, tremorum aëris, volatilium particularum; tum denique quia perceptiones ex singulis istorum sensuum, quantumvis videantur differre inter se, semper habent aliquid commune, ita ut possint comparari que similitudines et differentiæ earum possint detegi.

146. Hoc est verissimum de rebus, quas aures, nares vel lingua percipiunt. Verò oculi capiunt plures res, que eas satis dissimiles; scilicet colorem, figuram, magnitudinem et motum.

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which each of them perceives, are easily reduced into classes, differing from each other, and are referred to one and a proper sense. In the first place, because the sense itself has an individual and peculiar organ, nor resides elsewhere in the body, nor can be produced in any manner; also because the organ of sense is affected by one kind of impulse, as of light, tremors of the air, volatile particles; then, lastly because the perceptions from each of those senses, however they may appear to differ between themselves, have always something in common, so that they may be compared, and the resemblances and differences of them be detected.

146. This is very true concerning the things which the ears, nostrils, or tongue, perceive. But the eyes take in more objects, and those very dissimilar: namely, colour, shape, size, and motion. Nevertheless all these perceptions are easily referred to one sense, because they are perceived

Tamen omnes hæ perceptiones facile referuntur ad unum sensum, quia percipiuntur per idem organum que idem medium, ut vocatur, que idem genus impulsûs. Autem reliquæ perceptiones, utcunque dissimiles fuerint, referuntur ad sensum tactûs.

hæ perceptiones ad unum sensum facile referuntur, quia per idem organum idemque medium, ut vocatur, idemque genus impulsus, percipiuntur. Reliquæ autem perceptiones, utcunque dissimiles fuerint, ad sensum tactus referuntur.

147. Plerique sensus reperiuntur vel grati vel ingrati; scilicet non modo monent nos de rebus externis, que representant nobis qualitates earum, sed simul ita afficiunt animum ut vel cupiamus vel nolimus eosdem sensus, continuari aut repeti.

147. Sensus plerique vel grati vel ingrati reperiuntur: scilicet non modo nos de rebus externis monent, earumque qualitates nobis representant, sed animum simul ita afficiunt, ut eosdum sensus vel cupiamus vel nolimus, continuari aut repeti.

148. In quibusdam exemplis sensuum, sensus ipse, scilicet mutatio quæ efficitur in statû animi est jucundus, et voluptas nascitur ab eo solo. Verò in aliis exemplis, sensus non dat voluptatem tantum quam perceptio, nimirum qualitas seu conditio rei externæ quam percipimus et cognoscimus ope sensûs.

148. In quibusdam sensuum exemplis, sensus ipse, mutatio scilicet quæ in animi statu efficitur. jucundus est, et ab eo solo voluptas nascitur. In aliis vero exemplis, non tantum sensus quam perceptio, qualitas nimirum seu conditio rei externæ quam percipimus et sensus ope cognoscimus, voluptatem dat.

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through the same organ, and the same medium, as it is called, and the same kind of impulse. But the other perceptions, however dissimilar they may be, are referred to the sense of touch.

147. Most of the sensations are found (to be) either agreeable or disagreeable; that is to say, they not only admonish us of external objects, and represent to us their qualities, but at the same time so influence the mind, that we either desire or dislike the same sensations to be continued or repeated.

148. In some instances of sensations, the sensation itself, that is, the change which is produced in the state of the mind, is agreeable, and pleasure arises from it alone; but in other instances, sensation does not afford pleasure so much as the perception, that is, the quality or condition of an external object, which we perceive and know by aid of the sense.

149. Prioris generis exemplа sunt, jucundi sensus seu voluptates quas gustus, olfactus, auditus nobis suggerunt; quibus adjungere oportet sensus quosdam, veluti caloris, quos tactus dat. In his nimirum exemplis ad sensum solum attendimus, neque ab eo quicquid docemur de causa seu qualitate corporis externi quæ sensum efficit. Si quid istiusmodi novimus, id, ope aliorum sensuum et judicii, observando, periclitando, ratiocinando, plane didicimus.

150. Posterioris exempla sunt, perceptiones quædam jucundæ qualitatum rerum externarum, quas vel visus vel tactus nobis suggerunt; veluti pulchritudinis omnis visibilis, formæ, proportionis, motus, et forsitan coloris quoque; vel denique formæ tactilis, aut lævoris aut mollitiei. In his scilicet exemplis perceptio ipsa placet: neglectoque sensu, seu mutato animi statu, ad

149. Jucundi sensus seu voluptates, quas, gustus, olfactus, auditus suggerunt nobis, sunt exempla prioris generis: quibus oportet adjungere quosdam sensus quos tactus dat, veluti caloris. Nimirum in his exemplis attendimus ad sensum solum, neque docemur quicquid ab eo, de causâ seu qualitate externi corporis, quæ efficit sensum. Si novimus quid istiusmodi, planè didicimus id, ope aliorum sensuum et judicii, observando, periclitando, ratiocinando.

150. Quædam jucundæ perceptiones qualitatum externarum rerum, quas vel visus vel tactus suggerunt nobis, sunt exempla posterioris, veluti omnis visibilis pulchritudinis, formæ, proportionis, motûs, et forsitan quoque coloris, vel denique tactilis formæ, aut lævoris, aut mollitici. Scilicet perceptio ipsa placet in his exemplis: que sensû neglecto, seu statu animi

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149. The agreeable sensations or pleasures which taste, smell, and hearing suggest to us, are instances of the former kind; to which we must add certain sensations which touch supplies, as of heat. Indeed, in these instances, we attend to the sensation only, nor are we taught any thing from it concerning the cause or quality of the external body, which produces sensation. If we have known any thing of that kind, we have clearly learned it by means of the other senses and of judgment, by observing, experimenting, and reasoning.

150. Certain agreeable perceptions of qualities of external objects, which either sight or touch suggest to us, are instances of the latter kind; as of all visible beauty, form, proportion, motion, and perhaps also of colour; or, lastly, of tangible form, or smoothness, or softness: that is to say, the perception itself pleases in these instances; and the sensation being neglected, or the state of the mind being changed, we immediately pass on to

mutato, statim transimus ad rem seu qualitatem quam ille sensus suggerit, que sæpe contemplamur eam cum voluptate.

151. Profectò videtur difficillimum explanatu, cur tot diversi sensus oriantur a variis generibus impressionum factarum in certa organa corporis (145, 146). Autem est multò difficilius explanatu, cur tales sensus excitentur ferè ab omni genere impressionum in varia organa corporis, quales non modo singuli representaverint animo suam perceptionem (130, 131), sed simul delectaverint eundem vel plurimum, vel affecerint insigni dolore, angore, molestiâ, fastidio.

152. Enim sensus, utcunque diversi inter se, secundum varia organa eorum, que res quæ afficiunt hæc sunt tamen constantes, que semper singuli agnoscunt easdem causas ; neque eadem impressio dat varium sensum

rem seu qualitatem quam sensus ille suggerit statim transimus, eamque sæpe cum voluptate contemplamur.

151. Difficillimum profecto explanatu videtur, cur tot diversi sensus a variis impressionum generibus in certa corporis organa factarum oriantur (145, 146.) Multo autem difficilius explanatu est, cur ab omni fere genere impressionum in varia corporis organa tales excitentur sensus, quales non modo suam singuli perceptionem (130, 131,) animo representaverint, sed eundem, simul vel plurimum delectaverint, vel insigni dolore, angore, molestia, fastidio, affecerint.

152. Sensus enim, utcunque inter se, secundum varia eorum organa, resque quæ hæc afficiunt, diversi, tamen constantes sunt, easdemque semper singuli causas agnoscunt; neque eidem homini, variis temporibus, eadem impressio

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the object or quality which that sensation suggests, and often contemplate it with pleasure.

151. Indeed, it appears very difficult to be explained, why so many different sensations should arise from various kinds of impressions made upon certain organs of the body, (145, 146.) But it is much more difficult to be explained why such sensations should be excited by nearly every kind of impressions upon the different organs of the body, such as not only individually represent to the mind their individual perception, (130, 131,) but at the same time either afford it considerable delight, or affect it with great pain, anguish, trouble, (or) aversion.

152. For sensations, however different amongst themselves, according to the various organs of them and the circumstances which affect them, are nevertheless constant, and always individually recognise the same causes;

varium dat sensum seu perceptionem; neque ratio ulla existit, cur credamus eandem rem seu impressionem diversum diversis hominibus sensum aut perceptionem dare, nisi in nonnullis rarissimis exemplis, in quibus verisimile est vitium aliquod, neque sane leve, in corpore subesse, vel hujus saltem sensuum organa a solito et naturali statu multum alienari.

153. Voluptas vero, vel molestia, vel fastidium, quæ tot sensus comitantur, variant, quam maxime, cum in variis hominibus, tum in iisdem, variis temporibus.

154. Insignis quoque, et fere incredibilis, est vis consuetudinis in voluptates aut molestias sensus; exigua autem in sensum ipsum, et nulla omnino in perceptionem qualitatis rei externæ quam sensus suggerit. Nemo enim sanus, vel naturâ vel ullâ consuetudine, du-

seu perceptionem éidem homini, variis temporibus: neque ulla ratio existit, cur credamus eandem rem, seu impressionem dare diversum sensum aut perceptionem in diversis hominibus, nisi in nonnullis rarissimis exemplis, in quibus est verisimile aliquod vitium, neque sane leve, subesse in corpore, vel saltem organa sensuum hujus alienari multum a solito et naturali statu.

153. Verò voluptas, vel molestia vel fastidium, quæ comitantur tot sensus, variant, quam maximè, cum in variis hominibus, tum in iisdem, variis temporibus.

154. Quoque vis consuetudinis in voluptates aut molestias sensus est insignis et fere incredibilis; autem exigua in sensum ipsum, et omnino nulla in perceptionem qualitatis externæ rei quam sensus suggerit. Enim nemo sanus, vel naturâ vel ullâ consuetu-

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neither does the same impression afford a different sensation or perception to the same man at different times; nor does any reason exist, why we should suppose that the same object or impression affords a different sensation or perception in different men, unless in some very rare instances, in which it is probable that some disorder, and that not slight, exists in the body, or, at least, that the organs of the senses of this are changed considerably from their usual and natural state.

153. But the pleasure, uneasiness, or aversion, which attend so many sensations, vary very much, both in different men, as well as in the same men at different times.

154. Also the power of habit upon the pleasures and troubles of sensation is remarkable, and nearly incredible, but slight upon sensation itself, and completely void upon the perception of the quality of an external object, which the sensation suggests. For no sensible man, either by nature or any

dine, potest percipere durum, pro molli, aut rubrum pro viridi, aut mel pro absinthio, aut absinthium pro melle; quamvis vel singulari constitutione corporis, vel demum consuetudine solâ, ista amarissima herba potest fieri gratior et jucundior gustui Hymettio melle.

155. Quamvis plerique sensus sint plus minus grati, tamen non est negandum, insigne discrimen intercedere inter eos de hâc re, et alios naturâ ferè esse gratissimos omnibus hominibus, alios valdè ingratos, nonnullos demum adeo indifferentes ut dent neque voluptatem, neque ullam molestiam. Nulla ratio discriminum sensuum hujusmodi hactenus reddita est.

156. Tamen, est quoddam novisse, ferè unumquodque genus sensuum esse vel gratum vel ingratum, secundum vehementiam ipsius, naturâ ejus mutatâ nil. Enim nullus sensus existit adeò

rum pro molli, aut rubrum pro viridi, aut mel pro absinthio, aut absinthium pro melle, percipere potest; quamvis vel singulari corporis constitutione, vel demum sola consuetudine, amarissma ista herba Hymettio melle gratior et jucundior gustui fieri possit.

155. Quamvis sensus plerique plus minus grati sint, tamen non est negandum, insigne eos inter hac de re discrimen intercedere, et alios natura fere omnibus hominibus esse ingratissimos, alios valde ingratos, nonnullos demum adeo indifferentes, ut neque voluptatem neque molestiam ullam dent. Hujusmodi sensuum discriminum ratio nulla hactenus reddita est.

156. Est quoddam tamen novisse, unumquodque fere sensuum genus, vel gratum esse, vel ingratum, natura ejus nil mutata, secundum ipsius vehementiam. Nullus enim existit sensus adeo ju-

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habit, can mistake hard for soft, or red for green, or honey for wormwood, or wormwood for honey, although, either by peculiar constitution of body, or lastly by habit alone, that very bitter herb may become more acceptable and agreeable to the palate than Hymettian honey.

155. Although most of the sensations are more or less agreeable, yet it cannot be denied, that a great difference exists between them in this respect, and that some of them by their nature are most pleasing to all men, that others are very unpleasant, and lastly, that some are so indifferent, that they neither give pleasure nor uneasiness. No reason of differences of this description has hitherto been given.

156. Nevertheless, it is something to have known, that almost every kind of sensation is either pleasant or unpleasant, according to the force of it, its nature not being at all changed; for no sensation exists so agreeable, but

cundus, quin ultra modum intensus, ingratus evadat, nonnunquam fere intolerabilis. Et contra omnino, qui natura solitaque vehementia, multum offendunt, leviores facti, tolerabiles sæpe fiunt, et interdum admodum jucundi.

157. Par fere ratio est quod multi sensus, primo grati, delectare cessent, si sæpius repetiti fuerint, quamvis semper ejusdem naturæ et vehementiæ fuerint, quantum ipsam impressionem attinet; et multi primo ingrati displicere desinant, et tandem placeant, quamvis neque natura neque vehementia impressionis vel minimum mutatæ fuerint. Scilicet, sola consuetudine familiares facti, sensus sæpe repetiti, segnius percipiuntur (140,) et tandem negliguntur penitus, nulla animi attentione adhibita.

158. Hinc quoque ratio reddi potest, cur novi sensus fere magis placeant; cur varietas adeo jucun-

jucundus, quin ultra modum intensus, evadat ingratus, nonnunquam ferè intolerabilis. Et omninò contrà, qui offendunt multùm naturâ que solitâ vehementiâ, facti leviores, fiunt sæpe tolerabiles et interdum admodùm jucundi.

157. Est ferè par ratio quòd multi sensus, primò grati, cessent delectare, si sæpius repetiti fuerint, quamvis fuerint semper ejusdem naturæ et vehementiæ, quantum attinet impressionem ipsam; et multi ingrati primo desinant displicere, et tandem placeant, quamvis neque natura neque vehementia impressionis fuerint vel minimùm mutatæ. Scilicet, sensus sæpe repetiti, facti familiares consuetudine solâ, percipiuntur segniùs (140), et tandem penitùs negliguntur, nullâ attentione animi adhibitâ.

158. Hinc quoque ratio potest reddi, cur novi sensus ferè placeant magis; cur varietas adeò ju-

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that, immoderately extended, it may become unpleasant, and sometimes nearly intolerable; and altogether on the contrary (those sensations) which by their nature, and with their usual force, disturb cónsiderably, rendered milder, often become supportable, and sometimes very agreeable.

157. There is nearly the same reason that many sensations, at first agreeable, cease to delight, if often repeated, although they are always of the same nature and force, as far as concerns the impression itself; and many unpleasant at first, cease to displease, and at length please, although neither the nature nor force of the impression be in any degree changed: that is to say, sensations often repeated, and become familiar by habit alone, are perceived more feebly, and at length are quite neglected, no attention of the mind being applied.

158. Hence likewise a reason may be given why new sensations generally please more: why variety is so charming; why we desire stronger sensations,

cunda ; cur cupiamus validiores sensus, vel saltem impressiones in organa cujuslibet sensus, ut vel augeamus, aut continuemus voluptatem ; cur vix ac ne quidem vix attendamus ad tot voluptates, neque ferè sciamus tales exstitisse, antequam amiserimus eas ; cur tot voluptates, que tam constantes et puræ, que ideo tanta et tam continua hilaritas animi, pueris præ senibus. Enim quantumcunque voluptatis haberet subitò donatus novâ facultate sentiendi, aut cæcus denuò redditus visui, tantum omnes olim habuimus ab omnibus sensibus, quamvis longus usus et consuetudo jam pene deleverint istam voluptatem.

da ; cur validiores sensus, vel saltem impressiones in organa sensus cujuslibet, cupiamus, ut voluptatem vel augeamus vel continuemus ; cur ad tot voluptates vix ac ne vix quidem attendamus, neque fere tales ante exstitisse sciamus quam eas amiserimus ; cur tot voluptates tamque constantes et puræ, tantaque ideo et tam continua animi hilaritas, pueris præ senibus. Quantum enim cunque voluptatis, nova sentiendi facultate subito donatus, aut cæcus visui denuo redditus, haberet, tantum, omnes, ab omnibus sensibus olim habuimus, quamvis longus usus et consuetudo istam voluptatem jam pene deleverint.

159. Plerique sensus, satis validi ut distinguantur facilè et accuratè, quisque suo genere et modo, ferè placent maximè. Autem varia genera voluptatum existunt ; que igitur varii sensus possunt delectare animum, variis

159. Sensus plerique satis validi ut facile et accurate distinguantur, suo quisque genere et modo fere placent maxime. Varia autem existunt voluptatum genera ; variique igitur sensus variis modis

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or at least impressions, upon the organs of any sense, in order that we may either increase or continue our pleasure ; why we scarcely and not even scarcely attend to so many pleasures, nor scarcely commonly know that such existed before we have lost them ; why there are so many pleasures, and so constant and pure, and consequently so much and so constant cheerfulness of mind in boys compared with old men. For whatever degree of pleasure a person might derive suddenly endowed with some new sentient faculty, or a blind man again restored to sight, just as much we all formerly derived from all the senses, although long use and custom have now almost obliterated that pleasure.

159. Most of the sensations, sufficiently powerful that they can be distinguished easily and accurately each in its kind and manner, commonly please the most ; but various kinds of pleasures exist ; and, therefore, different

animum delectare possunt. Neque profecto aut splendor solis, aut pulchra et vivida totius naturæ facies meridiana, sola hominum oculos, neque magni concentus soli aures eorum delectant; scilicet qui longe diversa, sed tamen haud exigua voluptate, obscura Numinis templa spectant, et umbrosos lucos per lunam adeunt, noctisque demum nigram formidinem lubentes contemplantur; et zephyrum sylvas agitantem, aut apum susurrum, aut fluminis murmur, auscultant. Quin et tempus est, quo tenebræ, silentium, omnisque demum sensus absentia sola placent.

160. Sui igitur sunt, et quidem satis arcti, limites voluptatibus sensuum; quippe quæ neque multum augeri, neque nimis sæpe repeti, neque diu produci aut continuari possint: quasi ipsa natura hoc modo moneret, non solis vo-

modis. Neque profectò aut splendor solis, aut pulchra et vivida meridiana facies totius naturæ, sola delectant oculos hominum, neque magni concentus soli, aures eorum, scilicet qui, voluptate longe diversâ, sed tamen haud exiguâ, spectant obscura templa numinis, et adeunt umbrosos lucos per lunam, que demum lubentes contemplantur nigram formidinem noctis; et auscultant zephyrum agitantem sylvas, aut susurrum apum, aut murmur fluminis. Quin est et tempus, quo tenebræ, silentium, que demum absentia omnis sensûs, sola placent.

160. Igitur sunt sui limites, et quidem satis arcti, voluptatibus sensuum; quippe quæ possint neque multum augeri, neque nimis sæpe repeti, neque diù produci aut continuari: quasi natura ipsa hoc modo moneret, hominem non esse natum

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sensations may delight the mind in different ways. Neither indeed does either the splendor of the sun, or the fair and glowing noonday face of all nature alone delight the eyes of men, nor do great concerts alone please their ears; as being who, with a pleasure far different, but however not inconsiderable, behold the sombre temples of the deity and enter the shady groves by moonlight, and lastly from inclination contemplate the dark horror of night, and listen to the zephyr shaking the woods, or the hum of the bees, or the murmur of the stream. Moreover, there is also a time in which darkness, silence, and lastly the absence of every sense, alone give delight.

160. Therefore there are its limits, and indeed rather narrow, to the pleasures of the senses; as being which neither can be much increased, nor too often repeated, nor long called forth, or continued; as if nature herself, in

voluptatibus solis, saltem nonvoluptatibus hujusmodi: enim languor aut fastidium abrumpunt omnes nimis cultas; insignis molestia aut dolor tandem excipiunt nonnullas. Et profectò, ut voluptas transit tam facile, in molestiam aut dolorem, sic, ferè pari ratione, subita cessatio doloris, saltem magni, aliquando est incredibilis voluptas, qualis nimirùm emptores certè non deessent, si esset facultas emendi minore aut quovis alio pretio. Voluptas et dolor fuerunt sorores, ut pulchra fabula Socratis docet, utcunque dissimiles, que expertæ diversam sortem: nimirum altera optata et grata omnibus; altera pariter invisa; quas Jupiter tamen ita sociavit et conjunxit vinculo tam indissolubili, ut quamvis contrarias naturâ, et spectantes diversè, quicunque amplectitur alterutram, simul trahat alteram.

luptatibus, saltem non hujusmodi voluptatibus, hominem esse natum: omnes enim nimis cultas languor aut fastidium abrumpunt; nonnullas insignis molestia aut dolor tandem excipiunt. Et profecto, ut voluptas in molestiam aut dolorem tam facile transit, sic, pari fere ratione, doloris, saltem magni, cessatio subita, incredibilis aliquando voluptas est, qualis nimirum, si minore aut alio quovis pretio emendi facultas esset, certe non deessent emptores. Voluptas et dolor, ut pulchra Socratis fabula docet, sorores fuerunt, utcunque dissimiles, diversamque sortem expertæ; altera nimirum optata et grata omnibus, altera pariter invisa; quas tamen Jupiter ita sociavit, et tam indissolubili vinculo conjunxit, ut quamvis natura contrarias, et diverse spectantes, quicunque alterutram amplectitur, alteram trahat simul.

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this manner, admonished us, that man is not born for pleasures alone, at least not for pleasures of this description; for languor or loathing break off all of them too much followed; great uneasiness or pain at length follow others. And, indeed, as pleasure passes so easily into uneasiness or pain, so nearly in the same manner, sudden cessation of pain, at least considerable is sometimes an inconceivable pleasure, of such as forsooth purchasers truly would not be wanting, if there were an opportunity of purchasing it for a less or greater price. Pleasure and pain were sisters, as the beautiful fable of Socrates informs us, however dissimilar, and experiencing a different lot; for instance, one longed for and acceptable to all, the other equally detested; which Jupiter however has so associated and united in a bond so indissoluble, that although opposite in their nature, and looking in opposite ways, whoever embraces either, must at the same time take the other with him.

161. Magna autem hac de re inter varias sentiendi facultates, variasque quas dant voluptates, differentia observatur. Quædam brevi fatiscunt, neque res quas debent, distinguunt bene, neque amplius delectantur rebus ipsis quas satis distinguunt, et quæ primo gratissimæ fuerant: aliæ diutius ad sua munera valent, et magis diuturna fruuntur voluptate. Sic olfactus et gustus fere brevi satiantur; auditus tardius; visus omnium externorum sensuum longe tardissime. Voluptates autem quæ a sola mente seu sensibus internis derivantur, sunt omnium maxime longævæ. Omnes demum voluptates, eas variando, aliasque cum aliis miscendo, vel sæpe minus gratas res iis quæ magis delectant interponendo, ita ut ne quid nimis sit, haud parum producere possumus.

162. Supersunt et aliæ quædam

161. Autem magna differentia observatur de hâc re, inter varias facultates sentiendi, que varias voluptates quas dant. Quædam fatiscunt brevi, neque distinguunt bene res, quas debent, neque amplius delectantur rebus ipsis, quas satis distinguunt, et quæ fuerant primò gratissimæ; aliæ diutiùs valent ad sua munera, et fruuntur magis diuturnâ voluptate. Sic olfactus et gustus ferè satiantur brevi; auditus tardiùs; visus longè tardissimè omnium externorum sensuum. Autem voluptates quæ derivantur a mente solâ, seu internis sensibus sunt maximè longævæ omnium. Demum possumus producere haud parum omnes voluptates, variando eas, que miscendo alias cum aliis, vel sæpe interponendo res minùs gratas iis quæ delectant magis, ut sit ne quid nimis.

162. Et quædam aliæ res supersunt, planè di-

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161. But a great difference is observed, in this respect, between the various faculties of perceiving, and the different pleasures which they afford. Some of them weary quickly, nor distinguish properly the things which they ought, nor are longer pleased with the objects themselves, which they distinguish sufficiently, and which had been at first very agreeable: others are longer competent to their functions, and enjoy a more lasting pleasure. Thus, generally, smell and taste are quickly satiated, but hearing more slowly, and sight by far the slowest of all the external senses. The pleasures which are derived from the mind alone, or the internal sensations, are the most permanent of all. Lastly we may protract considerably all our pleasures, by varying them, and blending them together, or often by interposing things less pleasant with those which please more, that there may be no excess of either.

162. Also some other circumstances remain, quite different from those

versæ a jam memoratis, quæ regunt multùm nonnullas voluptates sensuum; nimirum variæ conditiones vel universi corporis, præsertim nervorum, vel quorundam organorum aut functionum præ aliis, quibus functionibus, quædam organa sensûs et fortasse sensus ipsi, ex magnâ parte inserviunt. Et hæc est inter alias causas, quod multæ voluptates, et quæ maximè coluntur, nequeant, esse immortales. Pura aqua est pro nectare sitienti; omnis cibus gratissimus, etiam odor cibi jucundus esurienti; frigus placet æstuanti aut febricitanti, calor frigenti. Verò eædem res non modo non sunt gratæ, sed sæpè valdè ingratæ iisdem hominibus, aliis temporibus, veluti cibus aut potio, utcunque delicatus, statim post pastum aut potum; vel odor cibi statim post prandium: neque profectò aut perpetuæ epulæ, aut alterum prandium statim

res, a jam memoratis plane diversæ, quæ nonnullas sensuum voluptates multum regunt; variæ nimirum conditiones vel universi corporis, præsertim nervorum, vel quorundam præ aliis organorum aut functionum, quibus functionibus, organa quædam sensus, fortasse et sensus ipsi, magna ex parte, inserviunt. Et hæc inter alias causas est, quod multæ, et quæ maxime coluntur, voluptates, immortales esse nequeant. Sitienti pura aqua pro nectare est; esurienti omnis cibus gratissimus, etiam cibi odor jucundus: æstuanti aut febricitanti frigus, frigenti calor, placet. Iisdem vero hominibus, aliis temporibus, eædem res non modo non gratæ sunt, sed sæpe valde ingratæ, veluti cibus aut potio, utcunque delicatus, statim post pastum aut potum; vel odor cibi statim post prandium; neque profecto aut epulæ perpetuæ, aut alterum prandium

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already mentioned, which influence considerably some pleasures of the senses; for instance, the different states either of the system generally, particularly of the nerves, or of certain organs or functions compared with others, to which functions some organs of sense, and perhaps the senses themselves, are in a great degree subservient; and this is one amongst other causes, why many pleasures, and those which are too much cultivated, cannot be immortal. Plain water is like nectar to the thirsty man; every kind of food is most acceptable, and even the odour of food is grateful to the hungry man; cold is pleasant to him who is heated or feverish, or heat to him suffering from cold. But the same things are not only not pleasant, but often very unpleasant to the same men, at other times; as food or drink, however delicate, immediately after eating or drinking, or the smell of food, directly after dinner; nor indeed either constant feasts, or a second dinner, directly after the first, are able to delight the most desperate gor-

statim a primo, perditissimum possunt delectare helluonem: neque Venus ipsa, strenuissimis etiam cultoribus, semper placet.

163. Quin et ab aliis sensibus præter illos qui ab impressione externa (133, 144) fiunt, voluptas aut molestia oriri possunt:—ab actione musculorum, quatenus, hæc fortis, facilis, alacris, fuerit, neque ad fatigationem continuata, voluptas percipitur; contrarii vero ab actione musculorum sensus, hebetudinis nempe, lassitudinis, difficultatis, debilitatis, semper molesti sunt; varii demum animi status, affectus, exercitationes variæ memoriæ, imaginationis, judicii, pari fere ratione, nunc grati nunc molesti reperiuntur.

164. Ex his omnibus, ut videtur, concludere æquum sit, tanta benignitate et liberalitate hominibus providisse naturam, totque iis voluptates suppeditasse, ut non mo-

a primo possunt delectare perditissimum helluonem: neque Venus ipsa semper placet etiam strenuissimis cultoribus.

163. Quin voluptas aut molestia possunt oriri et ab aliis sensibus præter illos, qui fiunt ab externâ impressione (133, 144):—voluptas percipitur ab actione musculorum, quatenus hæc fuerit fortis, facilis, alacris, neque continuata ad fatigationem; verò contrarii sensus ab actione musculorum, nempe habetudinis, lassitudinis, difficultatis, debilitatis, semper sunt molesti: demum varii status animi, affectus, variæ exercitationes memoriæ, imaginationis, judicii, ferè pari ratione, reperiuntur nunc grati nunc molesti.

164. Sit æquum concludere ex his omnibus, ut videtur, naturam providisse hominibus, tantâ benignitate et liberalitate, que suppeditasse tot voluptates iis, ut non modo

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mandiser; nor does Venus herself always attract even her most strenuous votaries.

163. Moreover pleasure or pain may arise from other sensations, besides those which take place from an external impression (133, 144). Pleasure is felt from the action of the muscles, inasmuch as it may have been powerful, vigorous, nor continued to fatigue; but the contrary sensations, from the action of the muscles, namely, of dulness, lassitude, difficulty, and debility, are always troublesome; lastly, different states of mind, the affections, the different exercises of memory, imagination, and judgment, commonly, for the same reason, are found at one time agreeable, at another painful.

164. It may be fair to conclude from all these circumstances, as it appears, that nature has provided for men with so much kindness and liberality, and

viverent, sed fruerentur vitâ, quam dedit.

165. Neque sane voluptates sensuum carent suis et eximiis usibus. Illa generalis suavitas, quæ comitatur ferè omnes sensus, præsertim primâ ætate, invitat nos ad probè exercendas varias facultates sentiendi, et sic acuendas, que simul acquirendam nobismet quotidie plurimam et utilissimam scientiam (131, 132).

166. Ferè pari ratione homines, præsertim pueri, invitantur ad exercenda modicè et crebrò sua organa motûs, quorum insita vis sic promovetur, et facilis et promptus usus discitur.

167. Quin invitamur præmio egregiæ voluptatis, et ad quasdam actiones et maximi momenti, qualibus nimirum aut singuli homines conservantur, aut humanum genus propagatur.

168. Postremò, inducido viverent, sed vita quam dedit fruerentur.

165. Neque sane suis et eximiis usibus carent sensuum voluptates. Suavitas illa generalis quæ omnes fere sensus, præsertim prima ætate, comitatur, invitat nos ad varias sentiendi facultates probe exercendas, et sic acuendas, plurimamque simul et utilissimam scientiam (131, 132) nobismet quotidie acquirendam.

166. Pari fere ratione ad sua organa motus modice et crebro exercenda invitantur homines, præsertim pueri, quorum sic vis insita promovetur, et facilis et promptus usus discitur.

167. Quin et ad quasdam et maximi momenti actiones, qualibus nimirum aut singuli homines conservantur, aut genus humanum propagatur, egregiæ voluptatis præmio invitamur.

168. Postremo, voluptate illa

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has supplied so many pleasures to them, that they might not only live, but enjoy the life which she gave them.

165. Nor, indeed, the pleasures of the senses are devoid of their own and important uses. The general suavity which attends almost all our sensations, particularly in early age, invites us to properly exercise the various faculties of sensation, and thus to sharpen them, and at the same time to acquire for ourselves daily much and most useful knowledge.

166. Nearly in the same way, men, and boys in particular, are invited to exercise moderately and frequently, their organs of motion, the innate power of which is thus promoted, and easy and free use is acquired.

167. Moreover we are invited, by a recompense of extreme pleasure, to certain actions of the greatest importance, namely, by such as, forsooth, either individuals are preserved, or the human race is propagated.

quæ a modica mentis exercitatione oritur, ad nobilissimas ejus facultates exercendas et excolendas inducimur; quæ neglectæ et otiosæ, exiguæ sunt, probe cultæ, pæne divinæ fiunt.

169. Singuli demum quibus instruimur sensus, tum externi tum interni, variis obnoxii sunt vitiis; unusquisque scilicet, præsertim externorum, potest esse vel nimis acutus, vel nimis obtusus, vel abolitus, vel denique depravatus.—Huc fortasse referri quoque possunt multi sensus molesti, qui, sive ipsi primarii morbi, sive tantum aliorum morborum signa sint, medici, attentionem optimo jure sibi vindicant (34.)

mur, illâ voluptate quæ oritur a modicâ exercitatione mentis, ad exercendas et excolendas nobilissimas facultates ejus, quæ, neglectæ et otiosæ, sunt exiguæ, probè cultæ, fiunt pænè divinæ.

169. Demum singuli sensus quibus instruimur, tum externi tum interni sunt obnoxii variis vitiis; scilicet, unusquisque præsertim externorum, potest esse vel nimis acutus, vel nimis obtusus, vel abolitus, vel denique depravatus.—Fortasse huc quoque multi molesti sensus possunt referri, qui, sive ipsi sint primarii morbi, sive tantùm signa aliorum morborum, optimo jure vindicant sibi attentionem medici (34).

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168. Lastly, we are induced by the pleasure which arises from moderate exercise of the mind, to exercise and cultivate the most noble faculties of it; which, when neglected and unemployed, are slight; properly cultivated, become nearly divine.

169. In fine, all the senses with which we are supplied, both external and internal, are liable to various diseases; that is to say, each particularly of the external ones, may be either too acute, or too obtuse, or destroyed, or lastly, depraved. Perhaps to this head several painful sensations may be referred, which, whether they be primary diseases or only symptoms of other diseases, by the greatest right claim to themselves the attention of the medical man.

CAP. V.—*De Tactû que vitiis ejus; nec non de dolore, anxietate et pruritû.*

CAP. V.—*De Tactu ejusque vitiis; nec non de dolore, anxietate et pruritu.*

170. TACTUS est simplicissimus et maximè generalis omnium externorum sensuum: quippe qui sit communis toti nervoso generi; sed acutior certis partibus, veluti cuti, et imprimis apicibus digitorum. Hi dicuntur habere nervosas papillas, quæ, erigantur quodammodo in tactû sanguine influente, daturæ accuratiorem sensum; sed hæc opinio nititur potiùs conjecturâ derivatâ a fabricâ linguæ, quæ est non modo organum gustûs, sed etiam delicatissimum organum tactûs, quam certis observationibus rei ipsius.

170. OMNIUM sensuum externorum tactus simplicissimus est, et maxime generalis; quippe qui toti generi nervoso communis sit: sed certis partibus acutior, veluti cuti, et imprimis apicibus digitorum. Hi papillas nervosas habere dicuntur, quæ, influente sanguine, quodammodo in tactu erigantur, sensum accuratiorem daturæ; sed potius conjectura a linguæ fabricâ derivata, quæ non gustus modo, sed tactus quoque delicatissimum organum est, hæc opinio nititur, quam certis rei ipsius observationibus.

171. Tactus percipit varias qualitates corporum; duritiem, mollitiem, asperitatem, lævitatem ca-

171. Varias corporum qualitates tactus percipit; duritiem, mollitiem, asperitatem, lævitatem,

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CHAP. V.—*On Touch, and the disorders of it; also on pain, anxiety, and itching.*

170. Touch is the simplest and most general of all the external senses; as being which is common to the whole nervous system; but is more acute in certain parts, as the skin, and particularly the points of the fingers. These are said to have nervous papillæ, which are erected in some way during touch, by blood flowing into them, about to give more accurate sensation; but this opinion rests rather on conjecture, derived from the structure of the tongue, which is not only an organ of taste but also a very delicate organ of touch, than on any certain observations of the fact itself.

171. Touch perceives various qualities of bodies, (such as) hardness, softness, roughness, smoothness, heat, cold, size, figure, distance, pressure, and

calorem, frigus, molem, figuram, distantiam, pressuram, pondus; raro fallax vel depravatus; quia scilicet corpora, quorum qualitates sunt explorandæ, proxime ad ipsum organum admoventur, nullo interposito medio, cujus varietates sensum fallere vel corrumpere possint.

172. Quod ad vitia tactus pertinet, nimis acutus in universum rarissimis si ullis in exemplis observatus est. Parti singulari vero acutior justo sæpe fit, vel a cuticula nimis tenui, aut molli, aut sublata, vel parte ipsa inflammata, vel nimio calori exposita.

173. Nimis obtusus fit, aut plane aboletur in universo corpore, vel in magna ejus parte, a variis vitiis cerebri nervorumque, compressione vulnere, vis vitalis defectu: hoc Anæsthesia vocatur, paralyseos aliquando comes; et nonnunquam in altero latere obser-

lorem, frigus, molem, figuram, distantiam, pressuram, pondus: rarò fallax vel depravatus; scilicet quia, corpora, qualitates quorum sunt explorandæ, admoventur proximè ad organum ipsum, nullo medio interposito, varietates cujus possint fallere vel corrumpere sensum.

172. Quod pertinet ad vitia tactus, observatus est nimis acutus in universùm rarissimis si ullis exemplis. Verò fit sæpe acutior justo singulari parti, vel a cuticulâ nimis tenui, aut molli, aut sublatâ, vel parte ipsâ inflammatâ, vel expositâ nimio calori.

173. Tactus fit nimis obtusus, aut planè aboletur in universo corpore, vel in magnâ parte ejus, a variis vitiis cerebri, que nervorum, compressione, vulnere, defectû vitalis vis: hoc vocatur, Anæsthesia, aliquando comes paralyseos: et nonnunquam observatum in al-

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weight; it is rarely fallacious or depraved; namely, because that bodies, the qualities of whlch are to be examined, are applied very near to the organ itself, no medium being interposed, the varieties of which can mislead or corrupt the sensation.

172. As to what relates to the disorders of touch, it has been observed too acute in the body generally, in very rare, if in any, instances; but it becomes often too acute in a single part, either from the cuticle being too thin, or soft, or raised, or from the part itself being inflamed, or exposed to too much heat.

173. Touch becomes too obtuse, or is quite destroyed in the whole body, or in great part of it, from different disorders of the brain and nerves, by compression, a wound, loss of vital power. This is called Anæsthesia, sometimes an attendant of paralysis, and sometimes observed on one side

tero latere sine paralysi, dum alterum factum est paralyticum, sensû integro.

174. Deficit in singulari parte, vel a vitio nervi ejus, compressione, obstructione, vulnere, &c. vel parte ipsâ expositâ nimio frigori: vel demum, cuticulâ quæ tegit eam vitiatâ, factâ nimis crassâ, aut durâ, contrectatione asperorum aut nimis calidorum corporum, quod accidit vitrariis fabris, que ferrariis: vel subjectâ cute elevatâ, sanguine, sero, pure interposito: vel cute ipsâ maceratâ, laxatâ, factâ torpidâ, quod nonnunquam accidit hydropicis: vel demum toto organo corrupto, gangrænâ, ustione, algore, contusione.

175. Tactus rarissimè depravatur, nisi forte inter delirium, quum omnes functiones cerebri, turbantur in mirum modum.

176. Ut voluptas aut dolor possunt oriri a reliquis sensibus, sic etiam

vatum sine paralysi, dum alterum, sensu integro, paralyticum factum esset.

174. Deficit in parte singulari, vel a vitio ejus nervo compressione, obstructione, vulnere, &c. vel parte ipsa nimio frigori exposita; vel demum, cuticula quæ tegit vitiata, nimis crassa, aut dura facta, asperorum aut nimis calidorum corporum contrectatione, quod vitrariis, fabrisque ferrariis accidit, vel a subjecta cute elevata, interposito, sanguine, sero, pure; vel ipsa cute macerata, laxata, torpida facta, quod hydropicis nonnunquam accidit; vel demum toto organo corrupto, gangrenâ, ustione, algore, contusione.

175. Rarissime depravatur tactus, nisi forte inter delirium, quum omnes cerebri functiones mirum in modum turbantur.

176. Ut a reliquis sensibus, sic etiam a tactu, voluptas aut dolor

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without paralysis, whilst the other has been rendered paralytic, with sensation entire.

174. It is defective in a single part either from disorder of the nerve of it, by compression, obstruction, a wound, &c.; or from the part itself being exposed to too much cold; or lastly, from the cuticle which covers it being disordered, rendered too thick or hard, by the handling of rough or too hot bodies, which occurs to glass-workers and blacksmiths; or from the subjacent skin being raised by blood, serum, or pus, interposed; or from the skin itself being macerated, relaxed, rendered torpid, which sometimes occurs to dropsical patients; or lastly, from the whole organ being corrupted by gangrene, burning, cold, (or) contusion.

175. Touch is very seldom depraved, except, by chance, during delirium, when all the functions of the brain are disturbed to a wonderful degree.

176. As pleasure or pain may arise from the other senses, so likewise from

oriri possunt. Lævorem, mollitiem, calorem modicum cum voluptate contemplari solemus. Levis quoque pruritus, seu titillatio, quæ pro voluptate habenda est, ad hunc sensum pertinet, quamvis sæpe a causis internis oriatur.

177. Dolorem ad hunc sensum referimus, cæterosque fere sensus molestos, anxietatem, pruritum, &c.; quamvis revera ab omni sensu vehementiore dolor oriri possit.

178. Dolor est sensus ingratus, vehemens, acer, quem ad certam corporis partem referimus; idque minus accurate, si pars interna dolet; sed magis accurate, si corporis superficies afficitur. Neque tamen causa doloris semper in parte dolente hæret. Nascitur a magna vi parti sentienti illata, sive intus sive extrinsecus illa vis fuerit. Quicquid igitur pungit secat, lacerat, distendit, comprimit,

a tactu. Solemus contemplari, lævorem, mollitiem, modicum calorem cum voluptate. Quoque levis pruritus, seu titillatio, quæ habenda est pro voluptate, pertinet ad hunc sensum, quamvis sæpe oriatur ab internis causis.

177. Referimus ad hunc sensum dolorem, que ferè cæteros sensus molestos, anxietatem, pruritum, &c.; quamvis reverà dolor possit oriri ab omni vehementiore sensû.

178. Dolor est ingratus vehemens, acer sensus, quem referimus ad certam partem corporis; que id minus accuratè, si interna pars dolet, sed magis accuratè, si superficies corporis afficitur. Tamen causa doloris neque semper hæret in dolente parte. Nascitur a magnâ vi illatâ sentienti parti, sive illa vis fuerit intus sive extrinsecus. Igitur quicquid pungit, secat, lacerat, distendit, comprimit,

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touch. We are accustomed to contemplate smoothness, softness, moderate heat, with pleasure. Also, slight itching or titillation, which is to be esteemed as a pleasure, appertains to this sensation, although it often arises from internal causes.

177. We refer to this sense pain, and commonly the other troublesome sensations, as anxiety, itching, &c.; although, in truth, pain may arise from every more violent sensation.

178. Pain is an unpleasant, powerful, keen sensation, which we refer to a certain part of the body; and we can do that with less accuracy, if an internal part is in pain; but more accurately, if the surface of the body is affected. However, the cause of the pain is not always seated in the affected part. It arises from great violence applied to a sentient part, whether that force be from within or without. Therefore whatever pricks, cuts, tears,

contundit, percutit, rodit, urit, vel stimulat aut irritat vehementer ullo modo, potest creare dolorem.

179. Hinc tot morbis frequentissimum, molestissimum comitem se jungit; sæpe ipso morbo intolerabiliorem. Modicus dolor partem affectam, et paulatim totum corpus, excitat, majorem sanguinis et vis nervosæ fluxum ad partem facit, et ad motus necessarios et salubres sæpe stimulat, fidelis, quamvis ingratus monitor. Hinc inter præsidia vitæ nonnunquam numerandus.

179. Hine jungit se, frequentissimum molestissimum comitem tot morbis; sæpe intolerabiliorem morbo ipso. Modicus dolor excitat affectam partem, et paulatim totum corpus; facit majorem fluxum sanguinis et vis nervosæ ad partem, et fidelis, quamvis ingratus monitor, sæpe stimulat ad necessarios et salubres motus. Hinc est nonnunquam numerandus inter præsidia vitæ.

180. Vehementior autem dolor nimiam irritationem facit, inflammationem, ejusque consequentias, febrem, et omnia mala quæ a nimio humorum motu profluunt; totum genus nervosum convellit, et pervigilium, convulsiones, delirium, debilitatem, animi defectionem inducit.

180. Autem vehementior dolor facit nimiam irritationem, inflammationem, et consequentias ejus, febrem, et omnia mala quæ profluunt a nimio motû humorum; convellit totum nervosum genus, et inducit pervigilium, convulsiones, delirium, debilitatem defectionem animi.

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distends, compresses, bruises, strikes, corrodes, burns, or stimulates, or irritates actively in any way, may produce pain.

179. Hence it unites itself as a very frequent and troublesome attendant upon so many diseases, often more insupportable than the disease itself. Moderate pain excites the part affected, and by degrees the whole body; it produces a greater flow of blood and nervous energy to the part; and a faithful although an unpleasant monitor, it often stimulates to necessary and healthy motions. Hence it is sometimes to be enumerated amongst the safeguards of life.

180. But more violent pain produces too much irritation, inflammation, and the consequences of it, fever, and all the evils which arise from excessive motion of the fluids; it agitates the whole nervous system, and induces great watchfulness, convulsions, delirium, debility, and fainting.

181. Immanem dolorem neque animus neque corpus diu ferre potest; et profecto certos fines natura posuit, quos ultra dolorem intendi non permiserit, quin delirium, aut convulsio, aut animi defectio, vel demum ipsa mors miserum supplicio eripiat.

182. Diuturnus dolor, quamvis mitior, sæpe partis affectæ debilitatem, torporem, paralysin et rigiditatem inducit.

183. Doloris tolerantia pendet multum a vi animi quam æger possidet: et, prout ipse tulerit, mala quæ a dolore nascuntur graviora vel leviora erunt. Nam in hoc, uti in aliis exemplis, leve fit quod bene fertur onus.

184. Dolor, si non nimis vehemens fuerit, neque eum febris aut anxietas comitetur, ad claritatem et acumen ingenii aliquando conferre videtur. Hoc qui podagra

181. Neque animus neque corpus potest diù ferre immanem dolorem: et profectò natura posuit certos fines, ultra quos non permiserit dolorem intendi, quin, aut convulsio, aut defectio animi vel demum mors ipsa eripiat miserum supplicio.

182. Diuturnus dolor, quamvis mitior, sæpe inducit debilitatem, torporem, paralysin et rigiditatem affectæ partis.

183. Tolerantia doloris pendet multum a vi animi, quam æger possidet: et, prout ipse tulerit, mala, quæ nascuntur a dolore, erunt graviora vel leviora. Nam onus, quod bene fertur, fit leve, in hoc, uti in aliis exemplis.

184. Dolor, si non fuerit nimis vehemens, neque febris aut anxietas comitetur eum, videtur aliquando conferre ad claritatem et acumen ingenii. Qui laboraverunt podagrâ

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181. Neither the mind nor the body can long endure intense pain; and indeed nature has set certain limits, beyond which she would not allow pain to be extended, but that either convulsions, or syncope, or, finally, death itself snatches the victim from its punishment.

182. A long continued pain, although milder, often produces debility, torpor, paralysis, and rigidity, of the affected part.

183. Tolerance of pain depends much upon the strength of mind which the patient possesses; and, according as he shall have borne them, the evils which arise from pain will be more severe or more slight. For the burden which is borne patiently, becomes light, in this, as in other instances.

184. Pain, if it has not been too violent, nor fever or anxiety attends it, appears sometimes to contribute to the brightness and acumen of the intellect. Those who have suffered from gout, testify that they have experienced this.

testantur se expertos fuisse hoc.

185. Homines ferunt aliquod judicium, a dolore quem sentiunt, de modo quo causa ejus agit: veluti pungendo, lancinando, lacerando, urendo, &c.: scilicet fingunt sibi quandam convenientiam et similitudinem inter res, quas viderint, vel noverint alio modo, et res magis obscuras.

186. Anxietas est alius molestus sensus, plane diversa a dolore, obtusior, minùs accuratè referenda ad singularem partem, et sæpe intolerabilior omni dolore. Probè distinguendum est inter hanc anxietatem de quâ agitur medico sensû, que eam, de quâ loquimur communi sermone. Hæc nimirum est a mente, neque pendet a statû corporis: quippe quæ oriatur a metû cujusvis prævisi periculi, vel magni impendentis mali. Autem illa est verê corporea, non secus ac do-

laboraverunt se expertos fuisse testantur.

185. A dolore quem sentiunt, homines judicium aliquod ferunt de modo quo causa ejus agit: veluti pungendo, lancinando, lacerando, urendo, &c.: scilicet inter res quas viderint, vel alio modo noverint, et res magis obscuras, convenientiam et similitudinem quandam sibi fingunt.

186. Alius sensus molestus est anxietas, a dolore plane diversa, obtusior, minus accurate ad partem singularem referenda, et sæpe omni dolore intolerabilior. Probe distinguendum est hanc inter anxietatem de qua sensu medico agitur, eamque de qua communi sermone loquimur. Hæc nimirum a mente est, neque a statu corporis pendet; quippe quæ oriatur a metu periculi cujusvis prævisi, vel magni mali impendentis. Illa autem vere corporea est, non secus

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185. Men form some judgment, from the pain which they feel, of the mode in which the cause of its acts; as in pricking, piercing, lacerating, burning, &c.; that is to say, they imagine to themselves a certain correspondence and resemblance between things, which they have seen or known in another way, and things more obscure.

186. Anxiety is another troublesome sensation, quite different from pain; more obtuse, less accurately to be referred to an individual part, and often more insupportable than all pain. Indeed, distinction is to be drawn between this anxiety, concerning which it is treated of in a medical sense, and that of which we speak in common discourse. The latter, indeed, is from the mind, nor depends upon the state of body; as being which may arise from the fear of any foreseen danger, or a great impending misfortune. But the former is truly corporeal, like pain, deriving its origin from a par-

ac dolor, a certo corporis statu originem ducens. Nihil vero obstat, quo minus utraque simul adsit, vel altera alterius causa sit. Revera ingens anxietas corporea metum et animi anxietatem firmissimo pectori incutiet. Et hæc vicissim, si gravis fuerit et diuturna, fractis corporis viribus, imprimis quæ sanguinis cursum efficiunt, alteram inducere poterit.

187. Anxietas, medico sensu, oritur imprimis a causa quacunque sanguinis motum, per cor vasaque magna prope cor pulmonemque, turbante vel impediente. Hinc vitia cordis ejusque vasorum multiplicia, amplificationem, constrictionem, conversionem in os, polypum, palpitationem, syncopen, inflammationem, debilitatem, et ideo nonnullos animi affectus, comitatur.

188. Oritur quoque ab omni spirandi difficultate, qualiscunque

lor, ducens originem a certo statû corporis. Vero nihil obstat, quo utraque minus adsit simul, vel altera sit causa alterius. Reverà ingens corporea anxietas incutiet metum et anxietatem animi firmissimo pectori. Et hæc vicissim, si fuerit gravis et diuturna, viribus corporis fractis, imprimis quæ efficiunt cursum sanguinis, poterit inducere alteram.

187. Anxietas, medico sensû, oritur imprimis, a quâcunque causâ turbante vel impediente motum sanguinis, per cor, que magna vasa prope cor que pulmonem. Hinc comitatur multiplicia vitia cordis que vasorum ejus, amplificationem, constrictionem, conversionem in os, polypum, palpitationem, syncopen, inflammationem, debilitatem, et ideo nonnullos affectus animi.

188. Quoque oritur ab omni difficultate spirandi, qualiscunque fuerit causa

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ticular state of the body. But nothing prevents that both may not be present at the same time, or the one may be the cause of the other. Indeed, great corporeal anxiety will strike fear and anxiety of mind into the firmest bosom: and this, on the other hand, if it has been acute and long continued, the powers of the body being broken down, especially those which maintain the circulation of the blood, will be enabled to bring on the other.

187. Anxiety, in a medical sense, arises especially from any cause disturbing or impeding the motion of the blood through the heart and the large vessels near the heart and lungs. Hence it accompanies the numerous disorders of the heart and the vessels of it; enlargement, narrowing, ossification, polypus, palpitation, syncope, inflammation, debility, and, consequently, some affections of the mind.

188. Also it arises from every difficulty of breathing, whatever may have

ejus: nimirum ab impeditâ exhalatione mephitis e pulmone, et istâ salutari mutatione sanguinis, quæ fit per spiritum; et forsan sanguine ipso transeunte minus libere per pulmonem. Anxietas hujusmodi sentitur profundè in pectore.

ejus causa fuerit: impedita nimirum exhalatione mephitis e pulmone, et mutatione ista salutari sanguinis quæ per spiritum fit; et sanguine forsan ipso minus libere per pulmonem transeunte. Hujusmodi anxietas profunde in pectore sentitur.

189. Quoque dicitur oriri a difficiliore transitu sanguinis per jecur, que cætera viscera abdominis.

189. Dicitur quoque oriri a difficiliore transitu sanguinis per jecur, cæteraque viscera abdominis.

190. Quoddam genus anxietatis familiaris et molestissimæ hypochondriacis, oritur a stomacho, et intestinis, vel gravatis multo onere crudi atque corrupti cibi que potûs, vel distentis aëre extricato per minùs sanam concoctionem. Ventriculus, delicatissimum organum male afficitur tali onere vel distentione. Igitur nil mirum, si dat ingratum sensum; quin et distentio ejus impedit liberum descensum transversi septi, et sic obest respirationi. Anxietas hujus-

190. Genus quoddam anxietatis hypochondriacis familiaris, et molestissimæ, oritur a stomacho et intestinis, vel multo crudi atque corrupti cibi potusque onere gravatis, vel aëre per concoctionem minus sanam extricato distentis. Tali onere, vel distentione, ventriculus, organum delicatissimum, male afficitur. Nil mirum igitur si sensum ingratum dat; quin et ejus distentio liberum septi transversi descensum impedit, et sic respirationi obest. Hujusmodi anxie-

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been the cause: namely, from impeded exhalation of mephitic air from the lungs; and that salutary change of the blood which takes place by breathing; and, perhaps, from the blood itself circulating less freely through the lungs. Anxiety of this kind is felt deeply in the chest.

189. It is also said to arise from a more difficult passage of blood through the liver, and other viscera of the abdomen.

190. A certain kind of anxiety, common and very troublesome to hypochondriacs, arises from the stomach and intestines, either being oppressed with a great accumulation of crude and corrupted food and drink; or distended with gas, extricated in consequence of less healthy digestion. The stomach, a most delicate organ, is distressed by such an accumulation or distention. Therefore, it is no wonder if it affords an unpleasant sensation; and besides, also, the distention of it impedes the free descent of the diaphragm, and thus is an obstacle to respiration. Anxiety of this kind is

tas, expulso aëre, multum et subito levari solet, et hoc et aliis pravæ concoctionis signis, facile dignoscitur. In his exemplis, anxietas, ad ventriculum, sed parum accurate, referri solet.

191. Febres quoque omnigenas anxietas sæpe comitatur, nunc gravior nunc levior: tum propter generalem debilitatem, tum propter sanguinem a superficie corporis pulsum, inque magnis vasis accumulatum, veluti ingruente febre intermittente; tum quoque propter ventriculum male affectum, et onere cibi crudi aut corrupti gravatum, vel multo potu, imprimis calido, medicato, distentum et nauseantem. Ingravescente febre, æger magis magisque angitur, insigniter, ut testantur medici, mox ante crisin, vel nocte quæ eam præcedit, veluti ante eruptionem super cutem, vel sanguinis profluvium, vel sudorem, vel alvi fluxmodi solet multum et subito levari, aëre expulso, et facilè dignoscitur ab hoc, et aliis signis pravæ concoctionis. Anxietas solet referri in his exemplis ad ventriculum, sed parùm accuratè.

191. Quoque anxietas, nunc gravior nunc levior sæpè comitatur omnigenas febres; tum propter generalem debilitatem, tum propter sanguinem pulsum a superficie corporis, que accumulatum magnis vasis, veluti intermittente febre ingruente; tum quoque propter ventriculum male affectum, et gravatum onere crudi aut corrupti cibi, vel distentum et nauseantem multo potû imprimis calido, medicato. Febre ingravescente, æger angitur magis que magis, insigniter ut medici testantur, mox ante crisin vel nocte quæ præcedit eam, veluti ante eruptionem super cutem, vel profluvium sanguinis, vel sudorem, vel fluxum alvi, quales

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accustomed to be much and suddenly relieved by the expulsion of flatus, and is easily known by this and other symptoms of bad digestion. Anxiety is wont to be referred, in these cases, to the stomach, but little accurately.

191. Also, anxiety at one time more severe, at another milder, frequently accompanies all kinds of fevers; both on account of the general debility, and on account of the blood being driven from the surface of the body, and accumulated in the large vessels, as in an intermittent fever commencing; as well as also on account of the stomach being disordered, and oppressed with a load of crude or corrupted food, or distended and nauseated with much drink, especially warm, or medicated. The fever increasing, the patient becomes much more and more anxious, and remarkably so, as medical men testify, just before a crisis, or during the night which precedes it; for instance, before an eruption on the skin, or a discharge of blood, or sweat, or

aliquando solvunt febres. Quoque æger angitur a repulsâ eruptione, vel salutari translatione.

um, quales febres aliquando solvunt. Angitur quoque æger a repulsa eruptione, vel translatione salutari.

192. Quin anxietas pariter comitatur et febres, et plerosque morbos, quum, vitâ jam deficiente, mors instat, cujus est prænuncia et signum. Nimirum fit, quum vitales vires, factæ impares propriis muneribus, nequeunt absolvere circuitum sanguinis. Autem cætera signa appropinquantis mortis docent satis que super, qualis hæcce anxietas sit.

192. Quin et febres, et plerosque morbos pariter anxietas comitatur, quum, vita jam deficiente, mors instat, cujus prænuncia est et signum. Fit, nimirum, quum vires vitales, propriis muneribus impares factæ, circuitum sanguinis absolvere nequeunt. Qualis autem sit hæcce anxietas, cætera appropinquantis mortis signa satis superque docent.

193. Porro, anxietas potest oriri inter somnum, ab iisdem causis. Hinc dira somnia, quæ sæpe rumpunt somnum subitò et cum terrore.

193. Porro, inter somnum ab iisdem causis anxietas oriri potest. Hinc dira somnia, quæ somnum sæpe subito et cum terrore rumpunt.

194. Pruritus, scilicet inquietans sensus, cum cupiditate scalpendi, est sæpe molestissimus, quamvis sit magis affinis voluptati quam dolori.

194. Pruritus, sensus scilicet inquietans, cum scalpendi cupiditate sæpe molestissimus est, quamvis voluptati magis quam dolori affinis sit.

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diarrhœa, such as sometimes carry off fevers. Also the patient is rendered anxious by a repelled eruption, or a salutary metastasis.

192. Moreover, anxiety equally accompanies both fevers and most diseases, when, life already failing, death is at hand, of which it is a forerunner and indication. Forsooth it comes on, when the vital powers, rendered incompetent to their proper functions, are unable to carry on the circulation of the blood. But the other symptoms of approaching death show sufficiently, and more than sufficiently, of what kind this anxiety is.

193. Moreover, anxiety may arise during sleep, from the same causes. Hence, frightful dreams, which often break the slumber suddenly, and with terror.

194. Itching, that is to say, a teasing sensation, with a desire of scratching, is frequently very troublesome, although it is more allied to pleasure than to pain.

195. Ut dolor a gravi irritatione, tam mechanica quam chemica, sic pruritus a leviore fit. Titillatio, seu frictio, veluti indusii lanei minus assueto homini, et delicatiore cute prædito, pruritum excitat; et multa acria ex animalibus, aut herbis, aut fossilibus rebus derivata. Sic primus sensus a cantharidibus cuti admotis, pruritus est, quamvis idem auctus dolor fiat.

196. Acria quædam in cutem delata, veluti in febribus quas eruptio super cutem comitatur, aut morbo regio, aut demum varii ipsius morbi, scabies, lepra, eundem effectum edunt.

197. Pediculi, vermes, ascarides, imprimis, vel cutem vel intestina irritantes, molestum pruritum excitant.

198. Species quædam pruritus interni, homines ad multas et necessarias, tam sani quam morbosi

195. Ut dolor fit a gravi irritatione, tam mechanicâ, tam chemicâ, sic pruritus a leviore. Titillatio seu frictio, veluti lanei indusii, excitat pruritum homini minus assueto, et prædito delicatiore cute: et multa acria derivata ex animalibus, aut herbis, aut rebus fossilibus. Sic pruritus est primus sensus a cantharidibus admotis cuti, quamvis idem auctus fiat dolor.

196. Quædam acria delata in cutem, veluti in febribus, quas eruptio super cutem comitatur, aut morbo regio, aut demum varii morbi ipsius, scabies, lepra, edunt eundem effectum.

197. Pediculi, vermes, imprimis ascarides, irritantes, vel cutem vel intestina, excitant molestum pruritum.

198. Quædam species interni pruritûs impellit homines ad multas et necessarias actiones, tam sani

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195. As pain is produced by great irritation, as well mechanical as chemical, so itching by a slighter one. The tickling or friction, as of a flannel shirt, causes itching to a person less accustomed to it, and endowed with a more delicate skin: likewise many acrid substances obtained from animals, or herbs, or fossils. Thus itching is the first sensation from cantharides, applied to the skin, although the same when increased may become pain.

196. Certain acrid substances conveyed to the skin, as in fevers, which an eruption upon the skin accompanies, or in jaundice, or, lastly, different diseases of (the skin) itself, as itch, or lepra, produce the same effect.

197. Lice, worms, especially ascarides, irritating either the skin or intestines, excite troublesome itching.

198. A certain kind of internal itching urges men to many and necessary

tam morbosi corporis; excretionem urinæ et alvi, tussim, sternutationem, et similia.

corporis, actiones impellit; urinæ et alvi excretionem, tussim, sternutationem, et similia.

CAP. VI.—*De Gustû, que usibus, varietatibus, et vitiis ejus.*

CAP. VI.—*De Gustu, ejusque usibus, varietatibus, et vitiis.*

199. LINGUA est princeps organum hujus: que ea habet sensum eo acutiorem, quo proprior est apici, eo obtusiorem, quo proprior gutturi: quamvis reverà, nonnulla acria vix gustata circa apicem, excitent acerrimum sensum prope radicem linguæ, vel in gutture ipso.

199. HUJUS organum princeps est lingua: eaque quo proprior apici, eo acutiorem; quo proprior gutturi, eo obtusiorem sensum habet; quamvis revera acria nonnulla, circa apicem vix gustata, prope radicem linguæ, vel in ipso gutture, acerrimum sensum excitent.

200. Lingua instruitur insignibus et pulcherrimis nervosis papillis, quæ videntur esse proxima sedes gustûs. Hæ elevantur et

200. Lingua insignibus et pulcherrimis papillis nervosis instruitur, quæ proxima gustus sedes videntur esse. Hæ inter gustan-

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actions, as well of the healthy as of the sickly body, (for instance) the excretion of urine and bowels, coughing, sneezing, and the like.

CHAP. VI.—*On Taste, the uses, varieties, and disorders of it.*

199. THE tongue is the principal organ of this; and it has more acute sensibility the nearer it is to the tip, more obtuse sensibility the nearer it is to the throat: although, in truth, some acrid substances, scarcely tasted at the tip, excite a very sharp sensation near the root of the tongue, or in the throat itself.

200. The tongue is supplied with remarkable and very beautiful nervous papillæ, which appear to be the proximate seat of taste; these are elevated

dum elevantur, et eriguntur, quo acutiorem sensum habeant.

201. Nihil gustare possumus, nisi quod in saliva, quæ fere aqua est, solubile sit, ut fluida forma linguæ admotum involucra ejus pervadat, pulpamque nervosam afficiat. Hinc terræ insolubiles nullius saporis sunt.

202. Neque sat est solubile esse corpus, ut id gustemus. Oportet salis, vel saltem acrimoniæ nonnihil in se habeat, quod nervosam substantiam stimulet. Quicquid igitur quam ipsa saliva minus salsum aut acre est, nullum habet saporem.

203. Saporum varia genera facile distinguuntur, et ideo nomina peculiaria etiam in communi sermone sibimet nacta sunt: veluti sapor acidus, dulcis, amarus, salsus, acer, aromaticus, putridus; hic vero cum odore quoque jungitur. Omnium saporum varii sunt

eriguntur inter gustandum, quo habeant acutiorem sensum.

201. Possumus gustare nihil, nisi quod sit solubile in salivâ, quæ est ferè aqua, ut admotum liuguæ fluidâ formâ, pervadat involucra ejus, que afficiat nervosam pulpam. Hinc insolubiles terræ sunt nullius saporis.

202. Neque est sat corpus esse solubile, ut gustemus id. Oportet, habeat nonnihil salis, vel saltem acrimoniæ in se, quod stimulet nervosam substantiam. Igitur quicquid est minus salsum aut acre quam saliva ipsa, habet nullum saporem.

203. Varia genera saporum facilè distinguuntur, et ideò nacta sunt sibimet peculiaria nomina etiam in communi sermone: veluti, acidus, dulcis, amarus, salsus, acer, aromaticus, putridus, sapor; vero hic quoque jungitur cum odore. Sunt varii gradus omnium saporum, que

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and erected during taste, in order that they may have more acute sensibility.

201. We can taste nothing, but what is soluble in saliva, which is almost water; that applied to the tongue in the fluid form, it may pervade its coverings, and affect the nervous pulp. Hence, insoluble earths are devoid of taste.

202. Nor is it sufficient that a body be soluble, that we may taste it; it is necessary that it contains something of salt, or at least acrimony within it, which may stimulate the nervous substance. Therefore, whatever is less salt or acrid than the saliva itself, has no taste.

203. Different kinds of tastes are easily distinguished, and therefore have obtained to themselves appropriate names, even in common discourse; as, an acid, sweet, bitter, salt, acrid, aromatic, or putrid taste: but the latter is

omnes possunt conjungi variè inter se.

gradus, omnesque varie inter se conjungi possunt.

204. Alii sapores sunt suavissimi et gratissimi: alii ingrati, que vix tolerandi. Tamen mira diversitas hominum de hâc re: ita ut quod est maximæ voluptati aliis, alii respuant non sine nauseâ et horrore.

204. Sapores alii suavissimi et gratissimi sunt; alii ingrati, vixque tolerandi. Mira tamen de hac re hominum diversitas: ita ut quod aliis maximæ voluptati est, alii non sine nausea et horrore respuant.

205. Quin homines solent brevi fastidire et suavissimos sapores, qui primo dederant magnam voluptatem: dum consuetudine discunt amare et appetere pessimos et ingratissimos, quales sunt nicotianæ tabaci, ferulæ assæfœtidæ, et similium.

205. Quin et suavissimos sapores, qui magnam primo voluptatem dederant, homines brevi fastidire solent; dum pessimos et ingratissimos, quales sunt nicotianæ tabaci, ferulæ assæfœtidæ, et similium, consuetudine amare discunt et appetere.

206. Præcipuus usus gustûs videtur esse, invitare ad bonum et salubrem cibum, divertere a noxio aut minus idoneo. Plerique et optimi cibi sunt grati gustui. Vero ferè nocent qui sunt mali saporis incorrupto gustui. Bruta animalia perducuntur ad idoneum cibum, et

206. Usus gustus præcipuus videtur esse, ad cibum bonum et salubrem invitare, a noxio aut minus idoneo divertere. Plerique et optimi cibi gustui grati sunt. Qui vero gustui incorrupto mali saporis sunt, ii fere nocent. Hujusmodi instinctu, raro fallace, quem

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also combined with smell. There are different degrees of all the tastes, and all may be variously combined together.

204. Some tastes are very sweet and agreeable; others are unpleasant and scarcely to be endured. However there is a wonderful diversity amongst men in this respect; so that, that which is the greatest pleasure to some, others reject not without loathing and horror.

205. Moreover, persons are accustomed in a short time to dislike even the sweetest tastes, which at first had afforded much pleasure; whilst by habit, they learn to like and long for the worst and most disagreeable, such as of tobacco, assafœtida, and the like.

206. The principal use of taste appears to be, to invite to good and wholesome food, to divert from what is noxious or less proper. Most, and the best kinds of food, are pleasant to the taste; but those are generally injurious which are of a bad taste, to an uncorrupted palate. The brute creation

olfactus quoque juvat, bruta animalia ad idoneum cibum perducuntur, et a noxio arcentur.

207. Hic vero instinctus, non secus ac reliqui, minus perfectus homini quam belluis datur; quippe qui tali auxilio minus egeat, aliis facultatibus præditus. Ipse vero qui datur instinctus, vitæ genere parum naturali sæpe corrumpitur.

208. Statuit porro alma rerum Parens, ut actio ad vitam alendam adeo necessaria, et sua natura quodammodo voluntaria, voluptate aliqua non careret. Grato cibi sapore tanquam præmio, ad cibum sumendum et conficiendum allicimur. Revera ista voluptas pendet multum a statu ventriculi, et a necessitate novi cibi sumendi. Vilissimus enim cibus, et fere insulsus, homini esurienti gratissimus est, saturi vero fastidium crearet. Porro, inter mandendum saliva copiosior affluit, quo accuratior

arcentur a noxio, instinctû hujusmodi, raro fallace, quem olfactus quoque juvat.

207. Vero hic instinctus, non secus ac reliqui datur minus perfectus homini quam belluis: quippe qui præditus aliis facultatibus, minus egeat tali auxilio. Verò instinctus ipse qui datur, sæpe corrumpitur parum naturali genere vitæ.

208. Porro alma Parens rerum statuit, ut actio adeo necessaria ad alendam vitam, et quodammodo voluntaria suâ naturâ, non careret aliquâ voluptate. Allicimur ad sumendum et conficiendum cibum, grato sapore cibi, tanquam præmio. Reverà ista voluptas multum pendet a statû ventriculi, et a necessitate sumendi novi cibi. Enim vilissimus cibus et fere insulsus, est gratissimus homini esurienti, vero crearet fastidium saturi. Porro, inter mandendum, copiosior saliva fluit, quo

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are directed to proper food, and are kept from what is noxious, by instinct of this kind, seldom deceptive, which the smell also assists.

207. But this kind of instinct, like the rest, is given less perfect to man than to brutes; namely, who being endowed with other faculties, has less need of such assistance; but the instinct itself which is supplied, is often vitiated by a little natural mode of life.

208. Moreover, the kind parent of nature has ordained, that an action, so necessary to support life, and in some degree voluntary in its nature, might not be devoid of some pleasure. We are allured to take and prepare food, by the agreeable taste of the food, as if by remuneration. Truly that pleasure much depends upon the state of the stomach, and the necessity of taking fresh food: for the most common food, and almost tasteless, is most acceptable to a hungry man, but would create disgust in one satisfied. Moreover, during mastication, a more copious saliva flows, in order that the taste may

gustus evadat accuratior, et sapor cibi gratior. Etiam saliva fluit ad conspectum esurienti, vel etiam ad imaginem aut recordationem grati cibi, quem appetit.

209. Gustus rarò observatur nimis acutus, nisi a vitio cuticulæ, quæ tegit linguam. Si hæc fuerit sublata, aut vulnerata, aut obsessa ulceribus, aphthis, que similibus malis, tum gustû facto nimis acri, sapores non percipiuntur sine dolore; vel aliquando nullus sapor distinguitur, dolor solus sentitur.

210. Deficit, non secus ac tactus a variis vitiis cerebri, que nervorum ipsius. Vero exempla hujusmodi sunt rara. Datur admodum obtusus nonnullis hominibus. Hi quoque solent habere parum olfactûs. Sæpissime deficit propter defectum salivæ: nam sicca lingua nequit gustare. Hinc est obtusus in multis morbis, imprimis febribus, grave-

evadat gustus, et cibi sapor gratior. Fluit etiam saliva esurienti ad conspectum, vel etiam ad imaginem aut recordationem grati cibi quem appetit.

209. Gustus raro nimis acutus observatur, nisi a vitio cuticulæ, quæ linguam tegit. Hæc, si sublata fuerit, aut vulnerata, aut ulceribus, aphthis, similibusque malis, obsessa, tum gustu nimis acri facto, sapores non sine dolore percipiuntur; vel aliquando sapor nullus distinguitur, solus dolor sentitur.

210. Deficit, non secus ac tactus, a cerebri variis ipsius nervorumque vitiis. Hujusmodi vero exempla rara sunt. Nonnullis hominibus admodum obtusus datur. Hi quoque parum olfactus habere solent. Deficit sæpissime propter defectum salivæ: nam sicca lingua gustare nequit. Hinc in multis morbis obtusus est, febri-

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become more accurate, and the savour of the food more agreeable. Also the saliva flows at sight, in a hungry man, or even at the idea or recollection of the pleasant food which he longs for.

209. Taste is seldom observed too acute, unless from disorder of the cuticle which covers the tongue. If this has been raised, or wounded, or covered with ulcers, aphthæ, and similar diseases, then taste having become too sharp, the savours are not perceived without pain; or sometimes no taste is distinguished, pain alone is felt.

210. It is defective, like touch, from various disorders of the brain and the nerves of it; but instances of this kind are rare. It is given very obtuse to some men. These persons likewise are accustomed to possess little smell. It is most frequently defective on account of a want of saliva; for a dry tongue is unable to taste. Hence, it is obtuse in many diseases; particularly

bus imprimis, gravedine, &c. tum ob salivæ, tum quoque ob appetitus defectum, qui in sano homine adeo juvat; vel propter linguam ipsam tenace et fœdo muco obductam.

211. Depravatur sæpe gustus. Scilicet, vel gustamus, nihil omnino linguæ admoto; vel, si quid ei admotum fuerit, saporem percipimus a vero et solito alienum. Hoc fit plerumque a vitio salivæ quæ ipsa gustatur. Hoc modo sapor dulcis, salsus, acer, amarus, putridus, rancidus, percipi potest, prout saliva, vel a statu generalis massæ humorum, vel organorum quæ ipsam secernunt, vel oris ipsius, vel ventriculi, unde vapor et ructus, præsertim si male se habet, ad os surgunt, corrupta fuerit.

212. Verum, præter salivæ vitia, ab aliis causis gustus vitiatur, veluti papillarum nervosarum con-

dine, &c. tum ob defectum salivæ tum quoque ob appetitûs, qui adeo juvat in sano homine: vel propter linguam ipsam, obductam tenace et fœdo muco.

211. Gustus sæpe depravatur. Scilicet vel gustamus, omnino nihil admoto linguæ: vel si quid admotum fuerit ei, percipimus saporem alienum a vero et solito. Hoc plerumque fit, a vitio salivæ, quæ ipsa gustatur. Hoc modo dulcis, salsus, acer, amarus, putridus, rancidus, sapor, potest percipi, prout saliva fuerit corrupta, vel a statû generalis massæ humorum, vel organorum quæ secernunt ipsam, vel oris ipsius vel ventriculi, unde vapor et ructus surgunt ad os, præsertim si habet se male.

212. Verum præter vitia salivæ, gustus vitiatur ab aliis causis, veluti conditione nervosarum papilla-

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in fevers, catarrh, &c., both on account of a want of saliva, as well as on account of loss of appetite, which is so useful in a healthy person; or on account of the tongue itself being covered with thick and filthy mucus.

211. The taste is often depraved; that is to say, we either have taste, no substance at all being applied to the tongue; or if something has been applied to it, we perceive a taste different from what is the proper and usual one. This generally occurs from disorder of the saliva, which itself is tasted: in this way, a sweet, salt, acrid, bitter, putrid, or rancid taste, may be perceived, according as the saliva may have been corrupted either from the condition of the general mass of the fluids or organs which secrete it, or of the mouth itself, or of the stomach, whence gas and eructations rise to the mouth, particularly if it be disordered.

212. But, besides the disorders of the saliva, the taste is vitiated from

rum: cujus verò parum notum est hactenus. Nam nonnunquam gustus planè alienatur quamvis ipsa saliva sit nullius saporis aliis hominibus.

213. Medici solent attendere multum nec immeritò ad conditionem linguæ in omnibus morbis, præsertim febribus. Nam possunt judicare ex eâ, de statû ventriculi, de siti vel potius de necessitate sumendi potûs, cum æger propter delirium, stuporem, &c. neque sentit sitim, neque potest conqueri de eâ; et demum medici conantur deducere aliquod judicium ab linguâ inspectâ. de naturâ, et augmento, vel remissione febris.

ditione; cujus vero parum hactenus notum est. Nam gustus, nonnunquam plane alienatur, quamvis saliva ipsa aliis hominibus nullius saporis sit.

213. Ad linguæ conditionem medici in omnibus morbis, præsertim febribus, multum solent attendere; nec immerito. Nam ex ea judicare possunt de statu ventriculi, de siti, vel potius de necessitate potus sumendi, cum æger, propter delirium, stuporem, &c. neque sitim sentit, neque de ea potest conqueri; et demum de natura, et augmento, vel remissione febris, ab inspecta lingua, medici judicium aliquod deducere conantur.

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other causes: as by the state of the nervous papillæ; of which, however, little is known hitherto: for sometimes the taste is evidently altered, although the saliva itself is of no taste to other persons.

213. Medical men are accustomed to attend much nor improperly, to the state of the tongue, in all diseases, particularly in fevers; for they are enabled to judge from it, of the state of the stomach, of the thirst, or rather of the necessity of taking drink, when the patient on account of delirium, stupor, &c. neither feels thirst, nor is able to complain of it; lastly, medical men endeavour to deduce some judgment from inspection of the tongue, concerning the nature, and increase, or remission of fever.

Cap. VII.—*De Olfactu; ejusque usibus, varietatibus et vitiis: nec non de natura Odorum, eorumque effectibus in corpore humano.*

Cap. VII—*De Olfactû—que usibus, varietatibus, et vitiis ejus; necnon ed naturâ Odorum, que effectibus eorum, in humano corpore.*

214. Hujus sensus sedes est in membrana illa mollissima, delicatissima, nervorum et vasorum sanguinem vehentium referta, quæ naribus internis, variisque sinibus et antris, quibus iter ex iis est obducitur. Acutior sensus circa medium septum, ossaque spongiosa, quibus membrana crassior, et mollior datur, quam in antris profundioribus, ubi membrana tenuior, minus nervosa, et vasis minus referta est: quamvis hæ quoque, ut videtur, partes olfactu non omnino careant.

214. Sedes hujus sensûs est in illâ mollissimâ et delicatissimâ membranâ, refertâ nervorum et vasorum vehentium sanguinem, quæ obducitur internis naribus que variis sinibus, et antris, quibus est iter ex iis. Sensus acutior circa medium septum, que spongiosa ossa quibus crassior et mollior membrana datur, quam in profundioribus antris, ubi membrana est tenuior, minus nervosa, et minus referta vasis: quamvis hæ partes ut videtur quoque, non omnino careant olfactû.

215. Ut gustu de partibus cor-

215. Ut judicamus de

Chap. VII.—*On Smelling, the uses, varieties, and disorders of it; also on the nature of Odours, and the effects of them in the human body.*

214. The seat of this sense is, in that very soft and very delicate membrane, supplied with nerves and vessels carrying blood, which is spread over the internal nares, and the various sinuses and cavities to which there is a passage from them. The sense is more acute about the middle septum and spongy bones, to which a thicker and softer membrane is given, than in the deeper cavities; where the membrane is thinner, less nervous and less supplied with vessels; although these parts, also, as it appears, are not entirely devoid of smelling.

215. As we judge of the soluble particles of bodies, by the taste, so by the

solubilibus partibus corporum gustû, sic olfactû de volatilibus partibus quæ subtilissimæ volitant per aëra. Ut aliquis olfaciat accuratè, inhalat aëra fortiter, naribus apertis quantum possit, que ore clauso, quo plures volatiles particulæ, que majore vi, admoveantur organo olfactus.

216. Quoque organum olfactûs, non secus ac organum gustûs, servatur madidum, quo habeat acutiorem sensum; partim proprio muco, partim lachrymis, quæ assiduè destillant ex oculis.

217. Ut gustus præponitur custos itineri cibi, sic olfactus ostio viarum, quas aër debet subire, moniturus ne quid noxii admittatur in corpus, viâ quæ semper patet. Porro, ut gustus, hic sensus quoque invitat ad salutarem cibum, deterret a noxio, aut corrupto, imprimis putrido, aut rancido.

218. Quin et quidam

porum solubilibus, sic olfactu de partibus volatilibus, quæ subtilissimæ per aëra volitant, judicamus. Ut accurate olfaciat aliquis, apertis quantum possit naribus, clausoque ore, aëra fortiter inhalat, quo plures particulæ volatiles, majoreque vi, olfactus organo admoveantur.

216. Organum quoque olfactus, non secus ac organum gustus, quo acutiorem sensum habeat, madidum servatur; partim proprio muco, partim lachrymis quæ ex oculis assidue destillant.

217. Ut gustus cibi itineri, sic olfactus ostio viarum, quas aër subire debet, custos præponitur, moniturus ne quid noxii, via quæ semper patet, in corpus admittatur. Porro, ut gustus, hic quoque sensus ad cibum salutarem invitat, a noxio aut corrupto, putrido imprimis vel rancido, deterret.

218. Quin et odores quidam

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smelling, of the volatile particles which, in a very fine state, float through the air. In order that one may smell accurately, he inhales the air forcibly; with the nostrils opened as wide as possible, and with the mouth closed; in order that more volatile particles may be applied, and with greater force, to the organ of smelling.

216. Also, the organ of smelling, like the organ of taste, is kept in a moist state, that it may possess more acute sensibility; partly by its own mucus, and partly by the tears, which constantly flow down from the eyes.

217. As taste is placed as a guardian to the passage of the food, so smelling to the opening of the passages which the air ought to enter; about to warn lest any thing noxious be admitted into the body by the passage, which is always open. Moreover, like taste, this sense also invites to wholesome food, keeps us from what is hurtful, or corrupted, particularly the putrid and rancid.

insigni vi in genere nervoso pollent, et mirandos nonnunquam effectus edunt. Alii grate excitant, et animo fere deficientem statim recreant: alii animo linqui faciunt, et aliquando, ut fertur, hominem plane extinguunt. Huc quoque pertinent quæ vocantur antipathiæ, ridiculæ profecto, sed sæpe nulla vi animi debellendæ.

219. Olfactus interdum nimis acutus fit, tum propter vitia quædam organi ipsius, quod rarius observatur, tum quoque propter universum genus nervosum nimis sentiens: ut in febribus quibusdam, in phrenitide, in hysteria, aliquando observatur.

220. Obtunditur sæpius, aut a vitiis cerebri nervorumque, veluti a vi capiti illata, vel a causa interna, provenientibus; aut a vitio ipsius organi, aridi, propter solitos humores suppressos, vel alio versos, vel nimia muci lachrymarum-

odores pollent insigni vi in nervoso genere, et nonnunquam edunt mirandos effectus. Alii excitant gratè, et statim recreant fere deficientem animo: alii faciunt linqui animo, et aliquando, ut fertur, planè extinguunt hominem. Quoque quæ vocantur antipathiæ pertinent huc, profectò ridiculæ, sed sæpè debellandæ nullâ vi animi.

219. Interdum olfactus fit nimis acutus, tum propter quædam vitia ipsius organi, quod rariùs observatur, tum quoque propter nimis sentiens universum nervosum genus: ut aliquando observatur in quibusdam febribus, in phrenitide, in hysteriâ.

220. Sæpiùs obtunditur, aut a vitiis cerebri que nervorum, veluti provenientibus a vi illatâ capiti, vel ab internâ causâ: aut a vitio organi ipsius, aridi propter solitos humores suppressos, vel versos aliò, vel obruti nimiâ copiâ

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218. Moreover, also, some odours are endowed with remarkable influence in the nervous system, and sometimes produce surprising effects: some excite agreeably, and immediately restore a person almost fainting; others bring on fainting, and sometimes, as it is reported, completely destroy a person. Also the things which are called antipathies may be referred to this place, truly ridiculous, but frequently to be subdued by no power of the mind.

219. Sometimes smelling becomes too acute, both on account of some disorders of the organ itself, which is more seldom observed, as well as also on account of a too sentient nervous system in general, as is sometimes observed in certain fevers, in phrenitis, and in hysteria.

220. It is more frequently blunted, either from diseases of the brain and nerves, as those proceeding from force applied to the head, or from an internal cause; or disorder of the organ itself, dry on account of the usual

muci que lachrymarum. Est exemplum utriusque in gravedine, ubi initio morbi nares arescunt, verò postea vel inundantur multo humore, vel obstruuntur spissiore muco. Sed, in his que in bene multis aliis exemplis, membrana ipsa nasi, afficitur inflammatione, relaxatione, vel nimiâ tensione, qua non potest fieri, quin nervi vitientur, qui efficiunt magnam partem ejus. Porro, quicquid impedit liberum introitum aëris in nares, aut transitum ipsius per eas non potest non obesse olfactui.

221. Olfactus nonnunquam depravatur, et odores percipiuntur, ubi fuit nihil odorati, vel odores rerum, alieni a veris et solitis percipiuntur. Odoratæ particulæ, post longam moram in antris, erumpentes demum, et denuò afficientes organum, nonnunquam efficiunt depravationem hujusmodi, etiam in sanissimo

que copia obruti. Utriusque exemplum est in gravedine, ubi initio morbi nares arescunt, postea vero vel multo humore inundantur, vel spissiore muco obstruuntur. Sed in his aliisque bene multis exemplis, membrana nasi ipsa afficitur inflammatione, relaxatione, tensione nimia, qua fieri non potest quin nervi, qui magnam ejus partem efficiunt, vitientur. Porro, quicquid liberum aëris in nares introitum, aut ipsius per eas transitum impedit, olfactui non obesse non potest.

221. Depravatur nonnunquam olfactus, et odores percipiuntur, ubi nihil odorati fuit, vel odores rerum percipiuntur a veris et solitis alieni. Particulæ odoratæ, post longam in antris moram, demum erumpentes, et organum denuo afficientes, hujusmodi depravationem, in sanissimo etiam homine, nonnunquam efficiunt.

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fluids suppressed, or being directed elsewhere, or overwhelmed with an excess of mucus or tears. There is an instance of both in catarrh, when in the beginning of the disease the nostrils are dry, but are afterwards either inundated with much fluid, or obstructed by a thicker mucus. But in this, and in many other cases, the membrane itself of the nose is attacked by inflammation, relaxation, or excessive tension; by which it cannot happen, but that the nerves are disordered, which form a considerable portion of it. Besides, whatever impedes the free entrance of air into the nostrils, or the passage of it through them, cannot fail to be an obstacle to smelling.

221. Smelling is sometimes depraved, and odours are perceived when there has been no odorous body, or odours of things unlike the real and true ones, are perceived. Odorous particles after long detention in the cavities, emerging at length, and again affecting the organ, sometimes produce a de-

Multa quoque vitia narium partiumque quibus ad eas iter patet ulcera, caries, cancer, corruptio quævis oris, dentium, gutturis, pulmonis, prava etiam in ventriculo concoctio, vaporem fœtidum, exhalando, olfactum corrumpere possunt. Depravatur interdum fortasse a vitiis cerebri nervorumque quorum ratio magis obscura est.

homine. Quoque multa vitia narium, que partium quibus iter patet ad eas, ulcera, caries, cancer, quævis corruptio oris, dentium, gutturis, pulmonis, etiam prava concoctio in ventriculo, exhalando fœtidum vaporem, possunt corrumpere olfactum. Fortasse interdum depravatur, a vitiis cerebri, que nervorum, ratio quorum est magis obscura.

Cap. VIII.—*De Auditu, Sonis, et Vitiis Auditus.*

Cap. VIII.—*De Auditû, Sonis, et Vitiis Auditûs.*

222. Hic sensus excitatur tremoribus aëris, quos corpora sonantia faciunt. Hos auris externa, cartilaginosa, et meatus auris uterque, colligunt, ad tympanum defe-

222. Hic sensus excitatur tremoribus aëris, quos sonantia corpora faciunt. Cartilaginosa externa auris, et uterque meatus auris colligunt hos deferunt ad tympanum, et

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pravation of this kind, even in a most healthy man. Likewise, many diseases of the nostrils and of the parts, from which a passage is open to them; (such as) ulcers, caries, cancer, any corruption of the mouth, teeth, throat, or lungs; also bad digestion in the stomach, by exhaling a fetid vapour, may vitiate the sense of smelling. Perhaps it is sometimes disordered by diseases of the brain and nerves; the reason of which is more obscure.

Chap. VIII.—*On Hearing, Sounds, and the Disorders of Hearing.*

222. This sense is excited by the tremors of the air, which sounding bodies occasion. The cartilaginous external ear, and each meatus of the ear, col-

simul intendunt quo feriant membranam tympani majore vi. Hæc membrana ipsa commota et tremens, commovet malleum annexum sibi, et facit ferire incudem junctam sibi: propriis musculis mallei simul juvantibus. Verò incus impertit suum motum ossi orbiculari et stapedi, qui iterum ita trahitur, tum hoc motû, tum quoque actione sui musculi, ut posterior pars baseos ejus impellatur in fenestram ovalem, que vestibulum ipsum. Porro, tremores membranæ tympani, communicantur simul cum aëre delato per Eustachianam tubam in tympanum: qui aër demùm ferit membranam fenestræ rotundæ, quâ pervenitur in labyrinthum, seu intimam aurem. Igitur tremores perveniunt, duplice modo ut videtur, ad labyrinthum, qui totus obductus mollissimâ et admodùm sentiente nervosâ membranâ, et plenus pellucidâ

runt, et simul intendunt, quo majore vi membranam tympani feriant. Hæc membrana, ipsa commota et tremens, malleum sibi annexum commovet, et junctam sibi incudem ferire facit; juvantibus simul propriis mallei musculis. Incus vero suum motum ossi orbiculari et stapedi impertit, qui iterum, tum hoc motu, tum quoque actione sui musculi, ita trahitur, ut pars posterior ejus baseos in fenestram ovalem, ipsumque vestibulum, impellatur. Porro, tremores membranæ tympani, cum aëre per tubam Eustachianam in tympanum delato, simul communicantur; qui demum aër fenestræ rotundæ membranam ferit, qua in labyrinthum, seu aurem intimam, pervenitur. Duplice igitur, ut videtur, modo, tremores ad labyrinthum perveniunt, qui totus, mollissima et admodum sentiente nervosa membrana, obductus, et aquula pellu-

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lect these (tremors,) carry them to the tympanum, and at the same time stretch it, that they may strike the tympanum with greater impetus. This membrane, itself agitated and trembling, moves the malleus annexed to it, and makes it strike the incus, articulated to it; the proper muscles of the malleus at the same time assisting. But the incus imparts its motion to the orbicular bone and stapes, which again is so drawn, both by this motion as well as by the action of its own muscle, that the posterior portion of the base of it is forced into the fenestra ovalis, and the vestibule itself. Moreover, the tremors of the membrane of the tympanum, communicate, at the same time, with the air conveyed by the Eustachian tube into the tympanum, which air at length strides the membrane of the fenestra rotunda, by which it is conveyed to the labyrinth, or internal ear. Therefore tremors, as it appears, arrive in a two-fold manner at the labyrinth, all which being lined with a very soft and very sensitive nervous membrane, and filled with

cida, subrubra, ad omnes tremores suscipiendos et propagandos aptissima, plenus, ultimum auditus organum est.

223. Neque sane quicquam certa fide de singularum auris internæ partium actionibus notum est, præterquam ossicula ipsa ad tremores suscipiendos et reddendos vel propagandos aptissima esse, et ideo ad auditum conferre: ita ut per dentes et maxillam, et petrosum os, soni ad ultimam nervosam organi partem perveniant, et sic homo fere surdus, neque per aëra audiens, musica quodammodo fruatur. Potius confitendum est, multum hic subesse obscuri, et actionem et usus multarum partium, quæ in aure sunt, parum adhuc intelligi.

224. Soni sunt fortes vel debiles, graves vel acuti. Soni magnitudo vel claritas pendet a vi seu magnitudine tremorum, quos corpus sonans aëri impertit; gravitas

aquulâ, subrubrâ, aptissimâ ad suscipiendos, et propagandos omnes tremores, est ultimum organum auditûs.

223. Neque sanè quicquam est notum certâ fide, de actionibus singularum partium internæ auris, præterquam ossicula ipsa esse aptissima ad suscipiendos, et reddendos vel propagandos tremores, et ideò conferre ad auditum: ita ut soni perveniant per dentes et maxillam, et petrosum os ad ultimam nervosam partem organi, et sic homo ferè surdus, neque audiens per aëra, fruatur musicâ quodammodo. Potius confitendum est, hic multum obscuri subesse, et actionem et usus multarum partium, quæ sunt in aure, adhuc parùm intelligi.

224. Soni sunt fortes vel debiles, graves vel acuti. Magnitudo vel claritas soni pendet a vi seu magnitudine tremorum, quos sonans corpus im-

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a pellucid, reddish fluid, best adapted to receive and propagate all terrors, is the ultimate organ of hearing.

223. Nor indeed is anything known for certain of the actions of the separate parts of the internal ear, except that the little bones themselves are best adapted for receiving, and returning or propagating tremors, and on that account contribute to hearing; so that sounds may arrive by means of the teeth, maxilla and petrous bone, to the ultimate nervous part of the organ; and thus a man nearly deaf, and not hearing through the air, may enjoy music to some extent. We must rather confess, that here there is much obscurity, and that the action and uses of many parts which are in the ear, are still little understood.

224. Sounds are strong or weak, deep or acute: the extent or clearness of sound depends upon the force or extent of the tremors, which a sounding body imparts to the air; depth, upon the number of tremors which are pro-

pertit aëri; gravitas a numero tremorum, qui absolvuntur dato tempore. Tamen sunt certi fines, citra et ultra quos, sonus est vel nullus vel acerrimus, et ingratissimus auri, que vix tolerabilis.

225. Porro vis soni intenditur repercussû multorum corporum, quæ suscipiunt et reddunt tremores, a tremente aëre. Itaque reflexi soni, quotquot concordant cum primario, feriunt aures unà cum eo, que faciunt eum fortiorem: hinc vox est debilior sub pleno Jove, quam in cubiculo. Quod si, reflexi soni perveniunt ad aures, certo intervallo post, audiuntur distincti a primario, et sic echo fit.

226. Est immensa varietas sonorum; quippe quorum, vel levissimæ mutationes et conjunctiones percipiantur ab acutâ, et doctâ aure. Quoque vis eorum est insignis, in animum hominis, et ideò in corpus. Inspirant varios affectus animi, imprimis

a numero tremorum qui dato tempore absolvuntur. Sunt tamen certi fines, quos citra et ultra, vel nullus sonus est, vel acerrimus, et auri ingratissimus, vixque tolerabilis.

225. Porro, vis soni intenditur repercussu multorum corporum, quæ tremores a tremente aëre suscipiunt et reddunt. Soni itaque reflexi, quotquot cum primario concordant, una cum eo aures feriunt, eumque fortiorem faciunt; hinc vox sub pleno Jove debilior quam in cubiculo. Quod si, certo post intervallo, reflexi soni ad aures peveniunt, a primario distincti audiuntur, et sic echo fit.

226. Sonorum immensa varietas est: quippe quorum vel levissimæ mutationes et conjunctiones, ab acuta et docta aure, percipiantur. Insignis quoque eorum vis est in animum hominis, et ideo in corpus. Varios animi affectus, tristes im-

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duced in a given time. Nevertheless, there are certain bounds within and beyond which, sound is either lost or very shrill, and most unpleasant to the ear, and scarcely supportable.

225. Moreover, the strength of a sound is increased by repercussion of many bodies, which receive and return the tremors, from the trembling air. Therefore, reflected sounds, as many as agree with the primary one, strike the ear together with it, and render it stronger; hence the voice is weaker under the open air than in a room. But, if the reflected sounds reach the ear in a certain interval afterwards, they are heard distinct from the primary one, and thus echo is produced.

226. There is an immense variety of sounds, namely, of which even the slightest changes and combinations may be perceived by an acute and tutored ear. Also, the influence of them is remarkable upon the mind of man, and

primis et lætos, inspirant; multique hominum ex hoc inexhausto fonte puras et suavissimas voluptates hauriunt. Auris vero, quæ vocatur musica, non omnibus datur; cujus rei ratio hactenus latet. Nullo modo pendet ab acutiore vel obtusiore auditu. Semi-surdi nonnunquam musica satis periti sunt et amantissimi, qua bene audientes parum sæpe fruuntur: et vir, auditu integro manente, aurem suam musicam, quam eximiam habebat, subito et sine nota causa amisit. Neque ratio ulla est cur defectum talem inæquali per binas aures auditui imputemus. Facultas ipsa naturæ donum est, nullo studio acquirenda: cultu vero et usu, non secus ac reliquæ hominis facultates, mirum in modum acuitur et roboratur.

227. Auditus fere omnium sensuum sæpissime vitiatur; quod profecto nil mirum; scilicet, quia or-

tristes et lætos; que multi hominum hauriunt puras et suavissimas voluptates ex hoc inexhausto fonte. Vero auris, quæ vocatur musica, non datur omnibus: ratio cujus rei hactenus latet. Pendet nullo modo ab acutiore vel obtusiore auditû. Semisurdi sunt nonnunquam satis periti musicâ et amantissimi, quâ bene audientes sæpè parum fruuntur; et vir, auditû manente integro, amisit subitò et sine notâ causâ, suam musicam aurem, quam habebat eximiam. Neque est ulla ratio cur imputemus talem defectum inæquali auditui per binas aures. Facultas ipsa est donum naturæ, acquirenda nullo studio: verò acuitur, et roboratur in mirum modum cultû et usu, non secus ac reliquæ facultates hominis.

227. Auditus vitiatur ferè sæpissimè omnium sensuum; quod profecto nil mirum; scilicet, quia

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consequently upon the body: they inspire different affections of the mind, especially the sad and cheerful; and many men derive pure and the sweetest pleasures from this inexhaustible source. But an ear, which is called musical, is not supplied to all persons, the reason of which hitherto lies hid. It depends in no degree upon more acute or more obtuse hearing. Persons half deaf are sometimes very skilful in, and very fond of music, which persons hearing well, often little enjoy; and a man, with his hearing continuing entire, has lost suddenly, and without any assignable cause, his musical ear, which he possessed in an exquisite degree. Nor is there any reason why we should impute such a defect to unequal hearing by the two ears.—The faculty itself is a gift of nature, to be acquired by no kind of study; but is rendered acute, and strengthened to a wonderful extent, by cultivation and use, like the other faculties of man.

227. Hearing is disordered nearly the most frequently of all the senses;

habet organum delicatissimum, et compositum ex plurimis et valde minutis partibus.

228. Auditus fit sæpe acutior justo, vel a nimis irritabili generali habitu corporis, qualem hystericæ aut puerperæ fœminæ sæpe habent; vel a cerebro ipso nimis sentiente, quod haud raro observatur in febribus; tum quoque in phrenitide, et aliquando, licèt rariùs, in verâ insaniâ; vel ab aure ipsa male habente se, et affectâ inflammatione, dolore, nimiâ tensione.

229. Hic sensus obtunditur vel planè aboletur, ita ut æger vel audiat graviter, vel fiat omnino surdus, fere similibus causis, et diversis tantùm gradû seu magnitudine; et imprimis, a defectû externæ auriculæ, aut vel altero vel utroque meatû, obstructo, muco, cerumine, pure, externis rebus; que concretione ejus, qualis observata est post suppurationem, nonnunquam

ganum habet delicatissimum, et ex plurimis et valde minutis partibus compositum.

228. Sæpe acutior justo fit auditus, vel a generali corporis habitu nimis irritabili, qualem fœminæ hystericæ aut puerperæ sæpe habent; vel a cerebro ipso nimis sentiente, quod in febribus haud raro observatur; tum quoque in phrenitide, et aliquando, licet rarius, in vera insania: vel ab aure ipsa male se habente, et inflammatione, dolore, tensione nimia, affecta.

229. Obtunditur vel plane aboletur hic sensus, ita ut æger vel graviter audiat, vel omnino surdus fiat, similibus fere causis, et gradu tantum seu magnitudine diversis; et imprimis a defectu auriculæ externæ, aut meatu vel altero vel utroque, muco, cerumine, pure, rebus externis, obstructo; ejusque concretione, qualis post suppurationem, nonnunquam post vario-

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which indeed is no wonder, namely, because it has a very delicate organ, and composed of very numerous and very minute parts.

228. Hearing becomes often more acute than proper, either from a too irritable general habit of body, such as hysterical or puerperal females possess; or from the brain itself being too sensitive, which is not unfrequently observed in fevers; as well as also in phrenitis, and sometimes, though more seldom, in real insanity; or from the ear itself being disordered, and affected with inflammation, pain, and too much tension.

229. This sense is rendered obtuse, or is completely destroyed, so that a sick man either hears with difficulty, or may become quite deaf, almost from similar causes, or differing only in degree or magnitude; and particularly, from a defect of the external ear, or from either one or both of the auditory passages being obstructed by mucus, wax, pus, or extraneous bodies; also by concretion of it, such as has been observed after suppuration, sometimes

lam, observata est; vel propter membranam tympani rigidam factam, aut relaxatam, aut erosam, aut ruptam; vel tympanum ipsum vel tubam Eustachianam aliquo modo obstructam; vel propter ossiculorum, aut membranarum, aut musculorum aliquem labyrinthi ipsius, concretione, spasmo, paralysi, torpore, affectum; et denique propter varia cerebri nervorumve vitia, salva omnino ipsius organi fabrica. Hinc sæpe morbus nervosi generis surditas, subito invadens et sponte decedens. Hinc quoque senibus familiaris, quibus omnes partes solidæ rigent, omnes nervosæ minus sentiunt.

230. Febre laborantes, illo imprimis febris genere, quod debilitas insignis et stupor comitari solent, sæpe surdi fiunt: quod forsitan aliquando, cum aliis signis cerebri valde oppressi, viriumque ægri exhaustarum accedens, ma-

post variolam; vel propter membranam tympani factum rigidam, aut relaxatam, aut erosam, aut ruptam; vel tympanum ipsum vel Eustachianam tubam obstructam aliquo modo; vel propter aliquem ossiculorum aut membranarum, aut musculorum labyrinthi ipsius, affectum concretione, spasmo, paralysi, torpore; et denique propter varia vitia cerebri vel nervorum, fabricâ organi ipsius omnino salvâ. Hinc surditas sæpe morbus nervosi generis, subito invadens, et sponte decedens. Hinc quoque familiaris senibus, quibus omnes solidæ partes rigent, omnes nervosæ minùs sentiunt.

230. Laborantes febre, imprimis illo genere febris, quod insignis debilitas et stupor solent comitari, sæpe fiunt surdi; quod forsitan erit aliquando malum signum, accedens cum aliis signis valdè oppressi cerebri, que exhaustarum virium

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after small-pox; or on account of the membrane of the tympanum become rigid or relaxed, or eroded, or ruptured; or the tympanum itself, or Eustachian tube, being obstructed in some manner; or on account of some one of the little bones, or membranes, or muscles of the labyrinth itself, being affected by concretion, spasm, paralysis, or torpor; and, lastly, on account of various disorders of the brain or nerves, the structure of the organ itself being perfectly sound. Hence deafness is frequently a disease of the nervous system, suddenly coming on and spontaneously departing. Hence also it is common to old persons, in whom all the solid parts are rigid, and all the nervous parts are less sensitive.

230. Persons suffering from fever, particularly that kind of fever which great debility and stupor are accustomed to attend, often become deaf: which perhaps will sometimes be a bad symptom, coming on with other signs of a very oppressed brain and exhausted powers of the patient; but it is gene-

ægri. Verò plerumque est optimi ominis, quamvis etiam aliquis sopor comitetur. Ratio hujus rei est satis obscura ; neque fortasse alia quàm quod talis surditas pendeat a statû cerebri morbido certè, sed vix periculoso suâ naturâ; cum auditus acutior justo, fit propter aliquid inflammationis obrepentis cerebro, quæ est semper valde periculosa.

231. Auditus sæpe depravatur potissimum hac ratione, ut soni, veluti tympani, campanæ, lapsûs aquarum, audiantur, cum nullus tremor est in aëre, neque sanus homo audit quidquam. Hoc malum vocatur, tinnitus aurium, cujus varia genera observata sunt. Plerumque leve et fugax malum ; verò nonnunquam pertinax, diuturnum, molestissimum, vexat diu que noctu.

232. Aures sæpe tinniunt a levissimâ causâ, pro parte obstruente meatum signum erit. Plerumque vero optimi ominis est, quamvis etiam sopor aliquis comitetur. Hujus rei ratio satis obscura ; neque alia fortasse, quam quod talis surditas pendeat a statu cerebri morbido certe, sed sua natura vix periculoso ; cum acutior justo auditus, fit propter aliquid inflammationis cerebro obrepentis, quæ semper valde periculosa est.

231. Depravatur sæpe auditus hac potissimum ratione, ut soni, veluti tympani, campanæ, lapsus aquarum, audiantur, cum nullus in aëre tremor est, neque sanus homo quidquam audit. Hoc malum tinnitus aurium vocatur, cujus varia genera observata sunt. Leve plerumque et fugax malum : nonnunquam vero pertinax, diuturnum, molestissimum, diu noctuque vexat.

232. Tinniunt sæpe aures a levissima causa, meatum ipsum vel

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rally of the best indication, although even some drowsiness may attend it. The reason of this is very obscure; nor perhaps is there any other than that such deafness may depend upon a state of brain, morbid indeed, but scarcely dangerous in its nature ; when the hearing is more acute than proper, it takes place on account of some inflammation stealing upon the brain which is always very dangerous.

231. Hearing is often depraved, particularly in this way, that sounds as of a drum, bell, or of a waterfall are heard, when there is no tremor in the air, nor a healthy person hears anything : this malady is called ringing of the ears, of which different kinds have been observed. Generally a slight and fleeting disorder; but sometimes obstinate, long continued, and very troublesome, it harasses by day and by night.

232. The ears often ring from a very slight cause, partially obstructing

tubam Eustachianam pro parte obstruente, ita ut imperfectus, interruptus aëri aditus concedatur; quo fit ut hic membranam tympani, vel fortasse partes interiores, inæqualiter, et impetu nimio feriat. Hinc bombi, tinnitus species, etiem a sanissimo homine, inter hiandum audiuntur.

233. Frequentior et molestior tinnitus multos morbos, tum febres, tum nervosi generis affectiones, comitatur; partim ab aucto sanguinis caput versus impetu, auctoque simul nervosi generis sensu, ita ut ipsarum arteriarum ictus audiantur; partim ab aucto nervorum et musculorum auris labyrinthi sensu et mobilitate; quo fit, ut partes quæ debebant quiescere, donec aëris tremoribus excitatæ essent, sua sponte motus concipiant, eosdemque aliis partibus, jam nimis sentientibus, impertiantur.

tum ipsum vel Eustachianam tubam, ita ut imperfectus, et interruptus aditus concedatur aëri; quo fit, ut hic feriat inæqualiter et nimio impetû, membranam tympani vel fortasse interiores partes. Hinc bombi, species tinnitûs audiuntur inter hiandum, etiam a sanissimo homine.

233. Frequentior et molestior tinnitus comitatur multos morbos, tum febres tum affectiones nervosi generis: partim ab aucto impetû sanguinis versus caput, que simul aucto sensu nervosi generis; ita ut ictus arteriarum ipsarum audiantur; partim ab aucto sensû et mobilitate nervorum et musculorum labyrinthi auris; quo fit, ut partes, quæ debebant quiescere, donec excitatæ essent tremoribus aëris, concipiant motus suâ sponte, que impertiantur eosdem aliis partibus, jam nimis sentientibus.

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the meatus itself, or Eustachian tube; so that an imperfect and interrupted access is given to the air; whence it happens, that it strikes unequally, and with too much impetus, the membrane of the tympanum, or perhaps, the internal parts. Hence, bombi, a species of ringing, are heard during gaping, even by a most healthy person.

233. A more common and more troublesome ringing attends many diseases; both fevers, as well as affections of the nervous system: partly from an increased impetus of the blood towards the head, and at the same time increased sensibility of the nervous system, so that the beats of the arteries themselves are heard; partly from increased sensibility and mobility of the nerves and muscles of the labyrinth of the ear; whence it occurs, that parts which ought to be at rest, until they were excited by the tremors of the air, receive motion of their own accord, and impart the same to other parts, already too sensitive.

234. Quoque tinnitus oritur a vehemente affectû animi; interdum nascitur a ventriculo male habente se: interdum a rheumatico malo afficiente caput et aures, vel a gravedine quæ solet afficere tubam: vero tinnitus nonnunquam invadit solus, profectò non exiguum malum.

235. Tamen variæ causæ, tum hujus, tum aliorum vitiorum auditûs, sæpe dignoscuntur difficillimè, non magis propter abditum situm organi, quam propter notitiam actionum variarum partium ejus, quam habemus parùm accuratam. Vero fit ex utrâque causâ, ut multiplices affectiones auditûs sanentur, neque certè neque facilè.

234. Oritur quoque tinnitus a vehemente animi affectu; interdum a ventriculo male se habente, nascitur: interdum a malo rheumatico caput et aures afficiente, vel a gravedine quæ tubam afficere solet: nonnunquam vero tinnitus solus invadit, malum profecto non exiguum.

235. Variæ tamen causæ, tum hujus tum aliorum auditus vitiorum, sæpe difficilime dignoscuntur, non magis propter abditum organi situm, quam propter notitiam variarum ejus partium actionum, quam parum accuratam habemus. Ex utraque vero causa fit, ut multiplices auditus affectiones neque certe neque facile sanentur.

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234. Likewise ringing arises from a powerful affection of the mind; it sometimes arises from the stomach being disordered: sometimes from a rheumatic disorder affecting the head and ears; or from catarrh, which is accustomed to affect the tube; but ringing sometimes comes on alone, indeed, not a slight disorder.

235. Yet the various causes both of this, as well as of the other disorders of hearing, are generally distinguished with great difficulty; not more on account of the concealed situation of the organ, than on account of the knowledge of the actions of the different parts of it, which we possess little accurate. But it happens from both causes, that the numerous affections of hearing are cured neither certainly nor easily.

Cap. IX.—*De Visu, ejusque varietatibus et vitiis.*

236. Radii, ab omni puncto corporis lucentis vel illuminati quod contemplamur, dimanantes, vel reflexi, in corneam oculi membranam incidunt: qui valde obliqui sunt, reflexi, vel in uvea vel pigmento nigro, quod processus ciliares oblinit, suffocati, ad interiores oculi partes nunquam perveniunt: qui vero rectius in corneam incidunt radii, per pellucidam illam membranam, et qui proxime jacet humorem aquosum transmissi, ad lentem crystallinam jam haud parum refracti perveniunt. Vi hujus lentis, et vitrei humoris qui proximus est, magis adhuc refringuntur, et in punctum, seu focum, ut vocatur, demum colli-

Cap. IX.—*De Visû, que varietatibus, et vitiis ejus.*

236. Radii, dimanantes vel reflexi ab omni puncto lucentis vel illuminati corporis quod contemplamur, incidunt in corneam membranam oculi: qui sunt valde obliqui, reflexi, vel suffocati in uveâ vel in nigro pigmento, quod oblinit ciliares processus, nunquam perveniunt ad interiores partes oculi: vero, radii qui incidunt rectiùs in corneam, transmissi per illam pellucidam membranam, et aquosum humorem qui jacet proximè, jam haud parum refracti perveniunt ad crystallinam lentem. Vi hujus lentis, et vitrei humoris qui est proximus, refringuntur adhuc magis, et demum colliguntur in punctum seu focum, ut

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Chap. IX.—*On Sight, the varieties and disorders of it.*

236. The rays emanating or reflected from every point of a shining or illuminated body, which we contemplate, fall upon the cornea, a membrane of the eye: those which are very oblique, reflected or buried in the uvea, or in the pigmentum nigrum, which is spread over the ciliary processes, never arrive at the inner parts of the eye: but the rays which fall more directly upon the cornea, transmitted through that transparent membrane, and the aqueous humour which lies next to it, already considerably refracted, arrive at the crystalline lens. By the power of this lens, and the vitreous humour which is next to it, they are refracted still more, and are at length collected into a point or focus as it is called, about to depict upon the

vocatur, depicturi super retinam, pulcherrimam, distinctam, quamvis inversam imaginem corporis, unde profluxerant.

237. Verò hæc delicatissima nervosa membrana est ultimum organum visûs: et ex inversâ imagine corporis, depictâ super eam homo sanus cerebrum que opticum nervum, videt corpus ipsum, erectum, distinctum, que expressum propriis coloribus.

238. Varii humores oculi dantur a naturâ moliente nihil frustrà, quamvis unus suffecisset, ad refringendos radios et colligendos in focum, que exprimendam imaginem in retinam, potissimùm, hoc consilio, ut videtur, ut præcaveretur ab alieno colore, quem una et simplex lens solet dare propter radios lucis inæqualiter refractos: et sic homo posset judicare de veris coloribus corporum, accuratione quâ oportebat. Enim constat certissimis experiguntur, pulcherrimam, distinctam, quamvis inversam, corporis unde profluxerant imaginem super retinam depicturi.

237. Hæc vero delicatissima nervosa membrana, ultimum visus organum est; et ex imagine corporis inversa super eam depicta, homo, cerebrum nervumque opticum sanus, corpus ipsum, erectum, distinctum, propriisque coloribus expressum, videt.

238. Varii dantur oculi humores a natura nihil frustra moliente, quamvis unus ad radios refringendos, et in focum colligendos, imaginemque in retinam exprimendam suffecisset, hoc potissimum, ut videtur, consilio, ut ab alieno colore, quem una et simplex lens dare solet, propter radios lucis inæqualiter refractos, præcaveretur: et sic homo, qua oportebat accuratione, de veris corporum coloribus judicare posset. Certissimis enim ex-

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retina a very beautiful and distinct, although inverted image of the body from whence they had emanated.

237. But this very delicate nervous membrane is the ultimate organ of vision; and from the inverted image of a body depicted upon it, a man healthy as to the brain and optic nerve, sees the object itself erect, distinct, and expressed in its proper colours.

238. Various humours of the eye are given by nature, framing nothing without an object, although one might have sufficed for refracting the rays, and gathering them into a focus, and for expressing the image upon the retina, particularly with this intention, as it appears, that provision might be made against a foreign colour, which one and a simple lens is apt to produce, on account of the rays of light being unequally refracted: and thus man might judge of the true colour of bodies, with that accuracy with which it was necessary. For it appears from very accurate experiments, that a lens

perimentis constat lentem, certa ratione compositam, hoc non levi simplicioris incommodo carere. Ad eundem finem haud parum conferre videtur, varia singulorum oculi humorum variis partibus densitas: qua fortasse varia vi refringente, diversa ipsorum radiorum ad refringendum facilitas compensatur.

239. Neque profecto minima humoris vitrei, qui omnium oculi humorum longe maximam partem efficit, utilitas est, globum oculi implere, retinamque probe distendere, ita ut fere sphæram concavam repræsentet, quo plura ejus puncta imagines rerum visibilium distinctas et accuratas accipiant: nam si planior fuisset oculi fundus, vel cujuslibet fere alius figuræ quam rotundæ, propter inæqualem variarum ejus partium a centro oculi distantiam, unum tantum retinæ punctum, pnta cen-

mentis, lentem compositam certâ ratione, carere hoc non levi incommodo simplicioris. Varia densitas singulorum humorum oculi, variis partibus, videtur conferre haud parum ad eundem finem: quâ variâ refringente vi fortasse diversa facilitas radiorum ipsorum, ad refringendum, compensatur.

239. Neque profecto est utilitas vitrei humoris minima, qui efficit longe maximam partem omnium humorum oculi implere globum oculi, que probè distendere retinam, ita ut fere representet concavam sphæram, quo plura puncta ejus accipiant distinctas et accuratas imagines visibilium rerum: nam si fundus oculi fuisset planior, vel fere cujuslibet alius figuræ quam rotundæ, unum punctum tantum retinæ, puta centrum ejus, habuisset distinctum visum, propter inæqualem distan-

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constructed upon a certain principle, is free from this, not a slight inconvenience, of a more simple one. The various density of the several humours of the eye in the different parts, appears to contribute no little to the same end; by which varied refracting power, perhaps, the different capability of the rays themselves to be refracted, is compensated.

239. Nor indeed is the use of the vitreous humour very inconsiderable, which forms by far the largest portion of all the humours of the eye, to fill the globe of the eye, and accurately to distend the retina, so that it may almost represent a concave sphere, by which many points of it may receive distinct and accurate images of visible objects. For if the bottom of the eye had been flatter, or nearly of any other shape than the round, one point only of the retina, suppose its centre, would have had distinct vision, on account of the unequal distance of the various parts of it from the centre of the eye.

tiam variarum partium ejus a centro oculi. Vero radii, qui incidissent in alia puncta, vel nondum satis refracti, vel dimanantes iterum, postquam semel collecti essent in focum, corrupissent visum multùm, confusâ imagine depictâ super retinam.

240. Oculus est rotundus, ut radii transeuntes per eum, colligantur in justum focum, priusquam incidant in retinam. Est par ratio prominentis convexæ corneæ, quæ fere tanto magis prominet, quanto planior oculus datus est animali. Quin et rotunditas oculi confert haud parum ad liberrimum et rapidissimum motum ejus.

241. Mira conspiratio vel consensus observatur, inter binos oculos, que inter varias partes oculi. Alter oculus sequitur motum alterius suâ sponte hâc ratione, ut axes utriusque sint semper paralleli ; et dirigantur in idem

trum ejus, distinctum visum habuisset. Qui vero in alia puncta incidissent radii, vel nondum satis refracti, vel postquam in focum semel collecti essent dimanantes iterum, imagine confusa super retinam depicta, visum multum corrupissent.

240. Rotundus est oculus, ut radii per eum transeuntes in justum focum prius colligantur quam in retinam incidant. Par ratio est corneæ convexæ, prominentis, quæ fere tanto magis prominet, quanto planior oculus animali datus est. Quin et rotunditas oculi ad liberrimum et rapidissimum ejus motum haud parum confert.

241. Mira conspiratio vel consensus inter binos oculos, interque varias oculi partes observatur. Alter oculus motum alterius sua sponte sequitur, hac ratione, ut axes utriusque semper paralleli sint ; et non nisi hominis conatu,

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But the rays, which would have fallen upon other points, either not sufficiently refracted, or again emanating, after they had been once collected into a focus, would have injured vision considerably, by a confused image depicted upon the retina.

240. The eye is round, that the rays passing through it may be collected into a proper focus, before they strike upon the retina. There is the same reason of the convex prominent cornea, which is generally so much the more prominent, the flatter the eye has been supplied to an animal. Moreover, also, the rotundity of the eye contributes considerably, to the very free and very rapid motion of it.

241. A wonderful harmony or sympathy is observed between the two eyes, and between the various parts of the eye. The one eye follows the motion of the other spontaneously, in this way, that the axes of both are always

levi quidem illo, et per instinctum et quasi sponte facto, in idem punctum corporis, quod contemplatur, dirigantur; quo fit, ut imago ejus prope centrum utriusque retinæ exprimatur: nam ibi loci fere semper perfectissimus est visus.

242. Pupilla in tenebris patula, admissa vel vividiore facta luce, statim contrahitur; et hoc consensui inter retinam et musculum qui pupillam regit, eamque vel arctat vel amplificat, plane tribuendum est, neque omnino irritationi ipsius musculi. Nam sano prorsus musculo isto, si nullus visus est, nulla fit pupillæ contractio. Quin et musculi pupillarum utriusque oculi conspirant: ita ut, admissa ad alterum oculum luce, utriusque simul pupillæ contrahantur.

243. Contrahitur quoque pupilla, siquid oculo proprius quam soliti limites distincti visus accu-

punctum corporis, quod contemplatur, non nisi conatû hominis, illo quidem levi, et facto per instinctum et quasi sponte; quo fit, ut imago ejus exprimatur prope centrum utriusque retinæ; nam ibi loci visus est fere semper perfectissimus.

242. Pupilla patula in tenebris, statim contrahitur luce admissâ vel factâ vividiore; et hoc plane tribuendum est consensui inter retinam et musculum, qui regit pupillam, que vel arctat vel amplificat eam, neque omnino irritationi musculi ipsius. Nam isto musculo prorsus sano, si est nullus visus, nulla contractio pupillæ fit. Quin et musculi pupillarum utriusque oculi conspirant; ita ut, luce admissâ ad alterum oculum, pupillæ utriusque simul contrahantur.

243. Quoque pupilla contrahitur, si intuemur accuratè quid propriùs oculo quam soliti limites

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parallel, and directed towards the same point of a body which it contemplates, not indeed without an effort of man, that indeed slight, and executed by instinct, and as it were spontaneously: by which it happens that the image of an object is expressed near the centre of each retina; for in that part vision is nearly always most perfect.

242. The pupil dilated in the dark, is immediately contracted by light being admitted or rendered more vivid: and this is evidently to be attributed to a sympathy between the retina and the muscle, which controls the pupil, and either contracts or dilates it, and not entirely to irritation of the muscle itself. For that muscle being entirely in a sound state, if there is no vision, no contraction of the pupil takes place. Moreover, also, the muscles of the pupils of both eyes harmonize, so that, light being admitted into one eye, the pupils of both are simultaneously contracted.

243. Likewise the pupil is contracted if we view attentively any thing

distincti visûs: hoc consilio, ut videtur, ut superflui et maxime obliqui radii, et quos refringentes vires oculi vix potuissent colligere in justum focum, excludantur. Videtur esse par ratio quod pupilla sit admodum patula infantibus et junioribus, fere contractior senibus, quibus oculi solent fieri planiores. Nondum constat pro certo, num, quoque aliis modis, oculus accommodet semet ad varias distantias rerum quas contemplatur: vero nonnulli putarunt hunc esse usum ciliarium processuum; nempe ut dimoveant lentem a solitâ sede, et trahant longiùs a retinâ, quo radii magis refringantur, priusquam incidant in eam. Autem est certissimum, oculum mutari quodammodo vel his viribus, tum musculi qui regit pupillam, tum ciliarium processuum, vel aliis minùs cognitis, et accommodari ad varias

rate intuemur; hoc, ut videtur, consilio, ut radii superflui et maxime obliqui, et quos vires oculi refringentes in justum focum vix potuissent colligere, excludantur. Par videtur esse ratio, quod pupilla infantibus et junioribus admodum patula, senibus fere contractior sit, quibus oculi planiores fieri solent. Nondum pro certo constat, num aliis quoque modis, oculus ad varias rerum quas contemplatur distantias, semet accommodet: hunc vero nonnulli putarunt esse usum processuum ciliarium: nempe ut lentem a solita sede dimoveant, et longius a retina trahant, quo magis refringantur radii, priusquam in eam incidant. Certissimum autem est, oculum, vel his viribus tum musculi qui pupillam regit, tum processuum ciliarium, vel aliis minus cognitis, quodammodo mutari, et ad varias rerum

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nearer than the usual limits of distinct vision; with this design, as it appears, that the superfluous and most oblique rays, and which the refracting powers of the eye had scarcely been able to collect into a proper focus, may be excluded; there seems to be an equal reason, that the pupil is very much dilated in infants and young persons, generally more contracted in old people, in whom the eyes are accustomed to become flatter. It does not appear for certain, whether the eye can accommodate itself also in other ways to the different distances of objects which it contemplates; but some have supposed that this is the use of the ciliary processes: namely, that they may remove the lens from its usual situation, and may pull it further from the retina, so that the rays may be more refracted before they fall upon it. But, it is very certain, that the eye is altered in some way, either by these powers, both of the muscle which governs the pupil, as well of the ciliary

quas contemplatur distantias, intra certos limites, accommodari.

244. Diu multumque disputatum est inter physiologos, mathematicos, metaphysicos, quo pacto fiat, ut, ab inversa super retinam depicta imagine, rem ipsam rectam videamus; et cur a duplice imagine, una nimirum in utroque oculo expressa, una tantum res spectetur.

245. Res ipsæ parum utiles vetant medicum in hanc arenam descendere, ubi tot magni nominis viri non sine laude semet exercuerunt. Scire tamen juvat, ad hoc tandem ventum esse simplicem de hac re latam esse a natura legem scilicet, ut omne visibile spectetur secundum directionem rectæ lineæ a puncto retinæ, super quod depicta fuerit ejus imago, per centrum oculi transeuntis. Nondum prolata sunt experimenta neque argumenta, quæ ostendant

distantias rerum quas contemplatur, intra certos limites.

244. Disputatum est diù que multum inter physiologos, mathematicos, metaphysicos, quo pacto fiat, ut videamus rem ipsam erectam, ab inversâ imagine depictâ super retinam; et cur una res tantùm spectetur, a duplice imagine, nimirum unâ expressâ in utroque oculo.

245. Res ipsæ parum utiles vetant medicum descendere in hanc arenam, ubi tot viri magni nominis exercuerunt semet non sine laude. Tamen juvat scire, tandem ventum esse ad hoc, simplicem legem de hac re latam esse a naturâ scilicet, ut omne visibile spectetur secundum directionem rectæ lineæ transeuntis per centrum oculi a puncto retinæ, super quod imago ejus depicta fuerit. Nondum experimenta neque argumenta prolata sunt, quæ ostendant dic-

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processes, or by others less known, and that it is accommodated to the different distances of objects which it contemplates, within certain limits.

244. It has been disputed a long time and much among physiologists, mathematicians, and metaphysicians, in what manner it occurs, that we see the object itself erect, from an inverted image painted upon the retina, and why one object only is seen from the double image; that is, from one expressed in each eye.

245. The subjects themselves of little use, forbid the medical man to enter into such a field of dispute, where so many men of great repute have exercised themselves not without honour. It is, however, useful to know, that at length it is come to this, that a simple law on this subject has been laid down by nature, namely, that every visible thing should be seen according to the direction of a straight line passing through the centre of the eye, from the point of the retina, upon which the image of the object was depicted. Nor yet experiments, nor arguments, have been brought forward

tam directionem esse veram, mathematicâ accuratione; sed neque ullus, vel levissimus error detectus est in hâc re. Igitur oportet concludamus ex experimentis jam institutis, directionem, quâ visibile punctum spectatur esse vel hanc, vel quam proximam huic. Igitur homo sic constitutus, nimirum lege latâ videndi hujusmodi, vidisset ipsam rem inversam, si imago fuisset erecta; et pari ratione, videt easdem erectas, quæ depinguntur inversæ.

dictam directionem, mathematica accuratione, esse veram: sed neque error ullus, vel levissimus, in hac re detectus est. Oportet igitur ex jam institutis experimentis concludamus, directionem, qua punctum visibile spectatur, esse vel hanc, vel huic quam proximam. Homo igitur sic constitutus, hujusmodi nimirum videndi lege lata, si imago erecta fuisset, rem ipsam inversam vidisset; et pari ratione, quæ inversæ depinguntur, easdem erectas videt.

246. Nec est verum quod videretur primo intuitû simplicius et clarius, rem spectari secundum verum situm et directionem quem habet: vel secundum directionem radiorum lucis, incidentium aut in corneam aut in retinam; enim facili experimento omne corpus potest spectari, loco non suo, vel pluribus locis eodem tempore; et radii lucis dimanantes a quo-

246. Nec verum est, quod primo intuitu simplicius et clarius videretur, rem spectari secundum verum quem habet situm et directionem; vel secundum directionem radiorum lucis, aut in corneam aut in retinam incidentium: facili enim experimento spectari potest corpus omne, loco non suo, vel pluribus locis eodem tempore; et radii lucis a puncto quovis dimanantes,

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which shew that the said direction is true, with mathematical accuracy; but not any, not even the slightest error, has been detected, on this head. Therefore it is necessary that we should conclude from the experiments already performed, that the direction in which a visible point is seen, is either this, or very nearly allied to it. Therefore man thus constituted, namely, with the law laid down of seeing of this kind, would have seen the object itself inverted, if the image had been erect; and for the same reason he sees the same objects erect which are painted inverted.

246. Nor is it true, which at first sight might appear more clear and simple, that the object is seen according to the true situation and direction which it has: or according to the direction of the rays of light falling either upon the cornea, or the retina; for by an easy experiment, every body may be seen in a situation not its own, or in many places at the same time; and the rays of light emanating from any point, possess so many directions, either

vel quum primum in oculum incidunt, vel postquam, a variis humoribus refracti, ad fundum oculi perveniunt, tot diversas directiones habent, ut si visus inde penderet, omne visibile, variis eodem tempore directionibus spectatum, multiplex et confusum videretur.

247. Quæstio de simplice visu a duplice imagine, parum accurate primo proposita, postea ad majorem accurationem redacta est: neque profecto verum est, visum in homine sanissimo semper esse simplicem. Simplex vel duplex est, prout oculi varia ratione in rem quam spectamus conversi fuerint. Si axes binorum oculorum in idem punctum directi fuerint, duplex imago ejus puncti, una nimirum in centro utriusque retinæ expressa, simplicem visum efficit. Porro, res quotquot pari ab oculo distantia ad utrumque latus talis

vis puncto, habent tot diversas directiones, vel quum primum incidunt in oculum, vel postquam refracti a variis humoribus, perveniunt ad fundum oculi, ut, si visus inde penderet, omne visibile, spectatum variis directionibus eodem tempore, videretur multiplex et confusum.

247. Quæstio de simplice visû a duplice imagine, primo proposita parum accuratè, postea redacta est ad majorem accurationem; neque profectò est verum, visum esse semper simplicem in sanissimo homine. Est simplex vel duplex, prout oculi conversi fuerint variâ ratione in rem quam spectamus. Si axes binorum oculorum directi fuerint in idem punctum, duplex imago puncti ejus, nimirum una expressa in centro utriusque retinæ, efficit simplicem visum. Porrò, quotquot res sitæ sunt pari distantiâ ab oculo ad utrumque latus

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when first they fall upon the eye, or after having been refracted by the various humours, they arrive at the bottom of the eye, that, if vision depended upon it, every visible thing seen in different directions at the same time would appear multiplied and confused.

247. The question concerning simple vision from a double image, at first propounded with little accuracy, has since been reduced to a greater degree of precision; nor, indeed, is it true, that sight is always single in a perfectly healthy person. It is single or double, according as the eyes may have been turned in a different manner towards the object we are viewing. If the axes of both eyes are directed towards the same point, the double image of the point of it, namely, the one expressed in the centre of each retina, produces single vision. Moreover, as many objects as are situated at an equal distance from the eye, on each side of such point, are at the same time seen

talis puncti, simul spectantur simplices; scilicet imagines quarum depictæ super utramque retinam, habent similem situm comparatum cum centro ejus. Igitur centra binarum retinarum, et puncta in iis, quæ habent similem situm quod ad centrum, nempe supra, vel infra, vel dextrorsum vel sinistrorsum, dicuntur consentire vel dare simplicem visum. Verò res positæ propiùs, vel remotiùs oculo, quam punctum, in quod axes oculorum conveniunt, possunt spectari simul cum illo, que visus earum est duplex. Facilè ostenditur imagines earum rerum occupare partes utriusque retinæ, quæ ponuntur dissimiliter quod ad centrum: nempe, depingi in dextrâ parte alterius oculi, in sinistrâ alterius. Igitur partes retinarum, positæ dissimiliter quod ad centra, non consentiunt: hoc est, efficiunt duplicem visum ejusdem rei, imago cujus

puncti sitæ sunt, simplices simul spectantur: quarum scilicet imagines super retinam utramque depictæ, similem cum centro ejus comparatum situm habent. Centra igitur binarum retinarum, et puncta in iis quæ similem quod ad centrum situm habent, supra, nempe, vel infra, vel dextrorsum, vel sinistrorsum, consentire dicuntur, vel simplicem visum dare. Res vero propius vel remotius ab oculo positæ, quam punctum in quod axes oculorum conveniunt, simul cum illo spectari possunt, earumque duplex visus est. Facile ostenditur imagines earum rerum partes retinæ utriusque occupare, quæ dissimiliter quod ad centrum ponuntur: nempe, in dextra parte alterius oculi, in sinistra alterius, depingi. Partes igitur retinarum, dissimiliter quod ad centra positæ, non consentiunt; hoc est, duplicem ejusdem rei, cujus super utramque

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single; that is to say, the images of which painted on each retina, have the same situation compared with the centre of it. Therefore, the centres of the two retinæ, and the points in them which possess a like situation in relation to the centre, namely, above or below, or to the right or left, are said to correspond, or produce single vision. But objects placed nearer, or further from the eye, than the point upon which the axes of the eyes meet, may be seen simultaneously, and the vision of them is double. It is easily shown that the images of those objects occupy parts of each retina, which are situated differently in regard to its centre; that is to say, they are painted on the right side in one eye, and on the left in the other. Therefore, the parts of the retinæ, situated dissimilarly in respect to its centre, do not correspond; that is, they produce double vision of the same object, the image of which was painted upon both.

imago depicta fuerit, visum efficiunt.

248. Varietates quædam, seu vitia leviora hujus sensus, quæ vix morbosa habentur, sæpe observantur. Myopes dicuntur, qui visum brevem habent, scilicet, qui nil clare et accurate vident, nisi proxime ad oculum admoveatur. Hoc fit propter radios lucis nimis refractos, in focum nimis cito collectos, et iterum a foco dimanantes, priusquam ad retinam perveniant; quo fit ut indistinctam super eam imaginem depingant. Causa hujus vitii frequentissima est, nimia totius oculi vel humoris ejus cujusdam convexitas, veluti corneæ nimis prominentis, &c. quæ radios lucis per oculum transeuntes nimis refringit. Incommodum, junioribus familiare, dum senescunt, aliquando, ut fertur, sublevatur: quod tamen minime perpetuum est. Quum primo levius hujusmodi vitium ob-

depicta fuerit super utramque.

248. Quædam varietates, seu leviora vitia hujus sensûs, quæ vix habentur morbosa, sæpe observantur. Dicuntur Myopes, qui habent brevem visum, scilicet, qui vident nil accuratè et clarè, nisi admoveatur proxime ad oculum. Hoc fit propter radios lucis nimis refractos, nimis cito collectos in focum, et iterum dimanantes a foco, priusquam perveniant ad retinam; quo fit ut depingant indistinctam imaginem super eam. Frequentissima causa hujus vitii est, nimia convexitas totius oculi, vel cujusdam humoris ejus, veluti corneæ nimis prominentis, &c. quæ nimis refringit radios lucis transeuntes per oculum. Incommodum, familiare junioribus, aliquando sublevatur ut fertur, dum senescunt; quod tamen est minimè perpetuum. Quum levius vitium hujusmodi primo

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248. Certain varieties or slight disorders of this sense, which are scarcely considered morbid, are often observed. Those persons are called Myopes, who have short vision, that is to say, who see nothing accurately or clearly, unless it be brought very close to the eye. This occurs from the rays of light being too much refracted, too soon collected into a focus, and again diverging from that focus, before they reach the retina; by which it occurs, that they paint an indistinct image upon it. A most frequent cause of this disorder is too great a convexity of the whole eye, or of any humour of it; as a cornea too prominent, which too powerfully refracts the rays of light passing through the eye. This inconvenience, common to young people, sometimes is alleviated, as it is said, when they grow old: which, however, is by no means constant. When a slighter disorder of this kind is first observed, it may in some degree be overcome by a habit of looking at distant

observatur, potest quodammodo vinci consuetudine contemplandi res remotas, que cohibendi oculos a valde minutis et vicinis rebus, non secus ac idem vitium acquiri contrario usû: nimirum, quia oculus accommodat quodammodo sese ad distantias rerum, quas contemplatur (243). Concavum vitrum, quod facit radios plus dimanare priusquam incidant in oculum, est simplicissimum et certissimum auxilium Myopibus.

249. Vocantur Presbyopes, qui habent longum visum, confusum vicinarum rerum, satis distinctum remotiorum rerum. Hoc vitium agnoscit contrarias causas ac alterum: imprimis oculum nimis planum, quo spatium non datur refringendis radiis; hinc, malum familiare senibus, etiam iis qui bene viderant florentibus annis solet sublevari usû convexi vitri, haud obscurâ ratione.

servatur, consuetudine res remotas contemplandi, oculosque a valde minutis et vicinis rebus cohibendi, quodammodo vinci, non secus ac contrario usu idem vitium acquiri, potest: nimirum, quia oculus quodammodo ad rerum, quas contemplatur, distantias sese accommodat (243.) Vitrum concavum, quod radios plus facit dimanare priusquam in oculum incidant, simplicissimum est, et certissimum Myopibus auxilium.

249. Presbyopes vocantur, qui visum longum habent, vicinarum rerum confusum, remotiorum satis distinctum. Contrarias hoc vitium ac alterum agnoscit causas; oculum imprimis nimis planum, quo spatium refringendis radiis non datur; hinc senibus, etiam iis qui florentibus annis bene viderant, malum familiare, ratione haud obscura, usu vitri convexi sublevari solet.

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objects, and keeping the eyes from those which are very small and near, in the same way as the same disorder may be acquired, by an opposite use; namely, because the eye accommodates itself, in some manner, to the distances of the objects which it contemplates (243). A concave glass, which makes the rays diverge more, before they fall on the eye, is the most simple and most certain auxiliary for the near-sighted.

249. They are called Presbyopes, who have a long sight, a confused one of near objects, sufficiently distinct one of more remote things.—This disorder recognises contrary causes to the other; in the first place an eye too flat, by which space is not afforded for refracting the rays; hence this disorder, common to old persons, even to those who had seen well in the vigour of their age, is accustomed to be alleviated by the use of a convex glass, for a reason not obscure.

250. Hemeralopes dicuntur, qui interdiu tantum, scilicet in vivida luce, vident; crepusculo vero, aut nocte, vel per lunam, vel per lucernas, pene vel penitus cæci sunt. Hujusmodi vitium, in quibusdam exemplis, oriri visum est a pupilla nimis contracta et rigida, neque sat lucis debilioris in oculum admittente; in aliis autem, a deficiente ipsius retinæ sensu; et aliis magis adhuc obscuris causis, veluti cum multos homines eodem tempore et loco prehenderit, quod interdum observatum est.

251. Nyctalopes dicuntur, qui noctu quam interdiu, hoc est, luce valde debili, quam vividiore, melius vident: rarum hominibus vitii genus, retinæ nimis sentienti, pupillæ nimis patulæ, ad debitam contractionem minus valenti, imputandum. Hujusmodi incommodum, sed leve et fugax, sanissimi etium patiuntur, qui postquam diu

250. Dicuntur Hemeralopes, qui vident tantùm interdiu, scilicet in vividâ luce; vero sunt penè vel, penitùs cæci, crepusculo, aut nocte, vel per lunam, vel per lucernas. Vitium hujusmodi visum est oriri, in quibusdam exemplis a nimis contractâ et rigida pupillâ, neque admittente sat debilioris lucis in oculum: autem in aliis a deficiente sensû retinæ ipsius; et aliis causis adhuc magis obscuris, veluti cum prehenderit multos homines eodem tempore et loco, quod interdum observatum est.

251. Dicuntur Nyctalopes, qui vident melius noctu quam interdiu, hoc est, valde debili luce quam vividiore: genus vitii rarum hominibus, imputandum nimis sentienti retinæ, pupillæ nimis patulæ, minus valenti ad debitam contractionem. Etiam sanissimi patiuntur incommodum hujusmodi, sed leve et fugax, qui postquam diu versati

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250. They are called Hemeralopes, who see only during the day, that is, by a powerful light; but are almost or completely blind by twilight, by night, or moonlight, or by candle-light. A disorder of this kind has appeared to arise in some cases, from a too contracted and rigid pupil, nor admitting sufficient of fainter light into the eye; but in others from deficient sensation of the retina itself, and from other causes still more obscure; as when it has seized many persons at the same time and place, which has sometimes been observed.

251. They are called Nyctalopes, who see better by night than by day; that is, by a very weak, than by a more vivid light; this kind of disorder, uncommon in men, is to be imputed to a too sensitive retina, to a pupil too much dilated, less competent to its proper contraction. Even the most healthy persons suffer an inconvenience of this kind, but slight and fugitive,

sunt in tenebris, denuò prodeunt subito ad lucem.

252. Interna superficies totius oculi sublinitur nigro pigmento, quod pertinet ad choroideam tunicam et ciliaria ligamenta: fortasse hoc consilio, ut oculus fiat perfectissima camera obscura, et imago depicta super retinam evadat accuratior, corrupta nullis reflexis radiis. Tamen constat esse quosdam miseros, vulgo dictos albos Æthiopes, quibus rubra choroidea data est, non secus ac albis cuniculis. Verò homines instructi tali choroideâ vident parùm vel nihil interdiu.

253. Vero animalia, quæ quærunt prædam sub nocte, genus felis, bubo, et similia, habent coloratam, splendentem choroideam, quæ bene reflectit radios lucis. Hoc modo, ut quidam putant, habent parum distinctum visum, sed qui sufficiat ad captandam prædam, etiam

in tenebris versati sunt, denuo ad lucem subito prodeunt.

252. Sublinitur totius oculi interna superficies pigmento nigro, quod ad choroideam tunicam et ligamenta ciliaria, pertinet; hoc fortasse consilio, ut oculus perfectissima camera obscura fiat, et imago super retinam depicta accuratior evadat, nullis radiis reflexis corrupta. Constat tamen miseros esse quosdam, albos Æthiopes vulgo dictos, quibus choroidea rubra, non secus ac cuniculis albis, data est. Homines vero tali choroidea instructi interdiu parum vel nihil vident.

253. Animalia vero, quæ sub nocte prædam quærunt, genus felis, bubo, et similia, choroideam habent coloratam, splendentem, quæ radios lucis bene reflectit. Hoc modo, ut quidam putant, visum parum distinctum, sed quæ ad prædam captandam sufficiat,

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who after they have been long engaged in the dark, again go out suddenly to the light.

252. The inner surface of the whole eye is smeared over with a black pigment, which pertains to the choroid coat and ciliary processes; perhaps with this intention, that the eye may become a most perfect camera obscura, and that the image depicted upon the retina may become more accurate, being corrupted by no reflected rays. Nevertheless, it appears that there are certain unfortunate creatures, commonly called white Æthiopians (Albinos), to whom a red choroid has been supplied, as to white rabbits. But persons supplied with such a choroid coat, see little or nothing during the day.

253. But animals that seek their prey during the night, the tribe cat and owl, and the like, have a coloured shining choroid coat, which well reflects the rays of light. In this way, as some think, they have slightly distinct

etiam in tenebris, habent; quod tamen nondum bene explicatum est. His quoque animalibus pupilla datur mobilissima, a tenuissima vixque visibili rima, in magnum circulum, secundum lumen quod est, sese dilatans, et retina, ut videtur, valde sentiens. Quædam ex his animalibus, albi Æthiopis instar, fulgente sole minus vident. An omnibus par vitium est? Non videtur. An arctissima pupillæ contractione corrigitur, qua parum lucis in oculum admittitur? An credibile est plus minusve reflectere lucis choroideam ipsam, prout tali auxilio opus sit, et facultatem illam lucem reflectendi pendere iterum a sanguinis in membranam vasculorum plenam influxu, quem animal quodammodo regat? Validior sanguinis motus, et ideo varii animi affectus, oculos omnium animalium, et hominis ipsius, splendescere facit: deficiens

in tenebris: quod tamen nondum bene explicatum est. Quoque mobilissima pupilla datur his animalibus, dilatans sese, a tenuissimâ que vix visibili rimâ, in magnum circulum, secundum lumen quod est, ut videtur, et valde sentiens retina. Quædam ex his animalibus, instar albi Æthiopis, vident minus sole fulgente. An est par vitium omnibus? Non videtur. An corrigitur arctissimâ contractione pupillæ, quâ parum lucis admittitur in oculum? An est credibile choroideam ipsam reflectere plus vel minus lucis, prout sit opus tali auxilio, et illam facultatem reflectendi lucem, pendere iterum ab influxû sanguinis in membranam plenam vasculorum, quem animal quodammodo regat? Validior motus sanguinis, et ideo varii affectus animi, facit oculos omnium animalium, et hominis ipsius splendescere; deficiens hebetat; demum pe-

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vision, but which may suffice to catch their prey, even in the dark; which however, has not yet been well explained. Also, a very moveable pupil is given to these animals, dilating itself from the thinnest and scarcely visible chink, into a large circle, according to the light which there is, and as it appears a very sentient retina. Some of these animals, like the white Æthiopian, see less perfectly in the shining sun. Is there an equal defect in all? It does not appear so. Is it corrected by the very close contraction of the pupil, by which little light is admitted into the eye?—Or is it credible, that the choroid itself reflects more or less light, according as there is necessity for such assistance; and that, that faculty of reflecting light depends upon the influx of blood into the membrane filled with vessels, which the animal can govern in some way? A more active motion of the blood, and, consequently, various affections of the mind, make the eyes of all

nitùs cessans prorsus extinguit splendorem eorum.

254. Visus est obnoxius multis et gravibus vitiis. Interdum ultra modum acuitur, ita ut æger vel videat nihil distinctè vel non sine magno dolore, pari ratione ac alii sensus, a nimis sentiente generali habitû corporis, a singulari statû cerebri, familiari phreniticis, vel etiam aliis febricitantibus, veluti in inflammatione cerebri vel membranarum ejus: verò sapiùs fimus impatientes lucis a conditione oculi ipsius. Inflammatio tunicæ adnatæ et anterioris partis scleroticæ, solet serpere ad posteriores partes oculi; et ideo ad choroideam, et retinam ipsam: hinc impatientia lucis, dolor, que magna irritatio, nonnunquam inducens vel augens delirium.

255. Visus sæpe obtunditur, vel plane aboletur, ætate ipsâ, cum ob ocu-

hebetat; penitus demum cessans eorum splendorem prorsus extinguit.

254. Multis et gravibus vitiis obnoxius est visus. Acuitur interdum ultra modum, ita ut æger vel nihil distincte videat, vel non sine magno dolore, pari ratione ac alii sensus, a generali corporis habitu nimis sentiente, a singulari cerebri statu, phreniticis, vel etiam aliis febricitantibus, familiari, veluti inflammatione cerebri vel ejus membranarum; sæpius vero a conditione ipsius oculi, lucis impatientes fimus. Inflammatio tunicæ adnatæ, et partis anterioris scleroticæ, ad posteriores partes oculi serpere solet; et ideo ad choroideam, et retinam ipsam; hinc lucis impatientia, dolor, magnaque irritatio, delirium nonnunquam inducens vel augens.

255. Obtunditur sæpe visus, vel plane aboletur ipsa ætate, cum ob

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animals, and of man himself, to sparkle: when deficient, it dulls them; at last ceasing, it entirely destroys the splendour of them.

254. The sight is liable to many and severe disorders.—Sometimes it is rendered immoderately acute, so that a patient either sees nothing distinctly, or not without great pain, for the same reason as the other senses; from a too sensitive general habit of body, or from a peculiar state of the brain, common to phrenitic patients, or to other feverish persons, as in inflammation of the brain, or the membranes of it; but we more frequently become intolerant of light, from the state of the eye itself. Inflammation of the conjunctiva and front part of the sclerotic, is accustomed to creep to the posterior parts of the eye; and, therefore, to the choroid and the retina itself; hence, the intolerance of light, pain, and excessive irritation, sometimes bringing or increasing delirium.

255. The sight is often weakened or completely destroyed by age itself,

oculum planiorem factum, aquoso humore non bene suppleto, et cornea, et lente, vel vitreo humore marcescentibus; tum quoque propter corneam siccam et obscuram factam, quod languenti sanguinis motui imputandum est, et plurimis vasis minoribus obstructis, conclusis, excæcatis; tum propter lentem flavescentem, instar electri factam, et ipsam retinam minus sentientem. Nam omnem sensum senectus minuit.

lum factum planiorem, aquoso humore non bene suppleto, et corneâ, et lente, vel vitreo humore marcescentibus; tum quoque propter corneam factam siccam et obscuram, quod est imputandum languenti motui sanguinis, et plurimis minoribus vasis obstructis, conclusis, excæcatis; tum propter lentem flavescentem, factam instar electri, et retinam ipsam minus sentientem. Nam senectus minuit omnem sensum.

256. Interdum visus prorsus aboletur, cerebro, nervo optico, vel retina, variis modis læsis, salva ipsius oculi fabrica. Hujusmodi vitium amaurosis, vel gutta serena vocatur: dilatata et immota pupilla, humoribus pellucidis manentibus, facile distinguendum; compressioni, congestioni sanguinis, stupori nervi fere tribuendum. Si pars tantum retinæ torpet, maculæ nigræ in rebus quas spectamus

256. Interdum visus prorsus aboletur, cerebro, optico nervo vel retinâ, læsis variis modis, fabricâ oculi ipsius salvâ. Vitium hujusmodi vocatur amaurosis, vel gutta serena; facilè distinguendum, dilatatâ et immotâ pupillâ, humoribus manentibus pellucidis; fere tribuendum compressioni, congestioni sanguinis, stupori nervi. Si tantùm pars retinæ torpet, nigræ maculæ conspiciuntur in re-

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both on account of the eye having become flatter by the aqueous humour not being well supplied, and the cornea and lens, or vitreous humour wasting away; as well as also on account of the cornea having become dry and dull, which is to be imputed to a languid motion of the blood, and to many smaller vessels being obstructed, closed, and choked up; also, on account of the lens becoming yellow, made like amber, and the retina itself less sensitive. For old age impairs every sense.

256. Sometimes the sight is quite destroyed, by the brain, the optic nerve, or retina being injured in various ways, the structure of the eye being sound. A disease of this kind is called amaurosis, or gutta serena, easily to be distinguished by the dilated and fixed pupil, by the humours remaining transparent; generally to be attributed to compression, congestion of blood, or stupor of the nerve. If only a part of the retina is torpid, black specks

bus, quas spectamus, et muscæ volitantes ante oculos, frequens sed pessimum, et vix non lethale signum in febribus.

257. Porro visus haud raro aboletur quâvis partium factâ obscurâ aut opacâ, per quas radii debent transire et refringi; veluti si cornea obsessa maculis evaserit impervia luci, vel aquosus humor corruptus fuerit sanguine, sero, pure: vel si lens adepta fuscum colorem, quod sæpe accidit, et dicitur cataracta, vel vitreus humor corruptus simili modo, vel denique omnes humores oculi, soluti, confusi, mixti inflammatione, suppuratione, vel non transmittant lucem, vel sinant transire parcius et inæqualiter. Quo fit, ut vel nulla, vel obscura, distorta, imperfecta, et male colorata imago depingatur super retinam.

258. Externa impedimenta visûs, quod ad oculum, scilicet vitia palpe-

conspiciuntur, et muscæ ante oculos volitantes, signum in febribus frequens, sed pessimum, et vix non lethale.

257. Visus porro haud raro aboletur partium quavis, per quas radii transire et refringi debent, obscura aut opaca facta; veluti si cornea maculis obsessa luci impervia evaserit; vel humor aquosus sanguine, sero, pure, corruptus fuerit; vel si lens, quod sæpe accidit, et cataracta dicitur, fuscum colorem adepta, vel humor vitreus simili modo corruptus, vel omnes denique oculi humores inflammatione, suppuratione, soluti, confusi, mixti, lucem vel non transmittant, vel parcius et inæqualiter transire sinant. Quo fit ut vel nulla, vel obscura, distorta, imperfecta, et male colorata imago super retinam depingatur.

258. Impedimenta visus, quod ad oculum, externa, vitia scilicet

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are seen in the objects which we look at; and flies dancing before the eyes, a frequent, but very bad and nearly fatal sign in fevers.

257. Moreover, the sight is not unfrequently lost, by any of the parts being rendered dull or opaque, through which the rays ought to pass and be refracted: as, if the cornea, covered with specks, has become impervious to light; or the aqueous humour has been corrupted by blood, serum, or pus; or if the lens has acquired a dark colour, which often happens, and is called cataract; or the vitreous humour is diseased in a similar manner; or, finally, all the humours of the eye dissolved, confused, or mixed up together, by inflammation or suppuration, either do not transmit light, or allow it to pass more sparingly and unequally. From which it happens, that either none, or an obscure, distorted, imperfect, and badly coloured image is painted upon the retina.

258. The external obstructions of vision, in regard to the eye, namely,

palpebrarum partiumque vicinarum tumentium, concrescentium, inflammatarum, nulla explicatione egent: neque profecto ipsius sensus vitium est, si quis non viderit, nulla luce ad oculum admissa.

259. Depravatur visus aliquando, et res colore non suo, vel etiam, quod rarius accidit, figura et situ alienis, spectantur. Hoc fit si humores insolito colore tincti fuerint, ut in morbo regio fertur accidere, quod tamen valde dubium est, vel a sanguine ex propriis vasis elapso et cum aquoso humore mixto. Mira depravatio, vel defectus visus constans et perpetuus, in hominibus alioquin sanissimis, et bene videntibus, non semel observatus est; nempe, ut certos colores, viridem, exempli causa, a rubro, distinguere nequeant. Alia depravatio est, quum, nulla ad oculum admissa luce, scintillas, guttulas flammeas, aureas, colores varios

brarum que vicinarum partium, tumentium, concrescentium, inflammatarum egent nullâ explicatione: neque profectò est vitium sensûs ipsius, si quis non viderit, nullâ luce admissâ ad oculum.

259. Aliquando visus depravatur, et res spectantur colore non suo, vel alienis figurâ et sitû quod rariùs accidit. Hoc fit, si humores tincti fuerint insolito colore, ut fertur accidere in regio morbo, quod tamen est valde dubium, vel a sanguine elapso ex propriis vasis, et mixto cum aquoso humore. Mira depravatio, vel constans et perpetuus defectus visûs, observatus est non semel, in hominibus alioquin sanissimis et bene videntibus; nempe, ut nequeant distinguere certos colores, viridem causâ exempli, a rubro. Est alia depravatio, quum conspicimus, scintillas, aureas flammeas guttulas, varios colores, nullâ luce admissâ ad oculum. Ple-

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diseases of the palpebræ, and neighbouring parts, swollen, growing together, inflamed, require no explanation: nor, indeed, is there disorder of the sense itself, if any one does not see, no light being admitted into the eye.

259. Sometimes vision is depraved, and objects are seen with a colour not their own, or altered in form and situation, which more seldom occurs. This takes place, if the humours have been tinged with an unusual colour, as is said to occur in jaundice, which, however, is very doubtful; or from blood having escaped from its proper vessels, and mixed up with the aqueous humour. A surprising depravation, or constant and permanent defect of vision, has been observed more than once, in persons in other respects very healthy, and seeing well: namely, they cannot distinguish certain colours, green for instance, from red. There is another depravation, when we see sparks, gold-coloured fiery drops, various colours, no light being admitted into the eye. For the most part, a slight and fleeting kind of

rumque leve, et fugax genus mali, familiare præditis valde sentiente et mobili constitutione corporis, oritur ut videtur a levi impulsû in retinam, imprimis arteriarum micantium vehementiùs solito, aut inordinate : flammeus circulus conspicitur, ab ipso digito premente oculum, clausis palpebris. Fortasse est par ratio scintillæ, quam laborantes comitiali morbo aliquando vident, crescentem in immensum et splendidum jubar, mox antequam corruant convulsi. Homines testantur se vidisse simile jubar, reduces ad vitam, postquam strangulati fuissent, aut mersi sub aquis. Respiratione nimirum cohibitâ, venæ capitis turgentes sanguine, feriunt et comprimunt totum cerebrum, que nervosas partes, quæ sunt in capite. Porro scintillæ istiusmodi observantur, haud secundo omine, ab iis laborantibus febre, quibus phrenitis

conspicimus. Leve plerumque et fugax mali genus, constitutione corporis valde sentiente et mobili præditis familiare, a levi, ut videtur, impulsu in retinam oritur, arteriarum imprimis vehementius solito aut inordinate micantium: ab ipso digito oculum premente, clausis palpebris, circulus flammeus conspicitur. Par fortasse ratio est scintillæ, quam vident aliquando morbo comitiali laborantes, in immensum et splendidum jubar crescentem mox antequam convulsi corruant. Simile jubar se vidisse testantur homines, ad vitam reduces postquam strangulati, aut sub aquis mersi fuissent. Cohibita nimirum respiratione, venæ capitis sanguine turgentes, totum cerebrum, partesque nervosas quæ in capite sunt, feriunt, et comprimunt. Observantur porro istiusmodi scintillæ, haud secundo omine, ab iis quibus febre laborantibus

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disorder, common to persons endowed with a very sensitive and mobile constitution of body, it arises, as it appears, from a slight impulse upon the retina, especially of the arteries beating more powerfully than usual, or irregularly: a fiery circle is seen, from a finger pressing upon the eye, with closed palpebræ. Perhaps there is the same reason of the spark which persons under an attack of epilepsy sometimes see, increasing to an immense and splendid beam, just before they fall down convulsed. Persons attest that they have seen a similar beam, when returning to life, after they have been strangled, or submersed under water. Respiration, indeed, being checked, the veins of the head, turgid with blood, strike and compress the whole brain and nervous parts which are in the head. Besides, sparks of that kind are observed with no favorable omen, by those persons suffering from fever, over whom phrenitis or raving delirium are impending, as well

phrenitis aut ferox delirium imminent; tum quoque ab iis quibus graviora capitis mala, paralysis, apoplexia, epilepsia, instant. An ipsis fibris nervosis retinæ, motum sponte concipientibus, perceptio lucis, ubi nulla lux est, recte tribuitur?

aut ferox delirium imminent; tum quoque ab iis, quibus graviora mala capitis paralysis, apoplexia, epilepsia, instant. An perceptio lucis ubi est nulla lux, recte tribuitur nervosis fibris ipsis retinæ, sponte concipientibus motum?

260. Visus distinctus, sed falsus, rerum visibilium nimirum quæ non sunt, quod genus vitii, utcunque mirum et explanatu difficile videatur, non valde rarum est; læso cerebro, insaniæ, delirio, non oculo ullo modo laboranti, imputari debet.

260. Distinctus sed falsus visus, nimirum visibilium rerum, quæ non sunt, quod genus vitii, utcunque videatur mirum et difficile explanatu, est non valde rarum; debet imputari læso cerebro, insaniæ, delirio, non oculo laboranti ullo modo.

261. Frequens visus vitium est oculorum distortio, quæ strabismus apud medicos vocatur. Strabo est, qui axes oculorum præter solitum obliquos habet, neque ad idem punctum directos. Hinc visus imperfectus, incertus, aliquando duplex, ideoque confusus, et sæpe ingens deformitas. Malum

261. Distortio oculorum, quæ vocatur strabismus apud medicos, est frequens vitium visûs. Est strabo, qui habet axes oculorum præter solitum obliquos, neque directos ad idem punctum. Hinc visus imperfectus, incertus, aliquando duplex, que ideo confusus, et sæpe ingens deformitas. Ma-

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as by those to whom more severe diseases of the head, as paralysis, apoplexy, or epilepsy, are approaching. Is the perception of light, where there is no light, properly attributed to the nervous fibres of the retina, spontaneously receiving motion?

260. Distinct but false vision, namely, of visible objects, which do not exist, which kind of disorder, however it may appear wonderful and difficult to be explained, is not very uncommon; it ought to be imputed to an injured brain, insanity, or delirium, not to the eye suffering in any way.

261. A distortion of the eyes, which is called strabismus, amongst medical men, is a frequent disorder of vision. He is a strabo, who has the axes of the eyes unusually oblique, nor directed towards the same point. Hence, the sight is imperfect, uncertain, sometimes double, and therefore confused, and often there is great deformity. This evil, generally congenital, is not

lum plerumque congenitum, corrigitur haud raro, conatibus, quos infans nondum conscius sui vitii, facit ad reddendum visum jucundiorem et accuratiorem. Idem facillimè discitur imitatione, quæ multum regit omnes homines, imprimis infantes etiam inscios. Dediscitur haud ita facilè.

262. Est verisimile causam tanti vitii sæpissime inesse musculis oculorum, qui male conformati, vel corrupti paralysi, rigiditate, contractione nequeant regere oculos ordinate et æqualiter.

263. Hoc vitium nonnunquam inducitur epilepsiâ, in quâ vehementissimæ convulsiones omnium musculorum, et imprimis oculorum fiunt, unde fortasse distortiones et lacerationes eorum, aut alia immedicabilia mala.

264. Nonnunquam comitatur quosdam morbos capitis, præsertim hydropem. Aliquando distortio

plerumque congenitum, haud raro conatibus, quos infans nondum conscius sui vitii, facit ad visum jucundiorem et accuratiorem reddendum, corrigitur. Idem, imitatione, quæ omnes homines, imprimis infantes, etiam inscios, multum regit, facillime discitur. Haud ita facile dediscitur.

262. Causam tanti vitii musculis oculorum sæpissime inesse verisimile est, qui male conformati, vel paralysi, rigiditate, contractione, corrupti, oculos ordinate et æqualiter regere nequeant.

263. Inducitur nonnunquam hoc vitium epilepsia, in qua vehementissimæ omnium musculorum, et oculorum imprimis, convulsiones fiunt. Unde fortasse eorum distortiones et lacerationes, aut alia mala immedicabilia.

264. Morbos quosdam capitis, hydropem præsertim, nonnunquam comitatur. A magna vi capiti illata

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unfrequently corrected by the attempts which an infant, not yet conscious of its defect, makes to render the vision more agreeable and more accurate. The same is very easily acquired by imitation, which much influences all persons, especially children, even ignorant of it.—It is unlearned not so easily.

262. It is probable that the cause of so great an evil very often exists in the muscles of the eyes, which, being badly formed, or injured by paralysis, rigidity, or contraction, are unable to govern the eyes regularly and equally.

263. This disorder is sometimes brought on by epilepsy, in which the most violent convulsions of all the muscles, and especially of the eyes, take place; whence, perhaps, the distortions and lacerations of them, or other irremediable evils.

264. It sometimes accompanies certain diseases of the head, especially dropsy. Sometimes distortion of the eyes has been brought on by great

aliquando inducta est oculorum distortio; aliquando, sed rarissime, sine nota causa subito accedit.

265. Est vel alterius vel utriusque oculi: quorum distortio, major, minor, quaquaversum esse potest.

266. Sunt qui sibi persuaserunt malum nonnunquam oriri a vitio retinarum; veluti si solita earum puncta, centra scilicet, et similiter quod ad centra posita, non consentiunt: contorsio enim ibi erit, ne visus duplex fiat. Hæc quoque videtur esse ratio quod eadem horrendum in modum augeatur, cum strabo rem prope oculum admovet, ut contempletur. Vel si centrum alterius aut utriusque retinæ parum vel nihil sentiret, ut videret homo, necesse foret ut oculos contorqueret: sic, verbi gratia, si nervus opticus non oblique oculum adiisset, sed centrum retinæ

oculorum inducta est a magnâ vi illatâ capiti; aliquando sed rarissimè accedit subitò sine notâ causâ.

265. Est vel alterius vel utriusque oculi: distortio quorum, potest esse major, minor, quaquaversum.

266. Sunt qui persuaserunt sibi malum nonnunquam oriri a vitio retinarum: veluti si solita puncta earum, scilicet centra, et similiter posita quod ad centra, non consentiunt: enim erit contorsio ibi, ne visus fiat duplex. Hæc quoque videtur esse ratio quod eadem augeatur in horrendum modum, cum strabo admovet rem prope oculum, ut contempletur. Vel si centrum alterius aut utriusque retinæ sentiret parum vel nihil, foret necesse, ut homo contorqueret oculos, ut videret: sic, gratiâ verbi, si opticus nervus non adiisset oculum obliquè sed occu-

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force applied to the head: sometimes, but very seldom, it comes on suddenly without any known cause.

265. It is either of one or of both eyes; the distortion of which may be greater or less in any direction.

266. There are persons who have persuaded themselves, that this disease sometimes arises from disorder of the retinæ: as, if the usual points of them, namely, their centres, and things similarly situated relatively to their centres, do not correspond, for there will be contortion there, lest the sight becomes double. This appears to be the reason, that the same is increased in a frightful manner, when a squinting person applies an object near the eye, that he may see it. Or, if the centre of the one or both retinæ possessed little or no sensibility, it would be necessary that a person twisted his eyes, that he might see; so, for example, if the optic nerve had not entered the

passet centrum retinæ, vel omnes fuissemus strabones, vel habuissemus duplicem visum.

267. Placuit medicis referre ad visum, quendam molestissimum sensum, quem vocamus vertiginem, quamvis revera æque pertineat ad tactum, vel potiùs ad conscientiam: enim malum fugatur neque in tenebris, neque palpebris clausis.

268. Malum vocatur vertigo, siquando credimus videre aut sentire nosmetipsos et res vicinas, quamvis revera immotas, titubare, circumferri aut tremere, vel moveri ullo modo. Si vertigo est gravior, æger neque potest videre, præ caligine velut obductâ oculis, neque incedere aut stare firmiter, quippe cui vires quæ regunt artus deficiant. Nausea solet comitari vertiginem, que altera inducere alteram.

269. Vertigo observatur comes, et signum, et præ-

occupasset, omnes vel strabones fuissemus, vel duplicem habuissemus visum.

267. Sensum quendam molestissimum, quem vertiginem vocamus, medicis placuit ad visum referre quamvis revera ad tactum, vel potius ad conscientiam, æque pertineat; neque enim in tenebris, neque clausis palpebris, malum fugatur.

268. Vertigo vocatur malum, siquando nosmetipsos et res vicinas, quamvis revera immotas, titubare, circumferri, tremere, vel ullo modo moveri, videre aut sentire credimus. Si gravior est vertigo, neque videre potest æger, præ caligine velut oculis obducta, neque firmiter incedere aut stare, quippe cui vires quæ artus regunt, deficiant. Vertiginem nausea solet comitari, alteraque alteram inducere.

269. Multorum et gravium quo-

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eye obliquely, but had occupied the centre of the retina, either we should all have been squinters or should have had double vision.

267. It has pleased medical men to refer to sight, a certain very troublesome sensation, which we call vertigo, although, in truth, it may as much appertain to touch, or rather to consciousness; for the disorder is dispersed neither by darkness, nor by the palpebræ being closed.

268. The disorder is called vertigo, whenever we imagine that we see or feel ourselves and objects near us, although remote, totter, to be carried round, tremble, or to be moved in any way. If vertigo be more severe, a patient can neither see, for the darkness, as it were, spread over the eyes, nor walk or stand firmly, namely, to whom the powers which direct his limbs fail. Nausea is wont to accompany vertigo, and the one to bring on the other.

269. Vertigo is observed an attendant, symptom, and forerunner of many

rundam morborum comes, et signum, et prænuncia observatur vertigo; apoplexiæ, epilepsiæ, hysteriæ, sanguinis profluvii e naribus vel aliis partibus, mensium suppressorum, magnæ corporis plenitudinis, febrium, tum quas debilitas, tum quas auctus caput versus sanguinis impetus, comitatur. Vis quoque capiti illata, raro quæ ipsis oculis infertur vis, nisi quatenus totum caput afficiat, vertiginem inducit. Ingens et subita sanguinis aliorumque humorum jactura, debilitas, syncope, varii morbi intestinorum, ventriculi imprimis, venena multa in corpus admissa, narcotica præsertim, opium, et similia, et vinum, et omnis potus meracior, vertiginem inducere solent. Hinc ebrietatis omnigenæ signum. Varii quoque motus inassuetis hominibus vertiginem creant: veluti rotatio capitis vel universi corporis, jactatio maritima, præsertim si

nuncia multorum et quorundam gravium morborum; apoplexiæ, epilepsiæ, hysteriæ, profluvii sanguinis e naribus vel aliis partibus, suppressorum mensium, magnæ plenitudinis corporis, febrium, tum quas debilitas comitatur, tum quas auctus impetus sanguinis versus caput. Quoque vis illata capiti, quæ vis raro infertur oculis ipsis, nisi quatenus afficiat totum caput, inducit vertiginem. Ingens et subita jactura sanguinis que aliorum humorum, debilitas, syncope, varii morbi intestinorum, imprimis ventriculi, multa venena admissa in corpus, præsertim narcotica, opium, et similia, et vinum, et omnis meracior potus solent inducere vertiginem. Hinc signum omnigenæ ebrietatis. Quoque varii motus creant vertiginem hominibus inassuetis: veluti rotatio capitis vel universi corporis, maritima jactatio, præsertim si na-

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and certain severe diseases; of apoplexy, epilepsy, hysteria, a discharge of blood from the nostrils, or other parts, suppressed menses, great fulness of the body, fevers, both which debility attends, as well as those which an increased impetus of blood to the head attends. Also force applied to the head, which force is seldom applied to the eyes themselves, except inasmuch as it affects the whole head, brings on vertigo. A great and sudden loss of blood and other fluids, debility, syncope, various diseases of the intestines, especially of the stomach, many poisons admitted into the body, particularly narcotics, opium, and the like, and wine and every stronger liquor, are accustomed to produce vertigo. Hence it is a symptom of every kind of intoxication. Also different motions produce vertigo in persons unaccustomed to them; as rotation of the head or whole body, tossing upon the sea, especially if the vessel be small and the sea rough, and the like.—In

vis fuerit parva, et mare turgidum, et similia. In his et similibus exemplis, insoliti et inordinati motus sanguinis excitantur, et communicantur cum nervosis partibus quæ sunt in capite; vel hæ male affectæ per consensum cum aliis partibus, dant confusum sensum, quasi rotationis.

navis parva, et mare turgidum, fuerint, et similia. In his et similibus exemplis, insoliti et inordinati motus sanguinis excitantur, et cum partibus nervosis quæ in capite sunt communicantur; vel hæ per consensum cum aliis partibus male affectæ, sensum confusum, quasi rotationis, dant.

270. Quin vertigo aliquando oritur et ex animo, affecto certâ ratione, veluti conspectû rapidæ rotationis, vel prærupti lapsûs aquarum, vel horrendi præcipitii vel etiam sine ullo visû, ab intensâ et veloce cogitatione.

270. Quin et ex animo, certa ratione affecto, veluti conspectu rotationis rapidæ, vel prærupti aquarum lapsus, vel præcipitii horrendi, vel etiam sine ullo visu a cogitatione intensa et veloce, vertigo aliquando oritur.

271. Vertigo plerumque comes et signum aliorum morborum, tamen nonnunquam princeps et solus morbus, rediens per intervalla, paulatim ingravescens, impedit et labefacit pariter functiones animi atque corporis: neque firmissimum et vividissimum ingenium Swiftii potuit resistere tanto malo.

271. Aliorum morborum plerumque comes et signum, nonnunquam tamen princeps vel solus vertigo morbus, per intervalla rediens, paulatim ingravescens, functiones animi pariter atque corporis impedit et labefacit: neque firmissimum et vividissimum Swiftii ingenium tanto malo potuit resistere.

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these, and in similar instances, unusual and irregular motions of the blood are excited, and communicate with the nervous parts which are in the head; or these being disordered by sympathy with other parts, afford a confused sensation, as of rotation.

270. Moreover, vertigo sometimes arises from the mind being affected in a certain manner; as by the sight of rapid rotation, or a broken waterfall, or frightful precipice; or even without any vision, from intense and rapid thought.

271. Vertigo, generally the attendant and symptom of other diseases, but sometimes the principal and sole disease, recurring at intervals, and gradually increasing, impedes and wears away equally the functions of mind and of the body; nor could the very powerful and very vigorous mind of Swift resist so great a disorder.

Cap. X.—*De sensibus qui dicuntur interni, memoria, imaginatione, judicio; eorumque varietatibus et vitiis.*

Cap. X.—*De sensibus, qui dicuntur interni, memoriâ, imaginatione, judicio; que varietatibus et vitiis eorum.*

272. Præter jam descriptos sensus, seu facultates, homo et alios possidet; qui ideo interni vocantur, quod sine impulsu vel ope externa suis fungantur muneribus; et organa quæ iis maxime inserviunt, interna, abdita, externis rebus inaccessa, propriis viribus agant.

273. Perceptio re externa excitata, sua natura fugax et peritura, brevi desinit: quod si eadem res organo denuo admota fuerit, non modo perceptionem renovat, sed homo simul pristini quem habuit sensus reminiscitur; novit, scilicet, se eundem antea habuisse.

272. Præter sensus seu facultates jam descriptos, homo possidet et alios: qui vocantur interni ideo, quòd fungantur suis muneribus sine impulsû vel externâ ope; et organa quæ maxime inserviunt iis, interna, abdita et inaccessa externis rebus, agant propriis viribus.

273. Perceptio excitata externâ re, fugax et peritura suâ naturâ, desinit brevi; quod si eadem res fuerit denuò admota organo, non modo renovat perceptionem, sed homo reminiscitur simul pristini sensûs, quem habuit; scilicet, novit se habuisse eundem anteà.

Chap. X.—*On the Senses which are called internal, Memory, Imagination, and Judgment; and on the varieties and disorders of them.*

272. Besides the sensations and faculties already described, man possesses also others, which are called internal, for the reason, that they perform their functions without impulse or external aid; and the organs which are most subservient to them are internal, hidden, and inaccessible to external objects, and act by their own powers.

273. The perception excited by an external object, fugitive and perishable in its nature, ceases in a short time; but if the same object has been again applied to the organ, it not only renews the perception, but man recollects at the same time the primary sensation which he had; that is to say, he knows that he had the same previously.

274. Hæc prima et simplicissima memoriæ species primæ ætati contingit, quippe quam infans semestris ostendat, dum parentes aut nutricem agnoscit, ignotos homines declinat. Hæc facultas recordatio vocatur, distinctionis causa, et principium et fundamentum perfectioris memoriæ videtur esse.

275. Quin et nihil omnino ad organa sensuum externorum admoto, nullaque juvante externa causa, et internis sæpe causis parum perspectis, sensus diu ante percepti, obliti, sopiti, homini invito nec opinanti renovantur, reviviscunt. Hujusmodi recordatio invita proprius adhuc ad perfectam memoriam accedit.

276. Vera et optima memoria dicitur facultas illa, qua varias cogitationes præteritas, veluti sensus, perceptiones, &c. eodem quo fuerant receptæ ordine, ad arbitrium

274. Hæc prima et simplicissima species memoriæ contingit primæ ætati, quippe quam infans semestris ostendit, dum agnoscit parentes aut nutricem, declinat ignotos homines. Hæc facultas vocatur recordatio, causâ distinctionis, et videtur esse principium et fundamentum perfectioris memoriæ.

275. Quin et nihil omnino admoto ad organa externorum sensuum, que nullâ externâ causâ adjuvante, et sæpe internis causis parum perspectis, sensus percepti diu ante, obliti, sopiti, renovantur, reviviscunt homini invito nec opinanti. Invita recordatio hujusmodi accedit adhuc propriùs ad perfectam memoriam.

276. Vera et optima memoria dicitur illa facultas, quâ revocamus, detinemus, contemplamur, dimittimus ad nostrum arbitrium varias

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274. This primary and most simple kind of memory occurs to the earliest age, as being which, the infant of six months old evinces, when he recognises his parents or nurse, and shrinks from strangers. This faculty is called recollection, for the sake of distinction, and appears to be the beginning and foundation of more perfect memory.

275. Moreover, nothing at all being applied to the organs of the external senses, and no external cause assisting, and often internal causes being little perceived, sensations felt long before, forgotten, and put to rest, are renewed, and revive to a person against his will, nor thinking upon them. Involuntary recollection of this kind makes approaches still nearer to perfect memory.

276. The true and best kind of memory is called that faculty by which we recall, detain, contemplate, and dismiss, at our pleasure, various past

nostrum revocamus, detinemus, contemplamur, dimittimus.

277. Hæc, prima ætate, nulla est; paulatim accedit atque augetur. Puerili ætate, promptissima, validissima, tenacissima fit; juvenili et virili viget; senili nonnihil fatiscere solet; summa senectute dilabitur, et tandem aboletur; et fere hac ratione, ut novas res dimittat facile, veterum, quas florente ætate recondiderat, adhuc tenacissima; ingravescentibus vero annis, omnes res novæ pariter atquè antiquæ, e memoria penitus delentur.

278. Aliis hominibus promptior et tenacior, aliis debilior datur: cultu et usu, modo hi non nimii fuerint, incredibiliter augetur. Variis hominibus, iisdemque variis temporibus, plus minus vivida aut prompta est: ita ut vel lente admodum vel incredibili fere veloci-

præteritas cogitationes, veluti sensus, perceptiones, &c., eodem ordine quo receptæ fuerant.

277. Hæc est nulla in primâ ætate: paulatim accedit, atque augetur. Fit promptissima, validissima, tenacissima, puerili ætate: viget juvenili et virili solet fatiscere nonnihil senili; summâ senectute dilabitur et tandem aboletur; et fere hac ratione, ut facilè dimittat novas res, adhuc tenacissima veterum quas recondiderat florente ætate; verò annis ingravescentibus omnes res pariter novæ atque antiquæ penitùs delentur a memoria.

278. Datur promptior et tenacior aliis hominibus, debilior aliis; incredibiliter augetur cultû et usû, modo hi non fuerint nimii. Est plus minus prompta aut vivida variis hominibus, que iisdem variis temporibus: ita ut fungatur suo officio vel admodum lente, vel fere

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thoughts, as sensations, perceptions, &c., in the same order as they were received.

277. This is without existence in the first age; by degrees it comes on and is increased: it becomes most ready, very powerful, and very retentive in boyhood; it is vigorous in youth and manhood; it is accustomed to fail somewhat in advanced age, in extreme old age it falls away, and is at length lost; and nearly in this manner, that it easily dismisses new matters, still very retentive of the older ones, which it had stored up in the vigour of life; but years weighing him down, all matters, equally new as well as old, are completely swept away from the memory.

278. It is supplied more prompt and more retentive to some men, more feeble to others: it is surprisingly increased by cultivation and use, provided these are not in excess.—It is more or less prompt or vivid, in different men, and in the same men at different times; so that it performs its

incredibili velocitate. Hic multum pendet a secundâ aut adversâ valetudine, quâ homo utitur; a statû animi, vel commoti gravi affectû, vel fruentis placidâ quiete, et accurate attendentis ad suas cogitationes. Tum quoque ratio est habenda corporis, magis vel minus sentientis aut mobilis: quoque incitatior aut languescens motus sanguinis facit multum hic; veluti ab exercitatione, febre, dolore, torpore, sopore, &c. Memoria solet esse rapidior, pueris, junioribus, et præter solitum vividis: et hæc est inter alias causas, cur hi polleant minus firmo aut certo judicio.

279. Memoria viget inter somnum, saltem leviorem sed parum accurata, neque paret voluntati, neque profert res suo ordine, ut solet homini sano et vigilanti.

280. Memoria potissimum retinet plerasque novas res, sæpe repetitas,

tate suo fungatur officio. Multum hic pendet a secunda aut adversa qua homo utitur valetudine; a statu animi, vel gravi affectu commoti, vel placida quiete fruentis et ad suas cogitationes accurate attendentis. Tum quoque corporis ratio habenda est, magis minusve sentientis aut mobilis; sanguinis motus quoque multum hic facit, incitatior, aut languescens; veluti ab exercitatione, febre, dolore, torpore, sopore, &c. Pueris, junioribus, et præter solitum vividis, rapidior solet esse memoria: et hæc inter alias causas est, cur hi judicio minus firmo aut certo polleant.

279. Viget inter somnum, saltem leviorem, memoria; sed parum accurata, neque voluntati paret, neque res suo ordine, ut sano et vigilanti homini solet, profert.

280. Plerasque res novas, sæpe repetitas, jucundas, ingratas, vel quæ mentem ullo modo magis so-

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function either very slowly, or with nearly incredible velocity. Here much depends upon the good or bad state of health which a person enjoys; on the state of mind, either excited by a severe affection, or enjoying placid rest, and accurately attending to its thoughts. Then also account is to be taken of the body, whether more or less sensitive, or irritable; likewise, a more excited or languid circulation has much influence here; as from exercise, fever, pain, torpor, drowsiness, &c. Memory is accustomed to be more rapid in boys, in young persons, and in those who are unusually lively; and this is, amongst other causes, why these are endowed with a less firm or accurate judgment.

279. Memory is active during sleep, at least the lighter kind, but is slightly accurate, nor does it obey the will, nor presents circumstances in their order, as it is wont, to a person healthy and awake.

280. Memory especially retains most new circumstances, often repeated,

lito afficiant, memoria potissimum retinet. Juvat, præ omnibus, ordo rerum, eoque tanquam auxilio præsentissimo uti solemus, ad rem quamlibet in memoriam revocandam. Scientiæ omnigenæ, et judicii, memoria fons et origo est, et igitur ordo fere maxima pars, nimirum sine quo aut nulla foret memoria, aut vaga et prorsus inutilis, qualis somniantibus et delirantibus contingit.

281. Minuitur aut turbatur memoria, aut prorsus deletur, variis morbis, imprimis qui cerebrum afficiunt, apoplexia, paralysi, epilepsia, tumoribus intra caput, vi externa eidem illata, febribus, imprimis quibus auctus est caput versus sanguinis impetus, aut cerebrum quacunque ratione valde affectum.

282. Rarissime depravatur memoria, ita ut res ordine non suo menti repræsentet: quod si tale

jucundas, ingratas, vel quæ afficiant mentem ullo modo magis solito. Ordo rerum juvat præ omnibus, que solemus uti eo tanquam præsentissimo auxilio, ad revocandam quamlibet rem in memoriam. Memoria est fons et origo omnigenæ scientiæ et judicii, et igitur ordo est maxime pars, nimirum sine quo memoria foret aut nulla, aut vaga et prorsus inutilis, qualis contingit somniantibus et delirantibus.

281. Memoria minuitur aut turbatur, aut prorsus deletur variis morbis, imprimis qui afficiunt cerebrum, apoplexiâ, paralysi, epilepsiâ, tumoribus intra caput, externâ vi illatâ eidem, febribus, imprimis quibus impetus sanguinis est auctus versus caput, aut cerebrum valde affectum quâcunque ratione.

282. Memoria depravatur rarissime, ita ut non representet menti, res suo ordine: quod si tale vi-

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agreeable, unpleasant, or those which affect the mind in any way more than usual. Arrangement of subjects is useful above all things, and we are accustomed to make use of it, as the most ready auxiliary to recall any thing to memory. Memory is the fountain and source of every kind of science and judgment, and, therefore, order is the chief part of it; namely, without which, memory would be either null or vague and quite useless, such as belongs to persons dreaming, and wandering.

281. Memory is weakened, or disturbed, or quite destroyed, by various diseases, particularly by those which affect the brain, apoplexy, paralysis, epilepsy, tumours within the head, external force applied to the same, and fevers, especially in which there is an increased impetus of blood towards the head, or the brain is very much affected in any manner.

282. The memory is very seldom injured in such a way, that it does not

tium acciderit, est referendum ad læsam imaginationem, vel delirium.

vitium acciderit, ad læsam imaginationem vel delirium referendum est.

283. Imaginatio est facultas quâ, homo conjungit, dividit, et disponit novo ordine ad suum arbitrium, varias res quas recondiderat memoriâ; veluti, si finxerit sibi Centaurum aut Sirenem mixtis et compositis formis, viri et equi, mulieris et piscis.

283. Imaginatio est facultas qua homo varias res, quas memoria recondiderat, ad arbitrium suum conjungit, dividit, et novo ordine disponit; veluti si mixtis et compositis, viri et equi, mulieris et piscis, formis, Centaurum aut Sirenem sibi finxerit.

284. Imaginatio est vividior, quam memoria, et habet latius imperium in animum, que affectus ejus et genus nervosum: quamvis memoria ipsa possideat nonnihil vis hujusmodi.

284. Imaginatio quam memoria vividior est, et latius imperium in animum, ejusque affectus, et genus nervosum, habet: quamvis memoria ipsa nonnihil hujusmodi vis possideat.

285. Cogitationes, quas innumeras hæc facultas suggerit, vix unquam confunduntur in sano homine, cum præteritis rebus, quas memoria contemplatur, multo minus cum veris et præsentibus rebus, quas sensus percipiunt: neque sanus homo, sobrius, et vigilans, credit

285. Cogitationes, quas hæc facultas suggerit innumeras, vix unquam in sano homine, cum rebus præteritis quas memoria contemplatur, multo minus cum rebus veris et præsentibus, quas sensus percipiunt, confunduntur: neque sanus homo, sobrius, et vigilans,

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represent circumstances to the mind in their order; but if such an evil should occur, it is to be referred to diseased imagination, or delirium.

283. Imagination is the faculty by which man connects, divides, and arranges in a new order, at his will, the various circumstances which he had treasured up in his memory: as if he has fancied to himself a Centaur, or a Siren, from the mixed and compound forms of a man and a horse, of a woman and of a fish.

284. Imagination is more vivid than memory, and has a more extensive control upon the mind and affections of it, and upon the nervous system; although memory itself possesses some influence of this kind.

285. The thoughts which, without number, this faculty supplies, are scarcely ever confounded, in a healthy person, with past occurrences which the memory contemplates, much less with true and present matters, which the senses perceive: nor does a healthy man, sensible and awake, believe

res quas imaginatio, ad suam arbitrium, fingit, aut esse veras, aut unquam fuisse, credit. Si talis error acciderit, pro morbo habendus est.

res aut esse veras, aut unquam fuisse quas imaginatio fingit ad suum arbitrium. Si talis error acciderit, est habendus pro morbo.

286. Imaginatio infanti parva, juveni maxima, viro temperatior, seni fere reprimitur: eadem hilaribus, irritabilibus, mobilibus, et præter solitum acriter sentientibus, vividior; torpidis, frigidis, stupidis, fere nulla. Neque solis poëtis utilis facultas; quippe cujus species, rerum similitudines et convenientias, a vulgo hominum non observatas, fingat, quærat, detegat, ad conjecturas primo, ad veram scientiam, ope judicii, tandem perducens. Huic forsitan Neutonum pariter ac Homerum debemus.

286. Imaginatio parva infanti, maxima juveni, temperatior viro, fere reprimitur seni: eadem est vividior hilaribus, irritabilibus, mobilibus, et præter solitum acriter sentientibus; fere nulla torpidis, frigidis, et stupidis. Neque est facultas utilis poetis solis; quippe species cujus, fingat, quærat et detegat similitudines et convenientias rerum non observatas a vulgo hominum, primo perducens ad conjecturas, tandem ad veram scientiam ope judicii. Forsitan debemus huic, Neutonum, pariter ac Homerum.

287. Imaginationi et memoriæ hoc commune est, quod in perceptiones visus et auditus tantum imperium habent: neque profecto

287. Hoc est commune imaginationi et memoriæ, quod habent tantum imperium in perceptiones visûs et auditûs; neque

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things either to be true, or ever were so, which imagination frames at its will. If such an error should have occurred, it is to be considered as a disease.

286. The imagination, slight to the infant, most powerful to the young man, more temperate to man, is nearly checked in old age: the same is more vivid in the cheerful, irritable, restless, and those unusually acutely sensitive; it is almost null in the torpid, cold, and stupid. Nor is this faculty useful to poets alone, inasmuch as a species of which can imagine, detect, and seek out similarities and correspondence between things, not observed by the bulk of men, at first leading to conjecture, at length to real science, by the aid of judgment. Perhaps we owe to this, Newton, as well as Homer.

287. This is common to imagination and memory, that they possess so much influence upon the perceptions of sight and hearing; nor, indeed, can

profectò possunt renovare aut accuratè aut fortiter perceptiones aliorum externorum sensuum.

288. Judicium est facultas, quâ contemplamur, comparamus omnigenas perceptiones et cogitationes, sensûs, memoriæ, et imaginationis, detegimus similitudines et differentias earum que inde deducimus varias conclusiones. Hæc facultas debilis infanti et puero: firmior et certior consistente ætate; paulatim corrumpitur ætate et morbis, quotquot minuunt memoriam; nam nullum judicium potest esse sine memoriâ.

289. Omnes hæ facultates sunt tam purè mentis, ut primo intuitû haud quicquam corporei videatur inesse iis; tamen morbi, qui impediunt eas, docent, certum statum cerebri requiri, ut bene exerceantur, que id esse primarium organum internorum sensuum. Nec philosophi, nec medici

aliorum sensuum externorum perceptiones, aut accurate, aut fortiter renovare possunt.

288. Judicium facultas est, qua perceptiones et cogitationes omnigenas, sensus, memoriæ, imaginationis contemplamur, comparamus, earum similitudines et differentias detegimus, variasque inde conclusiones deducimus. Hæc facultas infanti et puero debilis est; consistente ætate, firmior et certior: ætate paulatim corrumpitur et morbis quotquot memoriam minuunt; nam sine memoria nullum potest esse judicium.

289. Omnes hæ facultates tam pure mentis sunt, ut primo intuitu haud quicquam corporei iis inesse videatur: docent tamen morbi qui eas impediunt, certum cerebri statum, ut bene exerceantur, requiri: idque sensuum internorum primarium esse organum. Nec desunt philosophi et medici non parvi no-

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they renew accurately or forcibly the perceptions of the other external senses.

288. Judgment is the faculty by which we contemplate, compare all kinds of perceptions and thoughts, of sense, memory, and imagination, and detect the resemblances and differences of them, and thence deduce various conclusions. This faculty, weak to the infant and boy, is firmer and more accurate in established age; it is gradually corrupted by age, and by diseases, as many as diminish the memory; for no judgment can exist without memory.

289. All these faculties are so purely of the mind, that at first sight not any thing corporeal appears to exist in them; however, diseases, which impede them, shew that a certain state of the brain is required that they may be well exercised; and that that is the primary organ of the internal senses. Neither philosophers, nor medical men of no little report, are

minis, qui negant ullam in mente mutationem vel cogitationem fieri, quem certa et quæ eidem respondet cerebri mutatio non comitetur. Res parum certa, parum utilis, neque facile ad experimentum reducenda (120, et seq.) Tantum enim abest, ut ullam mutationum quæ in cerebro fiunt, vel modi quo variæ ejus partes operantur, dum memoria, imaginatio, judicium exercentur, scientiam habeamus, ut ne quidem sana de his rebus conjectura hactenus fuerit prolata.

290. Functionis igitur, cujus ratio in sanitate tam atra caligine obscuratur, morbos parum intellectos esse oportet. Suos tamen morbos habet, graves, molestos, miserandos, omni attentione dignos; nimirum qui mentem ipsam, qua cæteris animalibus præstamus, vitient, et inutilem reddant.

291. Alienatur mens, siquando homo cogitationes memoriæ aut

non parvi nominis desunt, qui negant ullam mutationem aut cogitationem fieri in mente, quem, certa mutatio et (mutatio), cerebri quæ respondet eidem, non comitetur. Res parum certa, parum utilis, neque facile reducenda ad experimentum (120, et seq.) Enim tantum abest, ut habeamus ullam scientiam mutationum, quæ fiunt in cerebro, vel modi quo variæ partes ejus operantur, dum memoria, imaginatio, judicium exercentur, ut ne quidem sana conjectura hactenus prolata fuerit de his rebus.

290. Igitur oportet morbos functionis esse parum intellectos, ratio cujus in sanitate obscuratur tam atrâ caligine. Tamen habet suos morbos, graves, molestos, miserandos, dignos omni attentione: nimirum, qui vitient et reddant inutilem, mentem ipsam, quâ præstamus cæteris animalibus.

291. Mens alienatur, siquando homo confundit

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wanting, who deny that any change or thought takes place in the mind, which a certain change of the brain, and a change which answers to the same, does not accompany. The matter itself is little certain or useful, nor easily to be reduced to experiment, (120, and following sections). For so much is wanting, that we may have any knowledge of the changes which take place in the brain, or of the manner in which its various parts operate, whilst memory, imagination, or judgment are exercised, that not even a sensible conjecture has hitherto been brought forward on these subjects.

290. Therefore, it is necessary that diseases of function should be little understood, the nature of which, in a state of health, is concealed in dark obscurity. Nevertheless, it has its own diseases, severe, troublesome, pitiable, and deserving all our attention; namely, such as vitiate and render useless the mind itself, in which we excel other animals.

cogitationes memoriæ aut imaginationis cum perceptionibus externorum sensuum, et sic credit adesse, quæ non sunt, vel nunquam fuêre: vel si fert judicium de rebus, male sanum et alienum a communi sensû hominum. Autem hoc accidit rarissime, si unquam. Captus mente solet ferre sanum judicium a falsis principiis: neque furens male ratiocinatur, sed potius decipitur, qui credens se Jovem, posceret fulmina Jovis.

imaginationis cum perceptionibus sensuum externorum confundit, et sic, quæ non sunt, vel nunquam fuere, adesse credit: vel si judicium de rebus male sanum, et a communi hominum sensu alienum, fert. Hoc autem rarissime, si unquam, accidit. Judicium sanum mente captus ferre solet a falsis principiis: neque male ratiocinatur, sed potius decipitur furens, qui, Jovem se credens, Jovis fulmina posceret.

292. Alienatio mentis vocatur generatim vesania; delirium, si est ex febre; citra febrem, generalis furor vocatur insania; vero minus generalis dementia, scilicet de unâ vel alteràve, mente sanâ de omnibus aliis, vocatur melancholia: quicum insignis tristitia aliquando conjungitur. Tamen nullus accuratus limes existit inter sanam mentem et vesaniam. Omnis hilaritas præter

292. Mentis alienatio vesania generatim vocatur; si ex febre est, delirium; citra febrem, generalis furor insania appellatur; dementia vero minus generalis, scilicet de re una alterave, sana de omnibus aliis mente, melancholia vocatur: quicum insignis aliquando tristitia conjungitur. Nullus tamen existit limes accuratus inter sanam mentem et vesaniam. Omnis præter solitum hilaritas ad insaniam

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291. The mind is deranged, whenever a person confounds the thoughts of the memory or imagination with the perceptions of the external senses, and thus believes to be present things which are not, or never were; or, if he forms a judgment on things unsound, and different from the common sense of men. But this occurs very seldom, if ever. A deranged person is accustomed to form a sound judgment, on false principles; nor does the raving madman reason badly, but rather is deceived, who, thinking himself Jupiter, would ask for the thunderbolts of Jove.

292. Aberration of intellect is called generally vesania; delirium, if it is from fever; without fever, general derangement is called insanity; but a less general derangement, that is, on one or a second subject, the mind being sound on all others, is called melancholy, with which, remarkable sadness is sometimes combined. However, no accurate limit exists between a sound mind

vergit; et mœstus et meticulosus animus ad melancholiam appropinquat.

293. Delirium varii generis febres comitatur: aliquando leve, facile discessurum, et vix mali ominis: sæpe tamen grave, et pessimi ominis, magnam curam et attentionem postulat.

294. Delirium ferox est vel mite. Ferox præcedunt et comitantur, vultus rubor, capitis dolor, ingens arteriarum pulsus, aurium tinnitus, oculi rubri, inflammati, truces, micantes, lucis impatientes, et vel nullus somnus, vel dira quies horrendis somniis rupta, mores soliti exuti, novi induti, pro mitibus morosi et immansueti, iracundia: animi alienatio, primo inter somnum et vigiliam observanda, imaginationi fides data, perceptiones ex sensibus externis nullæ vel neglectæ, et cogitationes memoriæ sine ordine prolatæ, furor demum,

solitum vergit ad insaniam; et mœstus et meticulosus animus appropinquat ad melancholiam.

293. Delirium varii generis comitatur febres: aliquando leve, facilè discessurum, et vix mali ominis: tamen sæpe grave, et pessimi ominis, postulat magnam curam et attentionem.

294. Delirium est ferox vel mite. Rubor vultûs, dolor capitis, ingens pulsus arteriarum, tinnitus aurium, oculi rubri, inflammati, truces, micantes, impatientes lucis, et vel nullus somnus, vel dira quies rupta horrendis somniis, soliti mores exuti, novi induti, morosi, et immansueti, pro mitibus, iracundia; alienatio animi primo observanda inter somnum et vigiliam, fides data imaginationi, perceptiones ex externis sensibus nullæ vel neglectæ, et cogitationis memoriæ prolatæ sine ordine, demum furor, et nonnunquam insolita et incredi-

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and vesania. Every kind of cheerfulness beyond ordinary, verges to insania; and a sad and timid mind approximates to melancholy.

293. Delirium of different kinds accompanies fevers: sometimes slight, easily going away, and scarcely of bad omen. However, often severe, and of the worst prognostic, it requires great care and attention.

294. Delirium is raving or mild. Redness of countenance, pain of the head, great pulsation of the arteries, ringing of the ears, the eyes red, inflamed, fierce, glistening, intolerant of light, and either no sleep, or frightful rest broken by horrible dreams, the usual manners shaken off, new ones put on, morose and uncouth instead of gentle, passion; first, aberration of mind, to be perceived between sleeping and waking, faith given to the imagination, the perceptions of the external senses null or neglected, and the thoughts of memory brought forth without order, at length raving and

bilis vis artuum, ita ut plures homines vix possint compescere unum ægrotantem, præcedunt et comitantur ferox.

295. Contra mite delirium sæpe observatur, cum pulsû sæpe debili, cum pallido collapso vultû, vertigine a erecto sitû prostratis viribus. Quoque dolor capitis adest, sed minus acutus, quam in altero genere; est raro iracundia, sæpe stupor, aliquando insignis mœror et metus: alienatio mentis primo observatur in semisomni, aliquando pellenda pro tempore, luce admissâ, amicis alloquentibus; æger mussitat multum sibi, parum curat, quæ fiûnt circum; tandem factus stupidus, percipit neque famem, neque sitim quâ fauces arescunt, nec alias solitas propensiones; quo fit ut urina et stercus elabantur, ægro inscio. Malum ingravescens, desinit in subsultus tendinum, tremores, convulsiones, defectiones ani-

et nonnunquam insolita et incredibilis vis artuum, ita ut plures homines unum ægrotantem vix possint compescere.

295. Mite, contra, delirium, cum pulsu sæpe debili, vultu pallido, collapso, vertigine a situ erecto, prostratis viribus, sæpe observatur. Dolor capitis quoque adest, sed minus acutus quam in altero genere; raro iracundia, sæpe stupor, aliquando mœror insignis et metus: in semisomni primo observatur mentis alienatio, admissa luce, alloquentibus amicis, pro tempore aliquando pellenda; æger multum sibi mussitat, quæ circum fiunt parum curat; tandem stupidus factus, neque famem, nec sitim qua fauces arescunt, percipit, nec alias solitas propensiones; quo fit, ut urina et stercus, inscio ægro, elabantur. Ingravescens malum, in subsultus tendinum, tremores, convulsiones, animi defectiones,

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sometimes an unusual and incredible strength of the limbs, so that many men can scarcely restrain one sick person, precede and accompany the raving delirium.

295. On the other hand, mild delirium is often observed, with a pulse frequently weak, with a pale collapsed countenance, with vertigo from the erect position, and with prostrate powers. Also pain of the head is present, but less severe than in the other kind: there is seldom rage, often stupor, sometimes remarkable sadness and fear; derangement of mind is first observed at half-sleeping, sometimes to be dispersed for a time by the admission of light, and conversing friends: the patient mutters much to himself, little cares what things are done around him; at length become stupid, he neither feels hunger nor thirst, by which his fauces are parched, nor other customary propensities; whence it occurs, that the urine and fæces escape from the patient unconscious of it. The malady increasing terminates in subsultus

mortem, desinit. Alterum quoque delirii genus, deficientibus ægri viribus, in hoc sæpe mutatur.

296. Docent quæ utrumque comitantur signa, insolitum, inordinatum, inæqualem sanguinis per cerebrum motum, statum ejus qui ad sanam mentem requiritur mutare: inflammationem cerebri, vel magis vel minus generalem et vehementem, aliquando subesse satis verisimile est, quamvis generalia inflammationis in corpore signa levia fuerint: docent cadaverum inspectiones, quæ sæpe ostenderunt insolitum, vel totius cerebri vel partis ejus, ruborem, et effusionem, suppurationem, &c. intra caput.

297. Verum et ab aliis causis, præter sanguinis motum, cerebri status multum affici potest et delirium induci. In multis febribus, veluti in iis quas insignis debilitas ab ipso initio comitatur, genus

mi (et) mortem. Quoque alterum genus delirii sæpe mutatur in hoc, viribus ægri deficientibus.

296. Signa quæ comitantur utrumque, docent, insolitum inordinatum, inæqualem motum sanguinis per cerebrum, mutare statum ejus qui requiritur ad sanam mentem: est satis verisimile, inflammationem cerebri vel minus vel magis generalem et vehementem aliquando subesse, quamvis generalia signa inflammationis in corpore fuerint levia; inspectiones cadaverum docent, quæ sæpè ostenderunt insolitum ruborem, vel totius cerebri vel partis ejus et effusionem, suppurationem, &c. intra caput.

297. Verum status cerebri potest multum affici et delirium induci et ab aliis causis, præter motum sanguinis. In multis febribus, veluti in iis, quas insignis debilitas comitatur ab ipso initio, nervo-

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tendinum, tremors, convulsions, fainting, and death. Also the other kind of delirium is often changed into this one, by the powers of the patient failing.

296. The symptoms which accompany both, shew that an unusual, irregular, and unequal motion of the blood, through the brain, changes that state of it, which is required for a sound mind: it is very probable that inflammation of the brain, either more or less general and acute, is sometimes present, although the general symptoms of inflammation in the body may have been slight; examinations of dead bodies shew this, which have often exhibited unusual redness, either of the whole brain, or of part of it; also effusion, suppuration, &c. within the head.

297. But the condition of the brain may be much affected and delirium brought on also from other causes, besides the motion of the blood. In many fevers, as in those which remarkable weakness attends from the very

sum genus ipsum laborat, priùs et magis, quam motus sanguinis; bene multa vitia cujus, non secus ac sanæ actiones non erunt obvia sensibus. Verò signa læsionis planè ostendunt inæqualem, inordinatam, actionem ejus, vel incitationem, ut multi vocant, fieri. Hæc quoque est ratio delirii a venenis.

298. Ex dictis, ratio redditur, non quidem plene sed aliquatenus cur delirium, varii generis, vehementiæ, ominis; cur sæpe auctum, motû, luce, strepitû, affectibus animi, stimulantibus medicamentis, calore; cur nunc tollatur sanguine misso ex venis, et tenui diætâ, nunc vino et stimulantibus; cur levetur vel compescatur aliquando visû et colloquio amicorum et adstantium, que conspectû bene notarum rerum; cur sæpe ingravescat, si æger detineatur in lecto, evasurum mitius si surrexerit, et sederit erectus paulisper.

ipsum nervosum prius et magis, quam sanguinis motus laborat: cujus vitia bene multa, non secus ac sanæ actiones, sensibus non obvia erunt. Signa vero læsionis plane ostendunt inæqualem, inordinatam ejus actionem, vel incitationem, ut multi vocant, fieri. Delirii a venenis hæc quoque ratio est.

298. Ex dictis, ratio non plene quidem sed aliquatenus, redditur, cur varii generis, vehementiæ, ominis, delirium; cur sæpe motu, luce, strepitu, animi affectibus, medicamentis stimulantibus, calore, auctum; cur nunc misso ex venis sanguine, et tenui diæta, nunc vino et stimulantibus tollatur; cur aliquando visu et colloquio amicorum et adstantium, rerumque bene notarum conspectu, levetur vel compescatur; cur sæpe ingravescat si æger in lecto detineatur, mitius evasurum si surrexerit, et paulisper erectus sederit.

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beginning, the nervous system suffers earlier, and more than the circulation: the very many disorders of which, like the healthy actions, will not be obvious to the senses. But the symptoms of injury clearly shew that an unequal irregular action of it, or an excitement, as many call it, takes place: this also is the reason of the delirium from poisons.

298. From the things mentioned, a reason is given, not indeed clearly, but to some extent, why delirium is of various kinds, violence, and prognostic; why it is often increased by motion, light, noise, affections of the mind, stimulant medicines, and heat; why, at one time, it is removed by blood taken away from the veins, and by weak diet; at another time, by wine and stimulants; why it is relieved or checked, sometimes by the sight and conversation of friends and bystanders, and by the sight of well known objects; why it often increases, if the patient be kept in bed, about to become mild if he has risen, and sat erect for a little time.

299. Melancholiæ et insaniæ ratio multo densioribus tenebris obtegitur: scilicet, quæ sine febre sunt aut motu sanguinis ullo modo turbato; sæpe quoque hæreditariæ, a prima et congenita corporis, et præsertim cerebri, fabrica, ut videtur, pendentes, cujus tamen vitium a subtilissimo anatomico non detegi posset: quæ per intervalla recurrunt sæpe longa, quibus homines mente sana in corpore sano frui videntur: et quæ denique a malis mentis, gravibus nimirum affectibus, sæpe oriuntur, quorum effectus in cerebrum, et ratio qua adeo nocent, prorsus ignota sunt.

300. Notum tamen est varia cerebri vitia, obstructiones, tumores, vel ipsius, vel calvariæ in id prementis, vim capiti illatam, et, ut ferunt scriptores medici, cerebri ipsius duritiem, siccitatem, et irritamenta quædam genus nervosum stimulantia, malum inducere. Et

299. Ratio melancholiæ et insaniæ obtegitur multò densioribus tenebris: scilicet, quæ sunt sine febre aut motû sanguinis turbato ullo modo; sæpe quoque sunt hæreditariæ, pendentes, ut videtur, a primâ et congenitâ fabricâ corporis, præsertim cerebri, vitium cujus tamen non posset detegi a subtilissimo anatomico: quæ sæpe recurrunt post longa intervalla, quibus homines videntur frui sanâ mente in sano corpore: et quæ denique sæpe oriuntur a malis mentis, nimirum gravibus affectibus, effectus quorum in cerebrum et ratio quâ nocent adeò, sunt prorsùs ignota.

300. Tamen notum est varia vitia cerebri, obstructiones, tumores, vel ipsius vel calvariæ prementis in id, vim illatam capiti, et, ut medici scriptores ferunt, duritiem, siccitatem cerebri ipsius, et quædam irritamenta stimulantia nervosum genus, inducere malum. Et

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299. The reason of melancholy and insania is veiled in much greater obscurity, namely, which exist without fever, or the circulation of the blood being disturbed in any way; they are often also hereditary, depending, as it appears, on the primary congenital structure of the body, especially of the brain, the disorder of which, nevertheless, cannot be detected by the most minute anatomist; which often occur after long intervals, in which persons appear to enjoy a sound mind in a sound body; and which, lastly, often arise from disorders of the mind, namely, severe affections, the effects of which upon the brain, and the manner in which they are so noxious, are entirely unknown.

300. However, it is known that various diseases of the brain, (such as) obstructions, tumours, either of the brain itself, or of the skull-cap pressing upon it, that force applied to the head, and, as medical writers relate, hardness and dryness of the brain itself, and certain irritating substances

profectò est tanta irritatio captis mente, ut sæpe per longum tempus dormiant parum vel nihil, neque facile sopiantur solitis remediis.

301. Sed neque hæc, quamvis exigua et imperfecta scientia de morbis cerebri et mentis, caret suis difficultatibus: nam læsione cerebri vel cujusvis partis ejus factâ, tumore, osse, crescente in mucronem et irritante, &c. nemo prædixerit, quidnam mali, talis læsio factura sit: epilepsiam, apoplexiam, hemiplegiam, stuporem, melancholiam, furorem, dolorem capitis, aut nil præter solitum. Enim exempla non desunt hominum, qui convaluerunt aut vixerunt diu, post amissam haud exiguam partem cerebri: vel qui perceperunt nil incommodi, magnâ parte cerebri corruptâ, donec tandem subitò corruerint convulsi et moribundi.

profecto tanta irritatio mente captis est, ut sæpe per longum tempus parum vel nihil dormiant, neque solitis remediis facile sopiantur.

301. Sed neque hæc, quamvis exigua et imperfecta, de cerebri et mentis morbis, scientia, suis difficultatibus caret: nam facta cerebri vel partis ejus cujusvis læsione, tumore, osse in mucronem crescente et irritante, &c. nemo prædixerit quidnam mali talis læsio factura sit; epilepsiam, apoplexiam, hemiplegiam, stuporem, melancholiam, furorem, dolorem capitis, aut nil præter solitum. Non desunt enim exempla hominum, qui, post amissam haud exiguam cerebri partem, convaluerunt, et diu vixerunt; vel qui, corrupta magna cerebri parte, nil incommodi perceperunt, donec tandem subito corruerint convulsi et moribundi.

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stimulating the nervous system, bring on this disorder. And indeed, there is such irritation in deranged persons, that generally for a long time they sleep little, or not at all, nor are easily put to sleep by the usual remedies.

301. But neither this, although slight and imperfect knowledge concerning diseases of the brain and mind, is without its difficulties; for from injury of the brain or any part of it being produced, no person could have foretold what disorder such an injury is about to produce; (whether) epilepsy, apoplexy, hemiplegia, stupor, melancholy, raving, pain of the head, or nothing unusual. For instances are not wanting of men who have recovered or lived for a long time after no inconsiderable portion of the brain being lost; or who have felt no inconvenience by a large portion of the brain being corrupted, until at last they sunk suddenly, convulsed, and moribund.

302. Superest et aliud, sensuum internorum vitium, ab his omnino diversum, fatuitas scilicet. Fatui sunt qui judicium de rebus nullum, et memoriam aut nullam, aut vitæ muneribus imparem, habent. Fatuitas quædam revera omnibus infantibus communis, naturalis, neque morbosa est: quod si ultra infantiam permanserit, tum morbus est gravis, et plerumque insanabilis. Similes ac alia sensuum internorum vitia fatuitas agnoscit causas, quantum hæ oculis vel scalpello detegi possint: epilepsiæ frequens comes et effectus observatur. Hæc, si a causis extra caput sitis originem duxerit, veluti a vermibus in intestinis hospitantibus, expulsis vermibus, sanataque epilepsia, mens fatuo aliquando accedit.

303. Haud absimile est, fatuitatem infantum, et memoriæ ideoque judicii defectum, qui senibus

302. Et aliud vitium internorum sensuum omnino diversum ab his superest, scilicet fatuitas. Sunt fatui qui habent nullum judicium de rebus, et aut nullam memoriam, aut imparem muneribus vitæ. Reverà quædam fatuitas est communis omnibus infantibus, naturalis, neque morbosa: quod si permanserit ultra infantiam, tum est gravis, et plerumque insanabilis morbus. Fatuitas agnoscit similes causas ac alia vitia internorum sensuum, quantum hæ possint detegi oculis vel scalpello: observatur frequens comes et effectus epilepsiæ. Si hæc duxerit originem a causis sitis extra caput, veluti a vermibus hospitantibus in intestinis, vermibus expulsis, que epilepsiâ sanatâ, mens aliquando accedit fatuo.

303. Est haud absimile, fatuitatem infantum, et defectum memoriæ, et ideò judicii, qui accidit

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302. Also another disorder of the internal senses, quite different from these remains, namely, fatuity. They are fatuous, who possess no judgment of things, and either no memory, or unequal to the duties of life. In truth, a certain kind of fatuity, common to all infants, is natural, and not morbid; but if it has remained beyond infancy, it is then an important, and generally an incurable disease. Fatuity acknowledges the like causes as the other disorders of the internal senses, as far as these can be detected by the eyes or the scalpel: it is observed as a frequent attendant and effect of epilepsy. If this has derived its origin from causes situated external to the head, as from worms dwelling in the intestines; the worms being expelled, and the epilepsy being cured, intellect sometimes returns to a fatuous person.

303. It is not improbable, that the fatuity of infants, and the loss of

senibus, oriri, a statû cerebri nimis duri et rigidi in his verò nimis mollis in illis.

accidit, a statu cerebri in his nimis duri et rigidi, in illis vero nimis mollis, oriri.

Cap. XI.—*De motu musculorum.*

Cap. XI.—*De motu musculorum.*

304. Ea conditio musculorum vocatur mobilitas quâ, stimulo admoto, fibræ eorum contrahant se.

304. Mobilitas vocatur ea musculorum conditio, qua, admoto stimulo, fibræ eorum se contrahant.

305. Varii stimuli existunt; imprimis, omne mechanicum acre scilicet, quicquid pungit, secat, vellit, lacerat, distendit, excitat contractionem fibrarum musculorum; tum quoque multa chemica acria derivata ex animalibus, et frugibus, et fossilibus rebus; etiam frigus, calor, electrica scintilla; demum, varii status sive

305. Varii existunt stimuli; omne imprimis acre mechanicum, quicquid scilicet pungit, secat, vellit, lacerat, distendit, contractionem fibrarum musculorum excitat; tum quoque multa acria chemica, ex animalibus, et frugibus, et fossilibus rebus derivata; frigus etiam, calor, scintilla electrica, varii demum animi status sive actiones (de

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memory, and consequently of judgment, which happens to old persons, arise from a state of brain, too hard and rigid in the latter, but too soft in the former.

Chap. XI.—*Of the motion of Muscles.*

304. That condition of the muscles is called mobility by which, a stimulus being applied, the fibres of them contract themselves.

305. Various stimuli exist; in the first place, every mechanical acrid, that is, whatever pricks, cuts, pulls, lacerates, distends, excites the contraction of the fibres of the muscles; as well also many chemical acrids derived from animals, and fruits, and fossil things; also cold, heat, the electric spark;

quibus postea sermo erit) cum his annumeranda sunt.

306. Quidam ex his stimulis, distentio imprimis, partes solidas, quæ, distinctionis causâ, mortuæ vocantur (76, et seqq.) afficere videntur, et aliquid contractionis in iis inducere. Multum vero differt contractio earum ab illâ de qua nunc agitur. Parva enim est, et lenta, et constans, nec prius fit quam vis distendens sublata fuerit, scilicet quam superare nequit.

307. Contractio musculorum vero subita est, et validissima, vi distendente sæpe major, quippe quam aliquando vincit; porro, alternam relaxationem habet. Facile igitur distingui potest mobilitas illa, quæ solis fibris musculorum propria est, a vi resiliendi, qua, plus minusve perfecta, omnes solidæ partes corporum animalium pollent.

308. Contractionis musculorum

actiones animi, de quibus erit postea sermo, sunt annumeranda cum his.

306. Quidam ex his stimulis, imprimis distentio, videntur afficere solidas partes quæ, causâ distinctionis, vocantur mortuæ, et inducere aliquid contractionis in iis. Vero contractio earum differt multum ab illâ de quâ nunc agitur. Enim est parva, et lenta, et constans, nec fit priusquam distendens vis sublata fuerit, scilicet quam nequit superare.

307. Vero contractio musculorum est subita et validissima, sæpe major distendente vi, quippe quam aliquando vincit; porro, habet alternam relaxationem. Igitur, illa mobilitas quæ est propria fibris solis musculorum, potest facilè distingui a vi resiliendi quâ, plus ve minus perfectâ, omnes solidæ partes corporum animalium pollent.

308. Ratio contractionis

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lastly, various states or actions of the mind, of which there will be afterwards mention, are to be enumerated among these.

306. Some of these stimuli, especially distention, seem to affect the solid parts, which, for the sake of distinction, are called dead, and to induce some contraction in them. But the contraction of them differs much from that of which it is now treated. For it is trifling, and slow, and constant, nor does it take place before that the distending force has been removed, namely, which it cannot overcome.

307. But the contraction of the muscles is sudden and very powerful, often greater than the distending force, as being that which it sometimes overcomes; moreover, it has an alternate relaxation. Therefore, that mobility which is peculiar to the fibres alone of the muscles, can easily be distinguished from the power of rebounding with which, more or less perfect, all the solid parts of the bodies of animals excel.

musculorum, diu que multum quæsita frustrà, adhuc latet; autem fere hic est modus, hæc lex ejusdem, si spectetur attentè in fasciculo fibrarum exsecto e corpore. Totus tremit, fit brevior, et crassior, et durior, et rugosus, et interdum pallidus, dum musculus contrahitur; tum relaxatur, fit planus, lævis, mollis, et iterum longus, et demum integrat suam contractionem.

ratio, diu multumque frustra quæsita, adhuc latet; ejusdem autem hic fere modus, hæc lex est, si in fasciculo fibrarum e corpore exsecto attente spectetur. Tremit totus, brevior fit, et crassior, et durior, et rugosus, et pallidus interdum, dum contrahitur musculus: tum relaxatur, fit planus, lævis, mollis et longus iterum, et demum suam contractionem integrat.

309. Vero multum abest ut musculi semper agant eodem modo in vivo et integro corpore. Enim longi musculi trunci corporis, et artuum, non modo contrahuntur, ad arbitrium hominis, sed manent contracti diu: quamvis profecto relicti sibi brevi relaxarentur. Porro, cavi musculi, scilicet fibræ, quæ circumdant cava organa corporis, nequeunt ostendere suam relaxationem ; veluti in corde, arteriis, intestinis, vesicâ ; quamvis functio-

309. Multum vero abest, ut semper in vivo et integro corpore eodem modo agant musculi. Longi enim musculi trunci corporis et artuum, ad arbitrium hominis, non modo contrahuntur, sed diu contracti manent; quamvis profecto sibi relicti brevi relaxarentur. Porro, cavi musculi, fibræ scilicet quæ cava corporis organa circumdant, relaxationem suam ostendere nequeunt; veluti in corde, arteriis, intestinis, vesica: quamvis harum

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308. The cause of the contraction of muscles, long and much sought for in vain, as yet lies hid; but commonly this is the manner, this the law of the same, if it be observed attentively in a bundle of fibres cut out from the body. The whole trembles, becomes shorter, and thicker, and harder, and wrinkled, and sometimes pale, whilst the muscle is contracted; then it is relaxed, becomes flat, smooth, soft, and again long, and at length renews its contraction.

309. But much is wanting that the muscles always act in the same manner in the living and sound body. For the long muscles of the trunk of the body, and the limbs, not only are contracted, at the pleasure of a man, but remain contracted a long time: although truly left to themselves, they shortly would be relaxed. Moreover, the hollow muscles, namely the fibres, which surround the hollow organs of the body, are unable to shew their relaxation; as in the heart, arteries, intestines, bladder; although the

quoque partium functiones, bene intellectæ, alternam relaxationem contractioni succedere, demonstrent. Postremo, musculi illi qui varia quibus præponuntur ostia claudunt, et sphincteres vocari solent, nunquam in sano homine, ut videtur, penitus relaxantur.

310. Perspectis probe diversorum musculorum fabricâ, et situ, et finibus, et, cum aliis partibus conjunctione et nexu, variæ illorum actiones, variique in corpore usus, facillime intelligentur; simulque perspicuum erit omnes quibus inserviunt actiones, communi illorum motu, scilicet vel simplice contractione, vel hac cum alterna relaxatione juncta, et repetita, absolvi. Sic longus musculus dum agit, oportet partes quibus adnectitur appropinquare faciat; cavus vero musculus oportet arctior fiat, et quicquid continet qua datur porta propellat; sphincter vero ostium

nes harum partium, quoque bene intellectæ, demonstrent alternam relaxationem succedere contractioni. Postremo, illi musculi qui claudunt varia ostia quibus præponuntur, et solent vocari sphincteres, nunquam, ut videtur, penitus relaxantur in sano homine.

310. Fabricâ, et situ, et finibus diversorum musculorum, et conjunctione et nexu cum aliis partibus, probè perspectis, variæ actiones illorum, que varii usus in corpore, intelligentur facillimè; que simul erit perspicuum, omnes actiones, quibus inserviunt, absolvi communi motu illorum, scilicet, vel simplice contractione, vel hac junctâ et repetitâ cum alternâ relaxatione. Sic oportet longus musculus, dum agit, faciat partes quibus adnectitur appropinquare: vero oportet cavus musculus fiat arctior, et propellat quicquid continet quâ porta datur; vero sphinc-

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functions of these parts also, well understood, demonstrate that an alternate relaxation succeeds contraction. Finally, those muscles which close the various openings before which they are placed, and are accustomed to be called sphincters, never, as it appears, are entirely relaxed in the healthy man.

310. The fabric, and situation, and terminations of the different muscles, and union and connexion with other parts, being clearly perceived, the various actions of them, and their various uses in the body, will be understood very easily; and at the same time it will be evident, that all the actions, to which they serve, are performed by the common motion of them, namely, either by simple contraction, or by this joined and repeated with an alternate relaxation. Thus it is necessary that a long muscle, whilst it acts, should cause the parts to which it is fastened to approximate; but it is necessary that a hollow muscle becomes more contracted, and propels what-

ter claudat ostium, cui præponitur. Et profecto hi sunt usus musculorum.

311. Musculi fere desinunt in tenuem, firmam, validam, et splendentem substantiam, (si comparata fuerit cum mole musculi ipsius); quam veteres scriptores vocarunt nervum, vero recentiores causa distinctionis ab alio genere nervorum, tendinem. Autem fabricatio hujusmodi datur musculosis partibus a Summo Opifice corporis, plane hoc consilio, quo adnectantur facilius et elegantius ossibus que cæteris partibus quibus est opus; et quo plures musculi inserti in punctis ipsis ossium quibus oportet, moveant et regnant varios artus et universum corpus quam optime. Vero tendo agit nihil, et potest haberi pro fune in machina, qua motus cujusvis partis communicantur cum aliis et remotis partibus.

312. Disputatum est multum, que diu, num

cui præponitur claudat. Et hi profecto musculorum usus sunt.

311. Musculi fere desinunt in substantiam tenuem (si cum mole ipsius musculi comparata fuerit) firmam, validam, splendentem; quam veteres nervum, recentiores vero scriptores, distinctionis causa ab alio nervorum genere (110) tendinem vocarunt. Hujusmodi autem fabricatio partibus musculosis, hoc plane consilio, a Summo corporis Opifice datur, quo facilius et elegantius ossibus, cæterisque quibus opus est partibus, adnectantur; et quo plures musculi, ipsis ossium punctis quibus oportet inserti, varios artus, et universum corpus, quam optime moveant et regant. Tendo vero nihil agit, et pro fune in machinâ haberi potest, qua motus partis cujusvis cum aliis et remotis partibus communicantur.

312. Diu multumque disputatum

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ever it contains where a passage is afforded; but the sphincter closes the opening before which it is placed. And truly these are the uses of the muscles.

311. Muscles commonly terminate in a thin, firm, strong, and shining substance, (if it be compared with the bulk of the muscle itself;) which the old writers called nerve, but more modern ones, for the sake of distinction from the other kind of nerves, tendon. But a structure of this kind is given to the muscular parts by the Supreme Constructor of the body, evidently with this design, that they may be joined more easily and more elegantly to the bones and the other parts in which it is necessary; and that more muscles being inserted in the points themselves of the bones in which it is necessary, may move and govern the different limbs and the whole body in the best manner possible. But tendon does nothing, and may be considered as a cord in the machine, by which the motions of any one part are communicated with other and remote parts.

est, musculi num augeretur an minueretur moles, donec contractus esset. Differentia, siqua revera sit, adeo parva est, ut neque ad mensuram facile reducatur, neque qualis sit hactenus pro certo constet.

313. Immani vixque credibili vi agunt musculi. Docent ingentia quæ tollant pondera, quamvis multum absit ut tota fibrarum vis apte ad istum motum efficiendum impendatur; imprimis ob tendinem proxime centrum motûs insertum, eundemque valde oblique decurrentem; tum quoque propter fibras singulas, quæ fasciculos constituunt, ipsosque demum fasciculos, oblique admodum tendentes, ad lineam directionis tendinis; quo fit ut magna pars virium, adeo oblique, fere contrarie, agentium, se perdat. Ex his principiis, subductis calculis, enormis vis musculorum eruitur, cujus denique duplum sumendum est, pro vi quam mus-

moles musculi augeretur aut minueretur donec contractus esset. Differentia reverà, si sit qua, est adeo parva, ut neque reducatur facile ad mensuram, neque hactenus constet pro certo qualis sit.

313. Musculi agunt immani que vix credibili vi. Ingentia pondera quæ tollant docent, quamvis multum absit ut tota vis fibrarum apte impendatur ad efficiendum istum motum: imprimis, ob tendinem insertum proxime centrum motûs que eundem decurrentem valde obliquè; tum quoque propter singulas fibras quæ constituunt fasciculos, que demum fasciculos ipsos tendentes admodum oblique ad lineam directionis tendinis; quo fit ut magna pars virium agentium adeo obliquè, fere contrariè, perdat se. Calculis subductis ex his principiis, enormis vis musculorum eruitur, duplum cujus denique est sumendum pro vi quam

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312. It has been debated much, and for a long time, whether the size of a muscle was increased or diminished whilst it was contracted. The difference truly, if there be any, is so trifling that neither can it be reduced easily to measure, nor to this time does it appear for certain of what sort it be.

313. The muscles act with great and scarcely credible power. The great weights which they can raise teach it, although much is wanting that the whole force of the fibres is properly expended for effecting that motion; in the first place, on account of the tendon being inserted very near to the centre of motion, and the same running down very obliquely; as also on account of the several fibres which make up the bundles, and indeed the bundles themselves, inclining very obliquely to the line of direction of the tendon; by which it happens that a great part of the powers acting so obliquely, almost oppositely, destroys itself. Calculations being drawn from these principles, an enormous power of the muscles is deduced, the double of

musculus exerat vel sustineat, quoniam omnis actio istiûsmodi est reciproca, et ideo musculus trahitur ad suam originem, tantâ vi quantâ trahit partem cui inseritur. Vel vigesima pars tantæ vis dirumperet et divelleret musculum exsectum e corpore. Igitur, si nil erroris subest hic, oportet vitalem vim musculorum esse miram.

culus exerat, vel sustineat; quoniam actio omnis istiusmodi reciproca est, et musculus ideo tanta vi ad suam originem trahitur, quanta partem cui inseritur trahit. Tantæ vis vel vigesima pars musculum e corpore exsectum dirumperet et divelleret. Miram igitur, si nil erroris hic subest, oportet esse vim vitalem musculorum.

314. Neque profecto Natura videtur consuluisse dispendio virium tantum, quantum elegantiæ et formæ corporis, pulcherrimè accommodatæ ad omnes motus.

314. Neque profecto, dispendio virium tantum consuluisse videtur Natura, quantum corporis elegantiæ et formæ, ad omnes motus pulcherrime accommodatæ.

315. Contractio ipsa quoque musculi est insignis, sed varia variis partibus. Sunt musculi qui fiunt breviores quartâ parte; sunt qui contrahuntur ad quartam partem, in quibusdam animalibus ad decimam partem, pristinæ longitudinis.

315. Insignis quoque est ipsa musculi contractio, sed varia variis partibus. Sunt qui quartâ parte breviores fiunt musculi; sunt qui ad quartam partem, in quibusdam animalibus ad decimam partem, pristinæ longitudinis contrahuntur.

316. Contractiones musculorum peraguntur et re-

316. Incredibili velocitate peraguntur et repetuntur musculorum

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which indeed is to be taken as the force which a muscle can exert or support, because every action of that kind is reciprocal, and therefore the muscle is drawn to its own origin, with as great a force as it draws the part into which it is inserted. Even the twentieth part of so great a force would break and tear in sunder a muscle cut out from the body. Therefore, if no error exists here, it behoves that the vital power of the muscles is wonderful.

314. Nor truly does Nature seem to have consulted the waste of powers so much, as the elegance and shape of the body, very beautifully adapted to all its motions.

315. The contraction itself also of a muscle is remarkable, but various in various parts. There are muscles which become shorter by a fourth part; there are those which are contracted to a fourth part, in some animals to a tenth part, of their former length.

316. The contractions of muscles are performed and repeated with incre-

contractiones. Docent cursus, præsertim quadrupedum; vel lingua, quæ quadringinta vocabula, fortasse bis mille literas, expresserit, spatio temporis quod minutum vocare solemus, quamvis ad multas literas exprimendas plures musculorum contractiones requirantur.

317. Musculi alii facilius, alii ægrius motus concipiunt: tum in variis hominibus, tum quoque in eodem homine variis temporibus, aliter atque aliter se habente.

318. Quin et eædem res quæ certos musculos ad motus vehementissime incitant, alios parum afficiunt.

319. Philosophi motui musculorum animos attendentes, varios se perspexisse fontes crediderunt, unde mira eorum vis derivata esset; subtilius aliquando quam vere de re satis simplice ratiocinati.

320. Vim resiliendi haud exi-

petuntur incredibili velocitate. Cursus, præsertim quadrupedum, docent; vel lingua quæ expresserit quadringinta vocabula, fortasse bis mille literas, spatio temporis quod solemus vocare minutum, quamvis plures contractiones musculorum requirantur ad exprimendas multas literas.

317. Alii musculi faciliùs concipiunt motus, alii ægriùs; tum in variis hominibus, tum quoque in eodem homine habente se aliter atque aliter variis temporibus.

318. Quin et eædem res, quæ incitant vehementissimè certos musculos ad motus, parum afficiunt alios.

319. Philosophi, attendentes animos motui musculorum, crediderunt se perspexisse varios fontes unde mira vis eorum derivata esset; aliquando ratiocinati subtiliùs quam verè de re simplice satis.

320. Musculi, non se-

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dible velocity. Races, especially of quadrupeds, prove this; or the tongue, which may have expressed four hundred words, perhaps twice a thousand letters, in a space of time which we are accustomed to call a minute, although many contractions of muscles are required to express many letters.

317. Some muscles more easily take on motions, others more difficultly; as well in different men, as also in the same man feeling himself differently at various times.

318. But also the same things, which most excite violently certain muscles to motions, little affect others.

319. Philosophers, applying their minds to the motion of muscles, believed that they had discovered the various sources from whence the wonderful power of them was derived; sometimes reasoning more subtly than truly about a thing simple enough.

320. Muscles, like every solid part of the bodies of animals, evidently

cus ac omnis solida pars corporum animalium, manifeste possident haud exiguam vim resiliendi; superstitem etiam post mortem; vero, quicquid amplius motûs habent, id omnino pendet a vitâ, et a nexu qui intercedit inter ipsos et cerebrum et nervos.

guam, non secus ac omnis pars solida corporum animalium, manifeste possident musculi; etiam post mortem superstitem: quicquid vero motus amplius habent, id a vita omnino pendet, et a nexu qui ipsos inter et cerebrum et nervos intercedit.

321. Tamen, proxima vis musculorum post hanc simplicem vim resiliendi, est quæ vocatur tonica: nimirum distentio ipsa est stimulus cui omnis musculus paret, et fere omnes musculi vivi hominis distenduntur plus minus ultra naturalem statum, scilicet, eum statum quem, facti suæ spontis, tenerent.

321. Proxima tamen post hanc simplicem vim resiliendi, est vis quæ vocatur tonica musculorum: nimirum, distentio ipsa stimulus est, cui omnis musculus paret (305, 306); et omnes fere musculi vivi hominis plus minus distenduntur ultra statum naturalem, eum scilicet statum, quem, suæ spontis facti, tenerent.

322. Distentio hujusmodi datur, imprimis, ossibus ipsis crescentibus quibus adnectuntur; tum quoque actione reciprocorum oppositorum musculorum: tum porro pondere quarundam partium quas musculi sustinent; et, denique, plenitudine

322. Hujusmodi distentio datur, imprimis, ipsis quibus adnectuntur crescentibus ossibus; tum quoque actione musculorum oppositorum, reciprocorum; tum porro pondere partium quarundam quas musculi sustinent; et denique plenitudine

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possess no small elasticity, remaining even after death; but, whatever more of motion they have, that entirely depends upon life, and upon the connexion which exists between themselves and the brain and nerves.

321. However, the next power of the muscles after this simple elasticity, is that which is called tonic: doubtless distention itself is a stimulus which every muscle obeys, and almost all the muscles of the living man are distended more or less beyond the natural state, namely, that state which, made of their own free will, they would keep.

322. Distention of this kind is occasioned, first of all, by the bones themselves growing to which they are joined; as well also by the action of the reciprocal opposed muscles: as moreover by the weight of certain parts which the muscles support; and, finally, by the fulness of the hollow organs or viscera which the muscles surround, or with which they are connected in any way.

cavorum organorum aut viscerum, quæ musculi circundant, vel quibuscum quivis modo connectuntur.

323. Vis tonica augetur, et vigor actionis musculi simul, majore distentione: minore, minuitur. Hinc intelliguntur vasorum plenitudinis effectus in motu sanguinis incitando: hinc quoque ratio pendet, sanguinis in multis morbis mittendi; nimirum, quo non detur, ad impetum sanguinis temperandum, certius aut præsentius auxilium.

324. Hæc autem vis tonica, quatenus a distentione pendeat, suos, et quidem satis arctos limites habet: ingens enim aut diuturna fibrarum musculosarum distentio tantum abest ut contractionem earum faciliorem et validiorem reddat, ut eandem sæpe minuat vel destruat; et sic musculi fere sol-

cavorum organorum aut viscerum quæ musculi circundant, vel quibuscum connectuntur quivis modo.

323. Tonica vis augetur, et simul vigor actionis musculi, majore distentione: minuitur minore. Hinc effectus plenitudinis vasorum in incitando motu sanguinis intelliguntur: hinc quoque pendet ratio mittendi sanguinis in multis morbis: quo, nimirum, certius aut præsentius auxilium, ad temperandum impetum sanguinis non detur.

324. Autem hæc tonica vis, quatenus pendeat a distentione, habet suos, et quidem satis arctos limites: enim tantum abest, ut ingens aut diuturna distentio musculosarum fibrarum reddat contractionem earum faciliorem et validiorem, ut sæpe minuat vel destruat eandem; et sic musculi, fere, sol-

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323. The tonic power is increased, and at the same time the vigour of action of a muscle, by greater distention: it is diminished by less. Hence the effects of fulness of vessels in quickening the motion of the blood are understood: hereupon also depends the reason of letting blood in many diseases; than which, without doubt, a more certain or more effectual remedy, to moderate the impetus of the blood, cannot be supplied.

324. But this tonic power, as far as it depends upon distention, has its own, and indeed sufficiently narrow limits; for so much is wanting, that great or long continued distention of muscular fibres renders contraction of them easier and more powerful, that it often diminishes or destroys the same; and thus muscles, for the most part, are relaxed, nor about to recover easily nor suddenly their former power.

vantur, neque recuperaturi facile neque subito pristinam vim.

325. Porro, musculus distentus nullo modo præter solitum, contrahit se ad contactum cujùsvis stimuli. Medici imposuerunt nomen vim insitam huic conditioni musculorum.

326. Denique, musculo intacto, si stimulus admotus fuerit nervo qui adit eum, similes motus excitantur. Vel, si cerebrum ipsum irritatum fuerit, plurimi aut omnes musculi convelluntur. Hæc conditio musculorum appellatur nervosa vis, diversa tantùm sede a vi insita.

327. Postremo, musculis, nervis, cerebro, intactis, ciemus plurimos musculos ad contractionem voluntate solâ: hæc vis rectè vocatur animalis, quippe quæ contingat animalibus solis.

328. Tamen, omnes musculi non subjiciuntur

vantur, pristinam vim neque facile neque subito recuperaturi.

325. Porro, musculus nullo præter solitum modo distentus, ad contactum stimuli cujusvis se contrahit. Huic musculorum conditioni nomen vim insitam medici imposuerunt.

326. Denique, intacto musculo, si stimulus nervo qui eum adit admotus fuerit, similes motus excitantur. Vel, si cerebrum ipsum irritatum fuerit, plurimi aut omnes musculi convelluntur. Hæc musculorum conditio vis nervosa appellatur; a vi insita sede tantum diversa.

327. Postremo, intactis musculis, nervis, cerebro, sola voluntate plurimos musculos ad contractionem ciemus: hæc vis recte animalis vocatur, quippe quæ solis animalibus contingat.

328. Non omnes tamen musculi voluntatis imperio subjiciuntur: et

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325. Moreover, a muscle distended in no way beyond usual, contracts itself at the contact of any stimulus. Physicians have applied the name vis insita to this condition of muscles.

326. Again, the muscle being untouched, if a stimulus should be applied to the nerve which goes to it, similar motions are excited. Or, if the brain itself has been irritated, most or all the muscles are convulsed. This state of muscles is called nervous power, differing only in seat from the vis insita.

327. Lastly, the muscles, nerves, brain, being untouched, we excite most muscles to contraction by the will alone: this power is rightly called animal, as being one which belongs to animals alone.

328. However, all the muscles are not subjected to the control of the will:

plurimæ et maximi momenti actiones, inscio, invito, vel contra nitente homine, absolvuntur. Hinc motus musculorum est vel voluntarius vel invitus.

329. Motus omnium, capitis, vultus, oculorum, oris ad pharyngem usque, cervicis, trunci, artuum, musculorum, in sano homine, voluntarius est, scilicet, sola voluntate excitari potest; quamvis nonnunquam citra morbum, inscio aut nolente homine, isti musculi exerceantur.

330. Inviti motus sunt cordis, arteriarum, organorum secernentium, totius tubi intestinorum a pharynge ad anum, pupillæ oculi, aliorumque sphincterum (quamvis sane in plerosque horum nonnihil imperii habeamus) meatuum urinæ, vesicæ, uteri, bronchiorum.

331. Medium fere locum hos inter occupant respirationis musculi,

imperio voluntatis: et plurimæ actiones, et maximi momenti, absolvuntur, homine inscio, invito, vel nitente contra. Hinc motus musculorum est vel voluntarius vel invitus.

329. Motus omnium musculorum capitis, vultûs, oculorum, oris usque ad pharyngem, cervicis, trunci, artuum, est voluntarius in sano homine, scilicet, potest excitari voluntate solâ; quamvis citra morbum, isti musculi nonnunquam exerceantur homine inscio aut nolente.

330. Inviti motus sunt cordis, arteriarum, secernentium organorum, totiûs tubi intestinorum, a pharynge ad anum, pupillæ oculi, que aliorum sphincterum, (quamvis sane habeamus nonnihil imperii in plerosque horum,) meatuum urinæ, vesicæ, uteri, bronchiorum.

331. Musculi respirationis occupant ferè me-

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and very many actions, and of the greatest moment, are performed, by a person ignorant of them, unwilling, even striving against them. Hence the motion of muscles is either voluntary or involuntary.

329. The motion of all the muscles of the head, countenance, eyes, mouth as far as the pharynx, of the neck, the trunk, the limbs, is voluntary in a healthy person, that is, can be excited by the will alone; although without disease, those muscles may sometimes be exercised by the person unconscious or unwilling.

330. The involuntary motions are those of the heart, of the arteries, of the secreting organs, of the whole tube of the intestines, from the pharynx to the anus, of the pupil of the eye, and of the other sphincters, (although truly we have some control upon most of these,) of the passages of the urine, of the bladder, the uterus, of the bronchia.

331. The muscles of respiration occupy nearly a middle place between

dium locum inter hos, scilicet, transversum septum, musculi abdominis, et qui jacent inter costas, et quotquot musculi ita conjunguntur cum costis, ut contractio horum possit vel firmare, vel elevare, vel deprimere eas.

septum scilicet transversum, musculi abdominis, et qui inter costas jacent, et quotquot cum costis ita conjunguntur musculi, ut horum contractio eas vel firmare, vel elevare, vel deprimere possit.

332. Est vix aut ne quidem vix credibile, vires quas Natura fecit distinctas, posse facile confundi, que sanum hominem unquam amisisse imperium in voluntarios motus, adeptum esse in invitos.

332. Vix aut ne vix quidem credibile est, vires, quas Natura fecit distinctas, facile posse confundi, hominemque sanum, imperium in voluntarios motus amisisse, in invitos adeptum esse unquam.

333. Singuli motuum, qui peraguntur citra voluntatem, excitantur quodam stimulo admoto aut musculis ipsis, aut sentienti forsitan distanti parti, quamvis conspiranti per nervosum consensum cum iis; aut afficiente cerebrum aut mentem ipsam; unde, secundum primam atque congenitam fabricam et constitutionem corporis, certæ partes tantum afficiuntur et cientur ad motum.

333. Motuum, qui citra voluntatem peraguntur, singuli excitantur stimulo quodam, aut ipsis musculis admoto, aut parti sentienti forsitan distanti, quamvis per consensum nervosum cum iis conspiranti: aut cerebrum, aut mentem ipsam, afficiente; unde, secundum primam atque congenitam corporis fabricam et constitutionem, certæ tantum partes afficiuntur, et ad motum cientur.

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those, namely, the transverse septum, the muscles of the abdomen, and those which lie between the ribs, and whatever muscles are so connected with the ribs, that the contraction of these may either fix, or elevate, or depress them.

332. It is scarcely or not even scarcely credible, that powers which Nature made distinct, can easily be confounded, and that a healthy man ever has lost control upon the voluntary motions, and has acquired it upon the involuntary.

333. Each of the motions, which are performed without the will, are excited by some stimulus applied either to the muscles themselves, or to a sentient perhaps distant part, although agreeing through nervous sympathy with them; or affecting the brain or the mind itself; whence, according to the original and congenital structure and constitution of the body, certain parts only are affected and are excited to motion.

334. Admovisse igitur videtur provida rerum Parens incitamenta quæ oportebat iis organis, quorum actiones ad vitam sustinendam, corpusque reficiendum, vel ad certa vitæ munera exercenda, omnino necessariæ essent. In ea autem quæ partim vitali munere funguntur, partim aliis, minoris momenti neque perpetuis, officiis inserviunt, divisum imperium homini dedit; reliqua demum ipsius arbitrio permisit.

334. Igitur provida Parens rerum videtur admovisse incitamenta quæ oportebat iis organis, actiones quorum essent omnino necessariæ ad sustinendam vitam, que reficiendum corpus, vel ad exercenda certa munera vitæ. Autem dedit homini divisum imperium in ea quæ partim funguntur vitali munere, partim inserviunt aliis officiis minoris momenti neque perpetuis; demum, permisit reliqua arbitrio ipsius.

335. Motuum qui ex voluntate sunt, homo sibi conscius est: vix sane uniuscujusque musculi qui juvet, sed ipsius voluntatis et conatus, et motus totius membri, dummodo animum ad hoc attendat. Longa consuetudine sensus iste debilior evadit; nunquam vero penitus deletur.

335. Homo est conscius sibi motuum qui sunt ex voluntate: vix, sane, uniuscujusque musculi qui juvet, sed voluntatis ipsiûs, et conatûs et motûs totiûs membri, dummodo attendat animum ad hoc. Iste sensus evadit debilior longa consuetudine; vero nunquam penitus deletur.

336. Contra, qui inviti sunt motus, vix percipiuntur; neque in sano corpore percipi possunt.

336. Contra, motus qui sunt inviti vix percipiuntur; neque possunt percipi in sano corpore.

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334. Therefore the provident Parent of things appears to have applied the incitements which it behoved to those organs, the actions of which were altogether necessary to sustain life, and recruit the body, or to exercise certain functions of life. But he has given to man a divided control over those which partly perform a vital function, partly subserve to other offices of less moment nor perpetual: finally, he has left the rest at the disposal of him.

335. Man is conscious to himself of the motions which are from the will: scarcely, indeed, of every single muscle which may assist, but of the will itself, and of the effort and motion of the whole limb, provided he apply the mind to this. That perception becomes weaker by long habit; but never is entirely destroyed.

336. On the other hand, the motions which are involuntary are scarcely perceived; nor can be perceived in the healthy body. But if they should be

Quod si fuerint vehementes, imperfecti, abnormes, difficiles, aut impediti, tunc quidam molesti sensus, veluti dolor aut anxietas, nascuntur.

Quod, si vehementes, imperfecti, abnormes, difficiles, aut impediti fuerint, tunc sensus quidam molesti, veluti dolor aut anxietas, nascuntur.

337. Motus medii inter hos, nempe, respirationis, permissi sibi, parum sentiuntur; sed attentione animi adhibitâ, possunt percipi. Quod si exerceantur ad nostrum arbitrium insolito more, tum faciunt majorem sensum; impediti, miserrimè angunt hominem.

337. Medii hos inter, motus respirationis nempe, sibi permissi, parum sentiuntur: sed, adhibita animi attentione, percipi possunt. Quod si insolito more ad nostrum arbitrium exerceantur, tum majorem sensum faciunt; impediti hominem miserrime angunt (186, et seqq.)

338. Musculi voluntarii motûs redduntur firmiores, mobiliores, et validiores, et fiunt magis torosi justo et valido usu, modo hic non fuerit nimius: hinc solemus judicare ab formâ ipsâ, de viribus hominis. Res bene perspecta sculptoribus, qui norunt exprimere quod ad musculos, Herculem aliâ ratione, Apollinem aliâ, Venerem aliâ.

338. Musculi voluntarii motus justo et valido usu, modo hic non nimius fuerit, firmiores, mobiliores, et validiores redduntur, et magis torosi fiunt: hinc, ab ipsa formâ, de viribus hominis judicare solemus. Res sculptoribus bene perspecta, qui alia ratione Herculem, quod ad musculos, alia Apollinem, alia Venerem exprimere norunt.

339. Robur et mobilitas

339. Robur et mobilitas singu-

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violent, imperfect, irregular, difficult, or impeded, then certain irksome sensations, as pain or anxiety, arise.

337. The motions intermediate between these, namely, of respiration, left to themselves, are little perceived; but attention of the mind being applied, they may be perceived. But, if they be exercised at our pleasure in an unusual manner, then they excite a stronger perception; obstructed, they very miserably torment a person.

338. The muscles of voluntary motion are rendered firmer, more mobile, and stronger, and become more brawny by proper and vigorous exercise, provided this has not been excessive: hence we are accustomed to judge from the form itself, of the strength of a man. A thing well understood by sculptors, who have known to pourtray, as to the muscles, a Hercules in one way, an Apollo in another, a Venus in another.

339. The strength and mobility of the individual muscles are increased

lorum musculorum usu augentur: quin et plurium, qui ad eundem motum præstandum conspirant, musculorum conjunctio, sæpe repetita, ipsa consuetudine, facilior, promptior, et accuratior fit.

340. Si vero motus vehementes, insoliti, difficiles, aut diuturni fuerint, tum vires exhauriuntur, homo defatigatur. Actiones, qualescunque exercebat, debiliores, incertæ, et tremulæ fiunt; sensus ingratus sui generis, deinde dolor, postea rigiditas, artubus laborantibus accedunt, debilitas et languor universo corpori; quæ omnia requiem et somnum fortiter suadent. Si nulla laborum intermissio intercedat, ingens et universus virium defectus, subitaque interdum animi defectio, ultima demum mors ipsa, iis finem imponunt.

341. Contra omnino, inviti motus musculi, neque usu roborari

singulorum musculorum augentur usu; quin et, conjunctio plurium musculorum qui conspirant ad præstandum eundem motum, sæpe repetita, fit facilior, promptior, et accuratior consuetudine ipsâ.

340. Vero, si motus fuerint vehementes insoliti, difficiles aut diuturni, tum vires exhauriuntur, homo defatigatur. Actiones, qualescunque, exercebat, fiunt debiliores, incertæ, et tremulæ; ingratus sensus sui generis, deinde dolor, postea rigiditas accedunt laborantibus artubus, debilitas et languor universo corpori; quæ omnia fortiter suadent requiem et somnum. Si nulla intermissio laborum intercedat, ingens et universus defectus virium, que interdum subita defectio animi, demum mors ipsa ultima imponunt finem iis.

341. Omnino, contra, musculi inviti motûs neque possunt roborari usu,

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by use, moreover, the combination of several muscles which concur to perform the same motion, often repeated, becomes easier, readier, and more accurate by habit itself.

340. But, if the motions should be violent, unusual, difficult, or long continued, then the powers are exhausted, the individual is wearied out. The actions, of whatever kind, he was performing, become weaker, uncertain, and tremulous; an unpleasant sensation of its own kind, then pain, afterwards stiffness, are added to the suffering limbs, debility and languor to the whole body; which all strongly advise rest and sleep. If no intermission of labours interposes, a great and universal failure of the strength, and sometimes sudden fainting, at length death itself last, put an end to them.

341. Altogether on the other hand, the muscles of involuntary motion neither can be strengthened by use, as being that which always they have

quippe quem semper habeant unum que eundem in sano corpore, neque fatigari ullâ exercitatione. Cor ipsum validissimus musculus quotidie micat centies millies, nihilo magis fatigatum post octoginta annos. Vero post vehementem, aut insolitum, aut abnormem motum musculi inviti motus evadunt quodammodo debiliores; vero nunquam habent sensum defatigationis.

342. Musculi respirationis, demum, permissi sibi, non defatigantur; facile recti imperio voluntatis, non secus ac musculi voluntarii motûs, ita ut non diutius valeant ad insolitam actionem. Vero sensus defatigationis vix percipitur ex iis.

343. Verum, enimvero, musculi ipsi voluntarii motûs, aliquando parent aliis stimulis quoque, etiam in sanissimo homine, qui vel subitò rapiunt hominem, nunc con-

possunt, quippe quem in sano corpore unum eundemque semper habeant, neque ulla exercitatione fatigari. Cor ipsum, validissimus musculus, centies millies quotidie micat, post octoginta annos nihilo magis fatigatum. Post vehementem vero, aut insolitum, aut abnormem motum, inviti etiam motus musculi quodammodo debiliores evadunt: nunquam vero sensum defatigationis habent.

342. Musculi demum respirationis sibi permissi non defatigantur; voluntatis imperio recti, facile, non secus ac musculi voluntarii motus; ita ut ad insolitam actionem diutius non valeant. Sensus vero defatigationis vix ex iis percipitur.

343. Verum enimvero, ipsi motus voluntarii musculi, in sanissimo etiam homine, aliis quoque stimulis aliquando parent; qui hominem, nunc conscium, nunc inscium, aut nolentem, vel subito rapiunt immani

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uniform and the same in the sound body, nor easily be fatigued by any exercise. The heart itself, the most powerful muscle, daily pulsates one hundred thousand times, nothing the more fatigued after eighty years. But after violent, or unusual, or irregular motion, even the muscles of involuntary motion become in some degree weaker; but never have a feeling of fatigue.

342. The muscles of respiration, indeed, left to themselves, are not fatigued; easily so, when ruled by the control of the will, like the muscles of voluntary motion, so that they are not longer competent to unusual action. But a feeling of fatigue is scarcely perceived from them.

343. But, indeed, the muscles themselves of voluntary motion, sometimes obey other stimuli also, even in the most healthy person, which either suddenly hurry off the individual, now conscious, now unconscious or unwilling,

vi, cui resistere nequeat, vel mitius et gratius solicitant invitant et, filo tenui, et parum sæpe perspecto ducunt.

344. Animi imprimis affectus, ira, gaudium, mœror, metus, amor, odium, certos motus in musculis excitant, præsertim vultus; quo fit ut singuli sese in ore exprimant, plus quam Phidiaca arte. Diuturni et graves, et sæpe repetiti, fortius et constantius depinguntur, difficillime delendi; hinc sæpe iracundiæ imago ubi nulla ira est: hoc fundamento nititur ars physiognomonis. Alii quoque musculi, præter vultus, eadem causa in motum cientur; ita ut homo, corpore, gestu, voce, multos animi affectus exprimat. Quin et in musculos inviti motus, animi affectus latum imperium habent; in cor, arterias, organa secernentia, ventriculum et intestina, et respirationis musculos:

scium, nunc inscium aut nolentem, immani vi, cui nequeat resistere, vel solicitant, invitant mitius et gratius, et ducunt tenui filo, et sæpe parum perspecto.

344. Imprimis, affectus animi, ira, gaudium, mœror, metus, amor, odium, excitant certos motus in musculis, præsertim vultûs; quo fit ut singuli exprimant sese in ore plus quam Phidiacâ arte. Diuturni, et graves, et sæpe repetiti, depinguntur fortiùs et constantiùs, difficillimè delendi: hinc sæpe imago iracundiæ, ubi nulla ira est: ars physiognomonis nititur hoc fundamento. Alii musculi quoque præter vultûs cientur in motum eâdem causâ; ita ut homo exprimat multos affectus animi corpore, gestu, voce. Quin et, affectus animi habent latum imperium in musculos inviti motûs; in cor, arterias, secernentia organa, ventriculum, et intestina, et musculos res-

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with impetuous sway, which he cannot resist, or entice, invite more mildly and more agreeably, and lead by a fine thread, and often little observed.

344. In the first place, affections of the mind, anger, joy, grief, fear, love, hatred, excite certain motions in the muscles, especially of the countenance, whence it happens, that all express themselves in the face more than in the Phidian art. Lasting, and powerful, and often repeated, they are depicted more strongly and permanently, very difficultly to be obliterated; hence often the appearance of anger, where no anger is: the art of the physiognomist rests on this foundation. Other muscles also besides those of the face are excited into motion by the same cause; so that an individual may express many affections of the mind by his body, gesture, voice. Moreover, also affections of the mind exercise a wide control upon the muscles of involuntary motion; upon the heart, arteries, secreting organs, stomach, and intestines, and the muscles of respiration: whence a quicker, weaker,

pirationis: unde incitatior, debilior, abnormis motus sanguinis, secretiones et concoctio cibi vitiatæ, et insolitus modus respirationis.

345. Affectus animi recte distinguuntur in excitantes et deprimentes; scilicet, qui vel augent vel minuunt vitales vires. Ira, gaudium, sunt prioris generis; mœror, metus, posterioris: sunt quoque mixti, et quasi ancipites affectus, referendi nunc ad unum, nunc rursus ad alterum genus; veluti amor, qui excitat vel deprimit animos, prout ipse fuerit prosperus aut infelix. Ingens et subitus terror quoque nonnunquam fungitur vice excitantis affectus, et impellit ad rapidos et vehementes motus.

346. Quin periculum potest esse ex utroque genere; que affectus ipsi animi recensentur, non immerito inter causas morborum. Qui valde

unde sanguinis motus incitatior, debilior, abnormis, secretiones et concoctio cibi vitiatæ et insolitus respirationis modus.

345. Affectus animi recte distinguuntur in excitantes et deprimentes: scilicet, qui vires vitales vel augent vel minuunt. Prioris generis sunt ira, gaudium; posterioris, mœror, metus: sunt quoque affectus mixti, et quasi ancipites, nunc ad unum, nunc rursus ad alterum genus, referendi; veluti amor, qui excitat vel deprimit animos, prout ipse prosperus fuerit aut infelix. Ingens quoque et subitus terror excitantis, nonnunquam affectus vice fungitur, et ad rapidos et vehementes motus impellit.

346. Quin ex utroque genere periculum esse potest: ipsique animi affectus inter causas morborum non immerito recensentur (61). Qui valde excitant, primo suo in

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irregular motion of the blood, the secretions and digestion of the food vitiated, and an unusual state of the respiration.

345. Affections of the mind are rightly distinguished into exciting and depressing: namely, which either increase or diminish the vital powers. Anger, joy, are of the former kind; grief, fear, of the latter: there are also mixed, and as it were doubtful, affections, to be referred now to the one, now again to the other kind; as love, which elevates or depresses the spirits, according as itself has been prosperous or unfortunate. Great and sudden terror also sometimes performs the part of an exciting affection, and impels to rapid and vehement motions.

346. But danger may exist from each kind; and the affections themselves of the mind are enumerated not undeservedly amongst the causes of diseases. Those which greatly excite, sometimes destroy a person, first by their

genere nervoso effectu hominem aliquando extinguunt: aut minus intensi, vitiato tantum humorum motu, eidem nocent. Qui deprimunt animos, totum hominem debilitant, ad omnes functiones vitales, naturales, animales, minus aptum reddunt: unde lenta valetudo, et morbi sæpe insanabiles.

347. Curiositas alia, et haud levis motus animalis causa, hic quoque fortasse debet annumerari; scilicet quæ ad res novas, ignotas, contemplandas et explorandas, hominem vix opinantem, sed conscium semper, impellit: infanti maxima, et utilissima est, quippe qua ad organa sua exercenda, eorumque usus discendos, incitetur, et sic multa sine magistro discat, melius et certius quam optimus magister docuisset. Præterea, hoc modo infans ipse propriis manibus futuræ suæ scientiæ fundamenta jacit.

excitant, aliquando extinguunt hominem primo suo effectu in nervoso genere; aut minus intensi, nocent eidem, motu humorum tantum vitiato. Qui deprimunt animos, debilitant totum hominem, reddunt minus aptum ad omnes functiones vitales, naturales, animales; unde lenta valetudo, et sæpe insanabiles morbi.

347. Alia et haud levis causa animalis motûs, curiositas, debet fortasse annumerari hic quoque; scilicet quæ impellit hominem vix opinantem sed semper conscium, ad contemplandas et explorandas novas ignotas res: est maxima et utilissima infanti, quippe quâ incitetur ad exercenda sua organa, que discendos usus eorum, et sic discat multa sine magistro melius et certius quam optimus magister docuisset. Præterea, infans ipse, hoc modo, jacit fundamenta suæ futuræ scientiæ, pro-

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impression in the nervous system; or, less intense, hurt the same, by the motion of the fluids only being vitiated. Those which depress the spirits, debilitate the whole person, render him less fitted for all the functions, vital, natural, animal; whence lingering illness, and often incurable diseases.

347. Another and not slight cause of animal motion, curiosity, ought perhaps to be enumerated here also; namely, which urges the individual scarce thinking but always conscious, to contemplate and investigate new unknown objects: it is very great and very useful to the infant, as being that by which it is excited to exercise its organs, and to learn the uses of them, and thus it may learn many things without a master better and more certainly than the best master could have taught. Besides, the infant itself, in this manner, lays the foundations of its future knowledge with its own

priis manibus. Eadem est sæpe minor adulto homini, fere nulla decrepito seni. Natura allicit hominem certa voluptate, tanquam præmio, ut exerceat probe sua organa, tum sensûs tum motûs, quo utraque roborentur et ipse sic discat simul multa quæ intersint sui. Impellitur quoque hoc stimulo, invitatur hoc præmio, ad persequendas remotiores res, et quas densa caligo tegat, donec tandem hauriat oculis pectoris, multas quas Natura negabat humanis visibus.

348. Porro facimus multa, imitatione solâ. Infans nondum conscius, imitatur quicquid vel videt vel audit, et vir adultus, et suæ spontis, inscius vel forsitan invitus adhuc tantum imitatur, ut acquirat, quamvis sæpe nolens mores et prolationem sermonis hominum cum quibus versatur. Infans discit omnem sermonem imitando, aliter, ut persuasum est quibusdam philo-

Eadem adulto homini sæpe minor, seni decrepito fere nulla est. Allicit natura hominem certa voluptate, tanquam præmio, ut organa sua, tum sensus tum motus, probe exerceat, quo utraque roborentur, et ipse simul multa sic discat quæ sui intersint. Hoc quoque stimulo impellitur, hoc præmio invitatur, ad res remotiores, et quas densa caligo tegat, persequendas, donec tandem multas, quas Natura visibus humanis negabat, oculis demum pectoris hauriat.

348. Porro, sola imitatione multa facimus, multa discimus. Imitatur nondum conscius infans quicquid vel videt vel audit; et vir adultus, et suæ spontis, inscius vel forsitan invitus, tantum adhuc imitatur, ut hominum quibuscum versatur mores et sermonis prolationem, quamvis sæpe nolens, acquirat. Omnem sermonem infans imitando discit, aliter, ut quibusdam persuasum est

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hands. The same is often less to the adult man, almost extinct in the decrepit old man. Nature entices man by a certain pleasure, as if by a reward, that he may exercise well his organs, as well of sensation as of motion, that both may be strengthened and he himself may thus learn at the same time many things which concern him. He is forced also by this stimulus, he is invited by this reward, to pursue more remote objects, and which a thick cloud covers, until at length he devours with the eyes of his breast, many things which Nature denied to human sight.

348. Moreover we do many things, we learn many things, by imitation alone. The infant not yet conscious, imitates whatever it either sees or hears, and man adult, and at his own freewill, unknowing or perhaps involuntarily yet so far imitates, that he acquires, although often unwilling the manners and the accent of the men with whom he is engaged. An infant

philosophis, mutum et turpe pecus futurus.

349. Huic quodammodo affinis est, altera illa, subita, et vehementior imitatio, quæ, dementiæ instar, non singulos tantum homines, sed totos populos, nonnunquam rapuit. Hac tanquam contagione, varii animi affectus, tristes, læti, ridiculi, ab unius vultu per omnium pectora dimanant. Ardor pugnæ, et quasi certæ fiducia victoriæ, ab alacri ducis cui confidunt milites vultu, totam aciem dicto citius pervadit, et multa millia pectorum pariter accendit: iidem vero milites, victoria jam parta, unius vel ignoti hominis terrore perculsi, turpiter terga dederunt, nullo modo coërcendi.

350. Quin et fanaticorum quorundam furor, simili modo aliquando diffusus est; hominesque se sanos credentes, qui talem insaniam tempsissent et irrisissent, solo visu

sophis futurus mutum et turpe pecus.

349. Quodammodo affinis huic est illa altera subita et vehementior imitatio, quæ, instar dementiæ, nonnunquam rapuit non tantum singulos homines sed totos populos. Varii affectus animi tristes, læti, ridiculi, dimanant hac, tanquam contagione, per pectora omnium, ab vultu uniûs. Ardor pugnæ, et quasi certa fiducia victoriæ, ab alacri vultu ducis cui milites confidunt, pervadit totam aciem citius dicto, et pariter accendit multa millia pectorum: vero iidem milites, victoriâ jam partâ perculsi terrore uniûs, vel ignoti hominis, turpiter dederunt terga, coërcendi nullo modo.

350. Quin et furor quorundam fanaticorum aliquando diffusus est simili modo; que homines credentes se sanos, qui tempsissent et irrisissent talem insaniam, ipsi facti sunt

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learns all language imitating, otherwise, as it has been persuaded to certain philosophers, likely to be a dumb and base brute.

349. In some manner allied to this is that other sudden and more violent imitation, which, like insanity, sometimes has hurried away not only individual men but the whole people. Various affections of the mind, sorrowful, joyful, ridiculous, flow from this, as if by contagion, through the breasts of all, from the countenance of one. The ardour of battle, and as it were a certain confidence of victory, from the cheerful countenance of a general whom the soldiers confide in, pervades an entire army quicker than speech, and equally inflames many thousands of breasts: but the same soldiers, the victory already being obtained, struck with the terror of one, even an unknown man, have basely turned their backs, to be restrained in no way.

350. Moreover the enthusiasm of some fanatics sometimes has been spread in a similar manner; and men believing themselves sound, who had despised

participes dementiæ, sole visu et auditu furentium.

et auditu furentium, ipsi dementiæ facti sunt participes.

351. Est par ratio quarundam affectionum nervosi generis: oscitationis, hysteriæ, epilepsiæ, quæ sæpe propagantur in mirum modum, visu solo.

351. Par ratio est affectionum quarundam nervosi generis; oscitationis, hysteriæ, epilepsiæ, quæ solo visu mirum in modum sæpe propagantur.

352. Etiam qui vocatur instinctus est causa motus notabilis in cæteris animalibus, haud levis momenti in homine ipso. Instructus hoc magistro, hospes novus in terris quærit mammam matris, præhendit papillam ore, et sugit, ope multorum musculorum conspirantium simul; actio haud ita facile imitanda adulto homini. Novit quoque regere binos oculos, ut decet, rectos musculis omnino distinctis, que habentibus diversos nervos, et convertere in eandem rem.

352. Instinctus etiam, qui vocatur, motus causa est, in cæteris animalibus notabilis, in homine ipso haud levis momenti. Hoc magistro instructus, novus in terris hospes mammam matris quærit, papillam ore prehendit, et, ope multorum musculorum simul conspirantium, sugit: actio adulto homini haud ita facile imitanda. Binos quoque oculos, musculis omnino distinctis, diversosque nervos habentibus, rectos, ut decet, regere, et in eandem rem convertere novit.

353. Varii appetitus quoque pertinent ad instinctum, quibus homo impellitur ad reficiendum pro-

353. Ad instinctum quoque pertinent appetitus varii, quibus ad proprium corpus reficiendum, ge-

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and ridiculed such insanity, themselves have become partakers of the madness, by the sole seeing and hearing of the frenzied persons.

351. There is a similar reason of certain affections of the nervous system; of yawning, of hysteria, of epilepsy, which often are propagated in a wonderful manner, by seeing alone.

352. Also that which is called instinct is a cause of motion remarkable in other animals, of no small moment in man himself. Instructed by this master, the stranger new in earth seeks the breast of the mother, seizes the nipple with the mouth, and sucks, by the aid of many muscles assisting together; an action not so easily to be imitated by the adult man. He knows how also to direct both eyes, as is proper, governed by muscles wholly distinct, and having different nerves, and to turn them upon the same object.

353. Various appetites also belong to instinct, by which man is impelled

nusque suum propagandum, homo impellitur. Fames itaque, sitis, cupido, motus excitant ad certos fines directos. Sunt et aliæ nonnunquam cupiditates definitæ, tum morbosæ, quam salutares, a statu corporis pendentes, instinctus referentes, quæ non immerito inter appetitus annumerantur: absorbentium, acescentium, herbarum, carnium salitarum, aromatum, et similium rerum desideria.

354. Propensiones bene multæ tum sano tum morbido corpori contingunt, variosque, plerumque non sine conscio homine, motus efficiunt: cujusmodi ad alvum evacuandam, urinam reddendam, tussim, sternutationem, oscitationem, artuum extensionem, et vomitum impellunt. Si levior fuerit propensio, voluntatis imperio aliquando utimur, ad motus naturales, quos excitare solet, reprimendos. Eadem vero gravior facta,

prium corpus que propagandum suum genus. Itaque fames, sitis, cupido, excitant motus directos ad certos fines. Sunt nonnunquam et aliæ definitæ cupiditates, tam morbosæ quam salutares, pendentes a statu corporis, referentes instinctus, quæ non immerito annumerantur inter appetitus: desideria absorbentium, acescentium rerum herbarum, salitarum carnium, aromatum et similium.

354. Bene multæ propensiones contingunt tum sano tum morbido corpori, que efficiunt varios motus, non sine homine plerumque conscio; cujusmodi impellunt ad evacuandam alvum, reddendam urinam, tussim, sternutationem, oscitationem, extensionem artuum, et vomitum. Si propensio fuerit levior, aliquando utimur imperio voluntatis ad reprimendos naturales motus quos solet excitare. Vero eadem facta gravior,

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to recruit his own body, and to propagate his species. Therefore hunger, thirst, desire, excite motions directed to certain ends. There are sometimes also other definite desires, as well morbid as salutary, depending upon the state of the body, resembling instinct, which not undeservedly are ranked amongst the appetites: the desires of absorbing, of acescent things, of vegetables, salted meats, aromatics, and the like.

354. Very many propensities belong as well to the sound as to the diseased body, and produce various motions, not without the man for the most part being conscious; some of which sort impel to evacuate the belly, to void the urine, to coughing, sneezing, yawning, the extension of the limbs, and vomiting. If the propensity should be slighter, sometimes we use the control of the will to repress the natural motions which it is accustomed to excite. But the same become more urgent, it cannot be hindered but that at length it produces its own motions.

nequit impediri quin demum efficiat suos motus.

355. Multi et miri motus fiunt in corpore ex tot variis causis, eo plures, et sæpe minus intellecti, quòd partes ipsæ intactæ moventur stimulo, qualiscunque is fuerit, admoto aliis et remotis partibus. Hoc solet vocari consensus vel nervosa sympathia: scientia cujûs erit imprimis utilis medico, tum ad dignoscendos tum ad sanandos morbos.

356. Totum corpus est una machina, variæ partes que variæ actiones cujûs conspirant ad certum finem. Quædam partes illius funguntur munere proprio sibi: vero longe plures habent functionem communem cum aliis partibus: neque possunt certæ partes affici, quin tota machina facta particeps ejûsdem affectionis subeat graves mutationes. Hinc iste generalis consensus quo fere omnes partes corporis reguntur: hinc

impediri nequit quin suos demum motus efficiat.

355. Multi et miri ex tot variis causis in corpore motus fiunt, eo plures, et sæpe minus intellecti, quod partes ipsæ intactæ moventur stimulo, qualiscunque is fuerit, aliis et remotis partibus admoto. Hoc, consensus, vel sympathia nervosa, vocari solet: cujus scientia, medico, tum ad dignoscendos tum ad sanandos morbos, imprimis utilis erit.

356. Totum corpus una machina est, cujus variæ partes, variæque actiones, ad certum finem conspirant. Partes quædam illius munere sibi proprio funguntur: longe vero plures communem cum aliis partibus functionem habent: neque certæ partes affici possunt, quin tota machina, ejusdem affectionis particeps facta, graves mutationes subeat. Hinc consensus iste generalis, quo omnes fere corporis partes reguntur; hinc quoque consensus

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355. Many and wonderful motions takes place in the body from so many various causes, so much the more, and often less understood, because the parts themselves untouched are excited by a stimulus, whatever kind it may have been, applied to other and remote parts. This is accustomed to be called consent or nervous sympathy: the knowledge of which will be especially useful to the physician, as well to distinguish as to cure diseases.

356. The whole body is a single machine, the various parts and the various actions of which conspire for a certain purpose. Certain parts of it perform a duty peculiar to themselves: but by far the more have a function common with other parts: nor can certain parts be affected without that the whole machine rendered a partaker of the same affection undergoes serious changes. Hence that general agreement by which almost all the parts of the body are governed: hence also that special consent, by which it happens that the

ille specialis, quo fit ut partes quæ communi munere funguntur, semet invicem afficiant, reliquo corpore parum vel nihil mutato.

357. Generalis consensus observatur inter cerebrum et totum genus nervosum, ideoque inter cerebrum et universum corpus: quod profecto nil mirum, quippe cujus vis omnis a cerebro derivetur. Porro, consensus vix minus generalis intercedit inter ventriculum et totum genus nervosum: quin et cutis ipsa, membrana reticulata, vasis nervisque probe instructa, tantum consensum cum reliquis partibus corporis habet, ut parva admodum ejus pars, certa ratione affecta, totam afficiat, et in remotis corporis partibus, ventriculo, renibus, et universo genere nervoso, miras mutationes inducat.

358. Specialis consensus multa exempla sunt: inter binos oculos,

quoque ille specialis consensus, quo fit ut partes quæ funguntur communi munere, invicem afficiant semet, reliquo corpore parum vel nihil mutato.

357. Generalis consensus observatur inter cerebrum et totum nervosum genus, que ideo inter cerebrum et universum corpus, quod profectò nil mirum, quippe cujûs omnis vis derivetur a cerebro. Porro consensus vix minus generalis intercedit inter ventriculum et totum nervosum genus; quin et cutis ipsa, reticulata membrana, probe instructa vasis que nervis, habet tantum consensum cum reliquis partibus corporis, ut admodum parva pars ejus, affecta certâ ratione, afficiat totam, et inducat miras mutationes in remotis partibus corporis, ventriculo, renibus, et universo nervoso genere.

358. Sunt multa exempla specialis consensûs, inter binos oculos, inter re-

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parts which discharge a common duty, in turn may affect themselves, the rest of the body being little or not at all changed.

357. A general consent is observed between the brain and the whole nervous system, and consequently between the brain and the entire body, which truly is not at all wonderful, as being that of which all the power is derived from the brain. Moreover a consent scarcely less general exists between the stomach and the whole nervous system; moreover the skin itself, the cellular membrane, well furnished with vessels and nerves, has so great a sympathy with the remaining parts of the body, that a very small part of it, being affected in a certain manner, may affect the whole, and may induce wonderful changes in remote parts of the body, the stomach, kidneys, and the whole nervous system.

358. There are many examples of special consent between the two eyes,

tinam et musculum ejusdem oculi, inter uterum et mammas, inter pulmonem et transversum septum, inter fauces et ventriculum, inter varias partes intestinorum, inter ventriculum, vel intestinum rectum, et musculos abdominis et transversum septum.

359. Quidam consensus sunt naturales, quidam morbosi: scilicet, alii observantur in sano corpore, conducentes vel plane necessarii ad munera vitæ et sanitatis; alii non ostendunt se, nisi morbo jam existente, que sunt signum et pars ejus. Hujusmodi observantur inter renem et ventriculum, nares vel asperam arteriam et transversum septum, pedes et ventriculum, in calculo, podagrâ, hysteria, gravedine.

360. Postremo, nonnulli consensus nunquam observandi in sanitate, etiam insoliti in morbis, observati sunt in quibus-

inter retinam et musculum pupillæ ejusdem oculi, inter uterum et mammas, inter pulmonem et septum transversum, inter fauces et ventriculum, inter varias partes intestinorum, inter ventriculum vel intestinum rectum et musculos abdominis et septum transversum.

359. Consensus quidam naturales, quidam morbosi sunt; scilicet, alii in sano corpore observantur, ad vitæ et sanitatis munera conducentes, vel plane necessarii; alii non nisi morbo jam existente se ostendunt, ejusque signum et pars sunt. Hujusmodi inter renem et ventriculum, nares vel asperam arteriam et septum transversum, pedes et ventriculum, in calculo, podagra, hysteria, gravedine, observantur.

360. Postremo, nonnulli consensus in sanitate nunquam observandi, etiam in morbis insoliti, in quibusdam morborum exemplis ob-

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between the retina and the muscle of the pupil of the same eye, between the uterus and mammæ, between the lungs and diaphragm, between the fauces and stomach, between the various portions of the intestines, between the stomach, or intestinum rectum, and the muscles of the abdomen and the diaphragm.

359. Some consents are natural, some diseased: that is, some are observed in the healthy body, conducing or clearly necessary to the functions of life and health; others do not shew themselves, except in disease already existing, and are a sign and part of it. Some of this kind are observed between the kidney and the stomach, the nostrils or trachea and diaphragm, the feet and stomach, in calculus, gout, hysteria, coryza.

360. Lastly, some consents never to be observed in health, even unusual in diseases, have been observed in some examples of diseases; as locked-jaw

servati sunt; veluti trismus a vulnere, quamvis fortasse levissimo; vel alii rarissimi, veluti dolor et calor plantarum pedum ab ulcere in vesica; vel dolor brachii immanis, et tandem lethalis, inter urinam reddendam.

361. Ratio harum rerum satis obscura; neque plena explicatio hactenus data est. Juvat tamen monuisse plerosque consensus, tum generales tum speciales, pendere a nexu, quem omnes corporis partes cum cerebro habent: idque certa ratione certo stimulo (ubicunque is demum admotus fuerit) affectum, vel statum universi generis nervosi mutare, vel quasdam præ cæteris partes ad motum incitare. Secto enim, vel compresso, vel obstructo, vel quovis modo læso, nervo alterutrius partium quæ consentiunt, vel demum, læso multum ipso cerebro, consensus nullus est; quamvis partes ipsæ ad contactum sti-

dam exemplis morborum; veluti trismus a vulnere, quamvis fortasse levissimo; vel alii rarissimi, veluti dolor et calor plantarum pedum ab ulcere in vesicâ; vel immanis, et tandem lethalis dolor brachii inter reddendam urinam.

361. Ratio harum rerum satis obscura; neque plena explicatio data est hactenus. Tamen juvat monuisse plerosque consensus, tum generales tum speciales, pendere a nexu quem omnes partes corporis habent cum cerebro: que id, affectum certâ ratione certo stimulo (ubicunque is demum admotus fuerit,) vel mutare statum universi nervosi generis, vel incitare quasdam partes præ cæteris ad motum. Enim nervo alterutrius partium quæ consentiunt, secto, vel compresso, vel obstructo, vel læso quovis modo, vel demum cerebro ipso multum læso, est nullus consensus; quamvis partes ipsæ, ad contactum sti-

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from a wound, although perhaps very slight; or others very rare, as pain and heat of the soles of the feet from an ulcer in the bladder; or a dreadful, and at length fatal pain of the arm during voiding the urine.

361. The cause of these things is sufficiently obscure; nor a full explanation has been given hitherto. However it benefits to have admonished that many sympathies, as well general as special, depend upon the connexion which all parts of the body have with the brain; and that it, affected in a certain manner by a certain stimulus (wheresoever it indeed has been applied,) either changes the state of the whole nervous system, or excites certain parts before others to motion. For the nerve of one or other of the parts which consent, being cut, or compressed, or obstructed, or injured in any manner, or indeed the brain itself being much injured, there is no sympathy; although the parts themselves, on the feel of a stimulus, may shew that they had not lost their own moving power.

muli, ostenderent se non amisisse suam moventem vim.

362. Vero alii consensus utriusque generis oriuntur a vicinitate partium, conjunctione vasorum vehentium sanguinem, nexu nervorum, reticulatâ membranâ extensâ ab aliâ ad aliam; veluti totius cutis, tunicæ adnatæ cum retina et aliis internis partibus oculi; intestini recti cum vesicâ et utero; vesicæ, cum ostio urethræ; tamen, fatendum est, consensus, qui observantur inter partes quæ longe distant, rarissime accepisse explicationem hoc modo; que multos perdidisse operam, qui laboraverant, haud mediocri industriâ et acumine, ut detegerent vel minutissimas conjunctiones arteriarum aut nervorum consentientium partium.

363. Quidam insoliti morbosi consensus videntur oriri a parte jam præter solitum sentiente, et

muli se vim suam moventem non amisisse ostenderent.

362. Alii vero consensus, utriusque generis, a vicinitate partium, vasorum sanguinem vehentium conjunctione, nervorum nexu, membrana reticulata ab alia ad aliam extensa, oriuntur; veluti totius cutis, tunicæ adnatæ cum retina et aliis partibus internis oculi; intestini recti cum vesica et utero, vesicæ cum ostio urethræ: fatendum tamen est, consensus, qui inter partes quæ longe distant observantur, rarissime hoc modo explicationem accepisse; multosque operam perdidisse, qui industria et acumine haud mediocri laboraverant, ut conjunctiones vel minutissimas, arteriarum, aut nervorum partium consentientium, detegerent.

363. Consensus quidam insoliti, morbosi, oriri videntur a parte jam præter solitum sentiente, et mobili,

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362. But some sympathies of both kind arise from contiguity of parts, union of the vessels carrying blood, the connexion of nerves, the reticulated membrane extended from one to the other; as of the whole skin, of the tunica adnata with the retina and other internal parts of the eye; of the intestinum rectum, with the bladder and uterus; of the bladder, with the orifice of the urethra: however, it must be confessed, that the sympathies, which are observed between parts which are far distant, very seldom have admitted of explanation in this manner: and that many have lost their labour who had endeavoured, with no inconsiderable industry and acumen, that they might detect even the most minute anastomoses of the arteries or nerves of the sympathising parts.

363. Some unusual diseased sympathies seem to arise from the part being already unusually sensitive, and irritable and weak, and consequently

et debili, ideoque ab aliarum partium statu, vitiis, irritamentis, plus æquo patiente. Hæc videtur esse ratio, cur multi morbi a causa generali provenientes, in partes jam debiles aut morbidas facilius incumbant.

364. Plurimi denique motus in corpore, tum sano, sed multo magis si morbidum fuerit, excitantur: qui sæpe præter spem multa incommoda, multa pericula, multa mala jam urgentia, summovent, morbos vel arcent vel depellunt, et sic totam machinam diu incolumem præstant (65, et seqq.)

365. Adhuc sub judice lis est de natura et potestatibus hujus autocrateiæ: nimirum, sive ad leges motus animalis generales referendi sint motus isti salutares, sive ipsa machina animalis vim habeat specialem et definitam, curandi, ne quid ipsa detrimenti capiat, motus-

mobili et debili, quæ ideo patiente plus æquo ab statu, vitiis, irritamentis aliarum partium. Hæc videtur esse ratio cur multi morbi provenientes a generali causâ, facilius incumbant in partes jam debiles aut morbidas.

364. Denique, plurimi motus excitantur in corpore, tum sano, sed multo magis si fuerit morbidum, qui sæpe, præter spem, summovent multa incommoda, multa pericula, multa mala, jam urgentia, vel arcent vel depellunt morbos, et sic diu præstant totam machinam incolumem.

365. Lis est adhuc sub judice de naturâ et potestatibus hujus autocrateiæ: nimirum, sive isti salutares motus referendi sint ad generales leges animalis motûs sive animalis machina ipsa, habeat specialem et definitam vim curandi, ne ipsa capiat quid detrimenti, quæ excitandi

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suffering more than proper from the state, disorders, excitements of other parts. This seems to be the reason why many diseases proceeding from a general cause, more easily fall upon parts already weak or diseased.

364. Finally, very many motions are excited in the body, as well when sound, but much more if it should be diseased, which often, beyond expectation, remove many inconveniences, many dangers, many evils, now pressing, either keep off or drive away diseases, and thus for a long time preserve the entire machine safe.

365. The dispute is still before the judge concerning the nature and powers of this autocrateia: namely, whether those salutary motions are to be referred to the general laws of animal motion, or the animal machine itself, possesses a specific and definite power of providing lest itself takes any detriment, and of exciting motions such as it may behove for this purpose.

motus quales oporteat ad hunc finem.

366. Est certissimum multas res, natura quarum est sopire et compescere motus, aliquando excitare motus validissimos, et quam maxime salubres. Neque, tamen, hoc adimit litem; quoniam, secundum communes leges animalis motûs, quas habemus satis perspectas, plurimæ causæ istiusmodi possint dare satis validum stimulum variis modis, secundum varias conditiones corporis, que diversas partes quæ afficiuntur. Debilitas ipsa sæpe facit hoc, et fere quicquid impedit solitas actiones organorum.

367. Medici non defuerunt nec parvi nominis, qui retulerint omnes motus hujusmodi ad mentem ipsam, judicantem quid periculi instaret, et quomodo esset summovendum, et igitur excitantem tales motus quales crederet aptissimos ad eum finem.

que excitandi quales ad hunc finem oporteat.

366. Certissimum est, multas res, quarum natura est motus sopire et compescere, motus aliquando validissimos, et quam maxime salubres, excitare. Neque tamen hoc litem adimit; quoniam, secundum leges communes motus animalis, quas satis perspectas habemus, plurimæ istiusmodi causæ, variis modis secundum varias corporis conditiones, diversasque partes quæ afficiuntur, stimulum satis validum dare possint. Ipsa debilitas hoc sæpe facit, et quicquid fere solitas orgnaorum actiones impedit.

367. Non defuerunt medici, nec parvi nominis, qui omnes hujusmodi motus ad mentem ipsam retulerint, judicantem, quid periculi instaret, et quomodo summovendum esset; et igitur tales motus excitantem, quales crederet ad eum finem aptissimos.

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366. It is very certain that many things, the nature of which is to lull and restrain motions, sometimes excite motions the most powerful, and most healthy possible. Nor, however, does this take away the dispute; because, according to the common laws of animal motion, which we have sufficiently perceived, very many causes of that kind may produce a sufficiently powerful stimulus in various ways, according to the various conditions of the body, and the different parts which are affected. Debility itself often does this, and commonly whatever impedes the usual actions of the organs.

367. Physicians have not been wanting nor of little reputation, who have referred all motions of this sort to the mind itself, judging what danger was impending, and in what manner it was to be removed, and therefore exciting such motions as it believed most fitted to that end.

368. Nemo qui Naturam contemplatur tam excors erit, qui negaverit, multos quos sæpe excitat motus saluberrimos esse, et medicis igitur quantum fieri possit imitandos et promovendos: verum nec quisquam, qui propriis oculis vult fidere, non viderit alios eorum bene multos, inutiles, nimios, noxios esse, et medicis ideo sopiendos, compescendos, temperandos, ut ægrum duplici periculo surripiant. Quod si omnes isti motus, ut quidam revera sunt, summo consilio, et sapientia instituti essent, non eo magis ad mentis actionem referri debuissent: nimirum, qui nullo modo a mente pendeant; quorum plerumque mens non conscia sit; quos sua sponte excitare nequeat; neque ab alia causa excitatos, aut impedire aut temperare; qui denique in stolidissimo hominum, aut in bellua, neque vitii neque remedii quod adhibetur conscio, pariter ac

368. Nemo qui contemplatur Naturam erit tam excors, qui negaverit multos motus quos sæpe excitat esse saluberrimos, et igitur imitandos et promovendos, quantum possit fieri, medicis: nec verum quisquam, qui vult fidere propriis oculis, non viderit bene multos alios eorum esse inutiles, nimios, noxios, et ideo sopiendos, compescendos, temperandos medicis, ut surripiant ægrum duplici periculo. Quod si omnes isti motus essent instituti, ut quidam revera sunt, summo consilio et sapientiâ, debuissent non magis eo referri ad actionem mentis; nimirum qui pendeant nullo modo a mente; quorum mens plerumque sit non conscia: quos nequeat excitare suâ sponte, neque aut impedire, aut temperare excitatos ab aliâ causâ; qui denique perficiantur in stolidissimo hominum, conscio neque vitii neque remedii quod adhibetur, aut in belluâ,

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368. No one who observes Nature will be so foolish, who could deny that many motions which she often excites are very salutary, and therefore to be imitated and promoted, as far as can be done, by physicians: nor indeed any one, who wishes to trust his own eyes, who could not observe that a great many others of them are useless, excessive, hurtful, and therefore to be lulled, restrained, moderated by physicians, that they snatch away the sick from a double danger. But if all these motions were instituted, as some truly are, with the greatest judgment and wisdom, they ought not the more, on that account, to be referred to the action of the mind: as being which can depend in no manner upon the mind; of which the mind generally is not conscious; which it cannot excite of its own accord, nor either prevent, or moderate when excited by any other cause; which indeed are performed in the most foolish of men, conscious neither of the disorder nor of the

pariter ac in sagacissimo et peritissimo philosopho aut medico. Medici discant interea quid boni sperandum sit, quid mali metuendum, a viribus quæ habent tam latum imperium in corpus; est non dubitandum quin dies ocyus serius attulerit lumen rationi, quamvis hactenus obscuræ, quâ fiunt.

in sagacissimo et peritissimo philosopho aut medico perficiantur. Discant interea medici, quid boni sperandum sit, quid mali metuendum, a viribus quæ tam latum imperium in corpus habent: rationi qua fiunt, quamvis hactenus obscuræ, non est dubitandum, quin serius ocyus dies lumen attulerit.

369. Omnes motus qui strictius vocantur animales, nempe, quotquot pendent a voluntate, et naturales et vitales ipsi, in quos habemus divisum imperium, reguntur in mirum modum consuetudine. Vis, velocitas, ordo, tempus, reditus, sensus, potissimum pendent ab hac. Motus, primo difficiles, nec perficiendi sine gravi sensu, et penitus voluntarii, sæpe repetiti, fiunt promptiores et faciliores; et tandem peraguntur, homine fere inscio, hoc est, non attendente. Permissi sibi, perficiuntur certo et solito ordine: ali-

369. Omnes motus qui strictius animales vocantur, nempe, quotquot a voluntate pendent, et ipsi naturales et vitales in quos divisum imperium habemus, mirum in modum reguntur consuetudine. Vis, velocitas, ordo, tempus, reditus, sensus, ab hac potissimum pendent. Motus primo difficiles, nec sine gravi sensu perficiendi, et penitus voluntarii, sæpe repetiti, promptiores et faciliores fiunt; et tandem, inscio fere homine, hoc est, non attendente, peraguntur. Sibi permissi, certo et solito ordine perfici-

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remedy which is administered, or in the brute, equally as in the most sagacious and skilful philosopher or physician. Let physicians learn in the mean time what advantage may be expected, what evil to be feared, from powers which have so extended an influence upon the body; it is not to be doubted but that time sooner or later will bring light to the manner, although hitherto obscure, by which they come to pass.

369. All the motions which more strictly are called the animal, for instance, as many as depend upon the will, also natural and vital ones themselves, over which we have a divided control, are governed to a wonderful degree by habit. Force, velocity, arrangement, time, return, feeling, chiefly depend upon it. Motions, at first difficult, nor to be performed without a troublesome feeling, and wholly voluntary, often repeated, become more ready and more easy; and at length are performed, the man almost not knowing it, that is, not attending. Left to themselves, they are performed

untur: aliquando etiam alieno aut novo ordine perfici nequeunt. Majorem vim et velocitatem motus musculi adipiscuntur usu, propter rationes (338, 339) memoratas. Quidam stimuli, motusque ab illis pendentes, qui incertis intervallis redire solebant, consuetudine ad certa tempora reducuntur; veluti cibi appetitus, propensio ad alvum evacuandam et urinam reddendam, et similia. Quin et novi appetitus consuetudine sæpe discuntur, haud ita facile dediscendi; veluti vini, theæ, coffeæ, nicotianæ, et multarum rerum, quas tantum abesset ut natura appeteremus, ut primo ingratæ et vix tolerabiles fuissent. Par ratio est, quod multi stimuli, validiores quam quos Natura necessarios fecit, post longam consuetudinem, necessarii fiant. Hinc factum est, ut homo seipsum, si cupiat, plurimum mutandi, et quasi denuo fabricandi, potestatem ha-

quando etiam nequeunt perfici alieno aut novo ordine. Musculi motus adipiscuntur majorem vim et velocitatem usu, propter rationes memoratas. Quidam stimuli, que motus pendentes ab illis, qui solebant redire incertis intervallis, reducuntur ad certa tempora consuetudine; veluti appetitus cibi, propensio ad evacuandam alvum, et reddendam urinam, et similia. Quin et novi appetitus sæpe discuntur consuetudine, haud dediscendi ita facile: veluti vini, theæ, coffeæ, nicotianæ, et multarum rerum, quas, tantum, abesset, ut appeteremus naturâ ut primo fuissent ingratæ, et vix tolerabiles. Ratio est par quod multi stimuli, validiores quam quos Natura fecit necessarios, post longam consuetudinem, fiant necessarii. Hinc factum est, ut homo, si cupiat, habeat potestatem mutandi seipsum plurimum, et quasi fabricandi denuo; res

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in a certain and habitual order: sometimes even they cannot be performed in a different or new order. The muscles of motion acquire a greater force and velocity by use, on account of the causes mentioned. Certain stimuli, and the motions depending upon them, which were accustomed to return at uncertain intervals, are reduced to certain times by habit; as the appetite for food, the propensity to evacuate the belly, and to void the urine, and the like. Moreover new appetites often are learned by habit, not to be unlearned so easily: as of wine, tea, coffee, tobacco, and many things, which, so much would be wanting, that we should desire by nature, that at first they were disagreeable, and scarcely tolerable. The reason is similar that many stimuli, stronger than those which Nature made necessary, after long habit, may become necessary. Hence it is accomplished, that man, if he wishes, has the power of changing himself very much, and as it were of

haud mediocris utilitatis facientibus medicinam, ad corrigenda quædam vitia constitutionis, et præcavendos multos morbos; dummodo cautum fuerit mutatio, quam cupiunt et tentant efficere, lente et prudenter inducatur.

beat: res medicinam facientibus haud mediocris utilitatis, ad vitia quædam constitutionis corrigenda, et multos morbos præcavendos; dummodo cautum fuerit mutatio, quam cupiunt, et efficere tentant, lente et prudenter inducatur.

CAP. XII.—*De Vitiis motûs musculorum; nimiâ mobilitate, torpore, paralysi, spasmo.*

370. Illæ vires, unde motus musculorum fit, sunt obnoxiæ multis vitiis, magis dignis attentione eo quod plerique morbi corporis pendeant ex his; quatenus aliquid motus musculorum requiratur ad omnes functiones vivi animalis.

CAP. XII.—*De vitiis motûs musculorum; mobilitate nimia, torpore, paralysi, spasmo.*

370. VIRES illæ (304, et seqq.) unde motus musculorum fit multis vitiis obnoxiæ sunt, eo magis attentione dignis, quod ex his plerique corporis morbi pendeant; quatenus ad omnes functiones vivi animalis aliquid motus musculorum requiratur.

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fabricating himself anew; a thing of no trifling utility to those practising medicine, for correcting certain disorders of the constitution, and for preventing many diseases; provided precaution has been taken that the change, which they wish and try to effect, may be slowly and carefully induced.

CHAP. XII.—*Of the Disorders of Motion of the Muscles; on too great irritability, torpor, palsy, spasm.*

370. Those powers, whence motion of the muscles arises, are liable to many disorders, the more worthy attention, because most of the diseases of the body depend on them; inasmuch as something of the motion of muscles is required to all the functions of the living animal.

371. Mobilitas ipsa nimia ésse potest. Probe distinguendum est hanc inter et vigorem. Mobilitas est facilitas quâ fibræ musculorum ad contractionem cientur; vigor, contra, est vis qua ipsarum contractio perficitur. Nonnunquam juncta, sæpius adversa, hæc vitia observantur, contrariasque fere agnoscunt causas.

372. Mobilitas nimia est, si quando vel a stimulo justo leviore motus excitantur, vel motus nimii a solito stimulo; quod si acciderit, motus quoque abnormes esse solent.

373. Certum corporis temperamentum, aliquando hæreditarium, homines huic vitio opportunos reddit. Fœminæ plus quam viri mobiles sunt. Prima ætas valde mobilis, sæpe nimis; juventus minus quam infantia, plus quam virilis ætas. Senectus sæpe vix satis. Vitæ genus otiosum, sedentarium, victus plenus, opiparus, excretiones solitæ

371. Mobilitas ipsa potest esse nimia. Probe distinguendum est inter hanc et vigorem. Mobilitas est facilitas quâ fibræ musculorum cientur ad contractionem: vigor, contra est vis quâ contractio ipsarum perficitur. Hæc vitia nonnunquam observantur juncta, sæpius adversa, que fere agnoscunt contrarias causas.

372. Mobilitas est nimia, si quando motus excitantur, vel a stimulo leviore justo, vel nimii motus a solito stimulo; quod si acciderit, motus quoque solent esse abnormes.

373. Certum temperamentum corporis, aliquando hæreditarium, reddit homines opportunos huic vitio. Fœminæ sunt plus mobiles quam viri. Prima ætas valde mobilis, sæpe nimis, juventus minus quam infantia, plus quam virilis ætas; senectus sæpe vix satis. Otiosum sedentarium genus vitæ, plenus opiparus

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371. Irritability itself may be excessive. Truly, we must distinguish between this and vigour. Irritability is the facility with which the fibres of the muscles are excited to contraction: vigour, on the other hand, is the power with which the contraction of them is performed. These disorders sometimes are observed combined, more often opposed, and commonly acknowledge contrary causes.

372. Irritability is excessive, if at any time motions are excited, either by a stimulus slighter than proper, or excessive motions by the usual stimulus; which if it should happen, the motions also are accustomed to be irregular.

373. A certain temperament of body, sometimes hereditary, renders men subject to this disorder. Women are more irritable than men. The first age is very irritable, often too much so, youth less so than infancy, more than virile age; old age often scarcely sufficiently so. An idle sedentary kind of life, a full sumptuous diet, the usual excretions suppressed, fulness

victus, solitæ excretiones suppressæ, plenitudo vasorum quæ vehunt sanguinem, nonnunquam subita exinanitio eorundem, laxitas seu flacciditas solidarum partium; vero aliquando nimia tensio moventium fibrarum, usus diluentium, præsertim tepidorum, calor, quomodocunque admotus fuerit, acutior sensus, dant nimiam mobilitatem.

suppressæ, plenitudo vasorum quæ sanguinem vehunt, nonnunquam subita exinanitio eorundem, laxitas seu flacciditas solidarum partium; aliquando vero tensio nimia fibrarum moventium, usus diluentium, præsertim tepidorum, calor, quomodocunque admotus fuerit, sensus acutior, nimiam mobilitatem dant.

374. Potest esse generalis vel specialis, prout causæ ejûs admotæ fuerint, vel cuidam parti vel universo corpori.

374. Potest esse vel generalis vel specialis, prout causæ ejus vel parti cuidam vel universo corpori admotæ fuerint.

375. Generalis vigor est rarò morbosus: tamen, nimius vigor quarundam musculosarum partium præ aliis nonnunquam observatus est. Ingens vis omnium musculorum, præsertim qui parent voluntati, spectatur in captis mente, in phreniticis, et habetur, non immerito, morbida. Ratio tanti excessus videtur satis obscura; qui tamen est plane

375. Vigor generalis raro morbosus est: nimius tamen quârundam partium musculosarum, præ aliis, vigor, nonnunquam observatus est. In mente captis, in phreniticis, ingens vis omnium musculorum, præsertim qui voluntati parent, spectatur, et non immerito morbida habetur. Ratio tanti excessus satis obscura videtur; qui tamen ad sta-

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of the vessels which carry blood, sometimes the sudden emptying of the same, laxity or flaccidity of the solid parts; but, sometimes too great tension of the moving fibres, the use of diluents, especially tepid, heat, in whatsoever way it shall have been applied, too acute sensibility, produce excessive irritability.

374. It may be either general or special, according as the causes of it shall have been applied, either to any part or to the whole body.

375. General vigour is seldom morbid: however, excessive vigour of some muscular parts before others sometimes has been observed. Great power of all the muscles, especially of those which obey the will, is observed in the insane, in phrenitics, and is considered not undeservedly morbid. The cause of so great an excess seems sufficiently obsure; which, notwithstanding, is evidently to be referred to the state of the brain being disordered.

tum cerebri male se habentis plane referendus est.

376. Frequentior, et majoris momenti, vigoris excessus, observatur in fibris musculorum qui voluntatis imperium non agnoscunt, præsertim in iis qui sanguinem movent. Hujus circuitus sæpe præter solitum intenditur, non sine gravi valetudinis et vitæ incommodo aut periculo. Levior hujusmodi excessus, totum corpus pervadens, homines morbis inflammationem habentibus opportunos reddit, et diathesis phlogistica apud medicos vocari solet: gravior autem, et partis singularis, in ipsa inflammatione cernitur.

377. Nimius vigor fibrarum musculosarum oriri potest, vel a vi nervosâ (326) præter modum auctâ, veluti in insaniâ, phrenitide, aut vehemente animi affectu; vel a nimia fibrarum tensione (320, 4) quâ facilius et vehementius motus concipiant, veluti arteriarum disten-

referendus ad statum cerebri habentis se male.

376. Frequentior excessus vigoris, et majoris momenti, observatur in fibris musculorum qui non agnoscunt imperium voluntatis præsertim in iis qui movent sanguinem. Circuitus hujus sæpe intenditur præter solitum, non sine gravi incommodo aut periculo valetudinis et vitæ. Levior excessus hujûsmodi, pervadens totum corpus, reddit homines opportunos morbis habentibus inflammationem, et solet vocari apud medicos phlogistica diathesis: autem cernitur gravior, et singularis partis in inflammatione ipsâ.

377. Nimius vigor musculosarum fibrarum potest oriri vel a nervosâ vi aucta præter modum veluti in insaniâ, phrenitide, aut vehemente affectu animi; vel a nimia tensione fibrarum, quâ facilius et vehementius concipiant motus, veluti distentione arteria-

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376. A more frequent excess of vigour, and of greater consequence, is observed in the fibres of the muscles which do not acknowledge the control of the will, especially in those which move the blood. The circulation of this often is increased beyond what is usual, not without serious inconvenience or danger of health and life. A slighter excess of this kind, pervading the whole body, renders men liable to diseases having inflammation, and is accustomed to be called by physicians the phlogistic diathesis: but it is observed more severe, and of a particular part in inflammation itself.

377. Excessive vigour of the muscular fibres may arise either from the nervous power increased beyond moderation, as in insanity, phrenitis, or a violent affection of the mind; or from excessive tension of the fibres, by which they more easily and vehemently take on motions, as in distention of the arteries from great fulness of the vessels, on account of an abundance

rum a magnâ plenitudine vasorum, propter abundantiam sanguinis, vel fortasse a frigore, vel calore excipiente frigus, ut solet accidere verno tempore; vel, denique, nervosâ vi et tensione fibrarum nil mutatis, actio earundem erit nimia, a stimulo vehementiore solito admoto, vel a solito stimulo, si fibræ ipsæ jam factæ fuerint nimis mobiles.

378. Hinc effectus pariter boni que mali multarum rerum intelliguntur, et actio multorum remediorum, quibus utimur, ad incitandum, temperandum, dirigendum vim et motum moventium fibrarum, veluti tenuis vel lautæ diætæ, vini, opii, stimulantium, et quorundam evacuantium.

379. Vitia contraria nimiæ mobilitati, sunt torpor, nimio vigori debilitas. Torpor est imminuta mobilitas, neque sufficiens ad bene exercenda munera vitæ. Agnoscit causas

tione a magna plenitudine vasorum propter sanguinis abundantiam, vel fortasse a frigore vel calore frigus excipiente, ut tempore verno solet accidere; vel, denique, vi nervosa et tensione fibrarum nil mutatis, actio earundem nimia erit, a stimulo (305) solito vehementiore admoto, vel a solito stimulo, si fibræ ipsæ jam nimis mobiles (371, et seqq.) factæ fuerint.

378. Hinc intelliguntur effectus multarum rerum boni malique pariter, et actio multorum remediorum, quibus utimur, ad vim et motum fibrarum moventium incitandum, temperandum, dirigendum; veluti diætæ tenuis vel lautæ, vini, opii, stimulantium, et quorundam evacuantium.

379. Mobilitati nimiæ torpor, vigori nimio debilitas, contraria vitia sunt. Torpor est imminuta mobilitas, neque ad vitæ munera bene exercenda sufficiens. Con-

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of blood, or perhaps from cold, or heat succeeding cold, as is used to happen in spring time; or, lastly, the nervous power and tension of the fibres being no way changed, the action of the same will be excessive, from a stimulus more vehement than usual being applied, or even from the accustomed stimulus, if the fibres themselves shall have already become too irritable.

378. Hence the effects alike good and bad of many things are understood, and the action of many remedies, which we use, for inciting, moderating, directing the force and motion of the moving fibres, as of a poor or rich diet, of wine, opium, stimulants, and of certain evacuants.

379. The disorders opposed to too great irritability are torpor, to excessive vigour, debility. Torpor is a diminished irritability, nor sufficing for properly exercising the functions of life. It acknowledges causes contrary

trarias ac nimia mobilitas agnoscit causas; solidarum imprimis partium conditionem duriorem, rigidiorem, vel aliquando laxam, flaccidam, ætatem provectam, temperamentum peculiare, phlegmaticum, frigidum, parum sentiens, laborem nimium, perpetuum, frigus, victum tenuem, exhaustum corpus. Malum eo magis metuendum, et sanatu difficilius, quod, solitis naturæ viribus deficientibus, neque corpus ipsum quicquam conetur, neque remedia, alioquin efficacissima, multum juvent.

380. Debilitas sive infirmitas vocatur vitium, si quando motus musculorum, sive id genus quod a voluntate est, sive alterum, quod invitum est, justa vi non perficitur. Major vel minor, generalis vel partis singularis, omnes fere morbos comitatur, neque minima eorum pars est. Corpus quoque innumeris morbis obnoxium reddit, et

contrarias ac nimia mobilitas; imprimis duriorem, rigidiorem, vel aliquando laxam, flaccidam conditionem solidarum partium, provectam ætatem, peculiare phlegmaticum, frigidum, parum sentiens temperamentum, nimium perpetuum laborem, frigus, tenuem victum, exhaustum corpus. Malum magis metuendum, et difficilius sanatu, eo quod solitis viribus naturæ deficientibus, neque corpus ipsum conetur quicquam, neque remedia, alioquin efficacissima, juvent multum.

380. Vitium vocatur debilitas, sive infirmitas, si quando motus musculorum, sive id genus quod est a voluntate, sive alterum, quod est invitum, non perficitur justâ vi. Major vel minor, generalis vel singularis partis, comitatur fere omnes morbos, neque est minima pars eorum. Quoque reddit corpus obnoxium

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to excessive irritability; first of all a harder, more rigid, or sometimes a lax, flaccid condition of the solid parts, advanced age, a peculiar phlegmatic, cold, little sensitive temperament, too constant labour, cold, thin diet, exhausted body. An evil the more to be feared, and the more difficult to be cured, because the usual powers of nature failing, neither does the body itself endeavour any thing, nor do remedies, otherwise very efficacious, assist much.

380. The disease is called debility, or weakness, if at any time the motion of the muscles, whether it be that kind which is from the will, or that other, which is involuntary, is not performed with due power. A greater or less, general or of a particular part, accompanies almost all diseases, nor is it the least part of them. It also renders the body liable to innumerable diseases,

innumeris morbis, et objicit quasi inerme. Sæpe pendet a primâ et congenitâ fabricatione corporis, penitus corrigenda nullis remediis, nullo genere vitæ. Varia vis et robur quoque contingunt variis ætatibus, et quod vir perfecerit facile, aut tulerit impune florente ætate, idem oppresserit, vel sustulerit e medio puerum vel senem. Sæpe, itaque, potest vix haberi morbosa. At debilitas præter solitum et vere morbosa, accidit a minutâ nervosâ vi, cerebro que nervis habentibus se male, musculis participantibus vitia eorum, aut corruptis propriis, debitâ tensione fibrarum sublatâ, vel nimiâ aut diuturnâ distentione earum, vel ipsis factis rigidis et torpidis, corpore exhausto parco victu, inediâ, exinanitione, que demum, morbis afficientibus vel totum corpus vel aliquas partes.

381. Summa debilitas, scilicet, vires musculorum

quasi inerme objicit. A prima et congenita corporis fabricatione sæpe pendet, nullis remediis, nullo vitæ genere, penitus corrigenda. Varia quoque vis et robur variis ætatibus contingunt, et quod vir, florente ætate, facile perfecerit, aut impune tulerit, idem, puerum vel senem, oppresserit, vel e medio sustulerit. Sæpe itaque vix morbosa haberi potest. At debilitas præter solitum et vere morbosa accidit, a vi (326) nervosa minuta, cerebro nervisque male se habentibus, musculis eorum vitia participantibus, aut propriis corruptis, debita fibrarum tensione (321, 2,) sublata, vel nimia aut diuturna earum distentione (324) vel ipsis rigidis et torpidis factis, corpore exhausto, victu parco, inediâ, exinanitione, morbisque, demum, vel totum corpus vel partes aliquas afficientibus.

381. Summa debilitas, vires scilicet musculorum penitus vel

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and exposes it as it were unarmed. It often depends upon the original and congenital structure of the body, to be thoroughly corrected by no remedies, by no kind of life. A various power and strength also belong to the various ages, and that which a man could have performed easily, or have borne with impunity in the prime of his age, the same would oppress or would remove from the midst of us a boy or an old man. Often, therefore, it can scarcely be considered morbid. But a debility unusual and truly diseased, comes on from diminished nervous energy, from the brain and nerves having themselves badly, the muscles partaking of the disorders of them, or injured by their own, the due tone of the fibres being destroyed, either by excessive or long continued distention of them, or themselves become stiff and torpid, from the body being exhausted by spare diet, fasting, evacuation, and lastly, diseases affecting either the whole body or some parts.

381. Extreme debility, that is, the powers of the muscles almost or

pene deletæ, paralysis vocatur. Est vel generalis, vel quorundam tantum musculorum. Generalis oritur a vitiis cerebri nervorumque, aliquando parum perspectis, neque scalpello anatomico detegendis; scilicet, vis ipsa nervosa deficit, fabrica organorum adhuc integra; sæpe tamen compressio, obstructio, læsio, inundatio sanguinis, seri, puris, tumores, &c. deteguntur. A quibusdam venenis nervos male afficientibus sæpe nascitur, fumis metallorum quorundam, veluti argenti vivi, plumbi, &c. nonnunquam a morbis partium, a cerebro, et musculis solutis valde remotarum, veluti a Colica Pictonum. Singulorum musculorum paralysis, sed minus perfecta, sæpe fit, intactis cerebro nervisque, a gravi et diuturno dolore, inflammatione, tensione nimia vel nimis diuturna (324) relaxatione, quiete, vel fabrica ipsorum corrupta, qualis,

pene vel penitus deletæ, vocatur paralysis. Est vel generalis vel tantum quorundam musculorum. Generalis oritur a vitiis cerebri que nervorum, aliquando parum perspectis, neque detegendis anatomico scalpello; scilicet, nervosa vis ipsa deficit, fabricâ organorum adhuc integrâ; tamen compressio, obstructio, læsio, inundatio sanguinis, seri, puris, tumores, &c. sæpe deteguntur. Sæpe nascitur a quibusdam venenis male afficientibus nervos, fumis quorundam metallorum, veluti vivi argenti, plumbi, &c. nonnunquam a morbis partium, remotarum a cerebro, et musculis valde solutis, veluti a ColicaPictonum. Paralysis singulorum musculorum, sed minus perfecta, sæpe fit, cerebro que nervis intactis, a gravi et diuturno dolore, inflammatione, nimiâ vel nimis diuturnâ tensione, relaxatione, quiete, vel fabricâ ipsorum corruptâ, qualis solet ac-

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entirely destroyed, is called paralysis. It is either general or only of certain muscles. General arises from disorders of the brain and nerves, sometimes little understood, nor to be detected by the anatomist with the scalpel; that is, the nervous energy itself fails, the fabric of the organs as yet being entire; however compression, obstruction, lesion, inundation of blood, of serum, of pus, tumours, &c. often are detected. It often arises from certain poisons disordering the nerves, the fumes of certain metals, for instance of quicksilver, lead, &c, sometimes from diseases of parts, removed from the brain, and the muscles being very much paralysed, as from the Colica Pictonum. Paralysis of particular muscles, but less complete, often arises, the brain and nerves being unhurt, from severe and lasting pain, inflammation, excessive or over long continue tension, relaxation, rest, or the structure of them being injured, such as is accustomed to

cidere post rheumatismum, podagram, luxationem, fracturas ossium, suppressionem urinæ in vesicâ.

post rheumatismum, podagram, luxationem, fracturas ossium, suppressionem urinæ in vesica, solet accidere.

382. Vero paralysis quæ habetur generalis, et quæ oritur a vitio cerebri, raro est universi corporis. Plerumque spectamus paralyticos captos altero latere. Hæc vocatur hemiplegia. Fertur, et sane jam confirmatur observationibus plurimorum medicorum, adversum latus ab eo in quo vitium cerebri est, sic resolvi. Interdum quoque, altero latere cerebri læso, idem latus corporis convellitur, oppositum resolvitur. Si omnes partes infra caput, vel infra lumbos resolvuntur, appellatur paraplegia. In paralysi sensus plerumque superest, aliquando deletur, sæpe obtunditur. Raro, quod tamen est pessimum, motus, sensus, pulsus, calor artuum qui solvuntur, pereunt simul; scilicet, arteriæ ipsæ fiunt paralyticæ. Paralysis uni-

382. Paralysis vero quæ generalis habetur, et quæ a vitio cerebri oritur, raro universi corporis est. Paralyticos plerumque altero latere captos spectamus. Hæc hemiplegia vocatur. Fertur, et sane plurimorum jam medicorum observationibus confirmatur, latus adversum ab eo in quo cerebri vitium est, sic resolvi. Interdum quoque, læso altero cerebri latere, idem corporis latus convellitur, oppositum resolvitur. Si partes omnes infra caput, vel infra lumbos, resolvuntur, paraplegia appellatur. In paralysi, sensus plerumque superest, aliquando deletur, sæpe obtunditur. Raro, quod tamen pessimum est, motus, sensus, pulsus, calor artuum, qui solvuntur, simul pereunt; scilicet, ipsæ arteriæ paralyticæ fiunt.

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happen after rheumatism, foot gout, dislocation, fractures of the bones, suppression of urine in the bladder.

382. But the palsy which is considered general, and which arises from disorder of the brain, seldom is of the whole body. Generally we see paralytics seized on one side. This is called hemiplegia. It is said, and truly is now confirmed by the observations of a great many physicians, that the opposite side from that in which the disease of the brain exists, is thus palsied. Sometimes also, the one side of the brain being injured, the same side of the body is convulsed, the opposite is paralysed. If all the parts below the head or below the loins are palsied, it is called paraplegia. In paralysis feeling frequently remains, sometimes it is destroyed, often it is blunted. Rarely, which however is the worst of all, the motion, the feeling, the pulsation, the heat of the limbs which are palsied, perish at once; that is, the arteries themselves become paralytic. Paralysis of the whole body;

Paralysis universi corporis, quod ad motus voluntarios, cum anæsthesia (173) et sopore, apoplexia vocatur. Hæc a læso cerebro provenit: status vero huic simillimus inducitur narcoticis, opio, et ipso vino, vel alio potu generoso, ultra modum sumpto, et denique aëre acido carbonico corrupto in pulmonem recepto.

383. Superest et aliud motus musculorum vitium, idque non leve aut rarum; spasmus scilicet. Hic est actio musculorum vehemens, abnormis. In duplex genus distinguitur, tonicum et clonicum. Hoc sæpe convulsio vocatur, distinctionis causa ab altero, cui soli nomen spasmus dari solet.

384. Spasmus igitur est vehemens, constans, abnormis, contractio fibrarum musculosarum: convulsio vero, insolita, vehemens contractio, cum relaxatione alternans. Utriusque est, si musculos voluntarii mo-

versi corporis, quod ad voluntarios motus, cum anæsthesiâ et sopore vocatur apoplexia. Hæc provenit a læso cerebro: vero status simillimus huic inducitur, narcoticis, opio et vino ipso, vel alio generoso potu, sumpto ultra modum, et denique aëre corrupto carbonico acido recepto in pulmonem.

383. Aliud vitium et motus musculorum superest, que id non leve aut rarum: scilicet, spasmus. Hic est vehemens abnormis actio musculorum. Distinguitur in duplex genus, tonicum et clonicum. Hoc sæpe vocatur convulsio, causâ distinctionis ab altero, cui soli nomen spasmus solet dari.

384. Spasmus igitur est vehemens, constans, abnormis, contractio fibrarum musculorum: vero convulsio insolita vehemens contractio, alternans cum relaxatione. Est utriusque, si occupat

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as relates to voluntary motions, with anæsthesia and sopor is called apoplexy. This proceeds from an injured brain: but a state very like to it is induced by narcotics, opium and wine itself, or any othergenerous drink, taken beyond moderation, and indeed from air corrupted with carbonic acid taken into the lungs.

383. Another disorder also of the motion of muscles remains, and that is not slight or rare; namely, spasm. This is a violent irregular action of the muscles. It is divided into a double kind, the tonic and clonic. The latter often is called convulsion, by way of distinction from the other, to which alone the name spasm is accustomed to be given.

384. Spasm therefore is a violent, constant, irregular, contraction of the fibres of the muscles: but convulsion an unusual violent contraction, alternating with relaxation. It is the property of both, if it affects the

musculos voluntarii motus, perfici sine voluntate; vero affectio est una que eadem, sive incumbat musculis voluntarii motus, sive iis, actio quorum non pendet a voluntate. Porro, binæ species hujus mali agnoscunt similes causas, sæpe observantur in eodem ægro et altera sæpe convertitur in alteram.

tus occupat, sine voluntate perfici: affectio vero una eademque est, sive musculis voluntarii motus incumbat, sive iis quorum actio a voluntate non pendet. Porro, binæ species hujus mali similes causas agnoscunt, sæpe in eodem ægro observantur, et altera in alteram sæpe convertitur.

385. Nimis sentiens et nimis mobilis habitus corporis reddit homines opportunos spasmis; hinc malum familiare fœminis, infantibus, debilibus, luxuriosis, desidibus, plenis sanguine.

385. Habitus corporis nimis sentiens (143) et nimis mobilis (371, 4) homines spasmis opportunos reddit; hinc malum fœminis, infantibus, debilibus, luxuriosis, desidibus, sanguine plenis, familiare.

386. Inducitur hominibus jam factis proclivibus quocunque stimulo admoto cerebro, nervo, musculo, consentienti parti; cujusmodi sunt dentitio, vermes hospitantes in intestinis, que irritantes eadem, acris materies inficiens sanguinem, vel gravans ventriculum aut intestina, irritatio nervi, aut

386. Inducitur hominibus jam proclivibus factis, stimulo quocunque (305) cerebro, nervo, musculo, parti consentienti (325, 26, 55, et seqq.) admoto; cujusmodi sunt, dentitio, vermes in intestinis hospitantes, eademque irritantes, materies acris sanguinem inficiens, ventriculumve aut intestina gravans,

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muscles of voluntary motion, to be performed without the will; but the affection is one and the same, whether it fall upon the muscles of voluntary motion, or those, the action of which does not depend upon the will. Moreover, both kinds of this disorder acknowledge similar causes, often are observed in the same patient, and the one is often converted into the other.

385. A too sensitive and too irritable habit of body renders persons liable to spasms; hence a disorder common to women, infants, to the weak, the luxurious, the slothful, those full of blood.

386. It is brought on in persons already become disposed by any stimulus applied to the brain, a nerve, a muscle, a sympathising part; of which kind are dentition, worms lodging in the intestines, and irritating the same, an acrid matter infecting the blood, or oppressing the stomach or intestines, irritation of a nerve, or of the brain, from bone growing out beyond nature

irritatio nervi aut cerebri, ab osse præter naturam excrescente et in cerebrum premente, tumore, nimia plenitudine vasorum quæ sanguinem vehunt; dolor, vehemens animi affectus, subita exinanitio, venena quædam in corpus admissa. Sæpe tamen malum consuetudine ingravescens (369) levioribus causis excitatur, parum cognitis, neque facile observandis.

387. Multorum morborum spasmus causa est et effectus, et sæpe maxima pars: cognitu et sanatu pariter aliquando difficilis; nimirum qui tot induat formas, et signa tam varia edat, prout varias corporis partes affecerit, quarum functiones mirum in modum perturbet, intendat, impediat: malum in ipsis primordiis constitutionis plerumque hærens, neque ideo levi aut subita quavis mutatione summovendum.

cerebri, ab osse excrescente præter naturam et premente in cerebrum, tumore, nimiâ plenitudine vasorum quæ vehunt sanguinem; dolor, vehemens affectus animi, subita exinanitio, quædam venena admissa in corpus. Sæpe, tamen, malum, ingravescens consuetudine, excitatur levioribus causis, parum cognitis, neque facile observandis.

387. Spasmus est causa et effectus, et sæpe maxima pars multorum morborum: aliquando pariter difficilis cognitu et sanatu; nimirum qui induat tot formas et edat tam varia signa, prout affecerit varias partes corporis, functiones quarum perturbet, intendat, impediat in mirum modum: malum plerumque hærens in primordiis ipsis constitutionis, neque ideo summovendum quâvis levi aut subitâ mutatione.

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and pressing upon the brain, tumour, excessive fulness of the vessels which carry the blood; pain, violent affection of the mind, sudden evacuation, certain poisons admitted into the body. Often, however, the disorder, increasing by habit, is excited by slighter causes, little known, nor easily to be observed.

387. Spasm is a cause and effect, and often the greatest part of many diseases: sometimes equally difficult to be understood and to be cured; as being that which can put on so many forms and produce such various signs, according as it shall affect the various parts of the body, the functions of which it may disturb, increase, impede to a wonderful degree: a disorder for the most part inherent in the first principles themselves of the constitution, nor on that account to be removed by any slight or sudden change.

CAP. XIII. — *De Somno, que usibus et causis et varietatibus et vitiis, defectu, excessu, ejus; que noxis eorum; et de ratione et causis somniorum.*

CAP. XIII.—*De Somno; ejusque usibus, et causis, et varietatibus, et vitiis, defectu, excessu; eorumque noxis: et de ratione et causis somniorum.*

388. HOMO non semper valet ad exercendum sensum que voluntarium motum: que oportet utramque functionem feriari per intervalla, ut vires musculorum que nervorum exhaustæ exercitatione, reficiantur quiete et otio.

388. HOMO non semper valet ad sensum motumque voluntarium exercendum: utramque functionem oportet per intervalla feriari, ut vires musculorum nervorumque, exercitatione exhaustæ, quiete et otio reficiantur (3).

389. Alter status, quo sentimus bene, que regimus musculos voluntarii motus ad arbitrium, est vigilia: alter, quo est neque sensus neque voluntarius motus, vocatur somnus.

389. Alter status, quo bene sentimus, musculosque voluntarii motus ad arbitrium regimus, vigilia est: alter, quo neque sensus est, neque motus voluntarius, somnus vocatur.

390. Vero alteruter potest esse plus vel minus perfectus, ita ut homo nec

390. Alteruter vero plus minusve perfectus esse potest, ita ut

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CHAP. XIII.—*Of Sleep, and the uses and causes and varieties and disorders, deficiency, excess, of it; and the mischiefs of them; and of the nature and causes of dreams.*

388. MAN is not always competent to exercise sense and voluntary motion: and it behoves that each function cease at intervals, that the powers of the muscles and of the nerves exhausted by exercise, may be restored by rest and leisure.

389. One state, in which we feel much, and govern the muscles of voluntary motion at pleasure, is waking; the other, in which there is neither sense nor voluntary motion, is called sleep.

390. But either may be more or less perfect, so that a person neither sleeps

homo nec plene dormiat, neque vigilantis muneribus bene fungatur. Qui sanissimi altum dormiunt, iis neque motus voluntarius est, neque sensus externus; neque interni, si quis fuerit, memoria ulla: semisomnes autem quodammodo sentiunt, et multas res externas percipiunt, quamvis parum accurate; multum recordantur, imaginantur, cogitant, variisque animi affectibus agitantur; loquuntur sæpe, surgunt aliquando, vestes induunt, ambulant, multaque, vigilantium instar, faciunt. Actiones vero vitales, quin et naturales, pergunt etiam in somno quam perfectissimo, quamvis nonnihil lentiores quam in vigili plerumque observentur.

391. Post solitos diei labores, levem cœnam, Venerem modice cultam, suavissimus somnus obrepit, suadentibus tenebris et silentio noctis. Præcedunt amor quietis et animi pariter et corporis tranquilli-

dormiat plene, neque bene fungatur muneribus vigilantis. Iis, qui sanissimi dormiunt altum, est neque voluntarius motus neque externus sensus; neque ulla memoria interni si fuerit quis: autem semisomnes sentiunt quodammodo, et percipiunt multas externas res, quamvis parum accurate: recordantur, imaginantur, cogitant multum, que agitantur variis affectibus animi; sæpe loquuntur, aliquando surgunt, induunt vestes, ambulant, que faciunt multa instar vigilantium. Vero vitales, quin et naturales actiones, pergunt etiam in somno quam perfectissimo, quamvis plerumque observentur nonnihil lentiores quam in vigili.

391. Suavissimus somnus obrepit, post solitos labores diei, levem cœnam, Venerem modice cultam, tenebris et silentio noctis suadentibus. Amor quietis et tranquillitatis pariter animi et corporis,

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soundly, nor properly discharges the duties of a waking person. To these, who being very healthy sleep soundly, there is neither voluntary motion nor external sensation; nor any recollection of internal sensation if there have been any: but those half asleep feel in some degree, and perceive many external things, although little accurately: they recollect, imagine, think much, and are agitated by various emotions of the mind; they often talk, sometimes rise up, put on their clothes, walk, and do many things like waking persons. But the vital, besides also the natural actions, go on even during sleep the most perfect possible, although generally they are observed somewhat slower than in a person awake.

391. Very sweet sleep creeps on, after the accustomed labours of the day, a light supper, Venus moderately cultivated, the darkness and silence of night inviting. A love of quiet and tranquillity alike of mind and of body,

debilitas, lassitudo, sensus defatigationis, præsertim in iis musculis quibus usi sumus maxime, et oscitatio, et frequens et valida extensio artuum præcedunt; hebetudo externorum sensuum, confusio internorum, attentio distracta, neque parens voluntati, recordatio injussa, invita, imaginatio vaga, et demum credita, species delirii, postremo, oblivio omnium rerum: musculi fatigati et relaxati, possunt neque regere et sustinere singulas partes quibus adnectuntur, neque ideo totum corpus; palpebræ nictant, et tandem clauduntur; maxilla cadit, caput nutat, omnia membra leviter flexa quiescunt, et corpus ipsum flectitur antrorsum, nisi dormiens decumbat. Pulsus arteriarum fiunt tardiores et pleniores, respiratio lentior et profundior, et multi dormientes, stertunt; calor minuitur, et pleræque secretiones; et soliti appetitus et pro-

tatis, debilitas, lassitudo, defatigationis sensus, in iis musculis præsertim quibus maxime usi sumus, et oscitatio, et frequens et valida artuum extensio; sensuum externorum hebetudo, internorum confusio, attentio distracta, neque voluntati parens, recordatio injussa, invita, imaginatio vaga, et credita demum, delirii species, postremo, omnium rerum oblivio: musculi fatigati et relaxati, neque singulas quibus adnectuntur partes, neque ideo totum corpus, regere et sustinere possunt: palpebræ nictant, et tandem clauduntur; maxilla cadit, caput nutat, omnia membra leviter flexa quiescunt, et corpus ipsum antrorsum flectitur, nisi decumbat dormiens. Pulsus arteriarum tardiores et pleniores fiunt, respiratio lentior et profundior, et multi dormientes stertunt; calor minuitur, et pleræque secretiones; et soliti appetitus (353)

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debility, lassitude, a sense of fatigue, especially in those muscles which we have used most, also yawning, and a frequent and powerful extension of the limbs precede; dulness of the external senses, confusion of the internal, the attention distracted, nor obeying the will, recollection unbidden, involuntary, imagination wandering, and at last believed, a species of delirium, finally, oblivion of all things: the muscles fatigued and relaxed, are able neither to govern and support the several parts to which they are attached, nor consequently the whole body; the eyelids wink, and at length are shut; the jaw falls, the head nods, all the members slightly bent become quiet, and the body itself is bent forwards, except the sleeping person lies down. The pulsations of the arteries become slower and fuller, respiration slower and deeper, and many sleeping, snore; heat is diminished, and most of the

et propensiones (354) non percipiuntur.

392. Diuturnitas somni pendet multum ab ætate, constitutione, consuetudine, et demum corporis statu tempore quo somnus obrepserat. Finem eidem imponunt varii stimuli, vel extrinsecus admoti, vel intus orti, lux, strepitus, tactus rudior, fames, sitis, propensio ad urinam reddendam, &c. Tandem somnus rumpitur, neque adeo subito, quin perturbatio sensuum internorum, insomnium, hebetudo, et imperfectus externorum sensuum usus, plerumque observentur, et sæpe insomnii matutini recordemur, aliorum plerumque obliti. Expergiscimur demum, oscitamus, membra diu flexa extendimus, non secus ac dormituri feceramus; appetitus et propensiones naturales denuo percipimus; exiguo temporis spatio, omnium corporis animique facultatum compotes facti.

pensiones non percipiuntur.

392. Diuturnitas somni pendet multum ab ætate, constitutione, consuetudine, et demum statu corporis tempore quo somnus obrepserat. Varii stimuli, vel admoti extrinsecus, vel orti intus, imponunt finem eidem, lux, strepitus, rudior tactus, fames, sitis, propensio ad reddendam urinam, &c. Tandem somnus rumpitur, neque adeo subito, quin perturbatio internorum sensuum, insomnium, hebetudo, et imperfectus usus externorum sensuum plerumque observentur, et sæpe recordemur matutini insomnii, plerumque obliti aliorum. Demum expergiscimur, oscitamus, extendimus membra flexa diu, non secus ac dormituri feceramus; denuo percipimus appetitus et naturales propensiones; facti compotes omnium facultatum corporis que animi exiguo spatio temporis.

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secretions; and the accustomed appetites and propensities are not perceived.

392. The continuance of sleep depends much upon age, constitution, custom, and lastly the state of the body at the time at which the sleep had come on. Various stimuli, either applied from without, or arising within, put an end to the same, light, noise, rougher handling, hunger, thirst, a propensity to void the urine, &c. At length sleep is broken, nor so suddenly, but that perturbation of the internal senses, dreaming, dulness, and an imperfect use of the external senses for the most part may be observed, and frequently we recollect the morning dream, mostly forgetful of the others. At length we awake, we yawn, we extend the limbs bent a long time, in like manner as when about to sleep we had done; we again perceive the appetites and natural propensities; become masters of all the faculties of the body and mind in a short space of time.

393. Causa somni, nimirum plena et proxima causa, adhuc latet, et fortasse latebit diu. Male tribuitur nervis exhaustis et repletis vicissim suo fluido; quippe quia somnus, in plurimis exemplis, prorogetur facile, ubi fluidum, si revera quid tale inest nervis et cerebro, non potest non esse valde exhaustum; et sæpe producatur diu postquam nervi debent abundare quam maxime proprio fluido.

393. Causa somni, nimirum, plena et proxima causa, adhuc latet, et fortasse diu latebit. Male fluido suo nervis exhaustis vicissim et repletis tribuitur; quippe quia somnus, plurimis in exemplis, prorogetur facile, ubi fluidum, si tale quid revera nervis et cerebro inest, non potest non esse valde exhaustum; et sæpe producatur diu, postquam nervi fluido proprio debent quam maxime abundare.

394. Nec somnus melius dicitur oriri a compresso cerebro; enim plerumque nulla talis compressio potest ostendi, aut profecto fieri et sopor inductus cerebro compresso, differt multum a naturali somno. Enim ille nec reficit vires, nec potest ita rumpi quin æger relabatur in eundem, statim ut stimulus qui excitabat sublatus fuerit. Vero naturalis somnus, nihil omnino admoto quod liberet cerebrum a compressione, fa-

394. Nec melius a compresso cerebro somnus oriri dicitur; plerumque enim nulla talis compressio ostendi aut profecto fieri potest: et sopor, compresso cerebro inductus, differt multum a naturali somno. Ille enim nec vires reficit, nec ita rumpi potest, quin statim in eundem æger relabatur, ut stimulus qui excitabat sublatus fuerit. Somnus vero naturalis, nihil omnino admoto quod cerebrum a compres-

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393. The cause of sleep, that is the adequate and proximate cause, as yet lies hid, and perhaps will lie hid for a long time. It is badly attributed to the nerves exhausted and repleted by turns with their own fluid; namely, because sleep, in very many instances, may be deferred easily, when the fluid, if in truth any such thing exists in the nerves and brain, cannot fail to be very much exhausted; and often it is protracted long after that the nerves ought to abound the most possible with their proper fluid.

394. Nor is sleep more properly said to arise from a compressed brain; for generally no such compression can be shewn, or indeed take place; and the drowsiness induced by the brain being compressed, differs much from natural sleep. For it neither recruits the strength, nor can so be broken but that the patient relapses into the same, as soon as the stimulus which excited him has been removed. But natural sleep, nothing at all being applied which

sione liberet, stimulo quocunque facillime pellitur.

395. Docent omnia quæ somnum comitantur signa, universi generis nervosi, et imprimis cerebri, statum multum mutari. Qualis vero ista mutatio fuerit, non docent. Juvabit tamen novisse causas somni et vigiliarum remotas, quibus ignotus iste status inducitur, et quarum ope medici sæpe conantur, neque frustra, somnum, prout res postulaverint, temperare.

396. Sensus omnis, externus internusque pariter, omnis animi affectus, omnis actio musculorum genus nervosum excitant, hominemque vigilem præstant, eo certius, quo ipsa vehementiora fuerint. Sic vivida lux, strepitus, dolor, ira, gaudium, mœror, metus, anxietas, fames, sitis, cupido vehemens, motus corporis, memoria aut imaginatio vivida, cogitatio intensa, somnum adimunt. Nulla vero, aut le-

cillime pellitur quocunque stimulo.

395. Omnia signa, quæ comitantur somnum, docent, statum universi nervosi generis, et imprimis cerebri, multum mutari. Vero non docent qualis ista mutatio fuerit. Tamen, juvabit novisse remotas causas somni et vigilarum, quibus iste ignotus status inducitur, et ope quarum, medici sæpe conantur, neque frustra, temperare somnum prout res postulaverint.

396. Omnis sensus, pariter externus que internus, omnis affectus animi, omnis actio musculorum, excitant nervosum genus, que præstant hominem vigilem, eo certius, quo ipsa fuerint vehementiora. Sic vivida lux, strepitus, dolor, ira, gaudium, mœror, metus, anxietas, fames, sitis, vehemens cupido, motus corporis, vivida memoria aut imaginatio, intensa cogitatio, adimunt somnum. Vero

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could relieve the brain from compression, is very easily driven off by any stimulus.

395. All the signs, which accompany sleep, prove, that the state of the whole nervous system, and especially of the brain, is much changed. But they do not shew what kind that change may be. However, it will benefit to know the remote causes of sleep and watchfulness, by which that unknown state is induced, and by means of which, physicians often endeavour, nor in vain, to regulate sleep according as circumstances shall have required it.

396. Every sensation, alike external and internal, every affection of the mind, every action of the muscles, excite the nervous system, and keep a person awake, the more certainly, as they shall be more violent. Thus vivid light, noise, pain, anger, joy, grief, fear, anxiety, hunger, thirst, ardent desire, motion of the body, lively memory or imagination, intense thinking,

nulla, aut levior impressio in organa sensuum, susurrus apum, murmur labentis rivi, frigida plumbea oratio, denique, talis exercitatio memoriæ ipsiûs, qualis neque est nimis laboriosa, neque commovet mentem ullo modo, invitant atque conciliant somnum. Nimius impetus sanguinis versus caput, qualis sæpe accidit in febribus, pellit somnum: vero libera et æqualis distributio sanguinis per totum corpus, que imprimis extremas partes, sæpe inducit somnum. Quicquid solvit corpus, favet somno: hinc variæ exinanitiones, balneum, fotus, calor ipse aliquando utilia ad conciliandum somnum. Somnus faciliûs obrepit post cibum et post concubitum; scilicet, vehemente sensu pacato, et corpore ipso nonnihil soluto. Intensum et diuturnum frigus inducit somnum, haud facilem ruptu, sæpe continuatum morti. Denique sunt res,

vior, in organa sensuum impressio, susurrus apum, murmur labentis rivi, oratio frigida plumbea, ipsius denique memoriæ talis exercitatio, qualis neque nimis laboriosa est, neque mentem ullo modo commovet, somnum invitant atque conciliant. Sanguinis caput versus impetus nimius, qualis sæpe in febribus accidit, somnum pellit: libera vero et æqualis sanguinis per totum corpus, partesque imprimis extremas, distributio, somnum sæpe inducit. Quicquid corpus solvit, somno favet: hinc variæ exinanitiones, balneum, fotus, calor ipse, aliquando ad somnum conciliandum utilia. Post cibum et post concubitum somnus facilius obrepit; pacato scilicet vehemente sensu, et corpore ipso nonnihil soluto. Frigus intensum et diuturnum somnum inducit, haud facilem ruptu, sæpe morti continuatum. Denique, sunt res, quæ corpori admotæ, aut

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remove sleep. But none, or a slighter impression upon the organs of the senses, the hum of bees, the murmur of a gliding stream, a cold dull oration, lastly, such an exercise of memory itself, as neither is too laborious, nor excites the mind in any manner, invite and procure sleep. An excessive impetus of blood towards the head, such as often happens in fevers, repels sleep: but a free and equal distribution of the blood through the whole body, and especially the extreme parts, often induces sleep. Whatever relaxes the body, favours sleep: hence various evacuations, the bath, fomentation, heat itself are sometimes useful to procure sleep. Sleep more easily creeps on after food and after venery; that is, turbulent feeling being calmed, and the body itself somewhat relaxed. Intense and continued cold induces sleep, not easy to be broken, often continued to death. Indeed there are things, which applied to the body or received into it itself, not only do

in id ipsum receptæ, genus nervosum non modo non excitant, sed plane sopiunt, ad sensum motumque minus aptum reddunt, et sic altum somnum inducunt. Hujusmodi sunt quæ vocantur narcotica remedia, opium, et similia: quibus annumerare oportet vinum ipsum nimia copia sumptum, et vapores quosdam lethiferos, veluti carbonis ardentis. Postremo, ipsa vigilia somni quodammodo causa est, quatenus inter vigilias, homo sua organa plus minusve semper exerceat, et sic vim nervosam minuat, consumat. Et profecto, quo vehementius corpus exercetur, pari fere ratione premit somni necessitas.

quæ admotæ corpori aut receptæ in id ipsum, non modo non excitant nervosum genus, sed plane sopiunt, reddunt minus aptum ad sensum que motum, et sic inducunt altum somnum. Hujusmodi sunt quæ vocantur narcotica remedia, opium et similia: quibus oportet annumerare vinum ipsum sumptum nimiâ copiâ, et quosdam lethiferos vapores, veluti ardentis carbonis. Postremo, vigilia ipsa est quodammodo causa somni, quatenus inter vigilias, homo semper exerceat sua organa plus ve minus, et sic minuat, consumat, nervosam vim. Et profecto, quo vehementiùs corpus exercetur, fere pari ratione necessitas somni premit.

397. Tempus quod fœtus in utero latet somno fere transire videtur; et partus immaturi, sed superstites tamen, primos menses fere totos dormiunt. Infantes quoque

397. Fœtus videtur transire somno fere tempus quod latet in utero; et immaturi partus, sed tamen superstites, dormiunt fere totos primos menses. Infantes quoque solent

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not excite the nervous system, but altogether lull it, render it less fit for sensation and motion, and thus bring on deep sleep. Of this sort are what are called narcotic remedies, opium and the like: with which it behoves to reckon wine itself taken in too great quantity, and certain deadly vapours, as of burning charcoal. Finally, watching itself is in some measure a cause of sleep, inasmuch as during watchings, a person always exercises his organs more or less, and thus diminishes, consumes, the nervous power. And truly, the more violently the body is exercised, almost in an equal degree the necessity of sleep urges.

397. The fœtus seems to pass in sleep nearly the time during which it lies hid in the uterus: and premature births, but nevertheless surviving, sleep nearly the whole first months. Infants also are accustomed to sleep a great deal. Boys, and men who lead a laborious life, sleep more, and also more

dormire multum. Pueri, et homines qui degunt laboriosam vitam, dormiunt plus, et quoque altius, quam adulti, aut luxuriosi et desides, homines; scilicet qui bene exercent corpus, neque habent mentem laceratam curis. Leves somni, præmium et solatium laboris, virtutis, temperantiæ, haud facile conceduntur immerentibus.

398. Porro, dum corpus crescit, indies plus somni requiritur, scilicet qui confert haud parum ad reficiendum et alendum corpus. Homines dormiunt minus medio ætate. Autem consuetudo facit multum hic: alii sunt contenti somno quatuor horarum, alii consumunt decem horas et amplius de die somno. Quidam, fere confecti senio, facti somniculosi et torpidi, transierunt maximam partem temporis somno.

399. Usus somni satis apparet ex effectibus quos

multum dormire solent. Pueri, et homines qui vitam laboriosam degunt, plus quam adulti homines, aut luxuriosi et desides, et altius quoque dormiunt; scilicet qui corpus bene exercent, neque hoc cibo gravatum, neque mentem curis laceratam habent. Leves somni, laboris, virtutis, temperantiæ, præmium et solatium, immerentibus haud facile conceduntur.

398. Porro, dum crescit indies corpus, plus somni requiritur; scilicet qui ad corpus reficiendum et alendum haud parum confert. Media ætate, homines minus dormiunt. Consuetudo autem multum hic facit: alii quatuor horarum somno contenti sunt, alii decem et amplius horas de die somno consumunt. Quidam, senio fere confecti, somniculosi et torpidi facti, maximam temporis partem somno transierunt.

399. Usus somni ex effectibus quos in corpore habet satis apparet.

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soundly, than adult, or luxurious and indolent, persons; as being persons who properly exercise the body, nor have the mind distracted by cares. Light slumbers, the reward and solace of labour, virtue, temperance, are not easily granted to the undeserving.

398. Moreover, as long as the body is growing, daily more sleep is required, as that which contributes not a little to recruit and nourish the body. Persons sleep less at the middle age. But habit does a great deal here: some are content with the sleep of four hours, others consume ten hours and more of the day in sleep. Some, almost worn out with old age, become drowsy and torpid, have passed the greatest part of their time in sleep.

399. The use of sleep sufficiently appears from the effects which it has on the body. It renews the powers both of mind and body worn out by exercise:

Vires et animi et corporis, exercitatione consumptas, reficit: huic vigorem, illi alacritatem pristinam conciliat: musculos valido labore defessos, rigidos, dolentes, tremulos, iterum vividos, validos, et mobiles reddit: pulsus arteriarum, sub vesperem frequentiores evadentes, temperat et ad moderationem matutinam reducit: cibi concoctioni, et appositioni nutrimenti ad reparandam partium solidarum jacturam, favere videtur: secretiones et excretiones minuit; et humores secretos spissescere sinit, corpore scilicet minus sentiente et mobili facto. Hinc ad vitam et sanitatem conservandas, somnus non utilis modo, sed prorsus necessarius; et ad multos morbos sanandos vel levandos, præstantissimum remedium.

400. Defectus somni multimodis nocet; imprimis generi nervoso. Organa sensuum externorum et in-

habet in corpore. Reficit vires et animi et corporis consumptas exercitatione: conciliat vigorem huic, pristinam alacritatem illi: reddit musculos, defessos, rigidos, dolentes, tremulos valido labore, iterum vividos, validos, et mobiles: temperat pulsus arteriarum, evadentes frequentiores sub vesperem, et reducit ad matutinam moderationem: videtur favere concoctioni cibi, et appositioni nutrimenti ad reparandam jacturam solidarum partium; minuit secretiones et excretiones; et sinit secretos humores spissescere, scilicet, corpore facto minus sentiente et mobili. Hinc somnus non modo utilis, sed prorsus necessarius ad conservandas vitam et sanitatem; et præstantissimum remedium ad sanandos vel levandos multos morbos.

400. Defectus somni nocet multimodis; imprimis nervoso genere. Reddit organa externo-

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it restores vigour to the latter, its former alacrity to the former: it renders the muscles, wearied, stiff, painful, tremulous by hard labour, again lively, strong, and active: it moderates the pulsations of the arteries, becoming more frequent towards evening, and reduces them to the morning regularity: it seems to favour the digestion of the food, and the apposition of the nutriment to repair the loss of the solid parts; it diminishes the secretions and excretions; and permits the secreted humours to thicken, that is, by the body being rendered less sensitive and irritable. Hence sleep is not only useful, but absolutely necessary to preserve life and health; and a most excellent remedy for curing or relieving many diseases.

400. Want of sleep hurts in many ways; especially in the nervous system. It renders the organs of the external and internal senses, and of every kind

rum et internorum sensuum, que omnigeni motus, minus apta ad sua munera. Hinc sensus vel nulli vel imperfecti et depravati, dolor capitis, vertigo, imbecillitas, defectus memoriæ, species delirii, demum, insania ipsa; debilitas artuum, et imperfecta et inordinata actio vitalium organorum, frequentes pulsus, calor, febris, prava concoctio cibi, corpus parum nutritum, macies, demum secretiones et excretiones auctæ, vel impeditæ vel perturbatæ.

ternorum, motusque omnigeni, ad sua munera minus apta reddit. Hinc sensus vel nulli, vel imperfecti et depravati, capitis dolor, vertigo, imbecillitas, memoriæ defectus, delirii species, ipsa demum insania; debilitas artuum, et imperfecta et inordinata vitalium organorum actio, pulsus frequentes, calor, febris, concoctio cibi prava, corpus parum nutritum, macies, secretiones demum et excretiones auctæ, vel impeditæ, vel perturbatæ.

401. Somnus impeditur, tum sanis tum morbosis hominibus, variis causis jam recensitis. Præterea, deficit in multis morbis, quorum sunt pauci qui non facessant tantum doloris aut anxietatis, quantum fuerit sat ad arcendum vel rumpendum somnum. Febres omnigenæ fere faciunt dormire male, cum ob generalem molestiam quæ non nunquam comitatur hoc ge-

401. Impeditur somnus, tum sanis hominibus, tum morbosis, variis causis jam (396) recensitis. Deficit præterea in multis morbis, quorum pauci sunt, qui non tantum doloris, aut anxietatis, aut molestiæ facessant, quantum sat fuerit ad somnum arcendum vel rumpendum. Febres omnigenæ fere male dormire faciunt, cum ob molestiam generalem, quæ nun-

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of motion, less fitted for their functions. Hence sensations either none or imperfect and depraved, pain of the head, vertigo, imbecility, loss of memory, a species of delirium, lastly, insanity itself; debility of the limbs, and an imperfect and irregular action of the vital organs, frequent pulsations, heat, fever, depraved concoction of the food, the body imperfectly nourished, emaciation, lastly the secretions and excretions increased, or impeded or disturbed.

401. Sleep is impeded, as well in healthy as in sick persons, by the various causes already enumerated. Besides, it fails in many diseases, of which there are few which do not cause so much pain or anxiety, as may be sufficient to keep off or to break the sleep. Fevers of every kind generally cause a person to sleep badly, as well because of the general uneasiness which

quam non hoc genus morborum comitatur, tum ob incitatum sanguinis impetum, sæpe caput versus; tum quoque ob ventriculum male se habentem, et crudo cibo gravatum, aut potu distentum. Hæc quoque ratio est cur multi hypochondriaci et hysterici tam male dormiant; scilicet qui male solent concoquere, et ventriculum habent multis, quamvis sæpe levibus, malis opportunum; quorum vel levissima, præsertim si corpus jam nimis mobile et irritabile fuerit, somnum auferent.

402. Defectus somni, pari ratione in morbis ac in sanitate, sed magis adhuc et citius nocere solet; viribus scilicet ægri minutis, viribus morbi intensis, dolore capitis aut delirio inductis, cibique concoctione impedita. Igitur non modo ipse molestissimum adversæ valetudinis signum est, sed et aliorum sæpe et gravium malorum causa.

nus morborum, tum ob impetum sanguinis versus caput, sæpe incitatum; tum quoque ob ventriculum habentem se male, et gravatum crudo cibo, aut distentum potu. Hæc quoque est ratio cur multi hypochondriaci et hysterici dormiant tam male; scilicet, qui solent concoquere male, et habent stomachum opportunum multis, quamvis sæpe levibus, malis; quorum vel levissima, præsertim si corpus jam fuerit nimis mobile et irritabile, auferent somnum.

402. Defectus somni, pari ratione, solet nocere, sed adhuc magis, et citius, in morbis ac in sanitate; scilicet, viribus ægri minutis, viribus morbi intensis, dolore capitis aut delirio inductis, que concoctione cibi impeditâ. Igitur ipse est non modo molestissimum signum adversæ valetudinis, sed sæpe et causa aliorum et gravium malorum.

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sometimes accompanies this class of diseases, as on account of the impetus of the blood towards the head, often increased; as also on account of the stomach having itself being disordered, and oppressed with crude food, or distended with drink. This also is the reason why many hypochondriacal and hysterical persons sleep so badly; that is, who are accustomed to digest badly, and have the stomach subject to many, although often slight, disorders; of which even the slightest, especially if the body already should be too mobile and irritable, will prevent sleep.

402. Want of sleep, for a like reason, is accustomed to hurt, but still more, and more quickly, in diseases than in health; namely, by the powers of the sick being reduced, the powers of the disease being increased, pain of the head or delirium being induced, and the digestion of the food being impeded. Therefore itself is not only a most troublesome symptom of bad health, but often also the cause of other and severe diseases.

403. Excessus somni quoque nocet haud parum. Reddit totum hominem debilem, torpidum, hebetem, fere fatuum, facit motum sanguinis languidum, et minuit plerasque secretiones et excretiones. Hinc plenitudo, obesitas, flacciditas, et impotentia ad omnia munera vitæ.

404. Causæ excessûs hujusmodi, sunt vel solitæ causæ somni jam recensitæ, intensæ ultra modum, vel aliquod vitium cerebri, veluti compressio, inundatio, &c. vel aliquando ut videtur magna insolita debilitas, et inducta ab insolitâ causâ; veluti sub finem quarundam febrium, vel in convalescentibus ex iis que aliis morbis, quamvis in his exemplis multum absit ut tam diuturnus somnus noceat; vel siquando forte graves et diuturni mœror aut metus induxerint mirum et inexpectatum soporem. Denique quidam homines

403. Excessus quoque somni haud parum nocet. Totum hominem debilem, torpidum, hebetem, fere fatuum reddit: motum sanguinis languidum facit, et plerasque secretiones et excretiones minuit. Hinc plenitudo, obesitas, flacciditas, et ad omnia vitæ munera impotentia.

404. Causæ hujusmodi excessus sunt, vel solitæ somni causæ jam (396) recensitæ, ultra modum intensæ, vel vitium aliquod cerebri, veluti compressio, inundatio, &c. vel aliquando, ut videtur, debilitas magna, insolita, et ab insolita causa inducta; veluti sub finem quarundam febrium, vel in convalescentibus ex iis aliisque morbis, quamvis in his exemplis multum absit ut tam diuturnus somnus noceat; vel siquando forte mœror aut metus graves et diuturni, mirum et inexpectatum soporem induxerint. Denique, sola consuetudine, plus

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403. Excess of sleep also hurts not a little. It renders the whole frame weak, torpid, dull, almost foolish, makes the motion of the blood languid, and diminishes most of the secretions and excretions. Hence fulness, obesity, flaccidity, and incompetency to all the duties of life.

404. The causes of excess of this sort, are either the usual causes of sleep already enumerated, increased beyond bounds, or some disorder of the brain, as compression, effusion, &c. or sometimes as it seems great unusual debility, and brought on by an unusual cause; as towards the end of certain fevers, or in persons convalescent from them and other diseases, although in these examples much is wanting that so prolonged sleep can hurt; or if ever by chance severe and long continued grief or fear have brought on a wonderful and unexpected drowsiness. Indeed some persons have learned, by habit alone, to sleep more than proper, not without great evil. Nor are there

justo dormire, non sine magno malo, quidam homines didicerunt. Nec desunt exempla hominum, qui, sine manifesta causa, totos dies, vel etiam menses, somno vix interrupto, transierunt.

405. Somnia, qualia dormientes sæpe agitant, delectant, angunt, terrent, in novos orbes rapiunt, pro morbis a medicis haberi solent; quippe quæ in perfectissimo somno vel prorsus desint, vel nulla saltem sui vestigia aut memoriam relinquant (390).

406. Fiunt vel propter hominem non plene sopitum, cui memoria et imaginatio adhuc vigent, quamvis voluntatis imperio manumissæ; vel propter impressiones quaslibet, internas vel externas, adeo validas ut eum sentire faciant, quamvis non rumpant somnum; de quibus semisomnis quodammodo judicet, easque cum cogitationibus memo-

didicerunt, consuetudine solâ, dormire plus justo, non sine magno malo. Nec desunt exempla hominum, qui, sine manifestâ causâ, transierunt totos dies vel etiam menses, vix interrupto somno.

405. Somnia, qualia sæpe agitant, delectant, angunt, terrent, dormientes, rapiunt in novos orbes, solent haberi a medicis pro morbis: quippe quæ vel prorsus desint in perfectissimo somno, aut saltem relinquant nulla vestigia aut memoriam sui.

406. Fiunt, vel propter hominem non plene sopitum, cui memoria et imaginatio adhuc vigent, quamvis manumissæ imperio voluntatis; vel propter quaslibet impressiones, internas vel externas, adeo validas ut faciant eum sentire, quamvis non rumpant somnum; de quibus semisomnis quodammodo judicet, et confundat eas in mirum modum

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wanting examples of men, who, without any manifest cause, have passed entire days or even months in a scarcely interrupted sleep.

405. Dreams, such as often agitate, delight, render anxious, terrify, persons sleeping, waft them into new spheres, are accustomed to be considered by physicians as diseases: as being which either are entirely wanting in the most perfect sleep, or at least leave behind no traces or memory of themselves.

406. They take place, either on account of the person not being fully lulled to sleep, to whom memory and imagination as yet are active, although emancipated from the controul of the will; or on account of some impressions, internal or external, so powerful that they cause him to perceive, although they do not break the sleep; about which a person half asleep in some measure judges, and confounds them to a wonderful degree with the

cum cogitationibus memoriæ et imaginationis. Enim hæ oblatæ suâ sponte homini inter somnum, sumuntur pro veris.

riæ et imaginationis mirum in modum confundat. Hæ enim sua sponte inter somnum homini oblatæ, neque ejus voluntati obedientes, pro veris sumuntur.

407. Somnia familiaria obdormiscentibus et expergiscentibus, quamvis alioquin sanissimis, et expositis nulli irritationi, docent; dira somnia quæ oriuntur ab anxietate corporis, veluti a supino situ corporis, aut a ventriculo gravato multo cibo et vino, docent; singularia somnia ducentia originem a dolore cujusvis partis, vel frigore admoto, vel inæquali et duriore lecto, vel statu genitalium organorum, vel a febribus, vel denique, a variis morbis pectoris, docent. Nimirum homo, in hoc statu ut videtur, quærit causam sensûs quem percipit, et sæpe fingit sibi absurdas et ridiculas.

407. Docent somnia obdormiscentibus et expergiscentibus familiaria, quamvis alioquin sanissimis, et nulli irritationi expositis; docent dira somnia quæ ab anxietate corporea (186, 193) oriuntur, veluti a situ corporis supino, aut a ventriculo multo cibo et vino gravato; docent singularia somnia, a dolore partis cujusvis, vel frigore admoto, vel lecto inæquali et duriore, vel statu genitalium organorum, vel a febribus, vel denique a variis morbis pectoris, originem ducentia. Nimirum, in hoc statu, ut videtur, homo sensus quem percipit causam quærit, et absurdas et ridiculas sæpe sibi fingit.

408. Vero sensus, quicunque fuerit, sic excitatus somnianti est quam

408. Sensus vero quicunque sic excitatus fuerit somnianti quam

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thoughts of memory and imagination. Moreover these presented spontaneously to a person during sleep, are taken for true.

407. The dreams common to persons falling asleep and awaking, although otherwise very healthy, and exposed to no irritation, teach this: the horrible dreams which arise from anxiety of body, as from a supine position of the body, or from the stomach oppressed with much food and wine, teach it; the singular dreams drawing their origin from pain of any part, or cold being applied, or an uneven and harder bed, or the state of the genital organs, or from fevers, or lastly, from the various diseases of the chest, teach it. Truly a person, in this state as it appears, seeks the cause of the sensation which he perceives, and often imagines to himself absurd and ridiculous ones.

408. But the sensation, whatever it has been, thus excited in the dreaming

maxime vividus est, scilicet in quo homo totus est, attentione adhibita indivisa, nulloque temperante judicio. Hinc nulla fere in somniis vis animi; sed timor, mœror, libido, quicquid demum forte menti se obtulerit, eam statim occupat, et totum hominem rapit.

409. Somnia fugacia, velocissima; ita ut longa series annorum, et res gestæ innumeræ, spatio temporis adeo parvo ut nomine careat, dormientis animo obversentur. Haud incredibile est, vocem quæ jubet expergisci longum sæpe prius dare somnium, quam somnum penitus rumpat.

410. Somnia multum reguntur consuetudine; ita ut quidam omnino arcere, alii sua somnia quodammodo dirigere, didicerint. Inter tot absurda et ridicula, nil mirum si quædam minus inepta, vel denique vera fuerint; scilicet si quis, fortasse boni judicii, plus vigilans

maxime vividus, scilicet in quo totus homo est, indivisâ attentione adhibitâ, que nullo judicio temperante. Hinc, fere, nulla vis animi somniis; sed timor, mœror, libido, demum, quicquid obtulerit se menti, statim occupat eam, et rapit totum hominem.

409. Somnia fugacia et velocissima; ita ut longa series annorum, et innumeræ res gestæ, observentur animo dormientis, spatio temporis adeo parvo ut careat nomine. Est haud incredibile vocem quæ jubet expergisci, sæpe dare longum somnium priusquam penitus rumpat somnum.

410. Somnia multum reguntur consuetudine; ita ut quidam didicerint arcere omnino, alii quodammodo dirigere sua somnia. Inter tot absurda et ridicula nil mirum si fuerint quædam minus inepta vel denique vera; scilicet, si quis, fortasse boni judicii, vigilans plus

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person is extremely vivid, as being that in which the whole man is, the undivided attention being given, and no judgment regulating it. Hence, mostly, no influence of reason in dreams; but fear, grief, lust, in a word, whatever may have presented itself to the mind, immediately engages it, and hurries off the whole man.

409. Dreams are fleeting and very rapid; so that a long series of years, and innumerable exploits, are observed by the mind of the sleeping person, in a space of time so small as to want a name. It is not incredible, that the voice which orders to awake, often produces a long dream before that it perfectly breaks the sleep.

410. Dreams are greatly regulated by habit; so that some have learned to expel them altogether, others in some degree to direct their dreams. Among so many absurd and ridiculous ones, it is no way wonderful if there should be some less foolish or even true; that is, if any one, perhaps of sound

quam dormiens, reputaverit multa secum, et præviderit probabiliora.

quam dormiens, multa secum reputaverit, et præviderit probabiliora.

CAP. XIV. *De communi et naturali motu Sanguinis.*

CAP. XIV.—*De Sanguinis motu communi et naturali.*

411. Circuitus sanguinis occupavit proximum, et profecto, in homine, que similibus animalibus, locum vix secundum peculiari functioni cerebri ipsiûs ; scilicet, organa quæ movent sanguinem habent tantum commercium cum cerebro, et motus sanguinis est adeo necessarius ad excitandum, que aptandum cerebrum suis muneribus, ut hæ binæ functiones vicissim ferant

411. PROXIMUM peculiari ipsius cerebri functioni, et profecto, in homine similibusque animalibus, vix secundum locum, occupavit sanguinis circuitus: scilicet organa quæ sanguinem movent tantum cum cerebro commercium habent, et sanguinis motus, ad excitandum, suisque muneribus aptandum cerebrum, adeo necessarius est, ut hæ binæ functiones subsidium ferant et

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judgment, waking more than sleeping, should have reflected on many things with himself, and should foresee the more probable.

CHAP. XIV. *Of the common and natural motion of the Blood.*

411. The circulation of the blood has occupied the next, and indeed, in man, and similar animals, a place hardly second to the peculiar function of the brain itself ; indeed, the organs which propel the blood have so great an intercourse with the brain, and the motion of the blood is so necessary to excite and fit the brain for its functions, that these two functions mutually

petant vicissim, neque altera sine alterius ope perfici queat.

412. Sanguinem per totum corpus moveri, docet ingens, vel lethalis nonnunquam, ejus jactura, a parvo vulnere in quivis corporis parte.

413. Cursus sanguinis in adulto homine hac ratione absolvitur. Sanguis ab omnibus corporis partibus redux, in sinum venosum et auriculum dextram cordis transit; hanc distendit, stimulat, et ad contractionem ciet: auricula se contrahens, sanguinem ventriculo dextro tradit: hic vero, pari ratione distentus et irritatus, se contrahit, sanguinemque in arteriam pulmonalem impellit, cujus ramis per utrumque pulmonem transit. Ab eo reducitur venis pulmonalibus in sinum et auriculam sinistram, cujus contractione in ventriculum ejusdem lateris propellitur. Hoc demum se contrahente, sanguis insigni vi

et petant subsidium, neque altera queat perfici sine ope alterius.

412. Sanguinem moveri per totum corpus, ingens, et nonnunquam lethalis jactura ejus, a parvo vulnere in quivis parte corporis, docet.

413. Cursus sanguinis, in adulto homine, absolvitur hac ratione. Sanguis, redux ab omnibus partibus corporis, transit in sinum venosum et dextram auriculam cordis; distendit, stimulat, et ciet hanc ad contractionem: auricula contrahens se tradit sanguinem dextro ventriculo: vero hic distentus et irritatus pari ratione, contrahit se, que impellit sanguinem in pulmonalem arteriam, ramis cujus transit per utrumque pulmonem. Reducitur ab eo pulmonalibus venis in sinum et sinistram auriculam, contractione cujus propellitur in ventriculum ejusdem lateris. Hoc, demum,

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bring and seek support, nor can the one be performed without the aid of the other.

412. That the blood is circulated through the whole body, the great, and sometimes fatal loss of it, from a small wound in any part of the body, teaches.

413. The circulation of the blood, in an adult person, is performed in this way. The blood, returning from all parts of the body, passes into the sinus venosus and right auricle of the heart: distends, stimulates, and excites this to contraction: the auricle contracting itself delivers the blood to the right ventricle: but this distended and irritated in like manner, contracts itself, and drives the blood into the pulmonary artery, by the branches of which it passes through both lungs. It is brought back from it by the pulmonary veins into the sinus and the left auricle, by the contraction of which it is

contrahente se, sanguis ejicitur insigni vi, et immittitur in aortam, innumeris ramis cujus defertur ad omnes partes corporis, reducendus denuo per sodales venas in cavam, et dextram auriculam cordis.

414. Valvæ in corde, positæ et in ostiis arteriarum et in venis, prohibentes reditum sanguinis, ostendunt hunc cursum; ligaturæ impositæ venis vel arteriis quæ faciunt has tumere citra, illas ultra, ligaturam, quoque docent; denique, hic cursus sanguinis facile conspicitur in pellucidis animalibus.

415. Vero multum abest ut singuli sacculi cordis, contrahant sese hoc ordine; contractio utriusque auriculæ perficitur eodem tempore, utroque ventriculo tunc relaxato; et hi rursus contrahunt se eodem tempore, auriculis simul relaxatis.

416. In moribundis sinister ventriculus primo

ejicitur, et in aortam immittitur, cujus innumeris ramis ad omnes corporis partes defertur, per venas sodales in cavam et auriculum dextram cordis denuo reducendus.

414. Hunc cursum ostendunt valvæ in corde, et in ostiis arteriarum et in venis positæ, reditum sanguinis prohibentes; docent quoque ligaturæ venis vel arteriis impositæ, quæ has citra, illas ultra ligaturam tumere faciunt: denique, hic cursus sanguinis in pellucidis animalibus facile conspicitur.

415. Multum vero abest ut hoc ordine singuli cordis sacculi sese contrahant; utriusque auriculæ contractio eodem tempore perficitur, relaxato tunc utroque ventriculo; et hi rursus eodem tempore se contrahunt, auriculis simul relaxatis.

416. In moribundis, ventriculus sinister primo quiescit, deinde auri-

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propelled into the ventricle of the same side. This, indeed, contracting itself, the blood is ejected with great force, and is sent into the aorta, by the numberless branches of which it is conveyed to all parts of the body, to be brought back again by the accompanying veins into the cava, and the right auricle of the heart.

414. The valves in the heart, placed both in the mouths of the arteries and in the veins, preventing the return of the blood, prove this course; ligatures put on the veins or arteries which cause the latter to swell on this side, the former beyond the ligature, also teach it: lastly, this course of the blood is easily seen in pellucid animals.

415. But much is wanting that the several cavities of the heart, contract themselves in this order; the contraction of both auricles is performed at the same time, both ventricles being then relaxed; and these again contract themselves at the same moment, the auricles at the same time being relaxed.

cula ejusdem lateris; sanguine scilicet ob defectum spiritus quasi effœto, et parcius forsan per pulmonem jam transmisso: postea ventriculus dexter, ultima auricula dextra desinit contrahere. Hinc aliquando fit, ut sanguis per magnas cavas, ascendentem et descendentem, aliquatenus redire cogatur, et levem in iis motum efficiat.

417. In fœtu, qui nempe nondum spiritum traxerit, alias et longe diversas vias sanguis legit: imprimis magna pars sanguinis arteriæ pulmonalis, a pulmone aversa (nimirum qui nondum evolutus tantum penum sanguinis accipere nequit) per canalem arteriosum in aortam transit: tum magna pars sanguinis aortæ per arterias umbilicales ad placentam defertur; inde per venam umbilicalem redux, partim in cavam, per ductum venosum, partim in jecur, transit, et non nisi altero per

quiescit, deinde auricula ejusdem lateris; scilicet, sanguine quasi, ob defectum spiritûs, effœto et forsan jam transmisso parciùs per pulmonem: postea dexter ventriculus, dextra auricula ultima desinit contrahere. Hinc aliquando fit, ut sanguis cogatur, aliquatenus, redire per magnas cavas, ascendentem et descendentem; et efficiat levem motum in iis.

417. In fœtu, nempe, qui nondum traxerit spiritum, sanguis legit alias et longe diversas vias: imprimis, magna pars sanguinis pulmonalis arteriæ aversa a pulmone (qui nimirum, nondum evolutus, nequit accipere tantum penum sanguinis) transit per canalem arteriosum in aortam; tum magna pars sanguinis aortæ defertur per umbilicales arterias ad placentam; redux inde per umbilicalem venam, transit partim in cavam, partim, per ductum venosum in jecur, et

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416. In dying persons the left ventricle first ceases, then the auricle of the same side; that is, the blood as it were, on account of want of air, being barren, and perhaps now transmitted more sparingly through the lungs: afterwards the right ventricle, the right auricle last ceases to contract. Hence it sometimes happens, that the blood is forced, in some measure, to come back through the great cavæ, ascending and descending; and produces a slight motion in them.

417. In the fœtus, that is, which has not yet drawn in the air, the blood chooses other and far different ways: first of all, a great part of the blood of the pulmonary artery turned away from the lungs (which without doubt, not yet developed, cannot receive so great a store of blood) passes through the canalis arteriosus into the aorta; then a great part of the blood of the aorta is carried through the umbilical arteries to the placenta; returning thence through the umbilical vein, it passes partly into the cava, partly

non nisi altero circuitu per hoc viscus absoluto, redit tandem in cavam et dextram auriculam cordis.

418. Arteriæ et venæ pariter referunt arborem, truncus cujus in magnos ramos, hi dividantur in minores, minores in minutissimos ramulos, que detegendos nullo modo sensibus: et semper hac lege, ut singuli rami minores trunco unde oriuntur, vero omnes sumpti simul sint nonnihil capaciores eodem.

419. Minimi ramuli arteriarum (majores nunquam) reflexi, fiunt venæ; vel immittuntur in venas hujusmodi jam formatas, per anastomosin, ut vocatur; et minimæ venæ, accipientes alias atque alias, paulatim grandescunt, et tandem formant cavam.

420. At est alia fabrica in abdomine, et longe diversus reditus sanguinis per venas observatur. Nimirum, sanguis, redux

hoc viscus circuitu absoluto, tandem in cavam et auriculam cordis dextram redit.

418. Arteriæ et venæ pariter arborem referunt, cujus truncus in magnos ramos, hi in minores, minores in minutissimos, sensibusque nullo modo detegendos ramulos, dividantur: et hac semper lege, ut singuli rami trunco unde oriuntur minores, omnes vero simul sumpti, eodem nonnihil capaciores sint.

419. Minimi arteriarum ramuli (nunquam majores) reflexi, venæ fiunt; vel in venas hujusmodi jam formatas per anastomosin, ut vocatur, immittuntur: venæ que minimæ, alias atque alias accipientes, paulatim grandescunt, et tandem cavam formant.

420. At in abdomine alia est fabrica, et longe diversus sanguinis reditus per venas observatur. Sanguis nimirum ab omnibus visceribus

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through the ductus venosus into the liver, and only by a second circulation through this viscus being performed, does it return at length into the cava and right auricle of the heart.

418. Arteries and veins alike resemble a tree, the trunk of which is divided into large branches, these are divided into less, the less into exceedingly minute little branches, and to be detected in no way by the senses: but always by this law, that each of the branches are less than the trunk whence they arise, but all taken together are somewhat more capacious than the same.

419. The smallest branches of the arteries (the larger never) reflected, become veins; or are inserted into veins of this kind already formed, by anastomosis, as it is called; and the smallest veins, receiving others and others, gradually enlarge, and at length form the cava.

420. But there is another mechanism in the abdomen, and a widely

quæ cibi concoctioni inserviunt, ventriculo, intestinis, mesenteria, omento, pancreate, splene, redux, in magnum vas defertur, venam scilicet portarum: quæ denuo, arteriæ more, per jecur diffusa, ingentem sanguinis copiam eo defert: qui tandem, postquam fellis secretioni inservierit, per cavam hepaticam, in magnam cavam, et ad cor redit.

421. In capite quoque sanguinis reditus quodammodo singularis observatur. Magnæ imprimis et frequentissimæ ibi conjunctiones, seu anastomoses, ut vocantur, sunt; et quidem inter magna vasa: venæque minores statim fere suum sanguinem in magna vasa, quæ dicuntur sinus, fundunt, et iis fere retrogradæ inseruntur.

422. Denique, in organis quibusdam quæ interdum erigi debent, pene virili, papilla mammæ muliebris, et partibus, ut videtur, non-

ab omnibus visceribus quæ inserviunt concoctioni cibi, ventriculo, intestinis, mesenteria, omento, pancreate, splene, defertur in magnum vas, scilicet, venam portarum: quæ, denuo, more arteriæ, diffusa per jecur, defert eò ingentem copiam sanguinis: qui tandem, postquam inservierit secretioni fellis redit per cavam hepaticam in magnam cavam et ad cor.

421. In capite quoque reditus sanguinis quodammodo singularis observatur. Imprimis, magnæ et frequentissimæ conjunctiones, seu anastomoses, ut vocantur, sunt ibi; et quidem inter magna vasa; et minores venæ fundunt suum sanguinem fere statim in magna vasa, quæ dicuntur sinus, et fere inseruntur retrogradæ iis.

422. Denique, est alia fabrica, interdum alius cursus sanguinis, in quibusdam organis quæ debent interdum erigi, virili

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different return of the blood through the veins is observed. That is to say, the blood, returning from all the viscera which subserve to the digestion of the food, from the stomach, intestines, mesentery, omentum, pancreas, spleen, is carried into a large vessel, namely, the vena portarum: which, again, after the manner of an artery, distributed through the liver, conveys thither a great abundance of blood: which at length, after that it has been subservient to the secretion of gall, returns by the cava hepatica into the great cava and to the heart.

421. In the head also a return of the blood somewhat peculiar is observed. First of all, great and very frequent unions, or anastomoses, as they are called, are there; and even between the great vessels; and the smaller veins pour their blood almost immediately into the great vessels, which are called sinuses, and are mostly inserted retrogade in them.

422. Indeed, there is a different mechanism, sometimes a different course

pene, papillâ muliebris mammæ, et, ut videtur, nonnullis partibus genitalium organorum muliebris sexûs; nimirum, qui effusus in quasdam cellulas reticulatæ telæ (fabricatas peculiari modo a Naturâ in hunc finem), scilicet, delatus, copiosior per arterias agentes insolito more, quam reducitur per venas, quas nonnulli putarunt constringi quodammodo, et comprimi, distendit eas partes, erigit, que reddit aptas suis muneribus; et demum, resumptus, istis cellulis contractis, reducitur ad cor suo tempore.

423. Autem vires quæ expediunt cursum sanguinis sunt, imprimis, contractio cordis, quæ impellit sanguinem in arterias insigni velocitate: vero multum abest ut hæc vis, quamvis probe sentiatur usque ad extremas partes corporis, sufficiat ad promovendum motum sanguinis; pulsus que calor deficientes in brachio affecto paralysi docent.

nullis genitalium organorum muliebris sexus, alia fabrica, alius interdum sanguinis cursus est; nimirum qui in cellulas quasdam telæ reticulatæ (peculiari modo a Natura in hunc finem fabricatas) effusus, copiosior scilicet per arterias insolito more argentes delatus, quam per venas, quas nonnulli quodammodo constringi et comprimi putarunt, reducitur, eas partes distendit, erigit, suisque muneribus aptas reddit; et demum, suo tempore, contractis paulatim istis cellulis, in venas resumptus, ad cor reducitur.

423. Vires autem quæ sanguinis cursum expediunt, sunt, cordis imprimis contractio, quæ sanguinem insigni velocitate in arterias impellit: multum vero abest ut hæc vis, quamvis ad extremas usque corporis partes probe sentiatur, sufficiat ad sanguinis motum promovendum: docent pulsus calorque deficientes in brachio paralysi affecto.

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of the blood, in certain organs which ought occasionally to be erected, the male penis, the nipple of the female breast, and, as it appears, in some parts of the genital organs of the female sex; that is to say, which effused into certain cells of the reticulated tissue (constructed in a peculiar manner by Nature for this purpose), that is, conveyed, more copious by the arteries acting in an unusual manner, than it is brought back by the veins, which some have supposed to be constricted in some manner, and to be compressed, distends those parts, erects them, and renders them fit for their functions; and at length, being taken up again, by those cells being contracted, is brought back to the heart in its proper time.

423. But the powers which expedite the circulation of the blood are, first of all, the contraction of the heart, which drives the blood into the arteries with remarkable velocity: but much is wanting that this force, although it is sensibly felt as far as the extreme parts of the body, can suffice to maintain the motion of the blood: the pulse and heat failing in an arm affected with paralysis prove this.

424. Juvat præterea actio arteriarum, non modo insigni vi resiliendi, sed vi propria musculosa se contrahentium: unda sanguinis e corde expulsa, sanguinem, qui jam in arteriis fuit, propellit, et simul, quoniam fluidi est quoquoversum premere arteriam ipsam distendit. Hæc distentio pulsus est, quem digito percipimus. Arteriæ vero hoc modo distentæ ad contractionem cientur, non secus ac ipsum cor: earumque contractio tanta velocitate absolvitur, ut exiguum omnino distinguatur intervallum inter ictum cordis, vel quæ proxima est arteriæ carotidis, et pulsum in remotissima corporis parte.

425. Hanc arteriarum actionem satis demonstrant, ipsius arteriæ fabrica, manifeste musculosa tunica instructæ, et multa quoque experimenta in vivis animalibus instituta; ubi arteriæ, admoto acri mechanico (nam veneno chemico parum fiden-

424. Præterea actio arteriarum juvat, non modo insigni vi resiliendi, sed propriâ musculosâ vi contrahentium se: unda sanguinis expulsa e corde, propellit sanguinem, qui fuit jam in arteriis, et simul, quoniam est fluidi premere quoquoversum, distendit arteriam ipsam. Hæc distentio est pulsus quem percipimus digito. Vero arteriæ distentæ hoc modo, cientur ad contractionem non secus ac cor ipsum: que contractio earum absolvitur tantâ velocitate, ut omnino exiguum intervallum distinguatur inter ictum cordis, vel carotidis arteriæ quæ est proxima et pulsum in remotissimâ parte corporis.

425. Fabrica arteriæ ipsius, manifeste instructæ musculosâ tunicâ, et quoque multa experimenta instituta in vivis animalibus; ubi arteriæ, mechanico acri admoto, (nam fidendum est parum chemico veneno,) validissime

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424. Moreover the action of the arteries assists, not only by their great elasticity, but their own muscular power of contracting themselves: the wave of blood driven out from the heart, propels the blood, which was already in the arteries, and at the same time, because it is the property of a fluid to press on all sides, distends the artery itself. This distention is the pulse which we feel with the finger. But the arteries distended in this manner, are excited to contraction like the heart itself: and the contraction of them is performed with so great velocity, that an exceedingly small interval can be distinguished between the stroke of the heart, or of the carotid artery which is next to it and the pulse in the remotest part of the body.

425. The mechanism of the artery itself, evidently furnished with a muscular coat, and also many experiments instituted in living animals; when the arteries, a mechanical irritant being applied, (for we must trust

contraxerunt se, satis demonstrant hanc actionem arteriarum : inflammatio vel orta suâ sponte, vel excitata arte, veluti cantharidibus, sinapi, aut similibus, applicatis ad cutem, præ omnibus docet. Neque est alia ratio cujusvis secretionis auctæ præter solitum, dum motus sanguinis per reliquum corpus parum vel nihil mutatur.

dum est) validissime se contraxerunt: docet, præ omnibus, inflammatio, vel sua sponte orta, vel arte excitata, veluti applicatis ad cutem cantharidibus, sinapi, aut similibus. Neque alia ratio est secretionis cujusvis præter solitum auctæ, dum sanguinis motus per reliquum corpus parum vel nihil mutatur.

426. Contractio arteriæ semper propellit sanguinem a corde ad remotiores ramulos; imprimis quia semilunares valvæ sitæ ad ostium utriusque magnæ arteriæ penitus claudunt viam quâ rediret in cor; igitur oportet ineat viam qua porta datur: quin et arteria ipsa contracta primo prope cor, (quamvis hæc contractio velocissime propagetur ad minutissimos ramos,) quodammodo dirigit cursum sanguinis, et fere fungitur munere valvæ, scilicet reditu ejus præcluso, libero progressu permisso.

426. Contractio arteriæ sanguinem semper a corde ad remotiores ramulos propellit; imprimis, quia valvæ semilunares, ad ostium magnæ arteriæ utriusque sitæ, viam penitus claudunt qua in cor rediret; oportet igitur qua datur porta viam ineat: quin et ipsa arteriæ prope cor primo contracta (quamvis hæc contractio velocissime ad minutissimos ramos propagetur) cursum sanguinis quodammodo dirigit, et fere valvæ munere fungitur, præcluso scilicet reditu ejus, permisso libero progressu.

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little to a chemical poison,) have very powerfully contracted themselves, abundantly prove this action of the arteries: inflammation either that has arisen of its own accord, or excited by art, as by cantharides, mustard, or the like, applied to the skin, before all things prove it. Nor is there any other reason of any secretion being increased beyond usual, whilst the motion of the blood through the rest of the body is little or not at all changed.

426. The contraction of the artery always propels the blood from the heart towards the more remote branches; chiefly because the semilunar valves placed at the mouth of each great artery totally close up the passage by which it could return into the heart; therefore it is necessary that it enters the course where a passage is afforded: moreover the artery itself contracted first near the heart, (although this contraction is most rapidly propagated to the minutest branches,) in some measure directs the course of the blood, and almost performs the office of a valve, that is by the return of it being precluded, the free advance being permitted.

427. His viribus impulsus, sanguis in venas transit, ad cor reducendus. Nondum satis constat de harum fabrica, aut vi musculosa, nisi in magnis truncis prope cor. Videtur itaque sanguis in iis moveri, partim vi a tergo, scilicet quam a corde et arteriis habuit; partim contractione musculorum vicinorum aut incumbentium, qui venas comprimant: hæ vero præsertim in partibus musculosis, valvis instruuntur, quæ reditum sanguinis ad arterias prohibent, progressum ejus ad cor permittunt.

427. Sanguis impulsus his viribus, transit in venas reducendus ad cor. Nondum constat de fabricâ aut musculosâ vi harum, nisi in magnis truncis prope cor. Itaque sanguis videtur moveri in iis partim vi a tergo, scilicet quam habuit a corde et arteriis; partim contractione vicinorum aut incumbentium musculorum qui comprimant venas: vero hæ, præsertim in musculosis partibus, instruuntur valvis, quæ prohibent reditum sanguinis ad arterias, permittunt progressum ejus ad cor.

428. Quantum ad cursum sanguinis expediendum et incitandum valeat contractio musculorum, docet motus sanguinis mirum in modum exercitatione incitatus: docet idem ignavia languescens, non sine gravi sæpe incommodo aut periculo; quamvis homines, quam maxime ignaviæ dediti, vel etiam dormien-

428. Motus sanguinis incitatus in mirum modum exercitatione, docet, quantum contractio musculorum valeat ad expediendum et incitandum cursum sanguinis: languescens ignaviâ docet idem, sæpe non sine gravi incommodo aut periculo; quamvis homines quam maxime dediti ignaviæ, vel etiam dormientes semper

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427. The blood impelled by these powers, passes into the veins to be brought back to the heart. It is not yet agreed concerning the structure or muscular power of these, unless in the great trunks near the heart. Therefore the blood seems to be moved in them partly by the vis a tergo, that is which it had from the heart and arteries; partly by the contraction of the neighbouring or incumbent muscles which may compress the veins: but these, especially in muscular parts, are furnished with valves, which prevent the return of the blood to the arteries, allow the advance of it to the heart.

428. The motion of the blood increased to a wonderful degree by exercise, shews, how much the contraction of the muscles can avail to accelerate and excite the circulation of the blood: becoming languid from idleness it proves the same, often not without great inconvenience or danger; although men

exerceant nonnihil mûsculosi motùs.

tes, nonnihil semper motus musculosi exerceant.

429. Hinc ratio redditur multorum morborum, et remediorum quibus utimur ad sanandos istos morbos. Hinc intelligitur cur quies corporis sit adeo necessaria in plerisque acutis morbis; cur in tot aliis, crebra exercitatio optimum remedium.

429. Hinc ratio redditur multorum morborum, et remediorum quibus ad istos morbos sanandos utimur. Hinc intelligitur, cur in plerisque morbis acutis corporis quies adeo necessaria sit; cur in tot aliis crebra exercitatio optimum remedium.

430. Postremo, cursus sanguinis neque per pulmones, neque sane per reliquum corpus, ne quidem per sinistrum latus cordis ipsius, potest fieri sine respiratione: ratio cujus est reddenda suo loco.

430. Postremo, sanguinis cursus neque per pulmones, neque sane per reliquum corpus, ne quidem per ipsius cordis latus sinistrum, fieri potest sine respiratione: cujus ratio suo loco reddenda est.

431. Motus sanguinis, velocissimus prope cor, evadit multo lentior in minoribus et remotis ramis arteriarum. Omnigena frictio confert huc, tenacitas sanguinis ipsiûs, adhæsio ejus ad parietes vasorum, pondus partium dimotarum et non perfecte resilientium: sed, præ omnibus, motus sanguinis motus,

431. Motus sanguinis prope cor velocissimus, in minoribus et remotis ramis arteriarum, multo lentior evadit. Frictio omnigena huc confert, tenacitas ipsius sanguinis, adhæsio ejus ad parietes vasorum, pondus partium dimotarum, et non perfecte resilientium: sed, præ omnibus, lentior fit sanguinis motus,

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however much addicted to sloth, or even sleeping, always perform somewhat of muscular motion.

429. Hence an explanation is rendered of many diseases, and of the remedies which we use to cure those diseases. Hence is understood why rest of body is so necessary in most acute diseases; why in so many others, frequent exercise is the best remedy.

430. Lastly, the circulation of the blood neither through the lungs, nor indeed through the rest of the body, not even through the left side of the heart itself, can take place without respiration: the explanation of which is to be given in its proper place.

431. The motion of the blood, quickest near the heart, becomes much slower in the smaller and remote branches of the arteries. Every kind of friction conduces to this, the tenacity of the blood itself, the adhesion of it to the sides of the vessels, the weight of the parts removed and not perfectly

propter auctam arteriæ capacitatem, prout ipsa in ramos divisa fuerit (418.) Et profecto omnes aliæ retardationis causæ ad hanc redeunt, nimirum quæ totius retardationis mensura est, dummodo nulla usquam obstructio fuerit. Nam quicquid per alias retardationis causas velocitatis suæ amisisset sanguis, arteriarum contractiones restituere et compensare potuissent.

432. Pari ratione hac in arteriis, ob hanc causam, lentius fluit, quo longius distat a corde sanguis; sic in venis, quo propius ad cor accedit, eo velocius movetur (418). Sanguinis vero motus in venis, quam in arteriis, multo lentior est : nimirum, quæ omnes simul sumptæ arteriis duplo vel triplo capaciores sunt.

433. Denique, pondus ipsius sanguinis impetum ejus nunc incitat, nunc retardat, secundum corporis, vel partis ejus cujusvis, situm :

guinis fit lentior propter auctam capacitatem arteriæ, prout fuerit divisa in ramos. Et profecto omnes aliæ causæ retardationis redeunt ad hanc, nimirum quæ est mensura totiûs retardationis, dummodo nulla obstructio fuerit usquam. Nam quicquid suæ velocitatis sanguis amisisset per alias causas retardationis, contractiones arteriarum potuissent restituere et compensare.

432. Sanguis fluit lentius, quo longius distat a corde, ob hanc causam, pari ratione, ac in arteriis, sic in venis, quo propiùs accedit ad cor eo velociùs movetur. Vero motus sanguinis est muito lentior in venis, quam in arteriis, nimirum quæ omnes sumptæ simul sunt capaciores, duplo vel triplo, arteriis.

433. Denique pondus sanguinis ipsius nunc incitat, nunc retardat impetum ejus, secundum situm corporis, vel cujusvis

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elastic : but, before all, the motion of the blood becomes slower on account of the increased capacity of the artery, according as it has been divided into branches. And truly all other causes of retardation return to this, as being that which is the measure of the whole retardation, provided no obstruction shall be any where. For whatever of its velocity the blood might have lost by other means of retardation, the contractions of the arteries would have been able to restore and compensate.

432. The blood flows more slowly, the farther it is distant from the heart, on this account, for a similar reason, as in the arteries; so in the veins, the nearer it approaches to the heart the more quickly it is moved : but the motion of the blood is by much slower in the veins than in the arteries, namely, which all taken together are more capacious, by double or triple, than the arteries.

433. Indeed the weight of the blood itself one time quickens, at another

partis ejus; quod profecto est haud levis momenti, tum ad inducendos tum ad sanandos morbos.

434. Arteriæ terminantur variis modis: vel fiunt reflexæ venæ, quæ accipiunt omnes partes, sanguinis tam crassas quam tenues; vel dividuntur in ramulos adhuc minores quam qui possint admittere crassiores particulas, et ideo tantum vehant pellucidum laticem, que demum habeant suas sodales venas; vel desinunt in exhalantia, secernentia, excernentia vasa.

435. Exhalantia vasa fundunt tenuem partem sanguinis in omnia cava organa corporis, quâ hæc, tum magna, veluti abdomen, thorax, caput, tum quoque parva, veluti cellulæ reticulatæ telæ ubique corporis semper madent.

436. Autem excernentia vasa assiduè exhalant tenuissimam, fere aquosam partem sanguinis; cum pauxillo animalis olei, et

quod profecto haud levis momenti est, tum ad inducendos, tum ad sanandos morbos.

434. Arteriæ variis modis terminantur: vel reflexæ venæ fiunt, quæ omnes sanguinis partes, tam crassas quam tenues, accipiunt; vel in minores adhuc ramulos dividuntur, quam qui crassiores particulas admittere possint, et ideo pellucidum tantum laticem vehant, suasque demum venas sodales habeant; vel in vasa desinunt exhalantia, secernentia, excernentia.

435. Exhalantia vasa tenuem sanguinis partem in omnia cava corporis organa fundunt: qua hæc, tum magna, veluti abdomen, thorax, caput, tum quoque parva, veluti cellulæ telæ reticulatæ ubique corporis, semper madent.

436. Excernentia autem vasa tenuissimam sanguinis partem, fere aquosam, cum pauxillo olei animalis, et parte haud exigua acidi car-

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retards the impetus of it, according to the position of the body, or of any part of it; which truly is of no small moment, as well to induce as to cure diseases.

434. Arteries are terminated in various ways: either they become reflected veins, which receive all parts of the blood, as well the thick as the thin; or are divided into branches still smaller than those which can admit the thicker particles, and therefore only carry a pellucid liquor, and finally have their accompanying veins; or terminate in exhalant, secreting, excreting vessels.

435. The exhalant vessels pour out the thin part of the blood into all the hollow organs of the body, by which these, as well the great, as the abdomen, thorax, head, as also the small, as the cells of the reticulated tissue, in every part of the body are always moist.

436. But the excerning vessels constantly exhale the thinnest, almost

bonici, aliarumque fortasse rerum quarum natura minus hactenus explorata est, a cute et pulmone assidue exhalant.

437. Secernentia demum vasa cum arteriis continua, in certis corporis organis, non modo certas partes sanguinis exhalant, a reliqua massa detractas, sed has quoque mirum in modum mutant, et in aliam fere naturam convertunt. De his vero postea locus erit dicendi, quum de secretione et excretione agendum erit.

438. Pars tenuior sanguinis, quæ in varia cava corporis organa effunditur, assidue ex iis resorbetur, et ad cor denuo reducitur, ope vasorum resorbentium, vel lymphaticorum, ut vocantur, quæ ex omni fere corporis parte, sive interna sive externa, veluti cute, nascentia, prope magna vasa quæ sanguinem vehunt sæpe repentia, tandem in receptaculum chyli, aut ductum

haud exigua parte carbonici acidi, que fortasse aliarum rerum, a cute et pulmone, natura quarum hactenus minus explorata est.

437. Demum secernentia vasa continua cum arteriis, in certis organis corporis, exhalant, non modo certas partes sanguinis detractas a reliquâ massâ, sed quoque mutant has in mirum modum, et convertunt in fere aliam naturam. Vero postea erit locus dicendi de his, quum agendum erit de secretione et excretione.

438. Tenuior pars sanguinis, quæ effunditur in varia cava organa corporis assidue resorbetur ex iis, et denuo reducitur ad cor, ope resorbentium vel lymphaticorum vasorum ut vocantur, quæ nascentia ex fere omni parte corporis, sive internâ sive externâ, veluti cute, sæpe repentia prope magna vasa quæ vehunt sanguinem, tandem desinunt in receptaculum chyli, aut

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watery part of the blood; with a little of animal oil, and a no small portion of carbonic acid, and perhaps of other things from the skin and lungs, the nature of which hitherto has not been examined.

437. In fine, the secerning vessels continuous with the arteries, in certain organs of the body, exhale, not only certain parts of the blood drawn off from the rest of the mass, but also change these to a wonderful degree, and convert them into an almost different nature. But hereafter there will be an opportunity of speaking of these, when we must treat of secretion and excretion.

438. The thinner part of the blood, which is poured out into the various hollow organs of the body, is continually taken up again from them, and is again brought back to the heart, by means of absorbing or lymphatic vessels, as they are called, which arising from almost every part of the body, whether internal or external, as the skin, often creeping near the large vessels which carry the blood, at length terminate in the receptaculum chyli, or

thoracicum ductum, aut demum subclaviam venam ipsam. Ad hoc genus vasorum quoque pertinent quæ vocantur lactea, scilicet, quæ orientia ab intestinis, que repentia per mesenteriam, vehunt nutrimentum in sanguinem.

439. Omnia resorbentia vasa, tum lactea, tum quæ vocantur lymphatica, vel hiantia, vel pendula in cava unde oriuntur, hauriunt suos humores, ut videtur, quâdam vi, qualis contingit capillaribus tubis: enim, neque est ulla vis a tergo quâ impleantur: neque possunt impleri a propriis cavis, veluti a thorace vel intestinis, tali vi admotâ arte. Tamen musculosa vis resorbentium vasorum et qualiscunque pressura accideret ipsis, juvat motum lymphæ vel chyli quem continent. Nam plerumque, nullus reditus datur lymphæ, propter innumeras valvas quibus vasa ipsa scatent.

thoracicum, aut demum venam ipsam subclaviam, desinunt. Ad hoc quoque genus vasorum pertinent quæ vocantur lactea, scilicet quæ ab intestinis orientia, perque mesenteriam repentia, nutrimentum in sanguinem vehunt.

439. Vasa resorbentia omnia, tum lactea, tum quæ vocantur lymphatica, vel hiantia, vel pendula in cava unde oriuntur, humores suos hauriunt, ut videtur, vi quadam, qualis tubis capillaribus contingit: neque enim vis ulla a tergo est qua impleantur, neque tali vi arte admota, a propriis cavis, veluti a thorace vel intestinis, impleri possunt. Juvat tamen motum lymphæ, vel chyli quem continent, vasorum resorbentium vis musculosa, et pressura qualiscunque ipsis acciderit. Nam nullus plerumque datur reditus lymphæ, propter innumeras quibus vasa ipsa scatent valvas.

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thoracic duct, or finally the subclavian vein itself. To this kind of vessels also belong what are called lacteal, namely which, arising from the intestines, and creeping through the mesentery, carry the nutriment into the blood.

439. All the absorbing vessels, as well lacteal as what are called lymphatic, either gaping or hanging down into the cavities whence they arise, suck up their fluids, as it seems, by a certain power, such as belongs to capillary tubes: moreover, neither is there any vis a tergo by which they can be filled: nor can they be filled from their own cavities, for instance, from the thorax or intestines, by such a power applied by art. However, the muscular power of the absorbing vessels, and whatever sort of pressure may happen to them, assists the motion of the lymph or chyle which they contain. For generally, no return is permitted to the lymph, on account of the numberless valves with which the vessels themselves abound.

440. Hujusmodi vasa quoque innumeras glandulas conglobatas habent, quas subeunt, et revera, maxima saltem ex parte, formare videntur: adeunt tamen singulas earum ramuli quidam nervosi, et vasa sanguinem vehentia; unde sensus et vis irritabilis, et ideo inflammatio aliquando. Hæ glandulæ in quibusdam corporis partibus numerosæ admodum sunt: veluti in inguine, axilla, mesenteria.

441. Usus earundem parum notus: dicuntur particulas quasdam albidas quasi fabricare et tornare, quales in vesiculis, rubris sanguinis reperiuntur; sed hoc minus certum est.

442. Sæpe obstruuntur hæ glandulæ conglobatæ, et in ingentem molem tument, plerumque ab acri aliquo ad ipsas delato, interdum fortasse et ab aliis causis minus cognitis; ut in strumis, vel scrofula, ut vocatur, cujus morbi primaria

440. Vasa hujusmodi quoque, habent innumeras conglobatas glandulas quas subeunt, et revera videntur, saltem ex maximâ parte, formare: tamen, quidam nervosi ramuli adeunt singulas earum, et vasa vehentia sanguinem; unde sensus et irritabilis vis, et ideo aliquando inflammatio. Hæ glandulæ sunt admodum numerosæ in quibusdam partibus corporis, veluti in inguine, axilla, mesenteria.

441. Usus earundem parum notus: dicuntur fabricare, et quasi tornare, quasdam albidas particulas, quales reperiuntur in rubris vesiculis sanguinis; sed hoc est minus certum.

442. Hæ conglobatæ glandulæ sæpe obstruuntur, et tument in ingentem molem, plerumque ab aliquo acri delato ad ipsas, interdum et fortasse ab aliis causis minus cognitis; ut in strumis, vel scrofulâ, ut vocatur, cujus

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440. Vessels of this sort also, have innumerable conglobate glands which they enter, and truly seem, at least for the greatest part, to form: however, some nervous twigs go to each of them, also vessels carrying blood: whence sensibility and irritable power, and consequently sometimes inflammation. These glands are very numerous in certain parts of the body, as in the groin, axilla, mesentery.

441. The use of these same parts is little known: they are said to fabricate, and as it were fashion, certain whitish particles, such as are found in the red vesicles of the blood: but this is less certain.

442. These conglobate glands often are obstructed, and swell to a very great size, oftentimes from some acrid conveyed to them, sometimes also perhaps from other causes less known; as in struma, or scrofula, as it is called, of which disease they seem to be the primary or at least the most

morbi videntur esse primaria vel saltem frequentissima sedes. Sed nihil certi constat de naturâ aut origine, ne quidem de præsentiâ acrimoniæ in initio hujus morbi, cum glandulæ primo tument, quamvis non sit dubium plurimum acrimoniæ gigni, et fortasse diffundi per totum corpus, his diu obstructis, inflammatis, exulceratis.

vel frequentissima saltem sedes videntur esse. Sed nihil certi constat de natura aut origine, ne quidem de præsentia acrimoniæ in initio hujus morbi, cum glandulæ primo tument: quamvis non dubium sit, his diu obstructis, inflammatis, exulceratis, plurimum acrimoniæ gigni, et fortasse per totum corpus diffundi.

CAP. XV.—*De varietatibus et vitiis motûs sanguinis.*

CAP. XV.—*De motus sanguinis varietatibus et vitiis..*

443. COR, que omnia vasa quæ conferunt ad motum sanguinis, arteriæ, venæ, resorbentia, observantur, comparata cum reliquo corpore, majora primâ quam provectâ ætate: maxima in fœtu,

443. COR vasaque omnia quæ ad sanguinis motum conferunt, arteriæ, venæ, resorbentia, majora, cum reliquo corpore comparata, observantur prima quam provecta ætate: in fœtu maxima, indies pro

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frequent seat. But nothing certain is established concerning the nature or origin, not even the presence of acrimony in the beginning of this disease, when the glands first swell, although it cannot be doubtful that a great deal of acrimony is generated, and perhaps is diffused through the whole body, by these being long obstructed, inflamed, ulcerated.

CAP. XV.—*Of the varieties and disorders of the motion of the blood.*

443. THE heart, and all the vessels which contribute to the circulation of the blood, arteries, veins, absorbing vessels, are observed, compared with the rest of the body, larger in early than advanced age: largest in the fœtus,

rata parte minuuntur, multaque eorum paulatim concluduntur. Hinc recens natus totus rubet, infans, puer, juvenis sæpe, mollis, lævis, humidus, flaccidus, eximii coloris est; vir autem firmior, durior, coloris vultus fusci, minus pulchri; senex rigidus, siccus, pallidus, macer.

444. Prima ætate, venæ multo quam arteriæ densiores, firmiores, et validiores sunt. Hæ vero, propter perpetuam quam patiuntur pressuram, et vim quoque quam inter contrahendum exerunt, indies firmiores, duriores, et validiores evadunt, donec tandem vim venarum æquent vel superent. Haud raro in senibus pars magnæ arteriæ in substantiam corneam, vel demum in verum os, convertitur.

445. Hinc prima ætate plus sanguinis pro rata parte in arteriis, provecta autem plus in venis, continetur: res sane haud levis mo-

indies minuuntur proparte ratâ, que multa eor rum paulatim concludun-tur. Hinc recens natus totus rubet infans, puer sæpe juvenis est mollis, lævis, humidus, flaccidus, eximii coloris; autem vir firmior, durior, fusci coloris vultûs, minus pulchri: senex rigidus, siccus, pallidus, macer.

444. Venæ sunt multo densiores, firmiores, et validiores, quam arteriæ primâ ætate. Vero hæ, propter perpetuam pressuram quam patiuntur, et vim quoque quam exerunt inter contrahendum, indies evadunt firmiores, duriores, et validiores, donec tandem æquent, vel superent vim venarum. Haud raro in senibus, pars magnæ arteriæ convertitur in corneam substantiam, vel demum in verum os.

445. Hinc prima ætate, plus sanguinis pro parte rata continetur in arteriis, autem provectá, plus in venis: res sane haud levis

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they every day are diminished in respect of the part considered, and many of them by degrees are shut up. Hence the new born child is all red, the infant, boy, often the youth is soft, smooth, moist, flaccid, of an excellent colour; but the man is firmer, harder, of a dark colour of countenance, less beautiful: the old man is stiff, dry, pale, lean.

444. The veins are by much denser, firmer, and stronger, than the arteries in early age. But the latter, because of the constant pressure which they endure, and the power also which they exert while contracting, daily become firmer, harder, and stronger, until at length they equal, or even exceed the strength of the veins. Not unfrequently in old men, part of the large artery is converted into a horny substance, or indeed into true bone.

445. Hence in early age, more blood in respect of the part considered is contained in the arteries, but in advanced, more in the veins; a thing truly

momenti, scilicet quæ quodam modo reddit rationem incrementi corporis, status et imminutionis. Porro, si fuerit plus sanguinis justo in corpore, quicquid mali oriatur ex eo, oportet manifestet se maxime primâ ætate in arteriis, autem provectâ in venis. Hæc (saltem ex aliqua parte) videtur esse ratio quorundam morborum qui solent comitari certa tempora vitæ.

menti, scilicet quæ rationem quodammodo reddit corporis incrementi, status, et imminutionis. Porro, si plus justo sanguinis in corpore fuerit, quicquid mali ex eo oriatur, oportet prima ætate in arteriis, provecta autem in venis, se maxime manifestet. Hæc (aliqua saltem ex parte) videtur esse ratio quorundam morborum qui certa vitæ tempora comitari solent.

446. Fœminæ multorum, fortasse omnium animalium, habent arterias, haud parum, capaciores et laxiores, comparatas cum venis, que venas ipsas multo minores quam mares ejusdem generis; quod est imprimis notabile in descendente aortâ, si fuerit comparata cum ascendente venâ cavâ quæ respondet eidem: consilium cujus rei est haud obscurum, nempe, quò meliùs valeant ad alendum fœtum quem debent gestare. Ratio vi-

446. Fœminæ multorum, fortasse omnium animalium, habent arterias haud parum capaciores et laxiores, cum venis comparatas, venasque ipsas multo minores, quam mares ejusdem generis; quod imprimis notabile est in aorta descendente, si cum vena cava ascendente, quæ eidem respondet, comparata fuerit: cujus rei consilium haud obscurum est, nempe, quo melius valeant ad fœtum alendum, quem gestare debent. Par quoque

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of no small moment, as that which in some degree furnishes the explanation of the growth of the body, of its perfection and decay. Moreover, if there should be more blood than proper in the body, whatever evil may arise from it, it is necessary that it manifests itself most in early age in the arteries, but in advanced in the veins. This (at least in some degree) seems to be the cause of certain diseases which are accustomed to accompany certain periods of life.

446. The females of many, perhaps of all animals, have the arteries, not a little, more capacious and lax, compared with the veins, and the veins themselves much less than males of the same species; which is particularly remarkable in the descending aorta, if it be compared with the ascending vena cava which answers to the same: the design of which thing is not obscure, namely, that they may be better able to nourish the fœtus which

videtur esse ratio, quod fœminæ ad plenitudinem corporis plus quam viri proclives sint. Huic quoque majori arteriarum capacitati et parvitati venarum eximius fœminarum vultus et cutis color tribuendus est, et elegantia brachiorum, nullis venis, ut in maribus, lividorum.

447. Quin et sanguis diversis partibus varia copia datur; iisdemque partibus alia proportione, alio vitæ tempore. A primis fundamentis corporis jactis, ingens copia ad caput mittitur; scilicet, quod primum formari et evolvi, suisque muneribus aptari, debeat: et profecto caput ante alias partes justam suam magnitudinem attingit. Auctus vero renixus, partesque haud facile amplius dilatandæ, sanguinem alio divertunt: tum reliquum corpus, pro rata parte, plus quam antea crescit, et organa quædam, prius admodum imperfecta, et quasi

detur quoque esse par quod fœminæ sint plus proclives ad plenitudinem corporis quam viri. Huic majori capacitati arteriarum et parvitati venarum est quoque tribuendus eximius color vultûs et cutis fœminarum, et elegantia brachiorum, lividorum nullis venis, ut in maribus.

447. Quin et, sanguis datur diversis partibus variâ copiâ, que iisdem partibus aliâ proportione, alio tempore vitæ. Ingens copia mittitur ad caput, a primis fundamentis corporis jactis; scilicet quod debeat primum formari et evolvi, que aptari suis muneribus: et profecto caput attingit suam justam magnitudinem ante alias partes. Vero renixus auctus, que partes haud facilè dilatandæ amplius, divertunt sanguinem aliò: tum reliquum corpus, pro parte ratâ, crescit plus quam antea, et quædam organa, prius admodum imper-

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they ought to carry. The reason seems also to be similar that women are more disposed to fulness of body than men. To this greater capacity of the arteries and smallness of the veins is also to be attributed the beautiful colour of the countenance and of the skin of women, and the elegance of the arms, livid with no veins, as in males.

447. Moreover, the blood is given to different parts in various quantity, and to the same parts in a different proportion, at a different period of life. A great quantity is sent to the head, from the first foundations of the body being laid; as being what ought first to be formed and evolved, and fitted for its functions: and indeed the head attains its proper size before the other parts. But the resistance being increased, and the parts not easily to be dilated more, divert the blood elsewhere; then the rest of the body, in respect of the part considered grows more than before, and certain organs,

fecta et quasi inutilia, perficiuntur et evolvuntur, facta idonea ad propria munera.

448. Effectus quoque cursûs sanguinis in infante mutati, observantur brevi post partum: scilicet quum nullus transit per umbilicum, et ideo plus mittitur per iliacas arterias ad inferiores artus: enim hi, parvi et tenues in fœtu, tum crescunt subito, ita ut infantes sæpe possint ante annum, nonnunquam ante sex menses, non modo insistere firmi propriis pedibus, sed ambulare haud malè.

449. Medici solent judicare de statu circuitûs sanguinis a pulsu: autem ille est admodum varius, tum quod attinet ad frequentiam ejus, tum quod ad vim et æqualitatem ictuum et intervallorum.

450. Communis frequentia pulsuum est, in adulto et sano homine, circiter septuaginta in minuto horæ. In fœtu, forinutilia, demum perficiuntur et evolvuntur, ad propria munera idonea facta.

448. Effectus quoque mutati sanguinis in infante cursus brevi post partum observantur: scilicet, quum nullus per umbilicum transit, et ideo plus per iliacas arterias ad artus inferiores mittitur: hi enim, in fœtu parvi et tenues, tunc crescunt subito, ita ut sæpe ante annum, nonnunquam ante sex menses, infantes non modo propriis pedibus firmi insistere, sed haud male ambulare, possint.

449. A pulsu medici judicare solent de statu circuitus sanguinis: ille autem admodum varius est, tum quod ad ejus frequentiam attinet, tum quod ad vim et æqualitatem ictuum et intervallorum.

450. Communis pulsuum frequentia est, in homine adulto et sano, circiter septuaginta in horæ minuto. In fœtu fortasse duplo et

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before very imperfect and as it were useless, are perfected and evolved, rendered fit for their proper functions.

448. The effects also of the course of the blood in the infant being changed, are observed shortly after birth: that is, when none passes by the umbilicus, and consequently more is sent by the iliac arteries to the lower limbs: for these, small and slender in the fœtus, then grow suddenly, so that infants often are able within the year, sometimes before six months, not only to stand firm upon their own feet, but to walk not badly.

449. Physicians are accustomed to judge of the state of the circulation of the blood from the pulse: but it is very various, as well to what relates to the frequency of it, as also as to what relates to the force and equality of the strokes and intervals.

450. The ordinary frequency of the pulsations is, in an adult and healthy person, about seventy in the minute of an hour. In the fœtus, perhaps, it

amplius velocior. In infante, primis vitæ mensibus, vix infra centum et viginti; puero et adolescenti paulatim lentior fit; in sene decrepito, aliquando ad quinquaginta et infra descendit.

451. Quin et multi, imprimis mobiliores, pulsus multo frequentiores; dum alii, florente etiam ætate, lentos admodum, habent. Fœminis quoque quam viris plerumque nonnihil frequentiores esse solent.

452. Frequentiores fiunt, cum in sano tum quoque in morboso corpore, propter multos stimulos eidem admotos. Exercitatio imprimis, reditu sanguinis qui in venis fuit expedito (427, 428) pulsus mirum in modum incitat. Irritationes quoque variæ, quales genus nervosum afficiunt, animi affectus vel cogitatio vehemens, dolor, calor, stimulantia medicamenta, vinum,

tasse, velocior, duplo et amplius. In infante primis mensibus vitæ, vix infra centum et viginti; fit paulatim lentior puero et adolescenti; in decrepito sene aliquando descendit ad quinquaginta et infra.

451. Quin et multi, imprimis mobiliores, habent pulsus multo frequentiores; dum alii, etiam florente ætate, admodum lentos. Fœminis quoque solent plerumque esse nonnihil frequentiores quam viris.

452. Fiunt frequentiores, cum in sano tum quoque in morboso corpore, propter multos stimulos admotos eidem. Imprimis, exercitatio incitat pulsus in mirum modum, reditu sanguinis, qui fuit in venis, expedito. Quoque variæ irritationes, quales afficiunt nervosum genus, affectus animi, vel vehemens cogitatio, dolor, calor, stimulantia medicamenta,

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is more frequent, by double and more. In the infant in the first months of life, scarcely under a hundred and twenty; it becomes gradually slower to the boy and young man; in the decrepit old man sometimes it sinks to fifty and under.

451. Moreover many, especially the more irritable, have the pulsations much more frequent; whilst others, even in the flower of age, have them very slow. In women also they are accustomed generally to be somewhat more frequent than in men.

452. They become more frequent, as well in the healthy as also in the diseased body, on account of many stimuli applied to the same. First of all, exercise quickens the pulse to a wonderful degree, by the return of the blood, which was in the veins, being quickened. Also various irritations, such as affect the nervous system, passions of the mind, or intense thinking, pain, heat, stimulating medicines, wine, aromatics, and the like, produce

vinum, aromata, et similia, præstant eundem effectum. Multi medici quoque crediderunt acrimoniam sanguinis ipsius reddere pulsum frequentiorem.

aromata, et similia, eundem effectum præstant. Acrimoniam quoque ipsius sanguinis multi medici crediderunt pulsum frequentiorem reddere.

453. Pulsus est rarus matutinis horis, quum primo expergiscimur, evasurus paulatim frequentior, propter multa irritamenta quibus objicimur; intenditur post cibum, imprimis ex carnibus, aut acrem aut conditum; sub vesperem, levis febricula quasi accedit, cui requies et somnus sunt remedio. Hæc, vix observanda in sano homine, produnt se manifeste satis in ægroto, febricitante, præsertim hectico.

453. Horis matutinis, quum primo expergiscimur, pulsus rarus est, paulatim frequentior evasurus propter multa quibus objicimur irritamenta; post cibum, ex carnibus imprimis, aut acrem, aut conditum, intenditur; sub vesperem, levis quasi febricula accedit, cui requies et somnus remedio sunt. Hæc in sano homine vix observanda, in ægroto, febricitante, hectico præsertim, satis manifeste se produnt.

454. Denique, debilitas ipsa, videtur sæpe reddere pulsum frequentiorem, vel saltem conferre nonnihil ad hunc effectum; nimirum quia tum ventriculus cordis non depletus bene, distenditur iterum citius, et denuo incitatur

454. Denique, ipsa debilitas pulsum sæpe frequentiorem reddere, vel saltem ad hunc effectum nonnihil conferre, videtur; nimirum, quia tum ventriculus cordis non bene depletus, citius iterum distenditur, et ad contractionem denuo

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the same effect. Many physicians also have believed that the acrimony of the blood itself renders the pulse more frequent.

453. The pulse is slow in the morning time, when first we awake, about to become gradually more frequent, on account of the many irritations to which we are exposed; it is increased after food, especially of meats, either acrid or seasoned; towards evening, slight feverishness as it were comes on, to which rest and sleep are a relief. These things, scarcely to be observed in a healthy person, shew themselves evidently enough in the sick, the feverish, especially the hectic.

454. Again, debility itself, seems often to render the pulse more frequent, or at least to contribute something to this effect; doubtless because then the ventricle of the heart not being emptied thoroughly, is distended again sooner, and is again incited to contraction. Wherefore it is never possible

incitatur. Quapropter medico nunquam licet de impetu sanguinis judicare a frequentia pulsuum.

455. Postremo, in omnibus febribus, utcunque inter se diversis, pulsus nimis frequentes observantur, partim fortasse ob debilitatem, partim ob humorum acrimoniam, partim ob sanguinem a superficie corporis repulsum, et in magnis vasis accumulatum, eademque stimulantem; partim quoque ob varias irritationes morbosas quæ in corpore tam male se habente et jam nimis irritabili facto nunquam desunt; partim demum per conamina quædam Naturæ (364, 368) ad corpus tanto malo liberandum: quamvis sane multum hic subsit obscuri, vel prorsus ignoti: nec facile quis dixerit quomodo autocrateia corporis hic agat; tantaque pulsuum frequentia referenda sit, necne, ejus conatibus.

ad contractionem. Quapropter nunquam licet medico judicare de impetu sanguinis, a frequentiâ pulsuum.

455. Postremo, pulsus observantur nimis frequentes in omnibus febribus, utcunque diveris inter se, partim fortasse, ob debilitatem, partim ob acrimoniam humorum, partim ob sanguinem repulsum a superficie corporis, et accumulatum in magnis vasis, que stimulantem eadem; partim quoque ob varias morbosas irritationes, quæ nunquam desunt in corpore habente se tam male, et jam facto nimis irritabili; partim demum, per quædam conamina Naturæ ad liberandum corpus tanto malo, quamvis sane multum obscuri vel prorsus ignoti subsit hic: nec quis facile dixerit quomodo autocrateia corporis agat hic: que necne tanta frequentia pulsuum sit referenda conatibus ejus.

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to the physician to judge of the impetus of the blood, from the frequency of the pulsations.

455. Lastly, the pulsations are observed too frequent in all fevers, however differing amongst themselves, partly, perhaps, because of debility, partly on account of the acrimony of the fluids, partly on account of the blood driven from the surface of the body, and accumulated in the great vessels, and stimulating the same; partly also by reason of various diseased irritations, which never are wanting in a body having itself so badly, and already become too irritable; partly, finally, by certain efforts of Nature to release the body from so great a disorder, although indeed much of obscurity or altogether of what is unknown may exist here: nor could any one readily say in what manner the autocrateia of the body acts here; and whether or not so great frequency of the pulse ought to be referred to the efforts of it.

456. Pulsus raro observantur nimis tardi, nisi a minutâ mobilitate corporis, veluti in ultimo senio, vel a cerebro compresso, vel aliter habente se male. Vero gravior compressio cerebri solet efficere ingentem frequentiam pulsuum, veluti in hydrocephalo, apoplexiâ, &c. Interdum pulsus fiunt mirabiliter tardi in hydrope pericardii, que aliis morbis vel hujus sacci vel cordis ipsius. Aliquando pulsus observatur præter solitum tardus in convalescentibus a diuturnis febribus. Res sane haud magni momenti; cujus aliquis torpor videtur esse causa. Quædam medicamenta sedantis generis, et imprimis nonnulla narcotica, veluti digitalis, sæpe visa sunt reddere pulsus multo tardiores solito.

456. Pulsus raro nimis tardi observantur, nisi a minuta corporis mobilitate, veluti in ultimo senio, vel a cerebro compresso, aut aliter male se habente. Gravior vero cerebri compressio ingentem pulsuum frequentiam efficere solet, veluti in hydrocephalo, apoplexia, &c. Interdum in hydrope pericardii, aliisque morbis vel hujus sacci vel cordis ipsius, pulsus mirabiliter tardi fiunt. Aliquando in convalescentibus a febribus diuturnis, pulsus præter solitum tardus observatur. Res sane haud magni momenti; cujus torpor aliquis videtur esse causa. — Medicamenta quædam sedantis generis, et imprimis narcotica nonnulla, veluti digitalis, sæpe visa sunt reddere pulsus multo tardiores solito.

457. Vero frequentiâ pulsuum nihil mutatâ, singuli possunt esse vel pleni, magni, validi, fortes, duri, vel parvi, debiles, molles.

457. Pulsuum vero frequentia nihil mutata, singuli possunt esse vel pleni, magni, validi, fortes, duri; vel parvi, debiles, molles. Pulsus

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456. The pulsations seldom are observed too slow, except from a diminished mobility of the body, as in extreme old age, or from the brain being compressed, or otherwise having itself badly. But more severe compression of the brain is accustomed to cause great frequency of the pulse, as in hydrocephalus, apoplexy, &c. Sometimes the pulse becomes wonderfully slow in dropsy of the pericardium, and in other diseases either of this bag or of the heart itself. Sometimes the pulse is observed unusually slow in convalescents from long-continued fevers. A thing truly of no great moment: of which some torpor seems to be the cause. Certain medicines of the sedative class, and especially some narcotics, as digitalis, often have seemed to render the pulse much slower than usual.

457. But the frequency of the pulsations being in no way changed, each of them may be either full, large, vigorous, strong, hard, or small, weak,

plenus, magnus, fortis fit, quum ventriculus fortiter et plene se deplet, magnamque undam sanguinis arteriis tradit, quæ has probe distendat, et ad validam contractionem incitet. Hujusmodi pulsus contingit hominibus validis et sanis, raro morbosus habendus. Quod si nimis fortis evadit, et pulpam digiti explorantis vehementer et acriter ferit, tum durus vocatur. Durities pulsus oritur a subita et vehemente ventriculi cordis et arteriarum contractione, quæ ramos remotiores, veluti carpi, nimis subito et acriter distendat, et ad contractiones pariter subitas et vehementes incitet. Denotat igitur pulsus durus nimiam cordis et arteriarum actionem.

458. Oritur vero a variis causis: Imprimis, a nimia arteriarum tensione, veluti a nimia plenitudine, qua hæ ad motum proniores fiunt, et ad vehementes motus suscipien-

Pulsus fit plenus, magnus, fortis, quum ventriculus deplet se fortiter et plene, que tradit magnam undam sanguinis in arterias, quæ probe distendat has, et incitet ad validam contractionem. Pulsus hujûsmodi, raro habendus morbosus, contingit validis et sanis hominibus. Quod, si evadit nimis fortis, et ferit vehementer et acriter pulpam digiti explorantis, tum vocatur durus. Durities pulsûs oritur a subitâ et vehemente contractione ventriculi cordis et arteriarum, quæ nimis subito et acriter distendat remotiores ramos, veluti carpi, et incitet ad contractiones pariter subitas et vehementes. Igitur, durus pulsus denotat nimiam actionem cordis et arteriarum.

458. Vero oritur a variis causis: imprimis, a nimiâ tensione arteriarum, veluti a nimiâ plenitudine, quâ hæ fiunt proniores ad motum, et

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soft. The pulse becomes full, large, strong, when the ventricle empties itself strongly and thoroughly, and sends a large wave of blood into the arteries, which can fully distend them, and stimulate them to powerful contraction. A pulse of this sort, seldom to be considered diseased, belongs to strong and healthy persons. But, if it becomes too strong, and strikes violently and sharply the pulp of the finger of the person examining, then it is called hard. Hardness of the pulse arises from the sudden and violent contraction of the ventricle of the heart and of the arteries, which too suddenly and sharply distends the more remote branches, as of the carpus, and excites them to contractions alike sudden and violent. Therefore, a hard pulse denotes excessive action of the heart and arteries.

458. But it arises from various causes: first of all, from excessive tension of the arteries, as from too great fulness, by which they become more dis-

aptiores ad suscipiendos vehementes motus; oritur quoque a nimiâ densitate seu firmitate solidarum partium; hinc frequentior in frigidis regionibus et temporibus, et familiaris robustis et validis hominibus et assuetis laboribus; denique potest oriri a variis irritamentis afficientibus vel totum nervosum genus vel tantum cor et arterias. Postremo comitatur multas febres et plerosque morbos qui habent inflammationem: sive a generali stimulo admoto corpori, sive ab irritatione quarundam partium, quæ paulatim extendi'ur ad totum corpus. Talis conditio circuitûs qualem hic pulsus indicat, sæpe eget detractione sanguinis, et fere semper fert jacturam sanguinis bene.

dos aptiores (321, 322, 323); oritur quoque a nimia solidarum partium densitate seu firmitate; hinc in regionibus et temporibus frigidis frequentior, et hominibus robustis et validis, et laboribus assuetis, familiaris (88, 91); denique, a variis irritamentis oriri potest, vel totum genus nervosum, vel tantum cor et arterias, afficientibus. Postremo, multas febres, et plerosque morbos qui inflammationem habent, comitatur: sive a generali stimulo corpori admoto, sive ab irritatione partium quarundam, quæ paulatim ad totum corpus extenditur. Talis conditio circuitus, qualem pulsus hic indicat, sæpe sanguinis detractione eget, et fere semper sanguinis jacturam bene fert.

459. Parvus, debilis, mollis pulsus agnoscit causas fere contrarias, que indicat contrarium conditionem circuitûs et

459. Pulsus parvus, debilis, mollis, contrarias fere causas agnoscit, contrariamque sanguinis circuitus et generis nervosi condi-

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posed to motion, and more fitted for taking on violent motions; it arises also from too great density or firmness of the solid parts; hence more frequent in cold climates and seasons, and common to robust and strong persons and those accustomed to labours; indeed, it may arise from various irritants affecting either the whole nervous system or only the heart and arteries. Lastly, it accompanies many fevers and most of the diseases which have inflammation; whether from the general stimulus applied to the body, or from irritation of certain parts, which by degrees is extended to the whole body. Such a state of the circulation as this pulse indicates, often requires detraction of blood, and almost always bears the loss of blood well.

459. A small, feeble, soft pulse acknowledges causes nearly opposite, and indicates an opposite condition of the circulation and of the nervous system; it often requires stimulants, and for the most part neither requires, nor

tionem indicat; stimulantia sæpe requirit, neque sanguinis detractionem plerumque postulat, neque facile tolerat. Aliquando vero pulsus istiusmodi observatur, quamvis gravis inflammatio urgeat, veluti ventriculi, aut intestinorum. In his et similibus exemplis ad naturam mali, plus quam ad statum pulsus, respicere oportet.

460. Pulsus intermittens vocatur, siquando post solitum intervallum ictus non renovatur, et spatium intercedit, sæpe duplo vel triplo, vel nonnunquam quadruplo, solito longius.

461. Hujusmodi pulsus quibusdam animalibus fere naturalis et perpetuus est; nonnullis hominibus optima sanitate fruentibus, familiaris; iisdemque, donec febricitant, pulsus interdum æqualis fit, neque prius solvitur morbus, quam pulsus intermittens rediverit.

462. Nonnullis porro hominibus,

nervosi generis; sæpe requirit stimulantia, plerumque neque postulat, neque facile tolerat, detractionem sanguinis. Vero aliquando pulsus istiusmodi observatur, quamvis gravis inflammatio, veluti ventriculi aut intestinorum, urgeat. In his et similibus exemplis, oportet respicere ad naturam mali plus quam ad statum pulsûs.

460. Pulsus vocatur intermittens, sequando ictus non renovatur post solitum intervallum, et spatium intercedit longius sæpe duplo vel triplo, vel nonnunquam quadruplo, solito.

461. Pulsus hujusmodi est fere et naturalis et perpetuus quibusdam animalibus; familiaris nonnullis hominibus fruentibus optimâ sanitate; que pulsus interdum fit æqualis iisdem, donec febricitant, neque morbus solvitur priusquam intermittens pulsus rediverit.

462. Porro nonnullis

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easily bears, abstraction of blood. But sometimes a pulse of that kind is observed, although severe inflammation, as of the stomach or of the intestines, may oppress. In these and similar examples, it behoves to look to the nature of the disease more than to the state of the pulse.

460. The pulse is called intermitting, whenever the stroke is not repeated after the usual interval, and a space intervenes longer often by double or triple, or even sometimes by four times, than the accustomed one.

461. A pulse of this kind is almost both natural and constant to some animals; common to some persons enjoying the best health; and the pulse sometimes becomes regular in the same, whilst they are feverish, nor is the disease resolved before that the intermitting pulse shall have returned.

462. Moreover, to some persons in whom, whilst they are healthy, the pulse is equal, if they are affected even by the slightest disease, an intermit

hominibus, quibus, dum sunt sani, pulsus est æqualis, si detinentur vel levissimo morbo, intermittens pulsus accedit. Alii, præsertim mobilioris habitûs corporis, veluti hysterici aut hypochondriaci, vel qui laborant a stomacho, habent pulsum intermittentem a levi malo ventriculi, vel ab aliquo affectu animi, vel interdum a minore que ne observatâ causâ, quem ipsi solent scire, quamvis non exploraverint pulsus arteriarum, anxietate solâ quam sentiunt in profundo pectore, quoties pulsus deficit.

463. Denique, in quibusdam morbis pectoris, imprimis hydrope, et gravi inflammatione pulmonis, et magnâ difficultate spirandi, et variis morbis cordis ipsius, que valvarum ejûs, aut majorum vasorum, et sane in omnibus morbis, præsertim febribus prope finem. quum, viribus ægri jam exhaustis, mors pulsat

quibus, dum sani sunt, pulsus æqualis est, si vel levissimo morbo detinentur, intermittens pulsus accedit. Alii, præsertim habitus corporis mobilioris, veluti hysterici aut hypochondriaci, vel qui a ventriculo laborant, a levi malo ventriculi, vel ab aliquo animi affectu, vel interdum a minore neque observata causa, pulsum intermittentem habent, quem ipsi scire solent, quamvis pulsus arteriarum non exploraverint, sola anxietate quam profunde in pectore sentiunt, quoties pulsus deficit.

463. Denique, in quibusdam morbis pectoris, hydrope imprimis, et gravi pulmonis inflammatione, et magna spirandi difficultate, et variis vitiis cordis ipsius, ejusque valvarum, aut majorum vasorum; et in omnibus sane morbis, præsertim febribus, prope finem, quum, viribus ægri jam exhaustis, mors ipsam vitæ arcem pulsat, intermissio pul-

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ting pulse comes on. Others, especially of a more irritable habit of body, as hysterical or hypochondriacal persons, or who suffer from the stomach, have the pulse intermitting from slight disorder of the stomach, or from some affection of the mind, or sometimes from a less and unobserved cause, which they are accustomed to know, although they should not have examined the pulsations of the arteries, by the anxiety alone which they feel deep in the breast, as often as the pulse fails.

463. In fine, in certain diseases of the chest, especially dropsy, and severe inflammation of the lungs, and great difficulty of breathing, and in various diseases of the heart itself, and of the valves of it, or of the larger vessels, and truly in all diseases, especially fevers near the end, when, the strength of the patient being now exhausted, death batters the citadel itself of life, intermission of pulse is observed, then the worst symptom, often the forerunner of death.

sus observatur: Signum tunc pessimum, sæpe lethi prænuncium.

464. Igitur videtur oriri, vel a vi nervosa in cor, aliaque organa quæ circuitum promovent, minus æqualiter influente; quod parvi omnino momenti est; vel a vi nervosa jam fracta et exhausta, et corde vix amplius ad contractionem valente, neque se deplente, donec plus solito distentum fuerit; vel denique a vitiis ipsius cordis partiumque vicinarum, vel a tumoribus, aut aqua et similibus prementibus, et actionem ejus impedientibus; quod pessimum, et vix non lethale erit.

465. Alias porro pulsuum varietates haud paucas medici descripserunt, variosque morborum eventus ex iis prædici crediderunt: quarum rerum fides sit penes auctores. Nondum enim repetitis observationibus satis comprobatæ sunt, in

arcem ipsam vitæ, intermissio pulsûs observatur, tunc pessimum signum, sæpe prænuncium lethi.

464. Igitur videtur oriri vel a nervosâ vi influente minus æqualiter in cor, que alia organa quæ promovent circuitum, quod est omnino parvi momenti; vel a nervosâ vi jam fractâ et exhaustâ et corde vix amplius valente ad contractionem; neque deplente se, donec distentum fuerit plus solito; vel, denique, a vitiis cordis ipsius que vicinarum partium, vel a tumoribus, aut aquâ et similibus prementibus, et impedientibus actionem ejus, quod pessimum, et erit vix non lethale.

465. Porro, medici descripserunt haud paucas alias varietates pulsuum, que crediderunt varios eventus morborum predici ex iis: fides quarum rerum sit penes auctores. Enim nondum satis comprobatæ sunt repetitis observationibus, saltem in

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464. Therefore it appears to arise either from the nervous power flowing less equally into the heart, and the other organs which promote the circulation, which is altogether of small moment; or from the nervous influence being now broken and exhausted, and the heart scarcely longer competent to contraction; nor emptying itself, until it has been distended more than usual; or, lastly, from disorders of the heart itself and of the neighbouring parts, or from tumours, or from water, and the like, oppressing and impeding the action of it, which is very bad, and will be scarcely not fatal.

465. Moreover, physicians have described not a few other varieties of the pulse, and have believed that the various issues of diseases are predicted from them: let the truth of which things be with the authors. For they have not yet been sufficiently proved by repeated observations, at least in our country, that we safely should trust them; nor truly has an explanation of them

nostris regionibus, ut tuto fidendum sit iis; neque profecto ratio earum hactenus est reddita, neque est status circuitûs sanguinis, qui efficit eas, omnino cognitus.

466. Motus sanguinis potest esse vel nimis vehemens vel nimis debilis, vel, denique, abnormis.

467. Ratio nimis vehementis motûs sanguinis facile redditur ex prædictis. Frequens pulsus, cæteris paribus, efficit rapidiorem motum ejus; nimirum, quo citius ventriculus cordis deplet sese, eo velociùs sanguis projicitur in arterias; que oportet actionem earum respondere huic validiori stimulo. Quin et, magnus et validus pulsus, cæteris paribus, intendit motum sanguinis. Igitur, variæ causæ utriusque generis pulsûs, vel singulæ vel plures junctæ simul, inducunt hoc vitium circuitûs; exercitatio, calor, stimulantia, plenitudo,

nostris saltem regionibus, ut tuto iis fidendum sit; neque profecto ratio earum hactenus reddita est, neque status sanguinis circuitus, qui eas efficit, omnino cognitus est.

466. Motus sanguinis potest esse vel nimis vehemens, vel nimis debilis, vel denique abnormis.

467. Motus sanguinis nimis vehementis ratio facile redditur ex prædictis (452, 453). Pulsus frequens, cæteris paribus, rapidiorem ejus motum efficit: nimirum, quo citius ventriculus cordis sese deplet, eo velocius sanguis in arterias projicitur; earumque actionem huic validiori stimulo respondere oportet. Quin et pulsus magnus et validus, cæteris paribus, motum sanguinis intendit. Variæ igitur causæ utriusque generis pulsus, vel singulæ, vel plures simul junctæ, hoc vitium circuitus inducunt: exercitatio, calor, stimulantia, pleni-

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hitherto been given, nor is the state of the circulation of the blood, which produces them, at all known.

466. The motion of the blood may be either too violent or too feeble, or, lastly, irregular.

467. The reason of the too violent motion of the blood is easily afforded from the previous statements. A frequent pulse, other things being equal, causes a more rapid motion of it; that is to say, the quicker the ventricle of the heart empties itself, the more rapidly the blood is projected into the arteries; and it behoves that the action of them corresponds to this more powerful stimulus. Moreover, a large and strong pulsation, other things being equal, accelerates the motion of the blood. Therefore, the various causes of each kind of pulse, either single or several joined together, bring on this disorder of the circulation; exercise, heat, stimulants, fulness, every kind of irritation, pain, exciting affections of the mind, fevers,

tudo, irritatio omnigena, dolor, animi affectus excitantes, febres.

468. Nimius vero sanguinis impetus vasa distendit, totum corpus excitat, calefacit, sæpe debilitat: sudorem auget, reliquas autem secretiones fere minuit, varias functiones tam animi quam corporis impedit atque perturbat: sitim inducit, nutrimento obest, adipem consumit, putredini, ut vulgo apud medicos receptum est, favet. Ingens aliquando sanguinis impetus, vasa, qua debiliora sunt, rumpit; unde effusiones, sanguinis fluxus, &c. Minime vero silentio prætereundum est, nimium sanguinis motum, utcunque vitiosus appareat, inter præstantissima auxilia esse, quibus Natura utitur ad plurimos morbos sanandos.

469. Languescit sæpe sanguinis motus, imprimis ob debilitatem, torporem, defectum irritationis, veluti exercitationis: sicubi vel vires

omnigena irritatio, dolor, excitantes affectus animi, febres.

468. Vero nimius impetus sanguinis distendit vasa, excitat totum corpus, calefacit, sæpe debilitat; auget sudorem, autem fere minuit reliquas secretiones, impedit atque perturbat varias functiones, tam animi quam corporis: inducit sitim, obest nutrimento, consumit adipem, favet putredini, ut vulgo receptum est apud medicos. Ingens impetus sanguinis aliquando rumpit vasa, quà sunt debiliora; unde effusiones, fluxus sanguinis, &c. Vero minime prætereundum est silentio nimium motum sanguinis, utcunque vitiosus appareat, esse inter præstantissima auxilia, quibus Natura utitur ad sanandos plurimos morbos.

469. Motus sanguinis sæpe languescit, imprimis ob debilitatem, torporem, defectum irritationis, veluti exercitationis: sicubi

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468. But a too great impetus of the blood distends the vessels, excites the whole body, heats, often debilitates it; increases sweat, but for the most part diminishes the other secretions, impedes and disturbs the various functions, as well of the mind as of the body: induces thirst, obstructs nutrition, consumes the fat, favours putrescency, as commonly has been admitted by physicians. A great impetus of blood sometimes breaks the vessels, where they are weaker; whence effusions, flowings of blood, &c. But by no means must we pass over in silence that the excessive velocity of the blood, however faulty it may seem, is amongst the most excellent aids, which Nature uses for curing many diseases.

469. The motion of the blood often becomes languid, principally on account of debility, torpor, want of irritation, as of exercise: as whenever the powers either fail, or are not excited, or can be excited as becomes them.

vires vel deficiunt, vel non excitantur, aut possunt excitari ut decet. Porro, motus humorum languescit, si fuerit obstructio vel quævis causa, qualis impediat iter eorum vel reddat difficilius.

470. Hoc modo, si quis institerit diutiùs pedibus, humores redibunt tardiùs ab inferioribus artubus, ab pondere ipso sanguinis. Porro, quodvis vitium cordis et arteriarum, amplificatio, constrictio, conversio in os, non potest, non impedire motum sanguinis. Quin et, quælibet obstructio afficiens venas, reddit motum sanguinis tardiorem ; veluti si, quod sæpe fit, jecur fuerit durum, et vix pervium sanguini affluenti per venam portarum ; vel, denique, respiratio impedita quâ iter minus facile conceditur sanguini per pulmones ad sinistrum latus cordis ; sed in hoc statu aliæ noxæ videntur quoque concurrere.

471. Cæterum quicquid

deficiunt, vel non, ut decet, excitantur, aut excitari possunt. Porro, motus humorum languescit, si obstructio vel causa quævis fuerit, qualis iter eorum impediat, vel difficilius reddat.

470. Hoc modo, ab ipso pondere sanguinis, si quis diutius pedibus institerit, humores tardius ab artubus inferioribus redibunt. Porro, vitium quodvis cordis et arteriarum, amplificatio, constrictio, conversio in os, motum sanguinis non impedire non potest. Quin et obstructio quælibet, venas afficiens, motum sanguinis tardiorem reddit; veluti si jecur, quod sæpe fit, durum fuerit, et sanguini per venam portarum affluenti vix pervium; vel denique, respiratio impedita, qua minus facile, per pulmones, ad sinistrum cordis latus, iter sanguini conceditur: sed in hoc statu aliæ quoque noxæ concurrere videntur.

471. Cæterum, quicquid causa

Furthermore, the motion of the fluids grows languid, if there should be obstruction or any cause, such as may impede the passage of them or render it more difficult.

470. In this way, if any one should stand too long on his feet, the fluids will return more slowly from the lower extremities, from the weight itself of the blood. Further, any disease of the heart and arteries, enlargement, constriction, conversion into bone, cannot but impede the motion of the blood. Moreover, any obstruction affecting the veins, renders the motion of the blood slower; as if, which often happens, the liver should be hard, and scarcely pervious to the blood flowing through the vena portæ; or, lastly, if respiration be impeded by which a passage is less easily allowed to the blood through the lungs to the left side of the heart; but in this state other injuries seem also to concur.

fuerit quod sanguis languidius moveatur, malum in venas maxime incumbit; nimirum, quia in his sanguinis motus semper tardior est (432). Hinc varices venarum, et congestiones sanguinis, præsertim in iis partibus, quarum venæ valvis carent, et in quibus motus musculorum sanguinis cursum juvare nequit.

472. Par quoque ratio est, cur ab impedito aut languido sanguinis motu Hydrops sæpe oriatur; scilicet, aucto in venis renixu, sanguis ægrius ex arteriis in eas recipitur, et plus humoris tenuis in vasa exhalantia (434) impellitur, et ex iis deponitur, haud adeo facile per vasa resorbentia hauriendum.

473. Hæc vero, et reliqua haud pauca, quæ a languido humorum motu profluunt, mala, eo lentius et difficilius sanantur, quod omnes simul naturæ vires deficiunt. Quæ vero a nimio humorum impetu pro-

fuerit causa, quod sanguis moveatur languidius, malum incumbit maxime in venas, nimirum quia motus sanguinis est semper tardior in his. Hinc varices venarum, et congestiones sanguinis, præsertim in iis partibus, venæ quarum carent valvis, et in quibus motus musculorum nequit juvare cursum sanguinis.

472. Ratio est quoque par cur Hydrops sæpe oriatur ab impedito aut languido motu sanguinis; scilicet renixu in venis aucto, sanguis recipitur ægriùs in eas ex arteriis, et plus tenuis humoris impellitur in exhalantia vasa, et deponitur ex iis, haud adeo facilè hauriendum per resorbentia vasa.

473. Vero hæc, et haud pauca reliqua mala, quæ profiuunt a languido motu humorum, sanantur lentiùs et difficilius, eo quod omnes vires naturæ deficiunt simul. Vero aut cita mors aut læta vic-

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471. But, whatever may have been the cause, that the blood is circulated more languidly, the evil falls most upon the veins, doubtless because the motion of the blood is always slower in these. Hence varices of the veins, and congestions of blood, especially in those parts, the veins of which want valves, and in which the motion of the muscles cannot assist the current of the blood.

472. The reason is also similar, why dropsy often arises from an impeded or languid circulation of the blood; because the resistance in the veins being increased, the blood is received more difficultly into them from the arteries, and more of thin fluid is driven into the exhalant vessels, and is deposited from them, not so easily to be taken up by the absorbent vessels.

473. But these, and not a few other disorders, which proceed from a languid motion of the fluids, are cured more slowly and more difficultly, because all the powers of nature fail at the same time. But either speedy

toria brevi imponit finem iis quæ proveniunt a nimio impetu humorum.

474. Quin et, vitium circuitûs sæpissime accidit, sicubi plus sanguinis justo qui debet deferri ad singulas partes in certâ copiâ, defertur ad quasdam partes, et impetu majore quam decet: unde defectus in aliis partibus, quæ defraudantur suo penu.

475. Talis abnormis distributio vitalis humoris sæpe oritur a stimulo admoto vel cuilibet parti, vel aliis, quamvis fortasse admodum remotis; primo afficiente vel cerebrum vel demum animum, qui tamen efficit certam et definitam distributionem sanguinis secundum leges consensûs.

476. Oritur quoque haud raro a spasmo inducto aliis et satis remotis partibus; scilicet, qui dirigat sanguinem, pulsum a solitis viis, in novas.

477. Prout abnormis

veniunt, iis aut mors cita, aut victoria læta, brevi finem imponit.

474. Quin et vitium circuitus sæpissime accidit, sicubi sanguinis, qui certa copia ad singulas partes deferri debet, plus justo ad quasdam defertur, et majore quam decet impetu: unde defectus in aliis partibus, quæ suo penu defraudantur.

475. Talis distributio abnormis humoris vitalis oritur sæpe a stimulo, vel parti cuilibet admoto, vel aliis, quamvis fortasse admodum remotis; vel cerebrum, vel demum animum primo afficiente, qui tamen, secundum consensus leges (355, 363) certam et definitam sanguinis distributionem efficit.

476. Oritur quoque haud raro a spasmo aliis et satis remotis partibus inducto; scilicet, qui sanguinem a solitis viis pulsum in novas dirigat.

477. Prout major minorve fuerit

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death or a joyful victory quickly puts an end to those which proceed from a too great impetus of the fluids.

474. Moreover, a disorder of circulation very often occurs, as when more blood than proper which ought to be conveyed to the several parts in a certain quantity, is conveyed to some parts, and with an impetus greater than it ought: whence a deficiency in other parts, which are defrauded of their due proportion.

475. Such an irregular distribution of the vital fluid frequently arises from a stimulus applied either to any one part, or to others, although perhaps very remote; at first affecting either the brain or at length the mind, which nevertheless produces a certain and definite distribution of the blood according to the laws of sympathy.

476. It arises also not unfrequently from spasm induced in other and tolerably remote parts; that is, which can direct the blood, driven from the ordinary channels, into new ones.

hujusmodi distributio abnormis, eo plura et graviora, vel pauciora et leviora mala ex ea proveniunt: calor, tumor, rubor, inflammatio, laceratione vasorum, sanguinis profluvia, effusiones, et telæ reticulatæ partiumque vicinarum solutio, destructio, corruptio, suppuratio.

478. Hoc quoque, ut primo intuitu videtur, vitio, natura sæpe neque frustra utitur, et in optimum remedium vertit. Neque medici dedignati sunt ejus vestigia premere, et sanguinis distributionem in variis morbis, quantum potuerint, mutare atque dirigere; neque fecisse pœnituit. Scilicet, jam probe experti sunt mutatam sanguinis distributionem sæpe præstantissimum esse auxilium, tum ad sanandos morbos, tum ad levanda eorum indicia quæ maxime urgent.

479. Postremo, supersunt adhuc consideranda vitia quædam motus

distributio hujusmodi fuerit major vel minor, eo plura et graviora, vel pauciora et leviora, mala proveniunt ex eâ: calor, tumor, rubor, inflammatio, laceratione vasorum, profluvia sanguinis, effusiones, et solutio, destructio, corruptio, suppuratio reticulatæ telæ, que vicinarum partium.

478. Natura quoque sæpe utitur hoc, ut videtur, primo intuitu vitio, neque frustra, et vertit in optimum remedium. Neque medici dedignati sunt premere vestigia ejus, et mutare et dirigere, quantum potuerint, distributionem sanguinis in variis morbis: neque pœnituit fecisse. Scilicet jam probe experti sunt distributionem sanguinis mutatam esse sæpe præstantissimum auxilium tum ad sanandos morbos tum ad levanda indicia eorum quæ urgent maxime.

479. Postremo, quædam vitia motus cordis ipsius, adhuc supersunt conside-

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477. In proportion as an irregular distribution of this sort shall be greater or less, so much the more and severer, or the fewer and slighter, disorders proceed from it: heat, swelling, redness, inflammation, lacerations of the vessels, discharges of blood, effusions, and solution, destruction, corruption, suppuration of the cellular tissue, and contiguous parts.

478. Nature also often uses this, as it seems at first sight, disorder, nor in vain, and converts it into the best remedy. Nor have physicians disdained to tread the footsteps of it, and to change and direct, as far as they could, the distribution of blood in various diseases: nor did it repent them to have done this. Because already they have fully experienced that the distribution of the blood, when changed, was often a most excellent auxiliary as well for curing diseases as for relieving the symptoms of them which trouble most.

479. Lastly, certain derangements of the action of the heart itself, as yet

randa, neque profecto adeo levia aut simplicia ut non mereantur attentionem medicorum: nimirum, palpitatio, et syncope, seu animi defectio.

480. Vehemens abnormis actio cordis vocatur palpitatio; qualis plerumque sentitur et ab ægro ipso, non sine gravi anxietate in pectore, et ab adstantibus, si admoverint manum pectori; quin potest quodammodo et spectari, scilicet, costæ aliquando feriuntur tantâ vi ut totum pectus moveatur. Dum cor palpitat, pulsus arteriarum observantur plerumque debiles, inæquales, et intermittentes.

481. Malum, naturâ spasmus, inducitur variis causis, tum quæ afficiant totum nervosum genus, tum quæ cor solum. Vitia omnigena, cordis ipsius, que valvarum que vasorum ejus, constrictio, amplificatio, conversio in os, polypus, impediendo

ipsius cordis, neque profecto adeo levia aut simplicia, ut medicorum attentionem non mereantur: palpitatio nimirum, et syncope, seu animi defectio.

480. Palpitatio vocatur actio cordis vehemens, abnormis; qualis plerumque, et ab ipso ægro non sine gravi anxietate in pectore sentitur, et ab adstantibus, si manum pectori admoverint; quin et interdum spectari quodammodo potest, tanta scilicet vi costæ aliquando feriuntur, ut totum pectus moveatur. Dum palpitat cor, pulsus arteriarum plerumque debiles, inæquales, et intermittentes observantur.

481. Malum, natura spasmus, variis causis inducitur, tum quæ totum genus nervosum afficiunt, tum quæ solum cor. Vitia omnigena cordis ipsius, ejusque valvarum vasorumque, constrictio, amplificatio, conversio in os, polypus,

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remain to be considered, nor truly so slight or simple as not to deserve the attention of physicians: namely, palpitation, and syncope, or fainting.

480. A violent irregular action of the heart is called palpitation; such as generally is felt both by the patient himself, not without an oppressive anxiety in the chest, and by the bystanders, if they should apply the hand to the breast; but it may in some degree even be seen, that is, the ribs sometimes are struck with so much violence that the whole chest is moved. Whilst the heart palpitates, the pulsations of the arteries are observed for the most part weak, unequal, and intermitting.

481. The disorder, in its nature a spasm, is brought on by various causes, as well those which affect the whole nervous system, as those which affect the heart alone. Diseases of every kind, of the heart itself, and of the valves and vessels of it, constriction, enlargement, conversion into bone, polypus,

liberam cordis actionem et exinanitionem impediendo, ipsum ad insolitam et vehementem contractionem incitant. Sanguinis quoque nimia abundantia, vel nimius impetus, veluti a cursu, &c. eundem effectum præstare potest.

482. Quin et cor, insignis mobilitatis organum, a statu generis nervosi vehementer affecti, et præter naturam mobilis, sæpe palpitat. Hinc aliquando ab animi affectu palpitatio: Hinc malum hystericis familiare.

483. Sæpe quoque oritur a ventriculo male se habente, vermibus, multo onere cibi crudi aut corrupti, aëre per concoctionem minus sanam copiose extricato, variisque acribus, stimulato, distento, gravato.

484. Podagram repulsam, aut male prodeuntem, sæpe comitatur palpitatio. Aliquando a debilitate oritur, qualiscunque ejus causa fuerit; sæpe etiam ab omni spirandi

liberam actionem et exinanitionem cordis, incitant ipsum ad insolitam et vehementem contractionem. Quoque nimia abundantia sanguinis vel nimius impetus, veluti a cursu, &c. potest præstare eundem effectum.

482. Quin et cor, organum insignis mobilitatis, sæpe palpitat a statu nervosi generis vehementer affecti, et præternaturam mobilis. Hinc palpitatio aliquando ab affectu animi: hinc malum familiare hystericis.

483. Sæpe quoque oritur a ventriculo habente se male, stimulato, distento, gravato, vermibus, multo onere crudi aut corrupti cibi, aëre copiose extricato per minus sanam concoctionem, que variis acribus.

484. Palpitatio sæpe comitatur podagram repulsam aut prodeuntem male. Aliquando oritur a debilitate, qualiscunque fuerit causa ejus; sæpe etiam ab omni difficultate spirandi.

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by preventing the free action and emptying of the heart, excite it to unusual and violent contraction. Also an over-abundance of blood or excessive impetus, as from running, &c. may produce the same effect.

482. Moreover the heart, an organ of remarkable mobility, frequently palpitates from the state of the nervous system violently affected, and unnaturally irritable. Hence palpitation sometimes from an affection of the mind: hence a disorder common to hysterical persons.

483. Often also it arises from the stomach having itself badly, being stimulated, distended, oppressed, by worms, a great load of crude or corrupted food, by gas abundantly disengaged during less healthy digestion, and by various acrid things.

484. Palpitation often accompanies gout when repelled or coming out badly. Sometimes it arises from debility, whatsoever may have been the

Variæ causæ palpitationis possunt quoque conjungi simul, et aliæ producere alias.

485. Hinc patet cur, sæpe immedicabile malum, ocyus vel serius evasurum lethale; cur sæpe leve et fugax; sæpe rediens per intervalla, sæpe accedens et ingravescens omni irritatione et exercitatione; vero aliquando leniendum aut summovendum stimulantibus remediis et exercitatione.

486. Vocatur syncope seu defectio animi, (cui medici imposuerunt varia nomina, prout fuerit gravius vel levius malum,) siquando actio cordis, et simul cum eâ arteriarum, multum et subito deficit; unde animales vires, sensus, que voluntarius motus statim collabuntur.

487. Fere omnes causæ palpitationis possunt aliquando quoque inducere syncopen; scilicet quicquid queat turbare et convellere motum cordis, po-

difficultate. Variæ quoque palpitationis causæ simul conjungi possunt, et aliæ alias producere.

485. Hinc patet, cur malum sæpe immedicabile, serius ocyus lethale evasurum; cur sæpe leve et fugax: sæpe per intervalla rediens, sæpe omni irritatione et exercitatione accedens et ingravescens; aliquando vero stimulantibus remediis, et exercitatione, leniendum aut summovendum.

486. Syncope, seu animi defectio, (cui varia nomina, prout gravius vel levius fuerit malum, medici imposuerunt), vocatur, si quando actio cordis, et arteriarum simul cum ea, subito et multum deficit; unde vires animales, sensus, motusque voluntarius, statim collabuntur.

487. Omnes fere causæ palpitationis syncopen quoque aliquando inducere possunt; scilicet, quicquid motum cordis turbare et con-

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cause of it; often also from every difficulty of breathing. The various causes of palpitation may also be combined together, and some produce others.

485. Hence it appears why it is often an incurable disease, sooner or later about to become fatal; why frequently slight and transient; often returning at intervals, often coming on and increasing by every kind of irritation and exercise; but sometimes to be relieved or removed by stimulating remedies and exercise.

486. It is called syncope or fainting, (to which physicians have given various names, according as it shall be a severer or slighter disorder,) whenever the action of the heart, and together with it of the arteries, greatly and suddenly fails; whence the animal powers, sensation, and voluntary motion instantly collapse.

487. Almost all the causes of palpitation can sometimes also induce

vellere queat, eundem nonnunquam debilitare vel suspendere potest.

488. Fabrica igitur ipsius cordis vitiata, graves animi affectus, tum deprimentes, tum qui subito et vehementer incitant, varia generis nervosi vitia, quidam morbi ventriculi, debilitas omnigena, omnis exinanitio, sanguinis imprimis jactura, excessus laboris, ejusque non intermissi, diuturna vigilia, calor, dolor, multa venena, &c. hominem animo linqui faciunt.

489. Quicquid sanguinis motum per arterias cerebri debiliorem reddit, syncopen inducere; quicquid eundem expedit, hominem vel jam deficientem reficere potest.

490. Hinc ratio in promptu est, cur solus corporis situs syncopen sæpe vel inducat, vel impediat, vel jam inductam depellat.

491. Patet quoque, malum aliquando pessimi ominis esse, neque

test nonnunquam debilitare vel suspendere eundem.

488. Igitur vitiata fabrica cordis ipsius, graves affectus animi, tum deprimentes, tum qui subito et vehementer incitant, varia vitia nervosi generis, quidam morbi ventriculi, omnigena debilitas, omnis exinanitio, imprimis jactura sanguinis, excessus laboris, que ejus non intermissi, diuturna vigilia, calor, dolor, multa venena, &c. faciunt hominem linqui animo.

489. Quicquid reddit motum sanguinis per arterias cerebri debiliorem, potest inducere syncopen; quicquid expedit eundem reficere hominem vel jam deficientem.

490. Hinc ratio est in promptu cur situs solus corporis, sæpe vel inducat syncopen vel impediat, vel depellat, jam inductam.

491. Quoque patet, malum aliquando esse pessimi ominis, que ipsum

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syncope; that is to say, whatever can disturb and convulse the motion of the heart, may sometimes debilitate or even suspend the same.

488. Therefore a faulty mechanism of the heart itself, severe affections of the mind, as well depressing, as those which suddenly and violently excite, various disorders of the nervous system, certain diseases of the stomach, every kind of debility, every sort of evacuation, especially loss of blood, excess of labour, and of it not intermitted, long continued watching, heat, pain, many poisons, &c. cause a person to faint.

489. Whatever renders the motion of the blood through the arteries of the brain weaker, may bring on syncope; whatever expedites the same may recover a person even already fainting.

490. Hence the explanation is at hand, why the position alone of the body, often either may induce syncope or prevent it, or drive it off, already induced.

ne carere suo periculo; nimirum quod sæpe est continuatum morti; vero aliquando esse levissimum, discessurum sponte, neque requirere auxilium medici: denique nonnunquam optari haud absurde, et induci arte a solerte medico, imitatore atque æmulo Naturæ ipsius, ut præstet ægrum incolumem a vehemente dolore, aut immani impetu sanguinis, vel profluvio vix temperando aliter.

ipsum suo periculo carere: nimirum quod sæpe morti continuatum est; aliquando vero levissimum esse, sponte discessurum, neque medici auxilium requirere. Nonnunquam, denique, a solerte medico, Naturæ ipsius imitatore atque æmulo, haud absurde optari, et arte induci, ut ægrum a vehemente dolore, aut immani sanguinis impetu, vel profluvio, vix aliter temperando, incolumem præstet.

CAP. XVI.—*De naturâ sanguinis ipsius; et varietatibus et vitiis.*

CAP. XVI.—*De sanguinis ipsius natura; et varietatibus, et vitiis.*

492. Multum abest ut sanguis ipse, motus et distributio cujus sunt adeo necessaria ad vitam, sit simplex humor que sem-

492. MULTUM abest, ut sanguis ipse, cujus motus et distributio ad vitam adeo necessaria sunt, humor sit simplex, semperque idem. Va-

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491. It is also evident, that the disorder sometimes may be of the worst omen, and that it itself does not want its own danger: truly because often it is continued to death; but that sometimes it is very slight, about to depart of its own accord, nor requires the aid of the physician; in fine, that sometimes it is wished for not absurdly, and is induced by art by the skilful physician, the imitator and rival of Nature herself, that he may preserve the patient secure from violent pain, or violent impetus of blood, or a discharge scarcely to be governed otherwise.

CAP. XVI.—*Of the nature of the blood itself; and its varieties and disorders.*

492. MUCH is wanting that the blood itself, the circulation and distribution of which are so essential to life, be a simple fluid and always the same. It

rias partes, variæque, ut videtur, utilitatis, continet; et ipse suis varietatibus et vitiis obnoxius est.

493. E venis missus, inque idoneum vas receptus, suam naturam et compositionem aliquatenus manifeste prodit, dummodo quas sponte subit mutationes attente spectentur.

494. Tenuem vaporem primo exhalat, fere aquosum, levissime olidum, sed parca admodum quantitate: quiete, frigore, admisso aëre, brevi cogitur in massam profunde rubram, tremulam, mollissimam: paulo post, ex ejus superficie, citius si secta fuerit massa, guttulæ quædam humoris tenuis, subflavi, pellucidi, exiliunt, quæ plures prodeuntes coëunt tandem, partemque crassiorem circumdant, et a vasis parietibus separant.

495. Pars crassior, quæ sola rubet, accuratius explorata, ulteriorem ostendit compositionem: mul-

per idem. Continet varias partes, que, ut videtur, variæ utilitatis; et ipse est obnoxius suis varietatibus et vitiis.

493. Missus e venis et receptus in idoneum vas, manifeste prodit, aliquatenus, suam naturam et compositionem, dummodo mutationes quas subit sponte, attente spectentur.

494. Primo exhalat tenuem, fere aquosum, levissimè olidum vaporem, sed admodum parcâ quantitate; brevi cogitur in profunde rubram, tremulam, mollissimam, massam, quiete, frigore, aëre admisso: paulo post, citiùs si massa fuerit secta, quædam guttulæ tenuis, subflavi, pellucidi humoris exiliunt ex superficie ejus, quæ prodeuntes plures tandem coëunt que circumdant crassiorem partem, et separant a parietibus vasis.

495. Crassior pars, quæ sola rubet, accuratiùs explorata, ostendit ulteriorem compositionem: con-

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contains different parts, and, as it seems, of different utility; and itself is liable to its peculiar changes and disorders.

493. Drawn from the veins and received into a proper vessel, it manifestly sets forth, in some degree, its peculiar nature and composition, provided the changes which it undergoes spontaneously, be attentively looked to.

494. At first it exhales a thin, almost watery, very slightly smelling vapour, but in very small quantity; it quickly is coagulated into a deeply red, tremulous, very soft, mass, by rest, cold, air being admitted; a little after, more quickly if the mass should be cut, some small drops of a thin, yellowish pellucid fluid go out from the surface of it, which coming forth, in great number, at length run together and surround the thicker part, and separate it from the walls of the vessel.

495. The thicker part, which alone is red, more accurately examined,

tinet multum tenuioris partis, quæ vocatur serum : probe elota amittit suum ruborem, glutinosa, tenace, albidâ parte tamen superstite ; hæc pars, nunc dicta fibrina a chemicis, olim habuit varia nomina, fibram sanguinis, coagulabilem lympham, gluten.

496. Crassamentum, præterea, continet innumeras rubras particulas, vulgo dictas globulos, quæ impertiunt colorem universo sanguini. Hæ, si explorantur ope microscopii, singulæ ostendunt pulcherrimam fabricam, quæ tamen differt, haud parum, in diversis animalibus.

497. In homine, et plerisque aliis animalibus, sunt rotundæ et planæ, instar nummi. Exterior pars, quæ sola rubet, est mantica seu vesicula, quæ continet centralem partem, solidum globulum ut videtur, multo minorem se.

498. Tenuis pars san-

tum continet partis tenuioris, quæ vocatur serum : probe elota, ruborem suum amittit, superstite tamen parte glutinosa, tenace, albida ; hæc pars, fibrina a Chemicis nunc dicta, olim varia habuit nomina, fibram sanguinis, lympham coagulabilem, gluten.

496. Continet præterea crassamentum innumeras particulas, rubras, vulgo globulos dictas, quæ colorem impertiunt universo sanguini. Hæ, si ope microscopii explorantur, singulæ pulcherrimam ostendunt, fabricam, quæ tamen haud parum differt in diversis animalibus.

497. In homine, et plerisque aliis animalibus, rotundæ sunt, et planæ, instar nummi. Exterior pars, quæ sola rubet, mantica seu vesicula est, quæ partem centralem, globulum ut videtur solidum, continet, multo se minorem.

498. Tenuis pars sanguinis, quæ

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shews an ulterior composition : it contains much of the thinner part, which is called serum : well washed it loses its redness, the glutinous, tenacious, whitish part however remaining ; this part, now called fibrine by chemists, formerly had various names, fibre of the blood, coagulable lymph, gluten.

496. The crassamentum, besides, contains innumerable red particles, commonly called globules, which impart their colour to the whole blood. These, if they are examined by means of the microscope, each shew a very beautiful structure, which however differs, not a little, in different animals.

497. In man, and most other animals, they are circular and flat, like money. The exterior part, which alone is red, is a little bag or vesicle, which contains the central part, a solid globule, as it appears, much smaller than itself.

498. The thin part of the blood, which is called serum, a proper heat

vocatur serum, idoneo calore admoto, coit quoque in massam albidam, tenacem, albumen dictam, lymphæ coagulabili, quæ sponte coit, satis similem; unde tenuior latex, serositas dictus, exprimi potest; quæ aliquantum gelatinæ continet.

499. Varii demum sales insunt sanguini, in sero ipsius soluti: phosphas imprimis sodæ, phosphas calcis, murias sodæ, soda pura, et nonnihil hydrosulphureti ammoniæ.

500. Totus sanguis, qualis e vena fluit, nedum coactus, calore coit multo minore quam qui ad serum cogendum sufficiat: majore vero quam vivo homini unquam accidit.

501. Particulæ rubræ, dum in sero, vel simili quovis humore, natant, qui salis aliquid in se solutum continet, propriam figuram aliquandiu bene conservant, Sed pura aqua dilutæ, brevi tument,

guinis, quæ vocatur serum, idoneo calore admoto, quoque coit in albidam tenacem massam, dictam albumen, satis similem fibrinæ, seu coagulabili lymphæ, quæ coit sponte: unde tenuior latex, dictus serositas, potest exprimi; quæ continet aliquantum gelatinæ.

499. Demum varii sales insunt sanguini, soluti in sero ipsius: imprimis phosphas sodæ, phosphas calcis, murias sodæ, pura soda, et nonnihil hydro sulphureti ammoniæ.

500. Totus sanguis, nedum coagulatus, qualis fluit e venâ, coit calore multo minore quam qui sufficiat ad cogendum serum; vero majore quam unquam accidit vivo homini.

501. Rubræ particulæ, dum natant in sero, vel quovis simili humore, qui continet aliquid salis solutum in se, aliquandiu bene conservant propriam figuram. Sed, dilutæ purâ aquâ, brevi tument, ex-

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being applied, also coagulates into a whitish tenacious mass, called albumen, pretty similar to fibrine, or coagulable lymph, which coagulates spontaneously: from whence a thinner fluid, called serosity, can be pressed out; which contains a little of gelatine.

499. Lastly, various salts are in the blood, dissolved in the serum of it: especially phosphate of soda, phosphate of lime, muriate of soda, pure soda, and a little of hydrosulphuret of ammonia.

500. The entire blood, not yet coagulated, such as it flows from a vein, coagulates by a heat much less than what can suffice to coagulate the serum; but greater than ever occurs to the living man.

501. The red particles, whilst they swim in the serum, or any similar fluid, which contains something of salt dissolved in it, for some time perfectly preserve their proper figure. But, diluted with pure water, they quickly swell, the external vesicle is distended into the shape of a globe,

terior vesicula distenditur in formam globi, et tandem rumpitur et solvitur, et centralis particula elabitnr ex eâ. Igitur hic videtur esse unus usus, neque forsitan minimus, seri que salium quos continet, diluere totam massam sanguinis, et reddere mobilem, et conservare rubras particulas integras, et figurâ quâ decet.

vesicula exterior distenditur in formam globi, et rumpitur tandem, et solvitur, et particula centralis ex ea elabitur. Hoc igitur videtur esse unus, neque forsitan minimus, usus seri saliumque quos continet, totam massam sanguinis diluere, et mobilem reddere, particulasque rubras integras, et qua decet figura, conservare.

502. Origo et finis et usus rubrarum particularum pariter incerta atque obscura. Sunt qui opinantur centrales particulas formari in conglobatis glandulis resorbentium vasorum, et primâ ætate in thymo, resorberi in sanguinem deferri ad varia organa corporis, et indui exteriore rubrâ parte a splene, et demum reduci per resorbentia vasa ejûs, ad cor. Sed hæc et commenta hujusmodi, videntur parum firma.

502. Origo, et finis, et usus particularum rubrarum pariter incerta atque obscura. Sunt qui opinantur, particulas centrales in glandulis conglobatis vasorum resorbentium, et prima ætate in thymo formari in sanguinem resorberi, ad varia corporis organi deferri, et a splene parte exteriore rubra indui, et per ejus vasa resorbentia ad cor demum reduci.—Sed hæc et hujusmodi commenta parum firma videntur.

503. Est non dubitandum quin particulæ fabricatæ tantâ curâ, inservi-

503. Non est dubitandum, quin particulæ tanta cura fabricatæ,

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and at length is broken and dissolved, and the central particle escapes from it. Therefore this seems to be one use, nor perhaps the least, of the serum and of the salts which it contains, to dilute the entire mass of blood, and render it moveable, and to preserve the red particles entire, and with the figure, which it becomes them.

502. The origin and end and use of the red particles are alike uncertain and obscure. There are some who imagine that the central particles are formed in the conglobate glands of the absorbing vessels, and at the first age in the thymus, are reabsorbed into the blood, are carried to the various organs of the body, and are clothed with the exterior red part by the spleen, and at length are brought back by the absorbing vessels of it, to the heart. But these, and expositions of such sort, seem in a little degree certain.

503. It is not to be doubted but that particles fabricated with so great care, serve for an important use in the body, although this be hitherto little

insigni in corpore usui inserviant, quamvis hic parum hactenus cognitus sit. Non defuerunt qui opinati sunt, Iatromathematici nimirum, eas ad calorem animalem gignendum quodammodo conferre; sed haud satis valida ratione. Vasa majora certe implent atque distendunt, neque minora intrant, neque facile e corpore elabuntur. Ad nutrimentum corporis quodammodo prodesse videntur, in valido et bene pasto animale quam plurimæ, in famelico et exhausto paucissimæ repertæ.

504. Fibrina et albumen et gelatina quoque vasa probe distendunt et implent, et ne humor vitalis effluat impediunt: humor enim prorsus tenuis, instar aquæ, ad vitæ munera non suffecisset, quippe quem vasa innumeris ostiis patula non potuissent continere. Ad nutrimentum imprimis conferre videntur principia ista; quoniam et ipsa

ant insigni usu in corpore, quamvis hic sit hactenus parum cognitus. Non defuerunt qui opinati sunt, nimirum, Iatromathematici, eas conferre quodammodo ad gignendum animalem calorem: sed haud satis ratione. Certè implent et distendunt majora vasa, neque intrant minora neque facile elabuntur e corpore. Videntur prodesse quodammodo ad nutrimentum corporis, repertæ quam plurimæ in valido et bene pasto animale, paucissimæ in famelico et exhausto.

504. Fibrina et albumen et gelatina quoque probe distendunt et implent vasa et impediunt ne vitalis humor effluat: enim prorsus tenuis humor, instar aquæ, non suffecisset ad munera vitæ, quippe quem vasa patula innumeris ostiis non potuissent continere. Ista principia videntur imprimis conferre ad nutrimentum;

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understood. There have not been wanting they who have imagined, namely, the Iatro-mathematicians, that they contribute in some way to generate animal heat; but not with sufficient reason. Truly they fill and distend the larger vessels, neither do they enter the smaller ones, nor easily escape from the body. They seem to avail in some measure to the nutrition of the body, being found very numerous in a strong and well fed animal, very few in the starved and exhausted one.

504. Fibrine and albumen and gelatine also fully distend and fill the vessels, and prevent lest the vital fluid escapes: for an altogether thin fluid, like water, would not have sufficed for the functions of life, as being one which vessels open with numberless mouths would not have been able to retain. These principles seem especially to contribute to nutrition; because both they themselves nourish very much, and all the aliments are converted,

quoniam et ipsa nutriunt multum, et omnia alimenta vertuntur, per duplicem concoctionem in corpore, primo in ventriculo et intestinis, postea in pulmonibus, in eadem priusquam impendantur ad alendum corpus, et reparandam jacturam solidarum partium.

505. Usus universæ massæ sunt varii, et maximi momenti. Imprimis probe distributa, excitat nervosum genus; videtur conferre haud parum ad gignendum animalem calorem, que diffundendum eundem per totum corpus; quin et sanguis est penus unde varii humores, apti varii muniis, derivantur vel secernuntur.

506. Partes sanguinis jam descriptæ, raro desunt; aliæ raro reperiuntur in sanguine. Vero in quibusdam exemplis, fuit aut nulla fibrina, aut tam parum ejus, aut ipsa adeo corrupta, ut sanguis missus e venis non coiret, et

multum nutriunt, et omnia alimenta, per duplicem in corpore concoctionem, primo in ventriculo et intestinis, postea in pulmonibus, in eadem prius vertuntur, quam ad alendum corpus, et partium solidarum jacturam reparandam, impendantur.

505. Universæ massæ usus varii et maximi momenti sunt. Genus nervosum imprimis excitat, probe distributa; ad calorem animalem gignendum, eundemque per totum corpus diffundendum haud parum conferre videtur: quin et sanguis penus est unde varii humores, variis muniis apti, derivantur vel secernuntur.

506. Sanguinis partes jam descriptæ raro desunt; raro aliæ in sanguine reperiuntur. In quibusdam vero exemplis, aut nulla fuit fibrina, aut tam parum ejus, aut ipsa adeo corrupta, ut sanguis e venis missus non coiret, et par-

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by a twofold concoction in the body, first in the stomach and intestines, afterwards in the lungs, into the same, before that they are expended to support the body, and to repair the waste of the solid parts.

505. The uses of the whole mass are various, and of the greatest moment. First of all properly distributed, it excites the nervous system; seems to contribute not a little to generate animal heat, and to diffuse the same through the whole body; moreover the blood is the store from whence the various fluids, fitted for their various offices, are derived or secreted.

506. The parts of the blood already described, rarely are wanting; others rarely are found in the blood. But in some examples, there was either no fibrine, or so little of it, or itself so corrupted, that blood drawn from the veins would not coagulate, and the red particles, like sand, sought the bottom of the vessel. A thing of the worst omen.

ticulæ rubræ, instar arenæ, fundum vasis peterent. Res pessimi ominis.

507. Serum aliquando album, instar lactis, observatur, quod ab adipe resumpto, neque iterum in gluten redacto, oriri videtur. Sæpe etiam præter naturam flavum observatur serum, propter bilem in sanguinem redeuntem.

508. Sæpe alia minus solita ratione cogitur sanguis, et crassamentum obducitur crusta alba, tenace, instar corii. Hæc crusta nihil est præter puram fibrinam tardius solito coactam, quo fit ut particulæ rubræ colorantes quodammodo subsidant.

509. Nullum, ut diu creditum fuit, sanguinis lentorem, densitatem, spissitatem, tenacitatem, indicat, sed potius tenuitatem, saltem minorem ad coagulationem proclivitatem. Oritur plerumque a vehementiore sanguinis intra corpus

rubræ particulæ, instar arenæ, peterent fundum vasis. Res pessimi ominis.

507. Serum aliquando observatur album, instar lactis, quod videtur oriri ab adipe resumpto, que ne iterum redacto in gluten. Serum etiam sæpe observatur præternaturam flavum, propter bilem redeuntem in sanguinem.

508. Sanguis sæpe cogitur aliâ minus solitâ ratione, et crassamentum obducitur albâ tenace crustâ, instar corii. Hæc crusta est nihil præter puram fibrinam coactam tardius solito, quo fit ut rubræ colorantes particulæ quodammodo subsidant.

509. Indicat nullum lentorem, densitatem, spissitatem, tenacitatem sanguinis ut diu creditum fuit, sed potius tenuitatem, saltem minorem proclivitatem ad coagulationem. Oritur, plerumque, a vehementiore agi-

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507. The serum is sometimes observed white, like milk, which seems to arise from the fat being taken up, and not again reduced into gluten. The serum also often is observed unnaturally yellow, on account of the bile returning into the blood.

508. The blood often is coagulated in another less usual manner, and the crassamentum is covered with a white tenacious crust, like leather. This crust is nothing but pure fibrine coagulated more slowly than usual, whence it happens that the red colouring particles in some degree subside.

509. It indicates no lentor, density, thickening, tenacity of the blood, as for a long time was believed, but rather a tenuity, at least a less tendency to coagulation. It arises, for the most part, from a more violent agitation or shaking of the blood within the body: hence it accompanies many fevers and almost all inflammations, and sometimes discharges of blood, and

tatione seu conquassatione sanguinis intra corpus: hinc comitatur multas febres et fere omnes inflammationes, et aliquando profluvia sanguinis, et febres quas eruptio super cutem comitatur, interdum plenitudinem corporis, aut dolorem, que multas irritationes. Neque est talis crusta semper habenda morbosa, quippe quæ aliquando contingat sanissimis, veluti fœminis donec gerunt uterum, etiam a primis mensibus, et quibusdam validis laboriosis viris viventibus lautè, et sane omnibus hominibus, frequentius hiemale et verno tempore, quo robur solidarum partium, et actio vasorum quæ vehunt sanguinem, est maxima. Quin et potest induci aut impediri a levissimis causis, dum sanguis fluit, vel postquam receptus est in pateram, veluti formâ ipsius: ita ut sæpe nulla crusta observetur in alterâ paterâ, in alterâ densissima et tenacissima.

agitatione, seu conquassatione; hinc multas febres, et inflammationes fere omnes, et aliquando sanguinis profluvia, et febres quas eruptio super cutem comitatur, interdum corporis plenitudinem, aut dolorem, multasque irritationes, comitatur. Neque semper morbosa habenda est talis crusta, quippe quæ sanissimis aliquando contingat; veluti fœminis, donec uterum gerunt, a primis etiam mensibus; et viris quibusdam validis, laboriosis, laute viventibus; et omnibus sane hominibus, frequentius tempore hiemale et verno, quo robur solidarum partium et actio vasorum quæ sanguinem vehunt, maxima est (467). Quin et a levissimis causis, dum fluit sanguis vel postquam in pateram receptus est, veluti ipsius forma, iuduci aut impediri potest: ita ut sæpe in altera patera nulla, in altera densissima et tenacissima crusta observetur.

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fevers which an eruption upon the skin accompanies, sometimes fulness of habit, or pain, and many irritations. Nor is such a crust always to be considered diseased, as being one which sometimes belongs to the most healthy, as to women while they are child-bearing, even from the first months, and some strong labouring men living luxuriously, and indeed all persons, more frequently in the winter and spring time, in which the vigour of the solid parts, and the action of the vessels which carry the blood the greatest. Moreover it may be induced or be prevented by very slight causes, whilst the blood is flowing, or after it has been received into the cup, as by the form of it; so that often no crust can be observed in the one cup, in the other a very thick and very tenacious one.

510. Hence the explanation is given, why often it may be proper to let blood whilst such a crust is observed, and the body is accustomed to bear

510. Hinc ratio redditur cur sæpe, dum talis crusta observatur, sanguinem mittere conveniat, ejusque jacturam corpus bene ferre soleat: patet quoque quantus eorum error fuit, et periculi quam plenus, qui auctores erant sanguinem iterum iterumque mittendi, donec nulla amplius crusta super eum appareret; scilicet quam morbosam sanguinis partem credebant. Utilissimum profecto medico signum est, quamvis multum absit, ut ad illud solum respicere debeat.

511. Eadem fibrina sanguinis, nonnunquam dum vivit homo, sæpius vero post mortem, imprimis si vitium aliquod organi, amplificatio, obstructio, &c. adfuerit, in magnis vasis prope cor, aut in ipsius cordis sacculis, coit in massam tenacem, quæ vocatur Polypus. Similes massæ quoque haud raro in utero formantur, et Molæ vocantur.

510. Hinc ratio redditur, cur sæpe conveniat mittere sanguinem dum talis crusta observatur, que corpus soleat ferre jacturam ejus bene: quoque patet quantus et quam plenus periculi fuit error eorum qui erant auctores mittendi sanguinem iterum que iterum, donec nulla crusta appareret amplius super eum, scilicet quam credebant morbosam partem sanguinis. Profecto est utilissimum signum medico, quamvis multum absit ut debeat respicere ad illud solum.

511. Eadem fibrina sanguinis, nonnunquam dum homo vivit, vero sæpiùs post mortem, imprimis si adfuerit aliquod vitium organi, amplificatio, obstructio, &c. coit in tenacem massam, in magnis vasis prope cor, aut in sacculis cordis ipsius, quæ vocatur Polypus. Similes massæ quoque formantur haud raro in utero, et vocantur Molæ.

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the loss of it well; also it is evident how great and how full of danger was the error of those who were the authors of drawing blood again and again, until no crust appeared longer upon it, as being what they believed the diseased part of the blood. Truly it is a most useful sign to the physician, although much is wanting that he ought to look to it alone.

511. The same fibrine of the blood, sometimes while the man lives, but oftener after death, especially if there have been some disorder of the organ, enlargement, obstruction, &c. congeals into a tenacious mass, in the great vessels near the heart, or in the cavities of the heart itself, which is called Polypus. Similar masses also are formed not unfrequently in the uterus, and are called Moles.

512. The quantity of the whole mass, and of the individual parts of the blood, is not easily reduced to measure. It may vary much, the health still

512. Quantitas universæ massæ, et singularum partium sanguinis, haud facilè reducitur ad mensuram. Potest variare multum, sanitate adhuc salva: quod si fuerit vel nimium, vel nimis parum sanguinis in corpore, vel proportio partium ejus fuerit facta aliena, demum vitium erit non leve, et sæpe causa multorum et gravium morborum.

513. Nimia copia sanguinis colligitur usu multi validi, pinguis cibi præsertim ex carnibus, et validi potûs, (modo concoctio sit bona,) et otioso et sedentario genere vitæ, et multo somno, præsertim in iis qui prius solebant exercere sese multum; solitis exinanitionibus cohibitis; consuetudine exinanitionum, qualescunque fuerint, nimirum quæ minuant vitalem vim, et faciant excretiones languere; præ omnibus exhalatione per cutem vel sudore aut suppressis aut paulatim deficientibus.

512. Quantitas universæ massæ, et singularum partium sanguinis, haud facile ad mensuram reducitur. Multum variare potest, salva adhuc sanitate; quod si vel nimium sanguinis vel nimis parum in corpore fuerit, vel aliena ejus partium proportio facta fuerit, vitium demum erit, non leve, et sæpe multorum et gravium morborum causa.

513. Nimia sanguinis copia colligitur usu multi cibi. validi, pinguis, ex carnibus præsertim, et potus validi (modo concoctio bona sit) et vitæ genere otioso et sedentario, et multo somno, præsertim in iis qui prius multum sese exercere solebant; exinanitionibus quibusvis solitis cohibitis; consuetudine exinanitionum, qualescunque fuerint, nimirum quæ vim vitalem minuant, et excretiones languere faciant; præ omnibus, exhalatione per cutem vel sudore, aut suppressis, aut paulatim deficientibus.

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being sound: but if there should be either too much or too little blood in the body, or the proportion of the parts of it should be made irregular, at length the disorder will be no slight one, and often a cause of many and severe diseases.

513. Too great a quantity of blood is collected by the use of much strong, rich food, especially of flesh, and of strong drink, (provided the digestion be good,) also by an idle and sedentary kind of life, and by much sleep, especially in those who before were accustomed to exercise themselves very much; by the usual evacuation being restrained; by the habitual use of evacuants, whatever kind they may be, that is, those which diminish the vital power, and cause the excretions to languish; above all, by the exhalation by the skin or the sweat, either being suppressed or gradually failing.

Homines corporis constitutionem laxi et debiles, præ aliis, huic vitio sunt obnoxii.

514. Multa mala a nimia plenitudine oriuntur. Homo nonnunquam fere opprimitur, hebes, languidus, debilis fit, neque ipsa quæ sanguinem movent organa ad tantum onus impellendum valent. Pulsus languet, et aliquando syncope, et vertigo, et palpitatio observantur. Sæpius vero vasa nimis distenta, ad motus præter solitum vehementes et abnormes procliviafiunt.

515. Hinc proclivitas ad febres, inflammationes, inæqualem sanguinis distributionem, insolitas ejusdem congestiones, vasorum lacerationes, et sanguinis profluvia. Porro, ob arctum inter vasa sanguinem vehentia, et genus nervosum nexum, mobilitas nimia, et proclivitas ad spasmos, et alios ejusdem generis morbos, a plenitudine oriuntur.

Homines laxi et debiles constitutionem corporis, sunt præ aliis obnoxii huic vitio.

514. Multa mala oriuntur a nimiâ plenitudine. Homo nonnunquam fere opprimitur, fit hebes, languidus, debilis, neque organa ipsa quæ movent sanguinem, valent ad impellendum tantum onus. Pulsus languet, et syncope, et vertigo, et palpitatio aliquando observantur. Vero sæpius vasa nimis distenta, fiunt proclivia ad præter solitum vehementes et abnormes motus.

515. Hinc proclivitas ad febres, inflammationes, inæqualem distributionem sanguinis, insolitas congestiones ejusdem, lacerationes vasorum, et profluvia sanguinis. Porro, ob arctum nexum inter vasa vehentia sanguinem et nervosum genus, nimia mobilitas, et proclivitas ad spasmos et alios morbos ejusdem generis, oriuntur a plenitudine.

Persons lax and weak as to their constitution of body, are above others subject to this disorder.

514. Many diseases arise from excessive fulness. A person sometimes is almost borne down, becomes dull, languid, weak, nor are the organs themselves which move the blood able to drive forward so great a load. The pulse languishes, even syncope, and vertigo, and palpitation sometimes are observed. But more frequently the vessels, being over distended, become disposed to unusually violent and irregular motions.

515. Hence a tendency to fevers, inflammations, irregular distribution of blood, unusual congestions of the same, ruptures of vessels, and flowings of blood. Moreover, because of the close connexion between the vessels carrying blood and the nervous system, excessive irritability, and tendency to spasms and other diseases of the same kind, arise from fulness.

516. Hinc intelligitur cur aliquando obscurus pulsus, aliquando validus vel durus comitetur plenitudinem ; cur ipsa causa et pars tot morborum ; cur sæpe effectus prosperæ valetudinis ; quâ ratione optime adimatur ; vel novis exinanitionibus institutis, vel antiquis et suppressis restitutis, vel tenui et parcâ diæta, et validâ et crebrâ exercitatione.

516. Hinc intelligitur cur aliquando pulsus obscurus, aliquando validus vel durus, plenitudinem comitetur ; cur ipsa tot morborum causa et pars ; cur sæpe prosperæ valetudinis affectus; qua ratione optime adimatur : vel novis institutis exinanitionibus, vel antiquis, et suppressis restitutis, vel diæta tenui et parca, et valida et crebra corporis exercitatione.

517. Medici crediderunt se perspexisse quoque haud paucas alias species plenitudinis diversas ab hac verâ et absolutâ, de quibus ratiocinati sunt multum, quamvis sæpe nimiâ subtilitate.

517. Alias quoque haud paucas plenitudinis species, ab hac vera et absoluta diversas, medici crediderunt se perspexisse, de quibus multum, quamvis sæpe nimia subtilitate, ratiocinati sunt.

518. Vocatur plenitudo ad spatium, siquando copia sanguinis que mole ejus auctis nihil præter solitum, vasa quæ continent eum constringuntur, coarctantur, ita ut ægrè, nec sine incommodo, contineant solitam copiam et molem sanguinis, veluti extremis et minutis vasis

518. Plenitudo ad spatium vocatur, siquando, copia sanguinis ejusque mole nihil præter solitum auctis, vasa quæ eum continent, constringuntur, coarctantur, ita ut solitam sanguinis copiam et molem ægre, nec sine incommodo, contineant : veluti vasis extremis et

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516. Hence is understood why sometimes an obscure pulse, sometimes a strong or hard one accompanies fulness ; why it is a cause and part of so many diseases ; why often it is the effect of good health : by what means it may be best removed ; either by new evacuations being instituted, or the old and suppressed ones being restored, or by a slender and spare diet, and by powerful and frequent exercise.

517. Physicians have believed that they had observed also not a few other kinds of fulness, differing from this true and absolute one, about which they have reasoned a great deal, although often with too much subtlety.

518. It is called plethora as to space, whenever the quantity of blood and the bulk of it being increased nothing beyond what is usual, the vessels which contain it are constringed, straitened, so that difficulty, nor without inconvenience, can they hold their usual quantity and volume of blood, like

minutis multum constrictis, ingruente febre, aut subito terrore, aut magno frigore: vel demum vasis ipsis, veluti in senibus, concrescentibus, eorumque nonnullis imperviis factis; vel denique, ipso corpore, amputato membro, mutilato.

519. Plenitudo alia, spuria, ad molem dicta, accidere dicitur, sicubi sanguis ipse, quantitate non auctus, expanditur, mole augetur, vasaque continentia non secus ac vera plenitudo distendit. Ingens calor, vel externus, vel a febre, aut exercitatione, aut stimulantibus, hoc mali genus induxisse fertur, sanguine nimirum pro rata parte plus rarefacto, quam vasa relaxata essent. Quin et insolita, præsertim subita, aëris levitas, qualis a magna tempestatis mutatione accidit, vel hominibus contingit qui altos montes ascendunt, sanguinem rarefacere, expanso quem habet aëre, dicta est. Annon aliquando de

constrictis febre ingruente, aut subito terrore, aut magno frigore: vel vasis ipsis, demum concrescentibus, que nonnullis eorum factis imperviis, veluti in senibus; vel, denique, corpore ipso mutilato membro amputato.

519. Alia spuria plenitudo, dicta ad molem dicitur accidere sicubi sanguis ipse, non auctus quantitate, expanditur, augetur mole, que distendit vasa continentia non secus ac vera plenitudo. Ingens calor, vel externus, vel a febre, aut exercitatione, aut stimulantibus, fertur induxisse hoc genus mali, nimirum, sanguine, pro parte rata rarefacto plus quam vasa essent relaxata Quin et, insolita, præsertim subita levitas aëris, qualis accidit a magnâ mutatione tempestatis vel contingit hominibus qui ascendunt altos montes, dicta est rarefacere sanguinem, aëre quem habet expanso.

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as the extreme and minute vessels being constricted by fever attacking, or by sudden terror, or by great cold: or the vessels themselves at length growing together, and some of them having become impervious, as in old persons; or, lastly, the body itself being mutilated by a limb being amputated.

519. Another spurious plethora, named as to volume, is said to happen whenever the blood itself, not increased in quantity, is expanded, is increased in volume, and distends the vessels containing it in like manner as real fulness. Great heat, either external, or from fever, or exercise, or stimulants, is said to have induced this kind of disorder, that is the blood, in respect of the part being rarified more than the vessels were relaxed. Moreover, an unusual, especially sudden lightness of the air, such as occurs from a great change of the weather, or happens to persons who ascend high mountains, has been said to rarefy the blood, by the air which it contains being expanded.

Annon Iatro-mathematici aliquando hallucinati sunt nonnihil de his rebus, credentes molem sanguinis augeri, quum auctus impetus ejus, propter calorem, vehementem exercitationem, que alia stimulantia, potius esset in vitio?

520. Talis abundantia sanguinis qualis opprimat moventes vires vocatur plenitudo ad vires. Plenitudo hujûsmodi semper efficit ingens incommodum, et igitur potest dici ad vires. Tamen, vitium istiusmodi frequenter observatur, si vires ægri fuerint multum fractæ quâcunque causâ, vel ab exiguo excessu sanguinis, qualem validus homo tulisset impunè.

521. Facile patebit varia genera plenitudinis posse simul accidere eidem homini, que graviora mala sæpe profluxura esse tali conjunctione.

522. Inopia sanguinis quoque nocet multum: debilitat hominem, reddit

his rebus nonnihil hallucinati sunt Iatro-mathematici, molem sanguinis credentes augeri, quum auctus ejus impetus (452, 458, 467) propter calorem, exercitationem vehementem, aliaque stimulantia, potius in vitio esset?

520. Plenitudo ad vires vocatur, talis sanguinis abundantia, qualis vires moventes opprimat (514.) Ingens plenitudo hujusmodi incommodum semper efficit, et igitur ad vires dici potest. Frequenter tamen observatur istiusmodi vitium, vel ab exiguo sanguinis excessu, qualem validus homo impune tulisset, si vires ægri quacunque causa multum fractæ fuerint.

521. Facile patebit varia plenitudinis genera eidem homini simul accidere posse, gravioraque mala a tali conjunctione sæpe esse profluxura.

522. Inopia sanguinis multum quoque nocet; hominem debilitat,

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Have not the Iatro-mathematicians occasionally blundered a little on these subjects, believing that the volume of the blood was increased, when the increased impetus of it, through heat, violent exercise, and other stimulants, rather was in fault?

520. Such an abundance of blood as oppresses the moving powers, is called plethora as to the powers. Plethora of this kind always causes great inconvenience, and therefore it may be named against the strength. However, a disorder of that sort is frequently observed, if the strength of the sick have been much broken by any cause, even from a trifling excess of blood, such as a strong person would have borne with impunity.

521. It will easily appear that the different kinds of fulness may at the same time occur to the same person, and that very severe evils often are likely to proceed from such a combination.

522. Scarcity of blood also injures very much: it debilitates a person,

ad omnia vitæ munera impotentem reddit, motum sanguinis languere facit, syncopen, convulsiones, et mortem tandem inducit: si levior fuerit defectus et diuturnior, corpus marcescit, ob defectum nutrimenti, et functiones ipsius variis modis vitiantur.

523. Talis inopia oritur a longa inedia, cibo pravo, parum nutriente, vel boni cibi prava concoctione, aut impedito nutrimenti ex eo parati in sanguinem itinere; aut febribus, aliisque morbis qui corpus exhauriunt et nutrimentum impediunt; vel demum a variis exinanitionibus, sanguinis præsertim, imprimis si hæ subitæ fuerint: lentis enim exinanitionibus vasa mirum in modum se accommodant: præterea, si lente depletur corpus, excretiones minuuntur, propter vis vitalis defectum, ita ut retentione insolita, insolitum dispendium pro parte saltem facile compensetur. Quod si subita et

impotentem ad munera vitæ, facit motum sanguinis languere, et tandem inducit syncopen, convulsiones, mortem: si defectus fuerit levior, et diuturnior, corpus marcescit ob defectum nutrimenti, que functiones ipsius vitiantur variis modis.

523. Talis inopia oritur a longâ inediâ, pravo cibo, parum nutriente, pravâ concoctione vel boni cibi, aut itinere nutrimenti parati ex eo in sanguinem impedito; aut febribus, que aliis morbis qui exhauriunt corpus et impediunt nutrimentum; vel demum a variis exinanitionibus, præsertim sanguinis, imprimis si hæ fuerint subitæ; enim vasa accommodant se in mirum modum lentis exinanitionibus: præterea, si corpus depletur lente, excretiones minuuntur propter defectum vitalis vis, ita ut insolitum dispendium, pro parte saltem, facile compensetur

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renders him unable for the duties of life, causes the motion of the blood to languish, and at length brings on syncope, convulsions, death: if the deficiency should be less, but longer continued, the body emaciates through deficiency of nutriment, and the functions of it are vitiated in various ways.

523. Such a dearth arises from long fasting, bad food, no way nourishing, depraved concoction even of good food, or the passage of the nutriment prepared from it into the blood being obstructed; or from fevers, and other diseases which exhaust the body and impede its nourishment; or at length from various evacuations, chiefly of blood, especially if they should be sudden; for the vessels accommodate themselves to a wonderful degree to slow evacuations: besides, if the body is emptied slowly, the excretions are diminished through defect of vital power, so that the unusual expenditure, in part at least, is easily compensated by unusual retention. But if the

insolita retentione. Quod si exinanitio fuerit subita et magna, potest vel esse brevi lethalis vel ita frangere hominem ut nunquam plene convalescat.

524. Magna aut diuturna inopia sanguinis potest vix non vitiare qualitates humoris ejûs. Nimirum, tenuior pars facile et citò reparatur; vero crassa pars, fibrina, et rubræ particulæ, haud ita facilè. Hinc tenuis, pallidus, vix rubens sanguis, neque bene concrescens neque bene nutriens corpus.

525. Porro, sanguis fit nimis tenuis multo præsertim aquoso potu, tenui et parum nutriente cibo, prava concoctione in ventriculo, vel forsitan in pulmonibus; que organis ipsis, quæ fingunt crassiores partes, habentibus se male; solitis tenuibus excretionibus, scilicet sudore et urinâ, suppressis, veluti frigore aut vitio organorum; vel, demum, ut fere omnes medici pu-

magna fuerit exinanitio, vel brevi lethalis esse potest, vel hominem ita frangere, ut nunquam plene convalescat.

524. Inopia sanguinis magna aut diuturna qualitates ejus humoris vix potest non vitiare. Nimirum, pars tenuior facile et cito reparatur; pars vero crassa, fibrina, et particulæ rubræ, haud ita subito. Hinc sanguis, tenuis, pallidus, vix rubens, neque bene concrescens, neque corpus bene nutriens.

525. Fit porro nimis tenuis sanguis, multo potu, præsertim aquoso, cibo tenui, et parum nutriente, prava concoctione in ventriculo, vel forsitan in pulmonibus; ipsisque organis quæ partes crassiores fingunt male se habentibus; suppressis excretionibus solitis tenuibus, sudore scilicet et urina, veluti frigore, aut vitio organorum; vel demum, ut omnes fere medici puta-

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evacuation should be sudden and great, it may either be quickly fatal or so break up the person that he never perfectly recovers.

524. Great or long-protracted deficiency of blood can scarcely not vitiate the qualities of the fluids of it. Without doubt, the thinner part is easily and quickly repaired; but the thick part, the fibrine, and red particles, not so easily. Hence the thin, pale, scarcely red blood, neither perfectly concreting nor perfectly nourishing the body.

525. Moreover, the blood becomes too thin by much especially watery drink, poor and no way nourishing diet, depraved concoction in the stomach, or perhaps in the lungs; and the organs themselves, which elaborate the thicker parts, having themselves badly; the usual thin excretions, for instance, the sweat and urine, being suppressed, as by cold or disorder of their organs; or, lastly, as almost all physicians have thought, by a putrid

runt, putrida universi corporis, et humorum præsertim, corruptione: sed de hac re controversia est; et si ita sit ut olim opinio fuit, tum præter meram tenuitatem, perspicuum est alia plerumque sanguinis vitia concurrere.

526. Sanguis nimis tenuis vel aquosus facit vultum pallidum, corpus debile, languidum, torpidum, partes solidas laxas, flaccidas, ob defectum nutrimenti, et nimiam humidæ materiæ in compage quantitatem (82, 88); effusiones aquosas hydropicas in omni corporis parte inducit, aucta nimirum exhalatione humoris tenuis qui omnia cava corporis organa irrorat, partim ob sanguinem ipsum nimis solutum, et facilius et copiosius justo elabentem, partim ob vasa præter solitum relaxata, neque ut decet renitentia: quin et tantum abest ut venæ resorbentes in hoc statu plus quam solent illius exhalati humo-

tarunt, putridâ corruptione universi corporis, et præsertim humorum: sed est controversia de hac re; et si opinio sit ita ut fuit olim, tum est perspicuum alia vitia præter meram tenuitatem sanguinis plerumque concurrere.

526. Nimis tenuis vel aquosus sanguis facit vultum pallidum, corpus debile, languidum, torpidum, solidas partes laxas, flaccidas, ob defectum nutrimenti, et nimiam quantitatem humidæ materiæ in compage, inducit aquosas hydropicas effusiones in omni parte corporis; nimirum, exhalatione tenuis humoris, qui irrorat omnia cava organa corporis, auctâ, partim ob sanguinem ipsum nimis solutum, et elabentem faciliùs et copiosiùs justo, partim ob vasa præter solitum relaxata, neque renitentia ut decet: quin et, tantum abest ut resorbentes venæ in hoc statu hauriunt plus quam solent illius exhalati humo-

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corruption of the whole body, and especially of the fluids: but there is a controversy upon this subject; and if the opinion should be like as it was formerly, then it is manifest that other disorders besides mere attenuation of the blood for the most part concur.

526. A too thin or watery blood renders the countenance pale, the body weak, languid, torpid, the solid parts lax, flaccid, through defect of nourishment, and the excessive quantity of fluid material in the frame brings on watery dropsical effusions in every part of the body; that is, the exhalation of the thin fluid, which bedews all the hollow organs of the body, being increased, partly because of the blood itself being too much dissolved, and escaping more easily and more copiously than proper, partly on account of the vessels unusually relaxed, nor resisting as is proper: moreover, so much is wanting that the absorbing veins in this state take up more than they are

ris, ut hæ quoque participes generalis debilitatis, vix valeant ad sua solita munera.

527. Verum enimvero Natura ipsa plerumque præcavit a tot que tantis malis simplicissimo modo; neque sanguis fit nimis tenuis adeo facilè ut multi crediderunt: neque, si factus fuerit ita, ideoneum remedium deest. Nam, si corpus est alioquin sanum, tenuiores excretiones multum augentur, fere statim, et tota massa sanguinis, sæpe, brevi tempore, denuo reducitur ad justam spissitatem.

528. Aliud et oppositum vitium sanguinis huic, scilicet, nimia spissitas, qualem medici sæpe finxerunt, observatum est rarissimis, si in ullis, exemplis. Asseruerunt tale vitium oriri a spisso, sicco, tenace, glutinoso cibo, vel a defectu potûs, vel ab excessu tenuium excretionum, puta, a calore, exercitatione,

ris hauriant, ut hæ quoque, generalis debilitatis participes, vix ad solita sua munera valeant.

527. Verum enimvero, Natura ipsa a tot tantisque malis simplicissimo plerumque modo præcavit; neque adeo facile, ut multi crediderunt, sanguis nimis tenuis fit; neque si ita factus fuerit, deest idoneum remedium. Nam statim fere, si corpus alioquin sanum est, excretiones tenuiores multum augentur, et tota sanguinis massa sæpe brevi tempore ad justam spissitatem denuo reducitur.

528. Aliud et huic oppositum sanguinis vitium, nimia scilicet spissitas, qualem medici sæpe finxerunt, rarissimis si ullis in exemplis observatum est. Tale vitium a cibo spisso, sicco, tenace, glutinoso, vel a defectu potus, vel ab excessu excretionum tenuium, puta a calore, exercitatione, &c. oriri asseruerunt. Haud facile tamen ostenduntur ex-

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accustomed of that exhaled fluid, that they, also partakers of the general debility, scarce are able for their ordinary functions.

527. But indeed Nature herself for the most part has provided against so many and such great evils in a most simple manner; nor does the blood become too thin so easily as many have believed: nor, if it should have become so, is a proper remedy wanting. For, if the body is otherwise sound, the thinner excretions are greatly increased, almost immediately, and the entire mass of blood, often, in a short time, is again reduced to a proper thickness.

528. Another and an opposite disorder of the blood to this, namely, excessive spissitude, such as physicians often have imagined, has been observed in very few, if in any, examples. They have asserted that such a disorder arises from thick, dry, tenacious, glutinous food, or from deficiency of drink, or from excess of the thin excretions, for instance, by heat, exercise,

empla talis vitii, vel morborum compositorum qui ex eo deriventur. Quorundam profecto, febrium imprimis, et inflammationum, quos medicis huc referre placuit, alia plane ratio est.

529. Ita enim corpus humanum a sapiente rerum Opifice constitutum est, ut quamprimum sanguis ad justam spissitatem, vel quam minimum ultra, redactus fuerit, excretiones tenues vel supprimantur vel minuantur, et corpus simul plus humoris ab aëre trahat; sitis quoque tunc oritur, et quantum opus fuerit ad sanguinem diluendum bibitur. Quod si ipsa aqua deficit, neque miseri, importunissimæ siti quæ eos ad bibendum urget, indulgere possunt, tum demum, tantum abest ut sanguis spissetur, ut fatentibus ipsis auctoribus qui hujusmodi commenta de vitiis humorum strenuissime tuentur, orta vel aucta

&c. Tamen, exempla talis vitii, vel compositorum morborum qui deriventur ex eo, haud facilè ostenduntur. Profecto est plane alia ratio quorundam, imprimis febrium et inflammationum, quos placuit medicis referre huc.

529. Enim, humanum corpus est ita constitutum a sapiente Opifice rerum, ut, quamprimum sanguis redactus fuerit ad justam spissitatem, vel minimum quam ultra, tenues excretiones vel supprimantur vel minuantur, et corpus simul trahat plus humoris ab aëre; tunc sitis quoque oritur, et quantum opus fuerit ad diluendum sanguinem, bibitur. Quod si aqua ipsa deficit, neque miseri possunt indulgere importunissimæ siti quæ urget eos ad bibendum, demum tum tantum abest ut sanguis spissetur, ut auctoribus ipsis qui strenuissimè tuentur commenta hujûsmodi de vitiis humorum

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&c. However, examples of such a disorder, or of the compound diseases, which may be derived from it, are not easily shown. Truly there is evidently a different explanation of some, especially of fevers and inflammations, which it has pleased physicians to refer to this head.

529. Moreover, the human body has been so constituted by the wise Fabricator of things, that, as soon as the blood has been reduced to its due consistency, or the least possible beyond it, the thin excretions either are suppressed or are diminished, and the body at the same time abstracts more moisture from the air; then thirst also arises, and as much as was necessary to dilute the blood, is drank. But if the water itself fails, nor the wretched persons can indulge the very urgent thirst which urges them to drink, even then so much is wanting that the blood is inspissated, that the authors themselves who most strenuously defend theories of this kind concerning the disorders of the fluids, confessing, putridity having arisen or being

fatentibus, putredine ortâ vel auctâ, multum solvatur, et fit acer que tenuis, ægre continendus suis vasis.

530. Medici scripserunt multum de acrimoniâ humorum, et conati sunt ædificare ingentem molem super hoc tenue et lubricum fundamentum.

531. Profecto, pleraque commenta medicorum de acrimoniâ humorum jam obsoluerunt, et merito negliguntur tanquam falsa, vel saltem incerta, et nihil conducentia ad medicum usum; et nunc graves controversiæ existunt etiam de iis acrimoniis quæ, consensu fere omnium, sunt diu habitæ certæ et manifestæ. Et fatendum est esse adhuc locum dubitandi etiam de his, gratiâ verbi, de putredine humorum. Vero interim, dum lis est sub judice, decet cavere, dum vitamus unum errorem, ne curramus in alium vix minorem, et male negligamus rem alicujus momputredine, multum solvatur, et acer tenuisque fiat (525) ægre suis vasis continendus.

530. De acrimonia humorum multum scripserunt medici, et super hoc tenue et lubricum fundamentum, ingentem molem ædificare conati sunt.

531. Obsoluerunt profecto jam et merito negliguntur pleraque medicorum commenta de humorum acrimoniis, tanquam falsa, vel incerta saltem, et nihil ad usum medicum conducentia : et graves nunc existunt controversiæ de iis etiam acrimoniis quæ diu, omnium fere consensu, certæ et manifestæ sunt habitæ. Et fatendum est, de his etiam, verbi gratia, de humorum putredine, adhuc locum esse dubitandi. Interim vero, dum lis sub judice est, cavere decet, ne dum unum errorem vitamus, in alium curramus vix minorem, et rem alicujus saltem momenti in re medica,

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increased, it is much dissolved, and becomes acrid and thin, with difficulty to be retained in its vessels.

530. Physicians have written a great deal on the acrimony of the fluids, and have endeavoured to build a mighty structure upon this slender and slippery foundation.

531. Indeed, most of the theories of physicians concerning the acrimony of the fluids have now grown obsolete, and deservedly are neglected as false, or at least uncertain, and in no way conducing to medical practice; and now serious controversies exist even about those acrimonies which, by the consent of almost all, were long considered certain and evident. And we must confess that there is still room for doubting even about them, for example, about the putridity of the fluids. But in the mean time, whilst the dispute is under the judge, it becomes us to take care, whilst we avoid one error, that we do not run into another hardly less, and badly neglect a

quamvis non tanti ut olim opinio fuit, male negligamus. Juvabit certe novisse quæ de hac re aut certa aut maxime verisimilia visa sunt.

532. Sanguis in sanissimo homine aliquantulum acer, variis causis nonnihil acrior fieri potest, et multa neque levia mala facere: docet incitata cordis, aut arteriarum, aut organorum secernentium, actio, ab acribus ingestis: docent humores secreti præter solitum acres, et vasa aliquando multum stimulata, nonnunquam plane inflammata, vel demum erosa.

533. Plurima revera acria in corpus quotidie ingeruntur: hæc autem in ventriculo, et intestinis, et pulmone, vel corriguntur, concoquuntur, permutantur, priusquam in sanguinem aortæ veniunt, per totum corpus diffundenda; vel saltem plurima aqua diluta, vel fibrina, albumine, gelatina, obtusa,

menti, saltem in medicâ re, quamvis non tanti, ut fuit opinio olim. Certe, juvabit novisse quæ visa sunt aut certa aut maxime verisimilia de hac re.

532. Sanguis, aliquantulum acer in sanissimo homine, potest fieri nonnihil acrior variis causis, et facere multa que ne levia mala: incitata actio cordis, aut arteriarum, aut secernentium organorum, ab acribus ingestis, docet: humores præter solitum acres secreti, et vasa aliquando multum stimulata, nonnunquam planè inflammata, vel demum erosa, docent.

533. Plurima acria revera ingeruntur quotidie in corpus: autem hæc vel corriguntur, concoquuntur, permutantur in ventriculo, et pulmone, priusquam veniunt in sanguinem aortæ, diffundenda per totum corpus; vel saltem diluta plurimâ aquâ, vel obtusa fibrinâ, albumine, gelatinâ, depo-

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matter of some moment, at least in medical practice, although not so great, as was the opinion formerly. At least, it will benefit to know what things have seemed either certain or most probable concerning this matter.

532. The blood, a little acrid in the most healthy person, may become somewhat more acrid from various causes, and produce many and no slight evils: the quickened action of the heart, or arteries, or secreting organs, from acrids ingested, teaches it: humours unusually acrid being secreted, and the vessels sometimes very much stimulated, occasionally evidently inflamed, or even eroded, teach it.

533. Very many acrids indeed are conveyed daily into the body: but these either are corrected, are digested, are changed in the stomach, and lungs, before that they come into the blood of the aorta, to be diffused through the whole body; or at least diluted with a great deal of water, or blunted

nunt multum suæ acritudinis, et assidue excernuntur, tanquam noxia, e corpore.

534. Hoc modo, ingens copia acidi, alcalini, medii, veluti, communis salis, potest transire per corpus, valetudine parum vel nihil affectâ. Quod, si quantitas ejus fuerit nimia, que hæc ne probe diluta, neque excreta, tum demum nocebit.

535. Videtur quoque verisimile, quamvis medici non desint qui dubitant de hoc, hominem, etiam usque dum vivit, putrescere, que gignere sive evolvere multum salem sui generis, qui possit non ineptè dici animalis: scilicet magna pars omnium quos ingerimus vertitur in hunc salem, et exit e corpore cum urinâ. Vero ista proclivitas ad putridam conditionem, si fuerit nimia, dabit quoque nimium hujus salis, præsertim si multum salis assumptum fuerit cum cibo, et parum aquæ vel aliûs

multum suæ acritudinis deponunt, et assidue e corpore tanquam noxia excernuntur.

534. Hoc modo ingens copia salis acidi, alcalini, medii, veluti communis, per corpus transire po test, valetudine parum vel nihil affecta. Quod si nimia quantitas ejus fuerit, neque hæc probe diluta, neque excreta, tum demum nocebit.

535. Verisimile quoque videtur, quamvis non desint medici qui de hoc dubitant, hominem etiam dum vivit putrescere usque; multumque salem (499) sui generis, qui non inepte animalis dici possit, gignere sive evolvere: scilicet in hunc salem magna pars omnium quos ingerimus vertitur, et cum urina e corpore exit. Ista vero ad putridam conditionem proclivitas, si nimia fuerit, nimium quoque hujus salis dabit, præsertim si multum salis cum cibo assumptum fuerit, et parum aquæ, vel alius

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with fibrine, albumen, gelatine, lay aside much of their acrimony, and are constantly excreted, as noxious, from the body.

534. In this manner, a great quantity of acidulous, alkaline, neutral, for example, common salt, may pass through the body, the health being little or not at all affected. But, if the quantity of it should be excessive, and this not properly diluted, nor excreted, then indeed it will hurt.

535. It seems also probable, although physicians are not wanting who doubt of this, that man, even so long as he lives, putrefies, and generates or evolves much salt of its own kind, which may not improperly be called animal: because a great part of all the things which we ingest is changed into this salt, and goes out of the body with the urine. But that tendency to a putrid condition, if it should be too great, will produce also too much of this salt, especially if much salt should be taken with the food, and little

potus, in promptu fuerit, qui salem dilueret primo, et tandem e corpore elueret. Quod mali genus socii navales satis superque experiri solent quum plures menses solo commeatu nautico vivendum est.

536. Huic autem corruptioni corporis (535) siqua revera sit, quæ sponte supervenit, Natura idoneum remedium suggerit; cibum nempe recentem, ex frugibus imprimis comparatum, acescentem, qui putridam corruptionem corrigit, et salubre nutrimentum corpori præbet.

537. Hujusmodi vero cibus si deficit, corpus citius corrumpi videtur, et insignis humorum acrimonia et tenuitas gigni dicuntur; præsertim si aqua simul deest, aut excretiones, quæ putrida et acria e corpore vehunt, languent, veluti a frigore, ignavia, torpore, deprimentibus animi affectibus, morbisque qui corporis vires frangunt, et de-

potûs fuerit in promptu, qui primo dilueret, et tandem elueret salem e corpore. Quod genus mali navales socii solent satis que super experiri quum vivendum est plures menses nautico commeatu solo.

536. Autem Natura suggerit idoneum remedium huic corruptioni corporis, si revera sit qua, quæ supervenit spontè: nempe, recentem, acescentem cibum, et imprimis comparatum frugibus, qui corrigit putridam corruptionem, et præbet salubre nutrimentum corpori.

537. Vero si cibus hujusmodi deficit, corpus videtur citiùs corrumpi, que insignis acrimonia et tenuitas humorum dicuntur gigni; præsertim si aqua deest simul, aut excretiones, quæ vehunt putrida et acria e corpore, languent, veluti a frigore, ignaviâ, torpore, deprimentibus affectibus animi, que morbis qui frangunt vires corporis; et demum

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water or other drink should be at hand, which at first might dilute, and at last wash out the salt from the system. Which kind of disorder ships' crews are accustomed sufficiently and above to experience when they are obliged to live many months on ship provisions alone.

536. But Nature suggests a suitable remedy for this corruption of the body, if indeed there be any, which comes on spontaneously; namely, fresh, ascescent food, and especially that prepared from vegetables, which corrects the putrid corruption, and affords wholesome nutriment to the body.

537. But if food of this kind fails, the body appears more quickly to be corrupted, and a remarkable acrimony and tenuity of the fluids are said to be generated; especially if water is wanting at the same time, or the excretions, which carry the putrid and acrid things out of the body, are languid, as from cold, idleness, torpor, depressing affections of the mind, and diseases

si magnus calor adfuerit, qui semper favet tali corruptioni.

538. Porro, medici crediderunt humores aliquando putrescere velocius, nimirum, putrido fermento recepto in corpus; veluti in quibusdam febribus ortis contagio, imprimis calore juvante, victu ex carnibus, quibusdam salibus, debilitate, immunditiâ.

539. Denique, singularis pars corporis sæpe plane putrescit variis causis, veluti inflammatione, gangrænâ, algore; et nonnunquam inficit totum corpus: quamvis morbus hujusmodi plerumque evadat lethalis priusquam rapiat totum corpus in putredinem.

540. Diu fuit sanctissimè persuasum, fere omnibus medicis, massam sanguinis, quandocunque putresceret multum, non modo fieri acrem, sed quoque solvi, cogi ægre, et ostendere tenue et rarum crassamentum, et rumum si magnus calor adfuerit, qui tali corruptioni semper favet.

538. Porro, medici crediderunt humores velocius aliquando putrescere, putrido nimirum fermento in corpus recepto; veluti in febribus quibusdam contagio ortis, juvante imprimis calore, victu ex carnibus, salibus quibusdam, debilitate, immunditia.

539. Denique, pars singularis corporis variis causis plane sæpe putrescit, veluti inflammatione, gangræna, algore; et totum corpus nonnunquam inficit: quamvis plerumque lethalis evadat hujusmodi morbus, priusquam totum corpus in putredinem rapiat.

540. Medicis fere omnibus diu sanctissime persuasum fuit massam sanguinis, quandocunque multum putresceret, non modo acrem fieri, sed solvi quoque, ægre cogi, et tenue et rarum crassamentum ostendere, et ipsas particulas rubras

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which break down the strength of the body; and finally if great heat should be present, which always favours such a corruption.

538. Moreover, physicians have believed that the fluids sometimes putrefy more speedily, that is, by a putrid ferment being received into the body; as in certain fevers arising from contagion, especially heat assisting, a diet of meat, certain salts, debility, uncleanliness.

539. Lastly, a particular part of the body often evidently putrefies from various causes, as inflammation, gangrene, cold; and sometimes infects the whole system: although a disease of this sort for the most part becomes fatal before that it can hurry the whole body into putridity.

540. It long has been most firmly persuaded, almost to all physicians, that the mass of blood, whensoever it putrefied very much, not only became acrid, but also was dissolved, was congealed with difficulty, and shews a thin and scanty crassamentum, and that the red particles themselves fell away

dilabi et frangi; sanguinem vero sic solutum et acrem, tum propter salem ipsius evolutum, tum propter fibrinam suam rancidam et putridam, vasa omnia stimulare et erodere, et ex iis elabi, et maculas primo rubras, postea livescentes vel nigrescentes, tumores, ulcera vix sanabilia nisi tempestive putredini occurreretur, sanguinis profluvia ab omni corporis parte vix compescenda, et fætorem insignem et intolerabilem halitus, et omnium excretionum, qualia in scorbuto, vel in pessimis quibusdam febribus sæpe observantur, efficere; et laxitatem solidarum partium, summamque debilitatem (læsa scilicet ipsa vi nervosa tali putredine tanquam veneno) et mortem tandem, inducere.

bras particulas ipsas dilabi et frangi; vero sanguinem, sic solutum et acrem, tum propter salem ipsius evolutum tum propter suam fibrinam rancidam et putridam, stimulare et erodere omnia vasa, et elabi ex iis, et efficere maculas primo rubras, postea livescentes vel nigrescentes, tumores, ulcera vix sanabilia, nisi tempestive occurreretur putredini, profluvia sanguinis, ab omni parte corporis, vix compescenda, et insignem et intolerabilem fætorem halitûs, et omnium excretionum, qualia sæpe observantur in scorbuto, vel in quibusdam pessimis febribus; et inducere laxitatem solidarum partium, que summam debilitatem, (scilicet, nervosâ vi ipsâ læsâ tali putredine, tanquam veneno,) et tandem mortem.

541. Acrimonia acida vix unquam sanguini humano contingere videtur, neque humorum ulli quum

541. Acida acrimonia vix unquam videtur contingere humano sanguini, neque ulli humorum

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and were broken down; but that the blood, so dissolved and acrid, as well on account of the salt of itself being evolved as because of its fibrine being rancid and putrid, stimulates and erodes all the vessels, and escapes from them, and produces spots at first red, afterward becoming livid or blackening, tumours, ulcers scarcely curable, except the putridity seasonably be resisted, discharges of blood, from every part of the body, scarcely to be restrained, and a remarkable and intolerable fætor of the breath, and of all the excretions, such as often are observed in the scurvy, or in some of the worst fevers: and bring on laxity of the solid parts, and the greatest debility, (that is, the nervous power itself being injured by such putridness, as if by poison,) and at length death.

541. An acid acrimony scarcely ever seems to belong to human blood, nor to any one of the humours when first it is secreted from it, although indeed

quum primum secernitur ex eo, quamvis profectò unus ex iis jam secretus, scilicet lac, sponte et brevi acescat.

542. Neque sanguis videtur infici magis alcalinâ acrimoniâ. Revera putredo vergit ad hanc, et tandem desinit in hanc, autem vix vitâ durante; autem quidam humor secretus a sanguine, scilicet urina, etiam recens sæpe distat parum ab alcalinâ naturâ; et aliquando, ut fertur, reddita est plane alcalina.

543. Variæ acrimoniæ possunt fortasse inesse sanguini, veluti a nimio usu multorum acrium, puta, aromatum, meracioris potûs; sed nihil certi est notum de his.

544. Tamen, variæ morbosæ acrimoniæ plane existunt, quæ sæpe videntur quodammodo inficere corpus et corrumpere quibusdam gravibus morbis: cujusmodi sunt acrimoniæ variolæ, morbil-

primum ex eo secernitur, quamvis profecto unus ex iis jam secretus, lac scilicet, sponte et brevi acescat.

542. Neque magis videtur sanguis alcalina acrimonia infici. Putredo revera ad hanc vergit, et in hanc tandem desinit, vix autem durante vita: humor autem quidam a sanguine secretus, urina scilicet, sæpe parum distat, etiam recens, ab alcalina natura; et nonnunquam, ut fertur, plane alcalina reddita est.

543. Variæ fortasse acrimoniæ sanguini inesse possunt, veluti a nimio usu multorum acrium, puta aromatum, aut potus meracioris; sed de his nihil certi notum est.

544. Variæ tamen plane existunt acrimoniæ morbosæ; quæ corpus sæpe quodammodo inficere videntur, et gravibus quibusdam morbis corrumpere: cujusmodi sunt acrimoniæ variolæ, morbillorum, car-

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one of them when secreted, namely milk, spontaneously and quickly becomes acid.

542. Nor does the blood seem to be infected more with an alcaline acrimony. Truly putridness tends to this, and at length ends in it, but scarcely while life remaining; but a certain fluid secreted from the blood, namely the urine, even recent, often differs little from an alkaline nature: and sometimes, as it is said, has been voided quite alkaline.

543. Various acrimonies may perhaps exist in the blood, as from the excessive use of many acrid things, for instance, of spices, of strong drink: but nothing certain is known of these.

544. However, various morbid acrimonies without doubt exist, which often seem in some degree to infect the body and corrupt it with some severe diseases: of which sort are the acrimonies of small-pox, of measles, cancer,

cinomatis, luis venereæ, quarum natura, et origo, et modus quo adeo nocent parum intellecta, effectus vero satis superque noti sunt.

545. A plerisque vero acrimoniis Natura præcavit haud minore cura quam a nimia spissitate sanguinis; nonnullis antidoto dato, vel excitata siti, ut probe diluantur bibendo; vel auctis idoneis excretionibus, ut ejiciantur; vel denique variis excitatis motibus et actionibus, quibus domitæ et permutatæ, vel innocuæ fiant, vel novis et insolitis viis et excretionibus e corpore expellantur.

lorum, carcinomatis, luis venereæ, natura et origo quarum, et modus quo adeo nocent, sunt parum intellecta, vero effectus satis que super noti.

545. Vero Natura præcavit a plerisque acrimoniis haud minore curâ quam a nimiâ spissitate sanguinis; antidoto dato nonnullis, vel siti excitatâ, ut diluantur probe bibendo; vel, idoneis excretionibus auctis, ut ejiciantur; vel, denique, variis motibus et actionibus excitatis, quibus fiant domitæ, et permutatæ, vel innocuæ, vel expellantur e corpore, novis et insolitis viis et excretionibus.

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of lues venerea, the nature and origin of which, and the manner in which they so hurt, are little understood, but the effects are sufficiently and more known.

545. But Nature has guarded against many of the acrimonies with no less care than against too great spissitude of the blood; an antidote being given for some, either by thirst being excited, that they may be washed out thoroughly by drinking; or, the proper excretions being increased, that they may be ejected; or, lastly, various movements and actions being excited, by which they become subdued, and changed, or harmless, or are expelled from the body, by new and unusual channels and excretions.

CAP. XVII.—*De respiratione, que usibus et varietatibus, et vitiis ejûs: voce, loquelâ, nixu, suspirio, oscitatione, risu, fletu, singultu, dyspnœâ, tussi, sternutatione.*

CAP. XVII. — *De respiratione, ejusque usibus, et varietatibus, et vitiis: voce, loquela, nixu, suspirio, oscitatione, risu, fletu, singultu, dyspnœa, tussi, sternutatione.*

546. ADHUC et alia functio consideranda superest, nempe, respiratio, quæ jure habetur vitalis; quoniam in homine et animalibus, quæ habent similem structuram corporis, est adeo necessaria ad vitam, ut ne possit suspendi, quidem per brevissimum spatium temporis, sine maximo incommodo aut instante periculo.

546. SUPEREST et alia functio adhuc consideranda, respiratio nempe, quæ jure vitalis habetur; quoniam in homine, et animalibus quæ similem corporis structuram habent, ad vitam adeo necessaria est, ut ne quidem per brevissimum temporis spatium sine maximo incommodo aut instante periculo suspendi possit (5).

547. Est nulla in fœtu; incipit statim a partu; perficitur duplice motu, nimirum, inspiratione et expiratione, alterâ quarum aër recipitur in pulmonem, alterâ vicissim expellitur ex eo.

547. In fœtu nulla est: statim a partu incipit; duplice motu perficitur, inspiratione nimirum et expiratione, quarum altera aër in pulmonem recipitur, altera ex eo vicissim expellitur.

CHAP. XVII.—*Of respiration, and the uses and varieties, and disorders of it; of the voice, speech, straining, sighing, yawning, laughter, weeping, hiccup, dyspnœa, cough, sneezing.*

546. YET also another function to be considered remains, namely, respiration, which rightly is considered vital; since in man and animals, which have a similar structure of body, it is so necessary to life, that it cannot be suspended, even for a very short space of time, without the greatest inconvenience or instant danger.

547. There is none in the fœtus; it begins immediately after birth; it is performed by a twofold motion, namely, inspiration and expiration, by the one of which the air is admitted into the lung, by the other in turn it is expelled from it.

548. Medicorum observationibus jam satis constat, pulmonem proxime sub pleura costarum jacere, nullo scilicet interposito aëre, sicut olim opinio fuit: ampliato igitur thorace, oportet, vel vacuum inter pleuram pulmonemque fiat, vel hic quoque sic distendatur, ut cavum thoracis iterum accurate impleat.

549. Ne vacuum fiat, vetat resiliendi vis et aucta igitur moles aëris qui pulmoni inest, et pondus aëris externi per asperam arteriam intrantis, liberumque cum aëre qui in pulmone est commeatum habentis; et hunc igitur aëra jam sub inspirationem nonnihil expansum, et ideo minus renitentem, quoquoversum per pulmonem prementis.

550. Duplex vero machinatio est, qua cavum thoracis ampliare solemus; aut septo transverso se contrahente, descendente, centrum suum deorsum trahente, et a con-

548. Jam satis constat ex observationibus medicorum pulmonem jacere proxime sub pleurâ costarum; scilicet, nullo aëre interposito, ut olim fuit opinio: igitur, thorace ampliato, oportet vel vacuum fiat inter pleuram et pulmonem, vel hic quoque sic distendatur, ut iterum accurate impleat cavum thoracis.

549. Vis resiliendi, et igitur aucta moles aëris qui inest pulmoni, vetat ne vacuum fiat, et pondus externi aëris intrantis per asperam arteriam, que habentis liberum commeatum cum aëre qui est in pulmone; et igitur prementis hanc aëra, jam nonnihil expansum sub inspirationem, et ideo renitentem minus, quoquoversum per pulmonem.

550. Vero machinatio, quâ solemus ampliare cavum thoracis, est duplex; aut transverso septo contrahente se, descendente, trahente suum centrum deorsum, et, a concavo

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548. It is now sufficiently established by the observations of physicians, that the lungs lie close under the pleura of the ribs: that is, no air being interposed, as formerly was the opinion: therefore, the thorax being enlarged, it behoves either that a vacuum be made between the pleura and lung, or that the latter also be so distended, that again it accurately fills up the cavity of the thorax.

549. The elasticity, and therefore the increased volume of the air which is in the lung, prevents, lest a vacuum takes place, also the weight of the external air entering by the aspera arteria, and having a free communication with the air which is in the lungs; and therefore pressing this air, now somewhat expanded during inspiration, and consequently resisting less, in every direction through the lung.

550. But the mechanism, by which we are accustomed to enlarge the cavity of the thorax, is twofold; either the transverse septum contracting itself, descending, drawing its centre downwards, and, from being concave

versus abdomen, verso fere in planum; aut musculis qui jacent inter costas contrahentibus se, que elevantibus costas: autem hæ, propter obliquum situm et nexum quem habent cum spinâ dorsi, nequeunt elevari, quin ipsæ simul protrudantur, et quoque protrudant sternum, et dimoveant aliquantum opposita latera pectoris invicem a se.

cavo abdomen versus in planum fere verso; aut musculis qui inter costas jacent se contrahentibus costasque elevantibus: hæ autem, propter obliquum quem cum spina dorsi habent situm et nexum, elevari nequeunt, quin simul protrudantur ipsæ, et sternum quoque protrudant, et latera pectoris opposita a se invicem aliquantum dimoveant.

551. Igitur thorax ampliatur quoquoversum his viribus, quibus solemus uti vel singulis aut omnibus junctis simul prout res postulaverit; nimirum, fit longior, et latior, et profundior.

551. His itaque viribus, quibus vel singulis, vel omnibus simul junctis, uti solemus, prout res postulaverit, thorax quoquoversum ampliatur; nimirum longior, et latior, et profundior fit.

552. Vero alii musculi quoque conspirant in validissimâ aut difficili inspiratione, scilicet, quotquot possint vel firmare superiores costas, ut inferiores trahantur validiùs et certiùs ad eas.

552. In validissima vero aut difficili inspiratione, alii quoque musculi conspirant, quotquot scilicet costas superiores vel elevare possint, vel firmare, ut inferiores validius et certius ad eas trahantur.

553. Thorax sic dilatatus brevi reducitur ad pristinam amplitudinem;

553. Thorax sic dilatatus ad pristinam amplitudinem brevi re-

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towards the abdomen, changed almost into a flat; or the muscles which lie between the ribs contracting themselves, and elevating the ribs: but these, on account of the oblique position and connexion which they have with the spine of the back, cannot be elevated, but that themselves are at the same time protruded, and also protrude the sternum, and remove to some extent the opposite sides of the chest mutually from each other.

551. Wherefore the thorax is enlarged in every direction by these powers, which we are accustomed to use either single or all joined together according as the occasion shall require; that is, it becomes longer, and broader, and deeper.

552. But other muscles also co-operate in a very strong or difficult inspiration, namely, as many as are able either to elevate or fix the superior ribs, that the inferior ones may be drawn more powerfully and certainly to them.

553. The thorax thus dilated is quickly reduced to its former capacity;

ducitur, relaxatis imprimis omnibus musculis inspirationis, ita ut propria partium dimotarum vis resiliendi haud parum ad hunc effectum conducat. Costæ enim, ope cartilaginum, et fortium ligamentorum, cum sterno et dorso junctæ, statim fere ad primum situm hoc modo redeunt; et quidem sponte et facillime, scilicet sine ullo hominis ipsius conatu voluntario, aut ulla musculi cujusvis contractione invita. Mediastinum quoque dicitur centrum septi transversi sursum trahere; musculi vero abdominis, per inspirationem distenti, non modo resilientes, sed vi quoque vitali contracti (306, 321) septum transversum sursum premunt, et costas deorsum trahunt: hoc modo aër iterum e pulmone expellitur, juvante simul contractione fibrarum musculosarum, quibus bronchia instruuntur.

554. In valida autem expiratione

imprimis omnibus musculis inspirationis relaxatis, ita ut propria vis resiliendi dimotarum partium conducat haud parum ad hunc effectum. Enim costæ junctæ, ope cartilaginum et fortium ligamentorum, cum sterno et dorso, fere statim redeunt hoc modo ad pristinum situm; et quidem sponte et facillime, sine ullo voluntario conatu, hominis ipsiûs, aut ullâ invitâ contractione cujusvis musculi. Mediastinum quoque dicitur trahere centrum transversi septi sursum; vero musculi abdominis distenti per inspirationem, non modo resilientes, sed contracti quoque vitali vi, premunt transversum septum sursum, et trahunt costas deorsum: aër iterum expellitur hoc modo e pulmone, contractione musculosarum fibrarum, quibus bronchia instruuntur, simul juvante.

554. Autem alii mus-

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first by all the muscles of inspiration being relaxed, so that the proper elasticity of the separated parts may contribute not a little to this effect. Moreover the ribs joined, by means of cartilages and of strong ligaments, with the sternum and back, almost immediately return by this means to their former position; and even spontaneously and very easily, without any voluntary effort of the man himself, or any unwilling contraction of any muscle. The mediastinum also is said to draw the centre of the transverse septum upwards; but the muscles of the abdomen distended by inspiration, not only rebounding, but contracted also by a vital power, press the transverse septum upwards, and draw the ribs downwards: the air is again expelled in this manner from the lung, the contraction of the muscular fibres, with which the bronchia are furnished, at the same time assisting.

554. But other muscles also assist in a strong expiration: namely, those

culi quoque adjuvant in valida expiratione; nimirum, qui queant deprimere costas; aut, demum, musculi ipsi abdominis, qui, parentes voluntati, possunt contrahi insignivi.

555. Igitur respiratio absolvitur his alternis viribus. Fuit diu et multum disputatum inter medicos quantum thorax ampliaretur sub inspirationem, vel quanta mensura externi aëris descenderet in pulmonem singulis inspirationibus; neque est lis hactenus prorsus composita. Autem non desunt multæ observationes et experimenta instituta variis auctoribus, quæ faciunt verisimile adultum hominem solitæ magnitudinis, (nam amplitudo thoracis ipsiûs valet multum hic,) accipere circiter quadraginta cubicos pollices aëris in communi inspiratione; centum cubicos pollices et amplius aëris superesse in iis post naturalem ex-

alii quoque musculi adjuvant; nimirum qui costas deprimere queant; aut demum ipsi musculi abdominis, qui voluntati parentes, insigni vi contrahi possunt.

555. His igitur alternis viribus respiratio absolvitur. Diu multumque inter medicos disputatum fuit quantum sub inspirationem ampliaretur thorax, vel quanta mensura externi aëris in pulmonem singulis inspirationibus descenderet; neque hactenus de his rebus prorsus composita lis est. Non desunt autem multæ observationes et experimenta, a variis auctoribus instituta, quæ verisimile faciunt hominem adultum, solitæ magnitudinis (nam multum hic valet ipsius thoracis amplitudo) in communi inspiratione, quadraginta circiter pollices cubicos aëris in pulmones accipere; post naturalem expirationem, centum et amplius pollices cubicos aëris in iis super-

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which can depress the ribs; or lastly, the muscles themselves of the abdomen, which, obeying the will, can be contracted with great force.

555. Therefore respiration is performed by these alternate powers. It has been long and much disputed amongst physicians how much the thorax was enlarged during inspiration, or how great a quantity of the external air descended into the lungs at each inspiration; nor has the dispute hitherto been completely settled. But there are not wanting numerous observations and experiments instituted by various authors, which render it probable that an adult person of the usual size, (for the capacity of the thorax itself avails much here,) takes in about forty cubic inches of air in a common inspiration; that a hundred cubic inches and more of air remain in them after a natural expiration; after a very strong expiration that scarcely fifty cubic inches of air remain in the lungs; that by a very powerful

esse; post validissimam expirationem, vix quinquaginta pollices cubicos aëris in pulmonibus manere; per fortissimam inspirationem, ducentos et quinquaginta fortasse pollices cubicos aëris in iis includi; et demum, per fortissimam expirationem, post talem inspirationem, ducentos fere pollices cubicos aëris e pulmonibus expelli.

556. Medium fere locum tenet respiratio inter actiones quæ a voluntate pendent, et eas quæ inscio aut invito homine perficiuntur. Quatenus ad vitam necessaria sit, probe curavit Natura ut semper exerceatur; quatenus vero plurimis, et admodum diversis, neque perpetuis, vivi corporis muneribus inserviat, eandem voluntati atque arbitrio nostro quodammodo permisit. Musculi omnes, ut videtur, respirationis, voluntatis imperio subjiciuntur; suggerit autem Natura idoneum atque perpetuum stimu-

pirationem: post validissimam expirationem vix quinquaginta cubicos pollices aëris manere in pulmonibus; per fortissimam inspirationem ducentos et quinquaginta cubicos pollices aëris fortasse includi in iis; et demum per fortissimam expirationem post talem inspirationem fere ducentos cubicos pollices aëris expelli e pulmonibus.

556. Respiratio tenet fere medium locum inter actiones quæ pendent a voluntate, et eas quæ perficiuntur homine inscio aut invito. Quatenus sit necessaria ad vitam, Natura probe curavit ut semper exerceatur; vero quatenus inserviat plurimis, et admodum diversis, neque perpetuis muneribus vivi corporis permisit eandem quodammodo nostro voluntati et arbitrio. Omnes musculi respirationis, ut videtur, subjiciuntur imperio voluntatis; autem Natura suggerit idoneum perpetuum stimulum, qui

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inspiration, two hundred and fifty cubic inches of air are perhaps inclosed in them: and lastly by the strongest expiration, after such an inspiration that nearly two hundred cubic inches of air are expelled from the lungs.

556. Respiration holds nearly an intermediate place between the actions which depend upon the will, and those which are performed by a person unconscious or involuntary. As far as it is necessary to life, Nature has specially provided that it always should be exercised: but so far as it is subservient to the many, and very different, nor constant functions of the living body, she has left the same in some measure to our own will and pleasure. All the muscles of respiration, as it appears, are subjected to the control of the will; but Nature supplies a suitable incessant stimulus, which excites them to a proper action, the person being even unconscious or sometimes unwilling or endeavouring against it.

cieat eos ad idoneam actionem, homine etiam inscio vel interdum invito aut nitente contra.

lum qui eos, etiam inscio vel interdum invito aut contra nitente homine, ad idoneam actionem cieat.

557. Quis iste stimulus fuerit medici quæsiverunt multum et cur infans, qui, donec lateret in utero, nunquam spiraverat, statim inciperet spirare, quamprimum objiceretur aëri.

557. Quis fuerit iste stimulus, medici multum quæsiverunt, et cur infans, qui, donec in utero lateret, nunquam spiraverat, quamprimum aëri objiceretur, statim spirare inciperet.

558. Alii tribuunt respirationem incipientem statim a partu singulari naturali instinctui; alii generali nixui quem novum animal edit, (et profecto opus est inspiratione ad omnem validiorem nixum, ut partes quibus magni musculi corporis annectuntur rite firmentur:) demum, alii tribuunt primum spiritum contractioni transversi septi ipsius, quod, quamvis maxime distentum, et daturum validissimam contractionem primâ occasione, potuit efficere nihil omnino, dum infans latebat in utero; quia

558. Respirationem statim a partu incipientem alii singulari instinctui naturali tribuunt; alii nixui generali quem novum animal edit, (et profecto ad omnem nixum validiorem inspiratione opus est, ut partes quibus magni musculi corporis annectuntur rite firmentur); alii demum ipsius septi transversi contractioni primum spiritum tribuunt, quod, quamvis maxime distentum, et prima occasione validissimam daturum contractionem, dum in utero latebat infans, nihil omnino efficere potuit; quia non aër, sed aquosus latex, eum cir-

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557. What that stimulus may be physicians have enquired very much, and why the infant, who, while it was lying hid in the uterus, had never breathed, immediately began to breathe, as soon as it was exposed to the air.

558. Some attribute respiration beginning immediately after birth to a particular natural instinct; others to a general struggle which the new animal makes, (and indeed there is need of inspiration for every more powerful effort, that the parts to which the large muscles of the body are attached may be properly fixed;) lastly, others attribute the first breathing to the contraction of the transverse septum itself, which, although very much distended, and about to produce a very powerful contraction on the first opportunity, could effect nothing at all, while the infant was lying hid in the uterus; because not air, but a watery liquor surrounded it, and this cannot pass through the glottis, but on the contrary, it very closely shuts up the aperture of it, by the powerful contraction excited there.

cumdabat, et hic glottidem transire nequit, sed contra rimam ejus arctissime claudit, forti contractione ibi excitata.

559. Primæ inspirationi expiratio succedit, viribus jam (553) recensitis facta; et huic iterum inspiratio, cum forsitan simplice contractione septi transversi sursum pressi, nec parum distenti, actione musculorum abdominis; tum quoque fortasse stimulo quem sanguis in arteriis et venis pulmonis collectus dat; maxime vero stimulo illo peculiari, quem aër in ipso pulmone retentus, variisque materiis per spiritum inquinatus (59, 564), forsan et aliter quoque vitiatus (565) per consensum (358) aliquem, ut videtur, omnibus inspirationis musculis impertit: hunc stimulum, quippe qui nobis familiaris sit, in communi respiratione vix percipimus; verum, si diutius spiritum cohibemus, eundem molestum et quidem validissi-

non aër, sed aquosus latex circumdabat eum, et hic nequit transire glottidem, sed contra arctissimè claudit rimam ejus, forti contractione excitatâ ibi.

559. Expiratio, facta viribus jam recensitis, succedit primæ inspirationi; et huic iterum inspiratio, cum forsitan simplice contractione transversi septi pressi sursum, nec parum distenti actione musculorum abdominis; tum quoque fortasse stimulo quem sanguis collectus in arteriis et venis dat; vero maxime illo peculiari stimulo, quem aër retentus in pulmone ipso, que inquinatus variis materiis per spiritum, et forsan quoque aliter vitiatus, impertit, per aliquem consensum, ut videtur, omnibus musculis inspirationis: vix percipimus hunc stimulum in communi respiratione, quippe qui sit familiaris nobis: verum, si cohibemus spiritum diutius, sentimus eundem

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559. An expiration, made by the powers already enumerated, succeeds the first inspiration; and to this again an inspiration, as well perhaps by the simple contraction of the transverse septum pressed upwards, nor a little distended by the action of the muscles of the abdomen; as also perhaps by the stimulus which the blood collected in the arteries and veins produces: but most of all by that peculiar stimulus, which the air retained in the lung itself, and adulterated with different matters through the breathing, and perhaps also otherwise vitiated imparts, by some consent, as it appears, to all the muscles of inspiration; we scarcely perceive this stimulus in ordinary respiration, as being that which is familiar to us; but if we restrain the breathing a long time, we feel the same to be troublesome and even very powerful, and such as we cannot resist.

esse molestum et quidem validissimum, et quali possumus non resistere.

560. Porro aliquid conatûs cujus simus conscii requiritur ad inspirationem : expiratio perficitur sponte et sine conatu. Hinc inspiratio est ultimus nisus in moribundo ; efflat animam sine conatu ; nam omnes moriuntur in expiratione.

561. Respiratio inservit variis usibus. Plerique medici existimarunt hanc esse non modo utilem, sed prorsus necessariam, scilicet quia opus esset eâ, ut crederent, ad promovendum circuitum sanguinis per pulmonem. Enim pulmo, donec est collapsus et compressus, veluti in fœtu, vel etiam in adulto homine, (ut quidam putarunt,) sub expirationem, nequit recipere tantum sanguinis quantum dextrum cor tradat ipsi. Igitur alia via patet huic sanguini in fœtu : vero in adulto homine, ubi est

mum esse sentimus, et quali non possumus resistere.

560. Ad inspirationem porro conatus aliquid cujus conscii simus requiritur : expiratio sponte et sine conatu (553) perficitur. Hinc ultimus in moribundo nisus inspiratio est ; animam sine conatu efflat ; nam omnes in expiratione moriuntur.

561. Respiratio variis usibus inservit. Plerique medici existimarunt hanc non utilem modo esse, sed prorsus necessariam, scilicet quia ea opus esset, ut crederent, ad sanguinis circuitum per pulmonem promovendum. Pulmo enim, donec collapsus et compressus est, veluti in fœtu, vel etiam in adulto homine, (ut quidam putarunt,) sub expirationem, tantum sanguinis recipere nequit, quantum cor dextrum ipsi tradat. In fœtu igitur alia huic sanguini patet via : in adulto vero homine, ubi nulla alia

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560. Moreover something of an effort of which we are conscious is required for inspiration : expiration is performed spontaneously and without effort. Hence inspiration is the last struggle in the dying person : he breathes out his soul without an effort ; for all die in an expiration.

561. Respiration serves for various uses. Most physicians have imagined that it was not only useful, but absolutely necessary, that is, because there was need of it, as they believed, to promote the circulation of the blood through the lung. For the lung, whilst it is collapsed and compressed, as in the fœtus, or even in the adult person, (as some supposed,) during expiration, cannot admit so much of blood as the right heart delivers to it. Therefore another course lies open to this blood in the fœtus : but in the adult person, where there is none other, physicians supposed that the blood was accumulated in some degree in the lung, at first about to produce an unpleasant, although slight, sense of uneasiness with a desire inspiring ;

est, medici putarunt sanguinem in pulmone quodammodo accumulari, primo ingratum quamvis levem molestiæ sensum, cum inspirandi cupiditate; postea vero, nisi prius homo spiritum traxerit, horrendum suffocationis sensum daturum. Sibimet quoque persuaserunt sanguinem etiam sub inspirationem vix melius per pulmonem transire: quamvis enim aliquanto major sanguinis copia in hoc statu in pulmonem recipi posset, hanc putarunt ægre per eum transmitti, propter ramulos minutissimos arteriæ pulmonalis, distentis cellulis pulmonis, nimis compressos. Sed hæc omnia, quamvis non prorsus falsa, saltem minus firma sunt, et minoris momenti, quam multi et graves auctores existimarunt.

562. Quod si ita res se habet ut hi auctores docuerunt, fieri non potest, quin status quidam pulmonis, medius quasi inter compressio-

nulla alia, medici putarunt sanguinem accumulari quodammodo in pulmone, primo daturum ingratum, quamvis levem, sensum molestiæ cum cupiditate inspirandi; vero postea, nisi homo prius traxerit spiritum, horrendum sensum suffocationis. Quoque persuaserunt sibimet sanguinem transire vix melius per pulmonem etiam sub inspirationem: enim quamvis aliquanto major copia sanguinis posset recipi in pulmonem in hoc statu, putarunt hanc transmitti ægre per eum propter minutissimos ramulos pulmonalis arteriæ nimis compressos distentis cellulis pulmonis. Sed omnia hæc, quamvis non prorsus falsa, sunt saltem minus firma, et minoris momenti, quam multi et graves auctores existimarunt.

562. Quod si res habet se ita ut hi auctores docuerunt, non potest fieri, quin quidam status pulmonis, medius quasi in-

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but afterwards, unless the person first drew breath, a horrible feeling of suffocation. Also they persuaded themselves that the blood passes scarcely better through the lung even during inspiration: for although a somewhat greater quantity of blood might be admitted into the lung in this state, they thought that it was transmitted with difficulty through it because of the very minute ramifications of the pulmonary artery being too much compressed by the distended cells of the lung. But all these things, although not utterly false, are at least not established, and of less moment, than many and grave authors have imagined.

562. But if the matter has itself so as these authors have taught, it cannot happen but that a certain state of the lung, intermediate as it were between compression and the greatest enlargement, both freely should receive and transmit the blood: that is, which will render the vessels carrying the blood

ter compressionem et maximam amplificationem, et libere accipiat et transmittat sanguinem: nempe, qui reddet vasa vehentia sanguinem quam maxime capacia. Et profecto, jam constat per idonea experimenta, scilicet, aquâ infusâ in thoracem vivi animalis, compressionem pulmonis multo majorem quam quæ fit in communi expiratione, parum impedire motum sanguinis per eum, neque lædere spiritum adeo ut fuit olim opinio.

563. Vero Natura potuit evitare istam necessitatem, si revera qua sit vel nullo pulmone dato homini, vel homine instructo simplice corde et pulmone fere arbitrario, qui accepisset totum suum sanguinem a ramo aortæ, qualem fabricam spectamus in amphibiis, et plerisque animalibus frigidi sanguinis. Præterea, leges philosophandi vetant fingere vel quærere plures causas quam quæ suffi-

nem et amplificationem maximam, sanguinem et accipiat et transmittat libere: nempe, qui vasa sanguinem vehentia quam maxime capacia reddet. Et profecto constat jam per idonea experimenta, aqua scilicet in thoracem vivi animalis infusa, multo majorem pulmonis compressionem, quam quæ in communi expiratione fit, motum sanguinis per eum parum impedire, neque spiritum adeo lædere, ut olim opinio fuit,

563. Istam vero necessitatem (561), si qua revera sit, Natura evitare potuit, vel nullo homini dato pulmone, vel homine corde simplice instructo, et pulmone fere arbitrario, qui totum suum sanguinem a ramo aortæ accepisset, qualem in amphibiis, et plerisque frigidi sanguinis animalibus, fabricam spectamus. Præterea, leges philosophandi vetant plures causas fingere vel quærere, quam quæ ad

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the most capacious possible. And, indeed, it is now established by suitable experiments, namely, water poured into the thorax of a living animal, that a compression of the lung much greater than what takes place in common expiration, little hinders the motion of the blood through it, nor hurts the breathing so much as was formerly the opinion.

563. But Nature could avoid that necessity, if indeed any be, either by no lung being given to man, or by man being furnished with a single heart and a lung almost arbitrary, which might have received the whole of its blood from a branch of the aorta, such a mechanism as we observe in amphibia, and in most animals of cold blood. Besides, the laws of philosophising forbid us to devise or seek more causes than what are sufficient to explain the subject: and there are others nor doubtful why

rem explicandam sufficiant: et aliæ sunt neque dubiæ, cur spiritus interclusus, vel sub inspirationem vel expirationem, vel demum sub medium statum, quo vasa capacissima et liberrima esse debent, hominem brevi extingueret.

564. Alios scilicet respirationis usus ex effectibus ejus docemur. Omne spirans, præter halitum aquosum, plurimum acidum carbonicum e pulmone usque exhalat, quod vel ipsi, vel aliis, lethali veneno foret, si in pulmone retentum, vel iterum in eum receptum esset. Non minimus certe respirationis usus est, hoc noxium excernere.

565. Constat quoque per innumera experimenta, insignem, et summi momenti sanguinis ipsius mutationem, per spiritum in pulmone fieri. Ille enim per venas cavas ab omni parte corporis redux, colore nigricans, per cor dextrum

ciant ad explicandam rem; et sunt aliæ neque dubiæ cur spiritus interclusus, vel sub inspirationem, vel expirationem, vel demum sub medium statum, quo vasa debēnt esse capacissima et liberrima, brevi extingueret hominem.

564. Scilicet docemur alios usus respirationis ex effectibus ejŭs. Omne spirans, præter aquosum halitum, usque exhalat plurimum carbonicum acidum e pulmone, quod foret lethali veneno vel ipsi vel aliis si retentum esset in pulmone vel iterum receptum in eum. Excernere hoc noxium certe, est non minimus usus respirationis.

565. Constat quoque per innumera experimenta, insignem mutationem sanguinis ipsius, et summi momenti, fieri per spiritum in pulmone. Enim ille redux per venas cavas ab omni parte corporis, impellitur, nigricans

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the breath stifled, either during inspiration, or expiration, or lastly during the intermediate state, in which the vessels ought to be most capacious and free, would quickly destroy a person.

564. Indeed we are taught other uses of respiration from the effects of it. Every breathing animal, besides a watery vapour, continually exhales a great deal of carbonic acid from the lungs, which would be a deadly poison either to itself or to others if it were retained in the lung or again received into it. To void this noxious principle, indeed, is not the least use of respiration.

565. It is established also by innumerable experiments, that a remarkable change of the blood itself, and of the greatest moment, takes place by the air in the lung. For it returning by the venæ cavæ from every part of the body, is driven, blackish in colour, by the right heart into the lungs, and

colore per dextrum cor in pulmones, et dum animal spirat redit ex his ad sinistrum cor, rubens lætius (quod notum est diu) et aliter mutatus et probe excitat hoc ad suum munus. Vero spiritu intercluso, sanguis transmissus per pulmones neque rubet solito more, neque satis irritat sinistrum cor, motus cujus statim fatiscit, periturus brevi. Animale iterum spirante, sanguis advectus a pulmone ad cor denuo rubescit, et hoc simul integrat suum motum et vitam moribundo. Hæ chemicæ mutationes sanguinis in pulmone videntur pendere maxime ab oxygenio (quod est tantum exigua pars communis aëris quem solemus spirare,) accepto quodammodo in sanguinem et probe permisto cum eo.

566. Porro exhalatio, carbonici acidi istiusmodi qualis fit e pulmonibus, habetur apud chemicos certum signum cujusdam

in pulmones impellitur, et, dum spirat animal, ex his lætius rubens (quod diu notum est) et aliter mutatus ad cor sinistrum redit, et hoc ad suum munus probe excitat. Intercluso vero spiritu, sanguis per pulmones transmissus neque more solito rubet, neque cor sinistrum satis irritat, cujus motus statim fatiscit, brevi periturus. Spirante iterum animale, sanguis a pulmone ad cor advectus denuo rubescit, et hoc simul motum suum, et vitam moribundo, integrat. Hæ mutationes chemicæ sanguinis in pulmone maxime pendere videntur ab oxygenio (quod exigua tantum pars est communis aëris quem spirare solemus) in sanguinem quodammodo accepto, et probe cum eo permisto.

566. Porro, istiusmodi acidi carbonici exhalatio qualis e pulmonibus fit (568) apud chemicos certum signum habetur mutationis

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whilst the animal breathes, it returns from these to the left heart, reddening more brightly, (which has been known a long time,) and otherwise changed and powerfully excites this to its proper duty. But the breathing being stopped, the blood transmitted through the lungs neither reddens in the usual manner, nor sufficiently irritates the left heart, the motion of which immediately fails, and about to perish quickly. The animal again breathing, the blood brought from the lung to the heart again becomes red, and this at the same time restores its own motion and life to the dying animal. These chemical changes of the blood in the lung seem to depend principally upon oxygen (which is only a small portion of the common air, which we are accustomed to breathe) received in some way into the blood, and thoroughly mixed with it.

566. Moreover an exhalation of carbonic acid, of that sort such as takes place from the lungs, is considered by chemists a certain sign of some change

cujusdam compositionis, in corpore unde ipsa oritur. Et satis verisimile est, sanguinem aliam quandam mutationem chemicam ibi loci subire, cujus acidi istius exhalatio signum sit et effectus; præsertim si animum ad hoc attendamus, nimirum nutrimentum omne prius per pulmonem transire, quam majorem circuitum intret, nec unquam, saltem in sano homine, crudum in eo sanguine conspici, quem cor sinistrum ad reliquum corpus miserit. Cruda fortasse materies, qualis ex intestinis defertur, oleosa, subdulcis, acescens, mediæ quasi naturæ inter fruges et carnes, in pulmone subigitur, in verum sanguinem (392, et seqq.) vertitur, concoquitur penitus, naturam animalem demum induit, putrescens facta, neque postea a pristinis corporis humoribus distinguenda.

567. Denique, sunt qui credunt calorem animalium in pulmone

mutationis compositionis in corpore unde ipsa oritur. Et est satis verisimile, sanguinem subire quandam aliam chemicam mutationem ibi loci, cujus exhalatio istius acidi est signum et effectus; præsertim si attendamus animum ad hoc, nimirum omne nutrimentum transire per pulmonem, prius quam intret majorem circuitum, nec crudum unquam conspici, saltem in sano homine, in eo sanguine quem sinistrum cor miserit ad reliquum corpus. Fortasse cruda materies, qualis defertur ex intestinis, oleosa, subdulcis, acescens, mediæ naturæ quasi, inter fruges et carnes, subigitur in pulmone, vertitur in verum sanguinem, penitus concoquitur, demum induit animalem naturam, facta putrescens neque postea distinguenda a pristinis humoribus corporis.

567. Denique, sunt qui credunt calorem animalium quodammodo gigni

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of composition in the body whence it arises. And it is very probable, that the blood undergoes some other chemical change in that place, of which the exhalation of that acid is a sign and effect; especially if we apply the mind to this, namely, that all the nourishment passes through the lung, before that it enters the greater circulation, nor is any crude thing ever seen, at least in a healthy person, in that blood which the left heart has sent to the rest of the body. Perhaps the crude matter, such as it is conveyed from the intestines, oily, sweetish, acescent, of an intermediate nature as it were, between vegetables and flesh, is reduced in the lung, is changed into true blood, is completely concocted, at length it puts on the animal character, having become putrescent nor afterwards to be distinguished from the former humours of the body.

567. Lastly, there are some who believe that the heat of animals is in some way generated in the lungs. For in other examples, whilst heat takes

in pulmone. Nam in aliis exemplis, dum calor fit, plurimum carbonicum acidum formatur; nimirum oxygenio aëris consumpto et conjuncto cum carbone. Discimus hoc imprimis ex flammâ, ubi est magnus calor, et, simul, ingens vis istius acidi avolat. Ille lenis calor qui oritur inter fermentandum, in multis exemplis docet idem.

568. Iste venenatus halitus, undecunque derivatus, videtur esse similis, sive evolutus spiritu, sive igne, sive fermentando. Extinguit pariter vitam et flammam: pars ejûs, scilicet, carbonicum acidum, attrahitur vivâ calce: vero quod superest, nimirum azotium, sine oxygenio, redditur non minus eo, infestum vitæ et flammæ.

569. Autem animalia quo sunt calidioris sanguinis, eo, observantur, citius corrumpere aëra quem spirant, et consumere oxygenium; et quo habent respirationem perfectio-

quodammodo gigni. Nam, in aliis exemplis, dum calor fit, plurimum acidum carbonicum formatur; consumpto nimirum aëris oxygenio et cum carbone conjuncto. Hoc ex flamma imprimis discimus; ubi magnus calor est, et simul ingens vis istius acidi avolat. Idem docet calor ille lenis qui in multis exemplis inter fermentandum oritur.

568. Halitus iste venenatus, undecunque derivatus, similis fere esse videtur, sive spiritu, sive igne, sive fermentando evolutus. Vitam pariter et flammam extinguit: pars ejus, acidum scilicet carbonicum, calce viva attrahitur; quod superest vero, azotium nimirum, sine oxygenio, non eo minus vitæ et flammæ infestum redditur.

569. Animalia autem, quo calidioris sanguinis sunt, eo citius aëra quem spirant corrumpere, et oxygenium consumere, observantur; et quo perfectiorum respirationem

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place, a great deal of carbonic acid is formed; truly by the oxygen of the air being consumed and combined with carbon. We learn this first of all from flame, where there is great heat, and, at the same time, a great quantity of that acid passes off. That gentle heat which arises during fermentation, in many examples teaches the same.

568. That poisoned vapour, whencesoever derived, seems to be similar, whether evolved by the breathing, or by fire, or by fermenting. It extinguishes alike life and flame; a part of it, namely, carbonic acid, is attracted by quick lime: but what remains, namely, the azote, without the oxygen, is rendered not less than it, destructive to life and flame.

569. But animals by what they are of warmer blood, by that they are observed, the more quickly to corrupt the air which they breathe, and to consume the oxygen; and by what they have respiration more perfect, by

habent, eo plus calere. Sic vermes, qui per spiracula in cute spirant, vix unum gradum thermometri Fahrenheitiani supra elementum quod habitant calent; pisces, qui branchias agitant, duos tresve gradus; amphibia, quæ arbitrario utuntur pulmone, paulo plus. His omnibus cor simplex est, et arteria pulmonalis ab aorta derivata, et spiritus qui aëra vel aquam ubi degunt tarde corrumpit, et sanguis frigidus, nostro saltem multo frigidior. Multorum quoque fortasse omnium hujusmodi animalium calor plurimum variat, secundum calorem aquæ vel aëris in quo ipsa vivunt: ut docent experimenta haud pauca a claro viro Joanne Hunter instituta.

570. Animalia vero quotquot corde duplice instruuntur, quorum totus sanguis prius per pulmones transit quam a venis cavis in aortam iterum redeat, quibus spiritus con-

rem eo plus calere. Sic vermes, qui spirant per spiracula in cute, vix calent unum gradum thermometri Fahrenheitiani supra elementum quod habitant; pisces qui agitant branchias, duos ve tres gradus; amphibia quæ utuntur arbitrario pulmone, paulo plus. Omnibus his est simplex cor, et pulmonalis arteria derivata ab aortâ, et spiritus, qui tarde corrumpit aëra vel aquam ubi degunt, et sanguis frigidus, saltem multo frigidior nostro. Calor quoque multorum fortasse omnium animalium hujusmodi, variat plurimum secundum calorem aquæ vel aëris in quo ipsa vivunt,: ut experimenta haud pauca, instituta a claro viro, Joanne Hunter, docent.

570. Vero animalia, quotquot instruuntur duplice corde, totus sanguis quorum transit per pulmones priusquam redeat iterum in aortam a venis cavis, quibus spiritus con-

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that to grow more warm. Thus worms, which breathe through spiracles in the skin, are scarcely warm one degree of the thermometer of Fahrenheit above the element which they inhabit; fishes which move gills, two or three degrees; amphibia, which use a voluntary lung, a little more. To all these there is a single heart, and the pulmonary artery derived from the aorta, and the breath, which slowly corrupts the air or water where they live, and the blood cold, at least much colder than ours. The heat also of many, perhaps of all animals of this class, varies very much according to the heat of the water or air in which they live: as the experiments, by no means few, instituted by a celebrated man, John Hunter, teach.

570. But, the animals, as many as are furnished with a double heart, the whole blood of which passes through the lungs before that it returns again into the aorta from the venæ cavæ, to whom the breathing is constant,

stans, onustus multo carbonico acido, potest ne intercludi quidem per breve spatium sine discrimine vitæ, omnia, ad unum, homo, quadrupedia, aves, genus cetæ, phocæ, sive habitant terras sive aquas, sunt calidi sanguinis: scilicet calent circiter centum gradus, secundum instrumentum jam dictum. Neque profecto calor horum variat multum, utcunque varius calor aquæ vel aëris quem habitant fuerit.

stans, multo acido carbonico onustus, ne quidem per breve spatium, sine vitæ discrimine, intercludi potest, ad unum omnia, homo, quadrupedia, aves, genus cete, phocæ, sive terras sive aquas habitant, calidi sanguinis sunt: calent scilicet centum circiter gradus, secundum instrumentum jam dictum. Neque profecto multum variat horum calor, utcunque varius fuerit calor aquæ vel aëris quem habitant.

571. Denique, quædam insecta spirantia, vel saltem multum et cito corrumpentia aëra, sunt ejusdem caloris; hoc est præsertim verum de apibus, calor quarum singularum vix explorandus; vero calor examinis earundem est vix minor calore humani corporis.

571. Denique, insecta quædam spirantia, vel saltem aëra multum et cito corrumpentia, ejusdem caloris sunt: de apibus præsertim hoc verum est, quarum singularum calor vix explorandus; examinis earundem vero calor humani corporis calore vix minor est.

572. Vero hæc non secus ac aliæ opiniones de ortu caloris animalium, non caret suis difficultatibus; quoniam hic calor semper

572. Hæc vero, non secus ac aliæ de ortu animalium caloris opiniones, suis difficultatibus non caret: quoniam hic calor semper

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loaded with much carbonic acid, cannot be interrupted even for a short time without danger of life, all to one, man, quadrupeds, birds, the tribe of the whale, of the seal, whether they inhabit the land or the waters, are of warm blood: that is, they have a heat of about one hundred degrees, according to the instrument already mentioned. Nor truly does the heat of these alter much, however altered the heat of the water or air which they inhabit shall be.

571. Lastly, some insects breathing, or at least much and speedily corrupting the air, are of the same temperature: this is especially true of bees, the temperature of which individuals is scarcely to be examined; but the heat of the swarm of the same is hardly less than the temperature of the human body.

572. But this not otherwise than the other opinions of the production of the heat of animals, does not want its own difficulties; because this heat

fere idem est, sive aër qui circundat, et quem trahimus, frigidissimus fuerit (570) sive fervidissimus; scilicet, quo majore caloris subsidio egemus, eo plus caloris nobismet comparamus; quo minore opus est, eo minus gignimus. Quin et quo calidior aër fuerit, et quo plus ipse homo caluerit, eo frequentius et plenius spiritum reciprocat.

573. Denique, sunt qui totis viribus contendunt, corpus aliquando non modo nullum gignere calorem, sed revera frigus gignere, et sic semet multo frigidius servare aëre calido qui circundat: veluti siquis spatium temporis haud exiguum in clibano, aut vaporario, parum calefactus permanserit.

574. Non est dubitandum, vaporationem tum a cute, sed multo magis ab ipso pulmone, calorem corporis, qua ratione cunque is fuerit genitus, temperare multum: neque incredibile est, hanc vapora-

est fere idem, sive aër qui circundat et quem trahimus, fuerit frigidissimus sive fervidissimus; scilicet, quo egemus majore subsidio caloris eo comparamus plus caloris nobismet; quo est opus minore eo gignimus minus. Quin et, quo calidior aër fuerit, et quo plus homo ipse caluerit eo frequentius et plenius reciprocat spiritum.

573. Denique, sunt qui contendunt, totis viribus, corpus aliquando non modo gignere nullum calorem, sed, revera, frigus, et sic servare semet multo frigidius calido aëre qui circundat; veluti siquis permanserit, parum calefactus, haud exiguum spatium temporis in cibano aut vaporario.

574. Non dubitandum est, vaporationem tum a cute, sed multo magis ab pulmone ipso, multum temperare calorem corporis, quacunque ratione is genitus fuerit: neque est incredibile hanc vapora-

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always is nearly the same, whether the air which surrounds and that which we breathe, be very cold or very hot; that is, by what we require a greater supply of heat by that we provide more heat for ourselves; by what there is need of a less by that we generate less. Moreover, the hotter the air be, and the more man himself shall become warm, the more frequently and fully he returns back the air.

573. Lastly, there are some who contend, with all their powers, that the body sometimes not only generates no heat, but, in fact, cold, and thus keeps itself much cooler than the warm air which surrounds it; as if a person should remain, little heated, no short space of time in an oven or stove bath.

574. It is not to be doubted, that the evaporation as well from the skin, but much more from the lung itself, greatly moderates the temperature of the body, in whatever way it may have been generated; nor is it incredible that

tionem aliquando plus quam compensare calorem genitum respirando, et itaque revera reddere corpus frigidius.

tionem aliquando calorem respirando genitum plus quam compensare, et corpus itaque revera frigidius reddere.

575. Tamen, oportet fateri multum adhuc requiri, ut hæc opinio recipiatur pro certâ et stabilitâ doctrinâ. Sane multa et pulcherrima experimenta instituta sunt nostris temporibus de hac re, quæ faciant fidem chemicos tandem ingressos esse idoneam viam, quam nuper et olim mathematici et physiologi quæsiverant frustra, ut detegerent et patefacerent hoc arcanum Naturæ. Neque profecto mirum, latissimum campum, adeo nuper patefactum, nondum esse ita exploratum ut habeamus plenam notitiam ejus.

575. Tamen fateri oportet, multum adhuc requiri, ut hæc opinio pro certa et stabilita doctrina recipiatur. Multa sane et pulcherrima de hac re nostris temporibus instituta sunt experimenta, quæ fidem faciant, chemicos tandem idoneam ingressos esse viam, quam frustra nuper et olim quesiverant mathematici et physiologi, ut hoc Naturæ arcanum detegerent et patefacerent. Neque profecto mirum, latissimum campum, adeo nuper patefactum, nondum ita exploratum esse, ut plenam ejus notitiam habeamus.

576. Fuerunt, et nuper et olim, multi qui crediderunt sanguinem, calefactum alibi, potius frigescere in pulmone: enim

576. Multi et nuper et olim fuerunt, qui crediderunt potius sanguinem alibi calefactum in pulmone frigescere: calet enim aër

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this evaporation sometimes more than compensates the heat produced by respiring, and thus in fact renders the body cooler.

575. However, it behoves us to confess that much as yet is required, that this opinion be admitted as a certain and established doctrine. Truly many and very beautiful experiments have been instituted in our own times upon this subject, which cause the belief that chemists at length have entered upon the proper path, which lately and formerly mathematicians and physiologists had sought after in vain, to detect and lay open this secret of Nature. Nor indeed is it wonderful that this most extensive field, so lately laid open, should not yet have been so far explored that we should have a full knowledge of it.

576. There have been, both lately and formerly, many who believed that the blood, heated elsewhere, rather grows cold in the lung: for the air, which we had drawn in cold, sent forth by the breath is warm.

spiritu emissus quem frigidum traxeramus.

577. Alia quoque officia haud pauca scriptores medici pulmoni imposuerunt; globulos scilicet rubros sanguinis fingendi et tornandi, multaque ad vitam necessaria, oxygenium imprimis, ab aëre hauriendi, et similia. De his vero nihil certi constat, ne quidem multum verisimilis habemus.

578. Respiratio naturalis hac fere lege absolvitur, ut quatuor circiter cordis et arteriarum ictus fiant tempore unius respirationis. Incitato pulsu, celerior plerumque fit spiritus, temperato tardior. Sed non semper talis convenientia observatur: in infantibus enim, quibus pulsus velocissimus est, spiritus non adeo celer: idem in febribus nonnunquam observatur. In respiratione vero difficili et laboriosa, pulsus aliquando duodecim et amplius observantur tem-

aër, quem traxeramus frigidum, emissus spiritu calet.

577. Medici scriptores quoque imposuerunt haud pauca alia officia pulmoni; scilicet, fingendi et tornandi rubros globulos sanguinis, et hauriendi ab aëre multa necessaria ad vitam, imprimis oxygenium et similia. Vero nihil certi constat de his, habemus ne quidem multum verisimilis.

578. Naturalis respiratio fere absolvitur hac lege, ut circiter quatuor ictus cordis et arteriarum fiant tempore uniûs respirationis. Pulsu incitato, spiritus plerumque fit celerior, temperato, tardior. Sed talis convenientia non semper observatur: enim spiritus est non adeo celer in infantibus, quibus pulsus est velocissimus: idem nonnunquam observatur in febribus. Vero in difficili et laboriosâ respiratione, duodecim pulsus et amplius aliquando observantur tempore uniûs res-

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577. Medical writers also have assigned not a few other duties to the lung; namely, of moulding and polishing the red globules of the blood, and of drawing in from the air many things necessary to life, especially oxygen and the like. But nothing certain is established upon these subjects, we have not even much of what is probable.

578. Natural respiration mostly is performed by this law, that about four strokes of the heart and arteries are made in the time of one respiration. The pulse being quickened, the breathing generally becomes quicker, being moderated, slower. But such a correspondence is not always observed; for the breathing is not so quick in infants, in which the pulse is very quick; the same thing sometimes is observed in fevers. But in difficult and laborious respiration, twelve pulsations and more sometimes are observed in the time of one respiration. Moreover, we can easily effect, by the control

pirationis. Quin et, possumus facile efficere, imperio solo voluntatis, ut pulsus fiant plures triplo vel quadruplo solito, antequam reciprocemus spiritum. Vero urinatores, ut ferunt, discunt cohibere suum spiritum fere decies diutus quam alii homines.

579. Habemus imperium in omnes musculos respirationis, quippe qui inserviant variis usibus præterquam spiritui.

580. Igitur, imprimis, omne animal cui pulmo datur, edit vocem, quâ exprimat suas varias cupiditates, que alios affectus animi. Vero hæc fit aëre transeunte per glottidem, nunc magis, nunc minus constrictam, tantâ vi, ut conjiciat cartilagines et ligamenta laryngis in tremores, quales faciunt sonum, et quorum aër ipse fiat particeps. Vox quoque fit fortior, clarior, gratior, dum transit per os et nares, ossa quarum partium et carti-

pore unius respirationis. Quin et solo voluntatis imperio facile efficere possumus, ut pulsus triplo vel quadruplo plures solito fiant, antequam spiritum reciprocemus. Urinatores vero, ut ferunt, decies fere diutius, quam alii homines, spiritum suum cohibere discunt.

579. Imperium in omnes respirationis musculos habemus, quippe qui variis usibus, præterquam spiritui, inserviant (331, 334, 556).

580. Imprimis igitur omne animal cui pulmo datur vocem edit, qua varias suas cupiditates, aliosque animi affectus, exprimat. Hæc vero fit transeunte aëre per glottidem, nunc magis nunc minus constrictam, tanta vi, ut cartilagines et ligamenta laryngis in tremores conjiciat, quales sonum faciunt, et quorum aër ipse particeps fiat. Vox quoque fortior, clarior, gratior fit, dum per os et nares transit, quarum partium ossa, et

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alone of the will, that the pulsations be made more by triple or quadruple than usual, before that we reciprocate the breath. But divers, as they say, learn to restrain their breathing almost ten times longer than other persons.

579. We have control over all the muscles of respiration, as being which serve for various uses besides the breathing.

580. Therefore, in the first place, every animal to which a lung is given, utters a voice, by which it can express its various desires, and other affections of its mind. But this is caused by the air passing through the glottis, now more, now less constricted, with so much force, that it throws the cartilages and ligaments of the larynx into tremors, such as cause a sound, and of which the air itself becomes a partaker. The voice also becomes stronger, louder, more agreeable, while it passes through the mouth and nose, the bones of which parts and the cartilages and even the membranes them-

cartilagines, membranæque demum ipsæ, juvant, sono quem acceperant repercusso et aucto. Variat insuper vox non modo secundum variam glottidis aperturam, sed prout larynx tota strictior vel laxior, depressa vel elevata fuerit: et in hos varios fines plurimi minuti musculi conspirant. Hæc omnia plane docent ipsarum partium fabrica per scalpellum explorata, et quidem visus et tactus gutturis vel nasi dum vocem edit aliquis, et vox ipsa variis et miris modis corrupta, propter vitia quæ dictæ sunt partium.

581. Soli homini loquela datur, quippe qui solus mirabili dono uti noverit. Multa profecto animalia loqui didicerunt, nulla vero loquela uti: scilicet quia mens deest. Fit autem loquela ope linguæ, labiorum, gingivarum, dentium, veli penduli palati, ossis palati, et nasi, et demum gutturis, variis modis

lagines que demum membranæ ipsæ juvant, sono quem acceperant repercusso et aucto. Vox insuper, variat, non modo secundum variam aperturam glottidis, sed prout tota larynx fuerit strictior vel laxior, depressa vel elevata: et plurimi minuti musculi conspirant in hos fines. Fabrica partium ipsarum explorata per scalpellum, et quidem visus et tactus gutturis vel nasi dum aliquis edit vocem, et vox ipsa corrupta variis et miris modis, propter vitia partium quæ dictæ sunt, docent omnia hæc.

581. Loquela datur homini soli, quippe qui solus noverit uti mirabili dono. Profecto, multa animalia didicerunt loqui, vero nulla uti loquelâ; scilicet, quia mens deest. Loquela fit ope linguæ, labiorum, gingivarum, dentium, veli penduli palati, ossis palati et nasi, et demum gutturis conspirantium variis modis; quâ

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selves assist, by the sound which they had received being reverberated and increased. The voice, moreover, varies, not only according to the varied aperture of the glottis, but according as the whole larynx shall be more constricted or more lax, depressed or elevated: and many minute muscles conspire for these purposes. The mechanism of the parts themselves explored by the scalpel, and indeed the sight and touch of the throat or nose whilst any one utters a voice, and the voice itself corrupted in various and wonderful ways, on account of the disorders of the parts which have been named, shew all these things.

581. Speech is given to man alone, as being who alone would know how to use the admirable gift. Indeed, many animals have learned to speak, but none to use speech; that is, because the mind is wanting. Speech is effected by means of the tongue, of the lips, gums, teeth, velum pendulum palati, the bone of the palate and of the nose, and lastly of the throat

machinatione tandem, vox, interrupta et mutata, formatur in distinctas literas seu elementa; discimus has primâ ætate, quasi per instinctum et imitationem, nedum conscii laboris, nec modi quo efficimus singulas literas.

582. Vero ratio proferendæ uniuscujusque literæ, et machinatio partium quâ formatur, sunt detectæ sedulâ observatione, neque tantus labor fuit prorsus inutilis humano generi: enim docemur corrigere varia vitia loquelæ hac notitiâ. Immo, sunt quibus est unum opus docere mutos sermonem. Plerique hi nascuntur tantum surdi, non manci aut imperfecti organis loquelæ: nec possunt imitari voces quas nunquam noverint existere. Quin et, pueri jam loquentes, si fiunt surdi, quovis casu, solent obmutescere. Vero nunc utrique, sive facti sunt surdi et ideo muti naturâ sive

conspirantium; qua tandem machinatione, vox interrupta et mutata, in literas distinctas seu elementa formatur: has prima ætate per instinctum quasi et imitationem discimus, nedum laboris conscii, nec modi quo singulas literas efficimus.

582. Uniuscujusque vero literæ ratio proferendæ, et machinatio partium qua formatur, sedula observatione detectæ sunt; neque tantus labor generi humano prorsus inutilis fuit: hac enim notitia, varia loquelæ vitia corrigere docemur. Immo sunt quibus unum opus est sermonem mutos docere. Hi plerique surdi tantum, non organis loquelæ manci aut imperfecti, nascuntur: nec voces possunt imitari, quas nunquam noverint existere. Quin et pueri jam loquentes, si casu quovis surdi fiunt, obmutescere solent. Nunc vero utrique, sive natura sive

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contributing in various ways; by which mechanism at length, the voice, interrupted and changed, is formed into distinct letters or elements; we learn these at the first age, as it were, by instinct and imitation, not yet conscious of the labour, nor of the manner in which we form single letters.

582. But the method of pronouncing every single letter, and the mechanism of the parts by which it is formed, have been detected by sedulous observation, nor has so great labour been wholly useless to the human race: for we are taught to correct the various disorders of speech by this knowledge. Nay, there are those to whom it is the sole labour to teach the dumb speech. Most of these are born only deaf, not deficient or imperfect in the organs of speech: nor can they imitate words which they never knew to exist. Moreover, children already speaking, if they become deaf, by any accident, are accustomed to become dumb. But now both, whether they have become deaf and therefore dumb by nature or by disease, by the touch

morbo surdi et ideo muti facti sunt, tactu et visu organorum loquelæ, dum loquitur aliquis, discunt literas distinguere, et tandem suis organis proferre: opus revera tædii plenum, sed nobile præmium.

583. Opitulantur præterea respirationis musculi variis actionibus viscerum abdominis. Ipsum per abdomen, et jecur præsertim, sanguinis motum promovere videntur, alterno et valido sæpe quo agitantur motu. Contractis vero septo transverso simul et musculis abdominis, abdomen totum, et quicquid in eo est, veluti in prelo comprimuntur. His viribus plerumque opus est ad alvum evacuandam et urinam reddendam (imprimis ad superandum renixum qui a musculis ostium vesicæ et anum claudentibus oritur; hoc enim superato, vis contrahens intestinorum et vesicæ sufficit ad urinam et stercus expellendum); pari ratione

morbo, tactu et visu organorum loquelæ dum aliquis loquitur, discunt distinguere et tandem proferre literas suis organis: revera opus plenum tædii, sed præmium nobile.

583. Præterea, musculi respirationis opitulantur variis actionibus viscerum abdominis. Videntur promovere motum sanguinis per abdomen ipsum, et præsertim jecur, alterno et valido motu quo sæpe agitantur. Vero transverso septo et musculis abdominis simul contractis, totum abdomen, et quicquid est in eo, comprimuntur veluti in prelo. Plerumque est opus his viribus ad evacuandam alvum et reddendam urinam (imprimis ad superandum renixum qui oritur a musculis claudentibus ostium vesicæ et anum; enim hoc superato, contrahens vis intestinorum et vesicæ sufficit ad expellendum urinam et stercus;) promovent par-

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and sight of the organs of speech whilst some one is speaking, learn to distinguish and at length to pronounce letters with their own organs: truly a work full of weariness, but the reward noble.

583. Besides, the muscles of respiration assist the various actions of the viscera of the abdomen. They seem to promote the circulation of the blood through the abdomen itself, and especially the liver, by the alternate and powerful motion by which they often are agitated. But the transverse septum and muscles of the abdomen being at the same time contracted, the whole abdomen, and whatever is in it, are compressed as if in a press. For the most part there is need of these powers to evacuate the belly and to void the urine (especially to overcome the resistance which arises from the muscles shutting up the mouth of the bladder and the anus; for this being overcome, the contracting power of the intestines and bladder suffices to expel the urine and fæces;) they promote parturition for a similar reason,

tum pari ratione, et conspirant cum ventriculo male affecto et jam nauseante, et faciunt vomitum.

partum promovent, et cum ventriculo male affecto et jam nauseante conspirant, et vomitum faciunt.

584. Præterea inspiratio, quatenus distendat thoracem, si spiritus reprimitur, figit humeros et dorsum et cervicem, et sic dat firmius fundamentum validissimis musculis trunci et brachiorum, quale requiritur in omne majore nisu.

584. Inspiratio præterea, quatenus thoracem distendat, si spiritus reprimitur, humeros, et dorsum, et cervicem, figit, et sic firmius fundamentum dat musculis trunci et brachiorum validissimis, quale in omne majore nisu requiritur.

585. Denique, quædam affectiones respirationis nedum morbidæ, indicant statum tum animi tum corporis, que id, homine sæpe inscio aut nolente.

585. Denique, affectiones quædam respirationis, nedum morbidæ, statum tum animi tum corporis indicant, idque sæpe inscio aut nolente homine.

586. Plena expiratio, facta tantâ vi ut feriat aures astantium, dicitur suspirium. Præter solitum vehemens et plena inspiratio sæpe præcedit. Fit propter sanguinem male expeditum per pulmonem, ob debiliorem actionem cordis que aliarum moventium virium.

586. Suspirium dicitur plena expiratio tanta vi facta, ut aures astantium feriat. Præcedit sæpe inspiratio præter solitum vehemens et plena. Fit propter sanguinem per pulmonem male expeditum, ob debiliorem cordis aliarumque virium moventium actionem. Hinc

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also concur with the stomach badly affected and now nauseated, and cause vomiting.

584. Moreover inspiration, inasmuch as it distends the thorax, if the breathing is restrained, fixes the shoulders and back and neck, and thus affords a steadier basis to the most powerful muscles of the trunk and arms, such as is required in every more powerful effort.

585. Lastly, certain affections of respiration not quite morbid, point out the state as well of the mind as of the body, and that, in a person often being unconscious or unwilling.

586. A deep expiration, made with so much force that it strikes the ears of the bystanders, is called sighing. An unusually strong and full inspiration often precedes. It arises on account of the blood badly dispatched through the lung, because of the weaker action of the heart and other moving powers. Hence it accompanies many diseases; nevertheless common

multos morbos comitatur: sanis tamen familiare, exhaustis viribus longa vigilia aut nimio labore. Animi demum index sæpe est, quatenus a mœstitia, vel metu, vel graviore quovis affectu corporis vires frangente, originem ducat.

587. Huic quodammodo affinis est Oscitatio, quantum a languidiore sanguinis motu per pulmones oriatur; ita ut alterum pro altera non indecore substitui possit. Oscitatio est ingens, plena, sonora inspiratio, hiante ore facta, quam æqua expiratio solet excipere, et interdum omnium artuum valida extensio comitatur, quæ pandiculatio vocari solet. Affectio esurientibus, somniculosis, labore et vigiliis exhaustis, familiaris; hystericis frequens, et inter sanissimos etiam contagio seu imitatione (351) mirum sæpe in modum propagata.

588. Risus est plena inspiratio, cui repetitæ, interruptæ, et valde

Hinc comitatur multos morbos; tamen familiare sanis, viribus exhaustis longâ vigiliâ, aut nimio labore. Demum, est sæpe index animi, quatenus ducat originem a mœstitiâ, vel metu, vel quovis graviore affectu frangente vires corporis.

587. Oscitatio est quodammodo affinis huic, quantum oriatur a languidiore motu sanguinis per pulmones; ita ut alterum possit, non indecore, substitui pro altera. Oscitatio est ingens, plena, sonora inspiratio, facta ore hiante, quam æqua expiratio solet excipere, et valida extensio omnium artuum interdum comitatur, quæ solet vocari pandiculatio. Affectio familiaris esurientibus, somniculosis, exhaustis labore et vigiliis; frequens hystericis, et sæpe propagata, etiam inter sanissimos, in mirum modum, contagio seu imitatione.

588. Risus est plena inspiratio, cui repetitæ, interruptæ, et valde sonoræ

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to the healthy, the strength being exhausted by long watching, or by excessive labour. In fine, it is often an index of the mind, so far as it may derive its origin from grief, or fear, or any more severe passion breaking down the powers of the body.

587. Yawning is in some degree akin to it, so far as it arises from the more languid motion of the blood through the lungs; so that the one may, not unbecomingly, be substituted for the other. Yawning is a large, full, sonorous inspiration, made with the mouth gaping, which an equal expiration is accustomed to succeed, and a powerful extension of all the limbs sometimes accompanies, which is used to be called pandiculation. An affection common to the hungry, drowsy, those exhausted by labour and watchings; frequent in hysterical persons, and often propagated, even amongst the most healthy, in a wonderful manner, by contagion or imitation.

588. Laughter is a full inspiration, to which repeated, interrupted, and

expirationes succedunt, adeo ut spiritus nonnunquam fere intercludatur, vel vasa pulmonis vehentia sanguinem distenta ultra modum, demum rumpantur, non sine periculo suffocationis. Nascitur, plerumque, ab aliqua nova, levi, grata, ludicra, ægre definienda affectione animi; vel a titillatione quarundam partium corporis, quæ habent acriorem sensum. Vehemens, non caret periculo: modicus, habetur saluberrimus; enim grate promovet cursum sanguinis, et quatit que excitat totum corpus; quod forsitan nec minus pertinet ad rem, denotat mentem vacuam gravioribus curis. Hilaris vultus, haud facile depingendus, comitatur risum.

sonoræ expirationes succedunt, adeo ut spiritus nonnunquam fere intercludatur, vel vasa sanguinem vehentia pulmonis ultra modum distenta demum rumpantur, non sine suffocationis periculo. Nascitur plerumque ab animi affectione aliqua nova, levi, grata, ludicra, ægre definienda; vel a titillatione partium corporis quarundam, quæ acriorem sensum habent. Vehemens periculo non caret; modicus saluberrimus habetur; cursum enim sanguinis grate promovet, et totum corpus quatit excitatque; nec minus forsitan ad rem pertinet, quod mentem gravioribus curis vacuam denotat. Risum comitatur vultus hilaris, verbis haud facile depingendus.

589. Fletus, oppositus huic, si spectamus excitantes causas, differt parum machinatione partium quâ fit. Plena inspiratio quoque contingit huic, et breves, fractæ,

589. Fletus huic oppositus, si causas excitantes spectamus, machinatione partium qua fit parum differt; huic quoque plena inspiratio contingit, et breves, fractæ,

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very loud expirations succeed, so that the breath sometimes is nearly stopped, or the vessels of the lungs carrying blood distended beyond bounds, at length are ruptured, not without the danger of suffocation. It arises, generally, from some new, slight, agreeable, ludicrous, difficultly to be defined affection of the mind; or from the tickling of certain parts of the body, which have a more acute sensibility. Violent, it is not free from danger: moderate, it is considered very salutary; for it agreeably promotes the course of the blood, and shakes and excites the whole body; and, what perhaps does not less relate to the matter, it shews a mind free from the more weighty cares. A cheerful countenance, not easily to be described, accompanies laughter.

589. Weeping, opposite to this, if we look to the exciting causes, differs little in the mechanism of the parts by which it is caused. A full inspiration also belongs to this, and short, broken, sonorous expirations, with a lofty

sonoræ expirationes, cum voce edita querula atque ingrata. Vultus simul tristis est, et lachrymæ effunduntur. Ab aliquo gravi animi affectu, mœrore imprimis, plerumque oritur, eundemque multum levare solet: saltem pericula a tali animi affectu instantia (61, 346) quam optime præcavere. Infantes quoque a dolore corporis sæpe flent. Raro periculosus est, nisi aliquando infantibus, quibus et risus et fletus a levissimis causis vehementiores sunt quam adultis. Uterque hystericis frequentissimus, et immodicus, non tamen, ut videtur, sine causa aliqua, vera vel imaginaria, quamvis causam hanc sæpe nolint fateri. Uterque homini proprius, fortasse quia ab animi affectionibus oritur, qualibus belluæ carent.

590. Singultus forsitan his annumerandus est, quippe qui sæpe integra valetudine utentibus acci-

sonoræ expirationes, cum editâ, querulâ, atque ingratâ voce. Vultus est simul tristis, et lachrymæ effunduntur. Plerumque oritur ab aliquo gravi affectu animi, imprimis mœrore, que solet multum levare eundem: saltem præcavere, quam optime, pericula instantia a tali affectu animi. Infantes quoque sæpe flent, a dolore corporis. Est raro periculosus, nisi aliquando infantibus, quibus et risus et fletus, a levissimis causis, sunt vehementiores quam adultis. Uterque frequentissimus et immodicus hystericis, non tamen, ut videtur, sine aliquâ causâ, verâ vel imaginariâ, quamvis sæpe nolint fateri hanc causam. Uterque proprius homini, fortasse quia oritur ab affectionibus animi, qualibus belluæ carent.

590. Singultus, forsitan, est annumerandus his, quippe qui sæpe accidat utentibus integrâ

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querulous, and disagreeable voice. The countenance is at the same time sorrowful, and tears are shed. It generally arises from some depressing affection of the mind, especially grief, and is accustomed greatly to relieve the same; at least to provide against, in the best manner possible, the dangers impending from such an affection of the mind. Infants also often weep, from pain of the body. It is seldom dangerous, unless sometimes to infants, to whom both laughing and weeping, from the slightest causes, are more violent than to adults. Each is very frequent and immoderate to hysterical persons, not however, as it appears, without some cause, real or imaginary, although they often are unwilling to confess this cause. Each is peculiar to man, perhaps because it arises from affections of the mind, such as brutes want.

590. Hiccup, perhaps, is to be reckoned with these, as being that which

valetudine, veluti si secutus fuerit immodicum risum; quamvis sæpe etiam sit morbidus, et in quibusdam morbis signum pessimi ominis. Vero est nihil aliud quam subita et sonora convulsio transversi septi; ventriculus quoque, ut videtur, aliquando convellitur; frequentissima causa ejûs, (præter jam dictum scilicet, vehementem actionem transversi septi,) est aliquod irritamentum afficiens ventriculum: distentio sola ejus sæpe inducit singultum; hinc familiarem ebriosis, aut gravibus crapulâ. Solet comitari inflammationem et gangrænam ventriculi vel intestinorum. Sæpe observatur importunissimus a debilitate, sub finem longorum morborum, aut in paralysi. Sæpe, post calculum exsectum ex vesicâ, si curatio est cessura male. Interdum quoque, pergens diu, insidet corpori quasi per aliquam consuetudinem, sistendus

dat, veluti si risum immodicum secutus fuerit: quamvis sæpe etiam morbidus sit, et in quibusdam morbis pessimi ominis signum. Est vero nihil aliud quam subita et sonora convulsio septi transversi; ventriculus quoque, ut videtur, aliquando convellitur; frequentissima ejus causa (præter jam dictum, vehementem scilicet septi transversi actionem) est irritamentum quodvis ventriculum afficiens: distentio ejus sola singultum sæpe inducit; hinc ebriosis aut crapula gravibus familiarem. Ventriculi vel intestinorum inflammationem et gangrænam comitari solet. Sæpe a debilitate, sub finem longorum morborum, aut in paralysi, sæpe post exsectum calculum ex vesica, si male cessura est curatio, observatur importunissimus. Interdum quoque diu pergens, quasi per consuetudinem aliquam (369, 386, 387) corpori insidet difficillime sis-

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often happens to those enjoying sound health, as when it has followed immoderate laughter; although often also it is morbid, and in some diseases a symptom of the worst omen. But it is nothing else than a sudden and loud convulsion of the transverse septum; the stomach also, as it appears, is sometimes convulsed; the most frequent cause of it, (besides what already has been mentioned, namely, the violent action of the transverse septum), is some irritation affecting the stomach: distention alone of it often brings on hiccup; hence common to drunken persons, or those oppressed by a surfeit. It is accustomed to accompany inflammation and gangrene of the stomach or of the intestines. Often it is observed very troublesome from debility, towards the end of long diseases, or in paralysis. Often, after a calculus having been cut out from the bladder, if the cure is about to fall out badly. Sometimes also, going on for a long time, it settles in the body as

tendus. Singultus autem ratio sæpe valde obscura est.

591. Quin et sæpissime respiratio variis morbis plus minus impeditur, insigni ægrotantis incommodo, nec raro periculo.

592. Dyspnœa apud medicos vocatur malum, si quando spiritus difficilius, laboriose, neque plene, neque sine dolore, trahitur: vitium profecto frequentissimum, multorumque morborum comes et pars.

593. Varias agnoscit causas, propter multa organa quæ respirationi inserviunt, eademque cum aliis partibus connexa, et demum propter multas externas res, aëris imprimis qualitates, densitatem, raritatem, calorem, &c. quæ variis modis corrumpi possunt.

594. Igitur impeditur respiratio, sano prorsus homine, multis vitiis aëris ipsius; veluti nimia, præsertim subita, levitate, raritate, humi-

difficillime. Autem ratio singultûs est sæpe valde obscura.

591. Quin et, respiratio sæpissime impeditur plus minus, insigni incommodo ægrotantis, nec raro periculo.

592. Malum vocatur apud medicos Dyspnœa, siquando spiritus trahitur difficilius, laboriose, neque plene, neque sine dolore; profecto frequentissimum vitium, que comes et pars multorum morborum.

593. Agnoscit varias causas propter multa organa quæ inserviunt respirationi, que eadem connexa cum aliis partibus, et demum propter multas externas res, imprimis qualitates aëris, densitatem, raritatem, calorem, &c. quæ possunt corrumpi variis modis.

594. Igitur respiratio impeditur, homine prorsus sano, multis vitiis aëris ipsiûs; veluti nimiâ, præsertim subitâ,

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if by some habituation, to be stopped most difficultly. But the cause of hiccup is often very obscure.

591. Moreover, respiration very often is impeded more or less, with the great inconvenience of the sick person nor unfrequently danger.

592. The disorder is called by physicians Dyspnœa, whenever the breath is drawn more difficultly, laboriously nor fully, nor without pain; truly a very frequent disorder, and an attendant and part of many diseases.

593. It acknowledges various causes on account of the many organs which are subservient to respiration, and the same being connected with other parts, and lastly on account of many external things, especially the qualities of the air, density, rarefaction, heat, &c. which may be corrupted in various ways.

594. Therefore respiration is impeded, in a person quite healthy, by many faults of the air itself; as by excessive, especially sudden, levity, rarefaction,

levitate, raritate, humiditate, impuritate, corruptione, imprimis si fuerit onustus noxiis et acribus, aut venenatis vaporibus, vis quorum est nonnunquam tanta, ut non modo impediant respirationem, sed brevi extinguant vitam ipsam.

595. Porro variæ obstructiones, sive a mero tumore sive ab inflammatione, sive contractione oris, narium, gutturis, glottidis, asperæ arteriæ, bronchiorum, quæ claudunt, aliquo modo, vias quas aër debet subire, impediunt respirationem.

596. Impeditur quoque omni vitio pulmonis, inflammati, obstructi tumoribus, inundati multâ aquâ, muco, sero, sanguine, neque dilatato ut decet.

597. Vero pulmone sano et omnibus viis liberis, quibus itur, ad eum, thorax ipse oppletus aquâ, sanguine pure, aëre ipso admisso per vulnus, impediet amplificationem

ditate, impuritate, corruptione, imprimis si vaporibus noxiis, et acribus, aut venenatis, onustus fuerit: quorum nonnunquam tanta vis est, ut non modo respirationem impediant, sed vitam ipsam brevi extinguant (54).

595. Porro, obstructiones variæ, sive a mero tumore, sive ab inflammatione, sive contractione, oris, narium, gutturis, glottidis, asperæ arteriæ, bronchiorum, quæ vias quas aër subire debet aliquo modo claudant, respirationem impediunt.

596. Impeditur quoque omni vitio pulmonis, inflammati, tumoribus obstructi, inundati multa aqua, muco, sero, sanguine, neque ut decet dilatato.

597. Sano vero pulmone, et liberis omnibus viis quibus ad eum itur, thorax ipse oppletus aqua, sanguine, pure, aëre ipso per vulnus admisso, pulmonis amplifica-

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humidity, impurity, corruption, especially if it should be loaded with noxious and acrid, or poisoned vapours, the influence of which is sometimes so great, that not only they impede respiration, but quickly extinguish life itself.

595. Moreover various obstructions, whether from mere tumour or from inflammation, or contraction of the mouth, nostrils, throat, glottis, aspera arteria, bronchia, which may close, in any way, the passages which the air ought to enter, impede respiration.

596. It is impeded also by every disease of the lung, being inflamed, obstructed by tumours, inundated with much water, mucus, serum, blood, nor dilated as it ought.

597. But the lung being sound and all the passages being free, by which they approach it, the thorax itself filled with water, by blood, pus, the air itself being admitted through a wound will hinder the enlargement of the

tionem, et ideo respirationem, impediet. Vulnus vel unius lateris thoracis (alia tunc nimirum aëri patente via, si thorax ampliatur, quam per asperam arteriam) respirationem impedit: utriusque vero lateris vulnus eandem brevi supprimit.

598. Vitia quoque multiplicia organorum quæ pectus ampliant, debilitas, paralysis, spasmus, inflammatio, dolor, rigiditas, septi transversi, aut musculorum abdominis, aut eorum qui inter costas jacent, respirationem imperfectam et difficilem reddent. Quin et, sanis ipsis organis moventibus, actio eorum quovis modo impedita, quo minus pectus amplietur, respirationem faciet difficilem: veluti costæ rigidæ factæ, ægre movendæ, vel descensus septi transversi impeditus, propter aquam, aut aëra, aut cibum, aut potum, aut fœtum, abdomen, vel uterum, vel

pulmonis et ideo respirationem. Vulnus vel uniûs lateris thoracis (tunc nimirum aliâ via, patente aëri, si thorax ampliatur, quam per asperam arteriam) impedit respirationem; vero vulnus utriûsque lateris brevi supprimit eandem.

598. Multiplicia vitia quoque organorum quæ ampliant pectus, debilitas, paralysis, spasmus, inflammatio, dolor, rigiditas transversi septi, aut musculorum abdominis, aut eorum qui jacent inter costas, reddent respirationem imperfectam et difficilem. Quin et, moventibus organis ipsis sanis, actio eorum impedita quovis modo, quo pectus minus amplietur, faciet difficilem respirationem: veluti costæ factæ rigidæ, movendæ ægre, vel descensus transversi septi impeditus propter aquam, aut aëra, aut cibum, aut potum, aut fœtum, distendentia abdomen vel

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lung and therefore respiration. A wound even of one side of the thorax (then truly another way, being open to the air, if the thorax be enlarged, than through the aspera arteria) impedes respiration; but a wound of both sides quickly suppresses the same.

598. The manifold disorders also of the organs which enlarge the chest, debility, paralysis, spasm, inflammation, pain, rigidity of the transverse septum, or of the muscles of the abdomen, or of those which lie between the ribs, will render respiration imperfect and difficult. Moreover, the moving organs themselves being sound, the action of them impeded in any way, by which the chest may not be so well enlarged, will cause difficult respiration; as when the ribs become rigid, are to be moved difficultly, or the descent of the transverse septum is hindered on account of water, or air, or food, or drink, or the fœtus, distending the abdomen or uterus, or

uterum, vel intestina, vel ventriculum, ve auctam molem cujusvis visceris, vel demum omnia prementia sursum plus justo; hinc fere omnis difficultas spirandi gravior ægro decumbenti.

599. Denique, organa respirationis, tum magni musculi tum quoque, ut videtur, minutissimæ fibræ quibus bronchia instruuntur, vel interdum rapta in abnormes motus, convelluntur, per consensum cum aliis partibus, imprimis ventriculo, vel ægre valent ad solitos motus: unde respiratio impedita.

600. Postremo, sanguis ipse, transmissus ægrius per pulmones, vel a vitio, puta fabricâ organorum quæ movent eum læsâ, vel a debilitate moventium virium, sæpe facit spiritum difficilem et laboriosum, qualis solet accidere moribundis.

601. Tot tamque diversis causis impeditæ respi-

intestina, vel ventriculum, distendentia, auctamve visceris cujusvis molem, vel demum omnia plus justo sursum prementia: hinc gravior fere omnis spirandi difficultas decumbenti ægro.

599. Denique, organa respirationis, tum magni musculi, tum quoque, ut videtur, fibræ minutissimæ, quibus bronchia instruuntur, per consensum cum aliis partibus, ventriculo imprimis, vel convelluntur interdum in motus abnormes rapta, vel ad solitos motus ægre valent: unde impedita respiratio.

600. Postremo, sanguis ipse per pulmones ægrius transmissus, vel a vitio, puta læsa fabrica, organorum quæ eum movent, vel a virium moventium debilitate, spiritum sæpe facit difficilem et laboriosum, qualis moribundis solet accidere.

601. Tot tamque diversis impeditæ respirationis bene perspectis

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intestines, or stomach, or the increased bulk of any viscus, or lastly all pressing upwards more than proper; hence almost every difficulty of breathing is more severe to the patient lying down.

599. Lastly, the organs of respiration, as well the great muscle, as also as it appears, the minutest fibres with which the bronchia are furnished, either sometimes hurried into irregular motions, are convulsed, by consent with other parts, especially the stomach, or hardly are competent to the usual motions: from whence respiration is impeded.

600. In fine, the blood itself, transmitted with more difficulty through the lungs, either from disorder, for instance, from the structure of the organs which move it being injured, or from debility of the moving powers, often renders the breathing difficult and laborious, such as is accustomed to happen to persons dying.

601. The many and so different causes of impeded respiration being clearly

causis (quarum aliæ alias invicem inducunt intenduntque) ratio in promptu erit, cur malum adeo frequens, cur tot morborum comes et signum, cur sæpe malum nervosi generis, cur nunc leve et fugax, nunc grave et insanabile, aliquando hæreditarium, aliquando periculi plenum, et subito lethale, nonnunquam vero periculo vacuum; cur per intervalla sæpe recurrat; calore et valida corporis exercitatione cur inductum, modica vero exercitatione interdum sublevatum, plenitudine ingravescens, detracto e venis sanguine sæpe fugatum, vel saltem mitius factum.

602. Impedita respiratio, qualiscunque demum ejus causa fuerit, motum sanguinis plus minusve impedit: et simul expulsioni materiæ noxiæ e pulmone, et mutationi isti salutari et necessariæ sanguinis (614, 615) quæ per spiritum natu-

rationis bene perspectis, (quarum aliæ invicem inducunt que intendunt alias) ratio erit in promptu, cur malum adeo frequens, cur comes et signum tot morborum, cur sæpe malum nervosi generis, cur nunc leve et fugax, nunc grave et insanabile, aliquando hæreditarium, aliquando plenum periculi, et subito lethale, vero nonnunquam vacuum periculo; cur sæpe recurrat per intervalla; cur inductum calore et validâ exercitatione corporis, vero sublevatum modicâ exercitatione, ingravescens plenitudine, sæpe fugatum, vel saltem factum mitius, sanguine detracto e venis.

602. Impedita respiratio, qualiscunque demum fuerit causa ejus, plus ve minus impedit motum sanguinis: et simul obest quodammodo expulsioni noxiæ materiæ e pulmone, et isti salutari et necessariæ mutationi san-

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understood, (of which some by turns bring on and increase others) the reason will be at hand, why the disorder is so frequent, why the attendant and sign of so many diseases, why often it is a disorder of the nervous system, why one time slight and transient, at another severe and incurable, sometimes hereditary, sometimes full of danger, and suddenly fatal, but sometimes devoid of danger; why it often recurs at intervals; why brought on by heat and strong exercise of the body, but relieved by moderate exercise, increasing by plethora, often removed, or at least rendered milder, by blood being drawn from the veins.

602. Impeded respiration, whatever at length may have been the cause of it, more or less impedes the motion of the blood; and at the same time obstructs in some manner the expulsion of noxious matter from the lung, and that salutary and necessary change of the blood which are caused by

guinis quæ fiunt per naturalem spiritum: hinc generalis debilitas, variæ impeditæ functiones, et multi morbi, imprimis hydropici generis. Pulmo quoque aliquando compressus et nunquam dilatatus ut decet, ægrius neque plene exhalat suum halitum; hinc sæpe obruitur aquoso humore; quin et irritatur simul quo fit ut plus muci ejus, que ejus tenacioris, secernatur, qui demum obstruit vias quas aët subit, stimulat que excitat vehementem et molestam tussim, quâ pulmo tandem liberet se suo onere.

ralem fiunt, quodammodo obest: hinc generalis debilitas, variæ functiones impeditæ, et multi morbi, generis hydropici imprimis (468, 472). Pulmo quoque compressus aliquando, et nunquam ut decet dilatatus, suum halitum difficilius, neque plene exhalat; hinc sæpe humore aquoso obruitur: quin et simul irritatur, quo fit ut plus ejus muci, ejusque tenacioris, secernatur, qui demum vias quas aër subit obstruit, stimulat, tussimque vehementem et molestam excitat, qua tandem pulmo suo se onere liberet.

603. Hæcce vitalis functio est obnoxia aliis vitiis quoque, nimirum, tussi, et sternutationi; quæ, quamvis videantur, primo intuitu, gravissima, tamen non carent suis usibus, et merito recensentur sæpe inter saluberrimos conatus Naturæ; tamen sæpe non vacant periculo et gravi incom-

603. Aliis quoque vitiis, tussi nimirum et sternutationi, obnoxia est vitalis hæcce functio, quæ, quamvis primo intuitu gravissima videantur, suis tamen usibus non carent, et merito sæpe inter saluberrimos Naturæ conatus recensentur (65, 70, 364, 368): sæpe tamen periculo non vacant, et

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natural breathing: hence general debility, various impeded functions, and many diseases, especially of the dropsical kind. The lung also sometimes compressed and never dilated as it ought, more difficultly and not fully exhales its own vapour; hence often it is overwhelmed with watery fluid: besides it is irritated at the same time, by which it happens that more of the mucus of it, and of that more tenacious, is secreted, which at last obstructs the passages which the air enters, stimulates and excites a violent and troublesome cough, by which the lung at length frees itself from its load.

603. This vital function is liable to other disorders also, namely, cough and sneezing; which, though they may seem, at first sight, very severe, nevertheless do not want their own uses, and deservedly are reckoned often amongst the most salutary efforts of Nature; however, often they are not free from danger and serious inconvenience, whether the efforts shall be only

gravi incommodo, sive tantum nimis vehementes, sive demum inepti fuerint conatus (70, 368) neque sapiente consilio instituti. Utcunque tamen hæc se res habuerit, medici est, naturam, et causas, et effectus earum affectionum novisse, quo melius sciat salutares promovere, nimias temperare, noxias et ineptas compescere.

604. Tussis vocatur vehemens sonora expiratio, sæpe invita, aëra per glottidem, nunc magis nunc minus fortiter clausam, magno impetu subito expellens. Convulsio musculorum expirationis dat insignem aëri impetum: contractio glottidis dat sonum. Tussis sæpe repetita et diuturna est, intercedente nimirum reciproca, post singulas expirationes, inspiratione, sed difficili, obstructa, imperfecta, proper contractam glottidem.

605. Excitatur tussis acri quo-

modo, sive conatus fuerint tantum nimis vehementes, sive demum inepti, neque instituti sapienti consilio. Tamen utcunque hæc res habuerit se, est medici novisse naturam et causas et effectus earum affectionum, quo melius sciat promovere salutares, temperare nimias, compescere noxias et ineptas.

604. Vehemens sonora, sæpe invita expiratio, sûbito expellens magno impetu, aëra per glottidem, nunc magis, nunc minus fortiter clausam, vocatur tussis. Convulsio musculorum expirationis dat insignem impetum aëri: contractio glottidis dat sonum. Tussis est sæpe repetita et diuturna, reciprocâ sed difficili, obstructâ, imperfectâ inspiratione, nimirum, propter glottidem contractam, intercedente post singulas expirationes.

605. Tussis excitatur

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too violent, or indeed unsuited, nor instituted with wise design. But howsoever this matter shall have itself, it is the duty of the physician to know the nature and causes and effects of these affections, that he may the better know how to promote the salutary, to moderate the excessive, to restrain the noxious and unsuitable ones.

604. A violent sonorous, often involuntary expiration, suddenly expelling with great force the air through the glottis, sometimes more, sometimes less strongly closed, is called coughing. A convulsion of the muscles of expiration gives a remarkable impetus to the air: the contraction of the glottis produces the sound. Coughing is often repeated and lasting, a reciprocal but difficult, obstructed, imperfect inspiration, indeed, on account of the glottis being contracted, intervening after each expiration.

605. Coughing is excited by any acrid thing, whether chemical or

quovis acri, sive chemico sive mechanico, admoto viis quas aër subit a glottide ad imam partem pulmonis. Hæ obducuntur delicatissimâ membranâ, que adeo impatiente omnis stimuli, ut ne ferat tactum quidem blandissimi corporis, veluti guttulæ aquæ, quin musculi expirationis statim rapiantur in violentam convulsionem, que glottis simul claudatur, propter consensum quo hæ partes, fungentes communi munere, conjunguntur. Hinc aër expellitur tantâ vi, ut aperiat rimam glottidis, quamvis fortiter clausam, et sæpe dimoveat et ejiciat irritamentum, quicquid fuerit, quod excitaverat tussim: actio non modo utilis, sed tutamen necessarium vitæ, quippe quæ sola possit liberare pulmonem ab irritamento aut onere, quod brevi suffocaret hominem.

vis vel chemico vel mechanico, viis quas aër subit a glottide ad imam partem pulmonis admoto. Hæ membrana obducuntur delicatissima, stimulique omnis adeo impatiente, ut ne quidem blandissimi corporis, veluti guttulæ aquæ, tactum ferat, quin statim musculi expirationis in violentam convulsionem rapiantur, glottisque simul claudatur, propter consensum (458) quo hæ partes, communi munere fungentes, conjunguntur. Hinc aër tanta vi expellitur, ut rimam glottidis, quamvis fortiter clausam, aperiat, et irritamentum quicquid fuerit quod tussim excitaverit, sæpe dimoveat et ejiciat: non utilis modo actio, sed necessarium vitæ tutamen, quippe quæ sola pulmonem liberare possit ab irritamento, aut onere, quod hominem brevi suffocaret.

606. Quicquid præter solitum in istis viis fuerit, mucus ipse

606. Quicquid præter solitum in istis

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mechanical, applied to the passages which the air enters from the glottis to the lowest part of the lung. These are lined with a most delicate membrane, and so impatient of every stimulus, that it cannot bear the touch, even of the blandest body, as of a small drop of water, but that the muscles of expiration are immediately hurried into violent convulsion, and the glottis at the same time is closed, on account of the sympathy by which these parts, performing a common office, are associated. Hence the air is expelled with so much violence, that it opens the rima glottis, however strongly closed, and often removes and ejects the irritating substance, whatever it may have been, which had excited the cough: an action not only useful, but a protection necessary to life, as being that which alone can free the lung, from an irritant or load, which quickly would suffocate a person.

nimius, spissus, tenuis, acer sanguis, serum, pus, aqua, tussim excitant: omnem pulmonis inflammationem, omnemque respirationem difficiliorem, comitatur fere inseparabilis. Quin et sæpe aspera arteria, bronchiisque nimis sentientibus, vel inflammatis, vel suo muco, qui ab aëre ipso defendere solet, orbatis, ne purissimus quidem aër sine dolore, irritatione, tussique vehemente, trahi potest. Denique, exempla non desunt ubi a vitiis et irritationibus aliarum partium, vel universi generis nervosi, tussis frequens et molestissima excitata fuerit: auris aliquando, vel ventriculi vel intestinorum a vermibus, vel jecoris ab inflammatione, irritationes hoc fecerunt.

607. Tussis quoque voluntate excitari potest, et tum ad arbitrium nostrum regitur: sæpe etiam cum invita prorsus est, eandem temperare, vel contrario conatu suppri-

viis, nimius mucus, ipse spissus, tenuis, acer, sanguis, serum, pus, aqua, excitant tussim: fere inseparabilis, comitatur omnem inflammationem pulmonis, que omnem difficiliorem respirationem. Quin et, ne quidem purissimus aër potest trahi sine dolore, irritatione, que vehemente tussi, asperâ arteriâ que bronchiis nimis sentientibus vel inflammatis, vel orbatis suo muco, qui solet defendere ab aëre ipso. Denique, exempla non desunt ubi frequens et molestissima tussis excitata fuerit a vitiis et irritationibus aliarum partium vel universi nervosi generis; irritationes auris, vel ventriculi, vel intestinorum a vermibus, vel jecoris ab inflammatione fecerunt hoc.

607. Tussis potest quoque excitari voluntate, et tum regitur ad nostrum arbitrium; sæpe etiam cum est prorsus invita possumus temperare ean-

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606. Whatever shall be unusual in those passages, too much mucus, itself thick, thin, acrid, blood, serum, pus, water, excite coughing: almost inseparable, it attends every inflammation of the lung, and every more difficult respiration. Moreover, not even the purest air can be drawn in without pain, irritation, and violent cough, from the aspera arteria and the bronchia being too sentient or inflamed, or deprived of their natural mucus, which is accustomed to defend them from the air itself. In fine, examples are not wanting where a frequent and very troublesome cough has been excited by disorders and irritations of other parts or of the whole nervous system; irritations of the ear, or of the stomach, or intestines from worms, or of the liver from inflammation, have caused this.

607. Coughing may also be excited by the will, and then it is governed at our own pleasure; often even when it is altogether involuntary, we can

dem, vel supprimere contrario conatu: tamen resistendum vehementi propensioni ad tussim nullo modo.

608. Semel excitata solet pergere donec vel irritamentum fuerit expulsum, vel sensus irritationis deletus fuerit, sopitus, fortasse superatus graviore sensu, quem tussis ipsa dederit; tum irritatione redeunte post intervallum, tussis redit denuo. Hinc docemur rationem sæpe sublevandi et sopiendi importunissimum malum, quamvis non detur penitus tollere causam ejûs.

609. Vehentissima sæpe est periculo; nimirum, spiritu intercluso, et valido nisu, plurimus sanguis congeretur in pulmone, vasa cujus distenduntur, nonnunquam rumpuntur; unde aliquando ingens, vel forsan lethale profluvium sanguinis: vero sæpius origo lentioris sed vix minus exitialis morbi: quin et, crebra et molesta tussis

mere possumus: vehementi tamen ad tussim propensioni nullo modo resistendum est.

608. Excitata semel, pergere solet, donec vel expulsum fuerit irritamentum, vel sensus irritationis deletus, sopitus, fortasse superatus fuerit, graviore sensu, quem ipsa tussis dederit: tum redeunte post intervallum irritatione, tussis denuo redit. Hinc rationem docemur importunissimum malum sublevandi sæpe et sopiendi, quamvis non detur causam ejus penitus tollere.

609. Vehentissima periculo sæpe est: intercluso nimirum spiritu, et valido nisu, plurimus sanguis in pulmone congeritur, cujus vasa distenduntur, nonnunquam rumpuntur; unde sanguinis profluvium aliquando ingens, vel forsan lethale; sæpius vero origo lentioris, sed vix minus exitialis morbi: quin et tussis crebra, et molesta, sine gravi

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moderate the same, or suppress it by a contrary effort: however we must resist a violent propensity to cough in no way.

608. Once excited it is accustomed to continue until either the irritating matter has been expelled, or the feeling of irritation has been destroyed, lulled, perhaps overcome, by a severer feeling, which the cough itself produced: then the irritation returning after an interval, the cough returns anew. Hence we are taught a method often of relieving and lulling this very troublesome disorder, although it may not be allowed entirely to remove the cause of it.

609. Very violent, it often is a danger; for indeed, by the breathing being obstructed, and by the powerful effort, a great deal of blood is congested in the lung, the vessels of which are distended, sometimes are broken; whence sometimes a great or perhaps fatal flow of blood; but more often the origin of a slower but hardly less pernicious disease:

aut sane ullo sanguinis profluvio, tantam pulmoni inferre potest labem, imprimis si hic debilioris fuerit fabricæ, ut phthiseos vix non immedicabilis fundamenta jecerit.

610. Denique, a longa et vehemente tussi, impedito per pulmonem sanguinis transitu, sanguis per venas refluit, imprimis ad caput: hinc vultus ipsorumque interdum oculorum rubor, et sæpe livor, et nonnunquam sanguinis profluvia vel e naribus, vel ex vasis internis in ipso cerebro, et paralysis, aut apoplexia, aut convulsio, aliquando lethalia.

611. Postremo, compressis insigni vi quotquot in abdomine continentur visceribus, si pars quædam præter solitum debilis fuerit, hernia, prolapsus, abortus, et similia mala accidere possunt.

612. Quod si lenior fuerit tussis, sed importuna et frequens, quamvis

sine gravi aut sane ullo profluvio sanguinis, potest inferre tantam labem pulmoni, imprimis si hic fuerit debilioris fabricæ, ut jecerit fundamenta vix non immedicabilis phthisëos.

610. Denique transitu sanguinis per pulmonem impedito a longâ et vehemente tussi, sanguis refluit per venas, imprimis ad caput; hinc rubor, et sæpe livor vultûs, que interdum oculorum ipsorum, et nonnunquam profluvia sanguinis, vel e naribus, vel ex internis vasis in cerebro ipso, et aliquando lethalia paralysis, aut apoplexia, aut convulsio.

611. Postremo, hernia, prolapsus, abortus, et similia mala, possunt accidere, si quædam pars fuerit præter solitum debilis, visceribus, quotquot continentur in abdomine, compressis insigni vi.

612. Quod si tussis fuerit lenior, sed importuna et frequens, quamvis nil

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moreover, a frequent and troublesome cough, without severe or indeed any profluvium of blood, may bring so great a mischief on the lung, especially if it should be of a weaker structure, that it lays the foundation, of a scarcely not incurable phthisis.

610. Indeed the passage of the blood through the lung being impeded by long and violent coughing, the blood flows back through the veins, especially to the head: hence redness, and often lividity of the countenance, and sometimes of the eyes themselves, and occasionally discharges of blood, either from the nostrils or from the internal vessels in the brain itself, and sometimes fatal paralysis, or apoplexy, or convulsion.

611. Lastly, hernia, prolapsus, abortion, and similar disorders, may happen, if any part should be unusually weak, by the viscera, as many as are contained in the abdomen, being compressed with great force.

612. But if the cough should be slighter, but troublesome and frequent,

istiusmodi sit metuendum, tamen non carebit periculo: nimirum agitat, fatigat ægrum, frangit vires corporis, adimit somnum, quatit et irritat pulmonem ipsum, impedit concoctionem cibi, que fere cæteras functiones, tandem evasura intolerabilis ægro.

nil istiusmodi metuendum sit, periculo tamen non carebit: ægrum nimirum agitat, fatigat, vires corporis frangit, somnum adimit, febrem intendit, ipsum pulmonem quatit et irritat, cibi concoctionem cæterasque fere functiones impedit, ægro tandem intolerabilis evasura.

613. Sternutatio est multum affinis huic, nimirum, ingens, plena inspiratio, cui sonora et violentissima expiratio succedit, directa ita ut aër expellatur per os et nares immani vi, quas partes verrat transeundo. Convulsio ipsa est multo vehementior tussi, vix excitanda aut imitabilis ad arbitrium, si fortis propensio adest, difficillime compescenda, que quatiens et excitans universum corpus magis quam tussis.

613. Huic multum affinis est sternutatio, ingens nimirum plena inspiratio, cui sonora et violentissima succedit expiratio, ita directa, ut aër, immani vi, per os et nares, quas partes transeundo verrat, expellatur. Convulsio ipsa tussi multo vehementior est, vix ad arbitrium excitanda aut imitabilis, si propensio fortis adest, difficillime compescenda, corpusque universum, magis quam tussis, quatiens, et excitans.

614. Ut tussis oritur ab irritatione glottidis et asperæ arteriæ, et bronchiorum et pulmonis, sic sternutatio plerumque ab

614. Ut tussis ab irritatione glottidis, et asperæ arteriæ, et bronchiorum, et pulmonis, sic sternutatio ab irritatione membranæ

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although nothing of that sort may be to be feared, however it will not be free from danger: for instance, it agitates, fatigues the patient, breaks down the strength of the body, takes away sleep, shakes and irritates the lung itself, impedes the digestion of the food, and nearly the rest of the functions, at length about to become intolerable to the patient.

613. Sneezing is much akin to this, that is, a large, full inspiration, to which a loud and very violent expiration succeeds, directed so that the air is expelled through the mouth and nose with great force, which parts, it sweeps in passing through. The convulsion itself is much more violent than cough, scarcely to be excited or imitated at pleasure, if a strong propensity is present, very difficultly to be restrained, and shaking and exciting the whole body more than coughing.

614. As coughing arises from irritation of the glottis and aspera arteria, and bronchia and lung, so sneezing generally (arises) from irritation of the

narium plerumque oritur, rarius a consensu cum remotis partibus; pari fere ac tussis ratione, causam irritationis summovet, vel abstergit, et corpori igitur sæpe prodest aliquando vero nocet, scilicet si nimis vehemens fuerit, aut nimis sæpe repetita, aut nimis diu continuata.

irritatione membranæ narium, rarius a consensu cum remotis partibus; fere pari ratione ac tussis, summovet vel abstergit causam irritationis, et igitur sæpe prodest corpori, vero aliquando nocet, scilicet si fuerit nimis vehemens, aut nimis sæpe repetita, aut nimis diu continuata.

Cap. XVIII. — *De concoctione alimentorum.*

Cap. XVIII.—*De concoctione alimentorum.*

615. Corpus variis actionibus, tum animalibus, tum vitalibus, brevi exhauritur, fluidis nimirum partibus dissipatis, solidis attritis, et utrisque forsitan ad putredinem sponte vergentibus (6, 539.)

615. Corpus brevi exhauritur, variis actionibus, tum animalibus tum vitalibus, nimirum fluidis partibus dissipatis, solidis attritis, et utrisque, forsitan, sponte vergentibus ad putredinem.

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membrane of the nostrils, more rarely from consent with remote parts; nearly in a like manner as cough, it removes or wipes away the cause of irritation, and therefore often benefits the body, but sometimes hurts it, that is, if it should be too violent, or too often repeated, or too long continued.

Chap. XVIII. *Of the Digestion of Aliments.*

615. The body is shortly exhausted, by the various actions, as well animal as vital, truly the fluid parts being dissipated, the solid worn down, and both, perhaps, spontaneously verging to putridity.

616. Vero monemur et incitamur importunissimo appetitu, et dirigimur instinctu quem gustus juvat, et olfactus et experientia, ad ingerendas res quales fuerint idoneæ ad reparandam jacturam corporis, que arcendam et corrigendam corruptionem ejus.

616. Monemur vero et incitamur importunissimo appetitu, et dirigimur instinctu, quem juvat gustus, et olfactus, et experientia, ad res ingerendas, quales idoneæ fuerint ad corporis jacturam reparandam, ejusque corruptionem arcendam et corrigendam.

617. Ventriculo jam vacuo, et corpore quoque nonnihil exhausto inediâ, que solitis laboribus vitæ, ingratus sensus, quem referimus ad ventriculum, cum cupiditate edendi, oritur, primo levis, ingravescens paulatim, tandem evasurus immanis, et quali resistendum sit nullo modo, nisi fuerit pacatus idoneo cibo. Hic appetitus vocatur Fames.

617. Vacuo jam ventriculo, et corpore quoque nonnihil exhausto, inedia, solitisque vitæ laboribus, sensus ingratus, quem ad ventriculum referimus, cum edendi cupiditate, oritur, primo levis, paulatim ingravescens, nisi idoneo cibo pacatus fuerit, tandem immanis evasurus, et quali nullo modo resistendum sit.—Hic appetitus Fames vocatur.

618. Autem fluidis partibus multum dissipatis, vel quovis acri, vel tantum sicciore cibo, ingesto in corpus, fauces arescunt, cum peculiari ingrato sensu, et ingens cupiditas bi-

618. Fluidis autem partibus multum dissipatis, vel acri quovis. vel cibo tantum sicciore, in corpus ingesto, fauces arescunt, cum sensu peculiari et ingrato, et ingens simul

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616. But we are admonished and incited by a most importunate appetite, and we are directed by an instinct which taste assists, also smell and experience, to ingest things such as shall be fit to repair the loss of the body, and to prevent and correct the corruption of it.

617. The stomach being now empty, and the body also being somewhat exhausted by fasting, and the usual labours of life, an unpleasant sensation, which we refer to the stomach, with a desire of eating, arises, at first slight, increasing gradually, at length about to become intolerable, and such as we can resist in no way, unless it shall be appeased by suitable food. This appetite is called Hunger.

618. But the fluid parts being greatly dissipated, or any acrid, or only drier food, being ingested into the body, the fauces grow dry, with a peculiar unpleasant sensation, and a great desire of drinking at the same time arises. This appetite is called Thirst.

bibendi cupiditas oritur.—Hic appetitus Sitis vocatur.

619. Neque profecto homo semper esurit a vacuo ventriculo: exinanitio aliqua universi corporis, libera imprimis per cutem excretio, ad hunc effectum haud parum conducit (357.) Quin et contractio quædam fibrarum musculosarum ipsius ventriculi subesse videtur, famemque (617) efficere: nam multa stimulantia in eum recepta, ipsiusque demum modica distentio, appetitum aliquem homini, alioquin non esurituro, conciliabunt: quod helluones sæpe, non sine magno suo malo, experiuntur.

620. Porro, si cibus prorsus fluidus et tenuis assumptus fuerit, corpus haud bene alit aut reficit: docuit igitur Natura hominem, crassiorem vel sicciorem aliquem cibum quærere et appetere, quem sumat simul, quamvis sæpe insulsum, et parum nutrientem.

bendi simul oritur. Hic appetitus vocatur Sitis.

619. Neque profecto homo semper esurit a vacuo ventriculo; aliqua exinanitio universi corporis, imprimis libera excretio per cutem conducit haud parum ad hunc effectum. Quin et, quædam contractio musculosarum fibrarum ventriculi ipsius, videtur subesse que efficere famem: nam multa stimulantia recepta in eum, que demum modica distentio ipsius conciliabunt aliquem appetitum homini alioquin non esurituro: quod helluones sæpe experiuntur, non sine suo magno malo.

620. Porro, si cibus assumptus fuerit prorsus fluidus et tenuis haud bene alit aut reficit corpus; igitur, Natura docuit hominem quærere et appetere aliquem crassiorem vel sicciorem cibum, quem sumat simul, quamvis sæpe insulsum, et parum nutrientem.

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619. Nor truly does a person always hunger from an empty stomach: any evacuation of the whole body, especially the free excretion by the skin, conduces not a little to this effect. Moreover, a certain contraction of the muscular fibres of the stomach itself seems to enter into and cause hunger: for many stimulating things, received into it, and indeed moderate distention of itself will excite some appetite to a man otherwise likely to be not hungry: which gluttons often experience, not without their own great injury.

620. Moreover, if the food taken should be wholly fluid and thin, it does not sufficiently support or refresh the body; therefore, Nature has taught man to seek out and to desire some more solid or drier food, which he may take at the same time, although often unsavoury, and little nutritive.

621. All food is derived either from animals or from vegetables. Man

621. Omnis cibus derivatur vel ex animalibus vel ex frugibus. Homo naturâ appetit utrumque genus: et vel altero vel utroque simul, quod est usitatius et melius, satis alitur, et habet se bene. Quamvis nonnulli, credentes se sapientiores Naturâ, vetent animalia imponi mensis, et jubeant vivere frugibus solis.

622. Quædam fossilia et multæ fruges quæ nutriant parum vel nihil, sumuntur pro condimentis. Omne animal, et præsertim homo. appetit condimenta hujusmodi, nimirum aliquid grati gustui, vel saltem acris, quamvis sæpe rançidi et fœtidi, et admodum ingrati, donec consuetudo docuit amare. Neque condimenta istiusmodi carent suis usibus. Stimulant linguam, que faciant gustare melius, quo cibus, ipse forsan habens parum saporis, evadat gratior; quin et sunt quoque stimulo ventriculo, et sic

621. Omnis cibus vel ex animalibus vel ex frugibus derivatur. Utrumque genus homo natura appetit: et vel altero, vel utroque simul, quod usitatius est et melius, satis alitur, et bene se habet. Quamvis nonnulli, se credentes Natura sapientiores, vetent animalia mensis imponi, et jubeant solis frugibus vivere.

622. Fossilia quædam, et multæ fruges, quæ parum vel nihil nutriant, pro condimentis sumuntur. Hujusmodi condimenta, aliquid nimirum gustui grati, vel saltem acris, quamvis sæpe rancidi et fœtidi, et admodum ingrati, donec consuetudo amare docuit, omne animal, et homo præsertim, appetit. Neque suis usibus carent istiusmodi condimenta. Linguam stimulant, meliusque gustare faciunt, quo gratior cibus evadat, ipse forsan parum saporis habens: quin et ventriculo quoque stimulo sunt,

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by nature desires both kind: and either by one or both together, which is more usual and better, is sufficiently nourished, and has himself well. Although some, believing themselves wiser than Nature, forbid animals to be placed on the tables, and order us to live on vegetables alone.

622. Certain fossil things and many vegetables which nourish little or not at all, are taken as condiments. Every animal, and especially man, desires condiments of this sort, doubtless as something agreeable to the taste, or at least sharp, although often rancid and fetid, and very unpleasant, until habit has taught him to like them. Nor do condiments of this description want their uses. They stimulate the tongue, and cause it to taste better, that the food itself perhaps having little taste, may become more agreeable: moreover they are also as a stimulus to the stomach, and thus assist digestion, especially if it should be weaker; nor is it digested well if the customary condiments have been denied.

et sic concoctioni, præsertim si ille debilior fuerit, opitulantur: neque bene concoquitur, si condimenta solita negata fuerint.

623. Parum concoctionis vel mutationis, præter solutionem, partium solidarum, requiritur, ut cibus animalis nutrimento corpori humano sit: quippe qui parum omnino differat a natura corporis humani. Olea vero, tam animalium quam frugum, quæ multum alunt, longius distant a natura humorum aut carnium humani corporis. Remotiora adhuc videntur esse fruges glutinosæ, vel quæ farinam aut saccharum præbent, et demum radices, et olera, quibus tamen omne animal nutritur, vel ipsum herbas depascens, vel aliis vivens, quæ eas depaverant.

624. Cibum labiis prehendimus, his, et buccis, et lingua, in ore volvimus, dentibus dividimus, contundimus, conficimus: affluente

opitulantur concoctioni, præsertim si ille fuerit debilior; neque concoquitur bene si solita condimenta fuerint negata.

623. Parum concoctionis vel mutationis, præter solutionem solidarum partium, requiritur, ut animalis cibus sit nutrimento humano corpori; quippe qui differat parum omnino a naturâ humani corporis. Vero olea, tam animalium quam frugum, quæ alunt multum, distant longius a naturâ humorum aut carnium humani corporis. Glutinosæ fruges, vel quæ præbent farinam aut saccharum, et demum radices et olera, quibus tamen omne animal nutritur, vel ipsum depascens herbas, vel vivens aliis, quæ depaverant eas, videntur esse adhuc remotiora.

624. Prehendimus cibum labiis, volvimus in ore his et buccis et linguâ, dividimus, contundimus, conficimus dentibus; vero

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623. Little of digestion or change, except the solution of the solid parts, is required, that animal food may be nourishment to the human body; as being that which differs in no way at all from the nature of the human body. But oils, as well of animals as of vegetables, which nourish much, differ farther from the nature of the juices or flesh of the human body. Glutinous vegetables, or which afford flour or sugar, and indeed roots and potherbs, by which notwithstanding every animal is nourished, either itself feeding upon the herbs, or living upon others, which had fed upon them, seem to be still more remote.

624. We take the food with the lips, we roll it in the mouth by these and the cheeks and tongue, we divide, we bruise, we chew it by the teeth; but a great deal of saliva flowing forth, also mucus, and the other fluids of the mouth, as well on account of the stimulus and taste of the food, as also on

plurimâ salivâ affluente, et muco, et aliis humoribus oris, cum ob stimulum et saporem cibi, tum quoque ob motum partium dum manditur, cibus subigitur in mollem fere fluidam massam, quam tradimus pharyngi, neque habemus, amplius potestatem in eam ; neque profecto est opus ; enim impellitur in gulam contractione hujus quam dilatat, et ciet ad contractionem, quâ contractione demum, incipiente a pharynge et propagatâ ad ventriculum, cibus pervenit ad ventriculum, ibi detinendus tempus quo sit opus. Neque sane cibus descendit tantum suo pondere quantum motu et contractione gulæ ipsius : enim multa animalia devorant sursum, quod et homo ipse potest facere.

625. Autem cibus non statim transit per ventriculum : detinetur ibi aliquamdiu, scilicet pyloro contracto, et simul nonnihil elevato, cum a fibris

vero plurima saliva, et muco, et aliis oris humoribus, cum ob stimulum et saporem cibi, tum quoque ob motum partium dum manditur, cibus in massam mollem, fere fluidam, subigitur, quam pharyngi tradimus, neque amplius in eam potestatem habemus ; neque profecto opus est, hujus enim contractione in gulam impellitur, quam dilatat, et ad contractionem ciet, qua demum contractione a pharynge incipiente, et ad ventriculum propagata, cibus ad ventriculum pervenit, ibi quo opus sit tempus detinendus. Neque sane tantum suo pondere, quantum motu et contractione ipsius gulæ descendit, cibus : multa enim animalia sursum devorant, quod et homo ipse facere potest.

625. Cibus autem non statim per ventriculum transit ; detinetur ibi aliquamdiu, contracto scilicet, et nonnihil simul elevato pyloro, cum a fibris quæ ipsum circumdant,

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account of the motion of the parts whilst it is masticated, the food is reduced into a soft, almost fluid mass, which we deliver to the pharynx, nor have we longer power over it ; nor indeed is there need ; for it is driven into the gullet by the contraction of this, which it dilates, and excites to contraction, by which contraction indeed, beginning from the pharynx, and propagated to the stomach, the food arrives at the stomach, there to be detained the time of which there may be need. Nor truly does the food descend so much by its own weight as by the motion and contraction of the œsophagus itself ; for many animals swallow upwards, which even man himself can do.

625. But the food does not immediately pass through the stomach : it is detained there some time, that is, by the pylorus being contracted, and at the same time somewhat elevated, as well by the fibres which surround

tum quoque a longioribus, quæ partem a ventriculi superiorem inter cardiam et pylorum occupant; tandem vero, relaxato iterum et descendente pyloro, duodeno traditur cibus, jam multum solutus, et actione ventriculi subactus, agitatus, propulsus.

626. Similis massa alimentaria, ex carnibus et frugibus mixtis confecta, cum aqua aut saliva in pulpam mollem probe subacta, et mollita, et diluta, et demum calore, qualis in corpore est, fota, extra corpus continuo fermentescere incipit: agitatur scilicet multum, et plurimum aëra exhalat, et acescit primo, et deinde putrescit.

627. Sæpe etiam in vivo homine idem accidere docet ructus, docent dolor ventriculi, et vomitus materiæ acidæ vel putridæ, male concoquentibus familiaria.

628. Porro, experimenta haud pauca, de industria instituta, os-

quæ circumdant ipsum, tum quoque a longioribus quæ occupant superiorem partem ventriculi inter cardiam et pylorum vero tandem, pyloro relaxato iterum et descendente, cibus traditur duodeno, jam multum solutus et subactus, agitatus, propulsus, actione ventriculi.

626. Similis alimentaria massa, confecta ex carnibus et frugibus mixtis, probe subacta, et mollita et diluta cum aquâ aut salivâ, in mollem pulpam, et demum fota calore qualis est in corpore, continuò incipit fermentescere extra corpus; scilicet, multum agitatur, et exhalat plurimum aëra, et primo acescit, et deinde putrescit.

627. Ructus docet idem sæpe accidere, etiam in vivo homine, dolor, ventriculi, et vomitus acidæ, vel putridæ materiæ familiaria concoquentibus male, docent.

628. Porro, haud pauca experimenta instituta de

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itself, as also by the longer ones which occupy the superior part of the stomach between the cardia and the pylorus: but at length, the pylorus being relaxed again and descending, the food is delivered to the duodenum, now much dissolved and reduced, agitated, propelled, by the action of the stomach.

626. A similar alimentary mass, made up of flesh and vegetables mixed, well reduced, and softened and diluted with water or saliva, into a soft pulp, and at last heated by a heat such as is in the body, immediately begins to ferment without the body; that is, it is much agitated, and exhales a great deal of air, and at first grows acid, and then putrefies.

627. Belching proves that the same often happens, even in the living man, the pain of the stomach, and the vomiting of an acid, or a putrid matter common to those digesting badly, teach it.

628. Moreover, no few experiments instituted on purpose have shewn

industriâ ostenderunt alimenta semper fermentescere aliquantum in ventriculo hominis, quamvis sanissimi, que totam alimentariam massam acescere paucis horis post prandium.

629. Tamen, fatendum est vel nulla, vel saltem levissima indicia mutationis istiusmodi unquam manifeste prodere se in sano homine: et est bene notum quo vehementius fuerit fermentatum in ventriculo, fere eo pejus et tardius hominem concoquere.

630. Igitur aliquid videtur esse in ventriculo, quod impediat istud incommodum, neque sinat alimenta fermentescere adeo vehementer. Proprius succus ventriculi ipsius, secretus copiosus, videtur præstare hoc. Vero si cibi fuerint detenti diutius justo in ventriculo, (quod sane vix acciderit si concoctio fuerit alioquin bona,) hic succus non sufficit ad compes-

tenderunt alimenta in ventriculo hominis, quamvis sanissimi, semper aliquantum fermentescere, ipsamque massam alimentariam, paucis post prandium horis, totam acescere.

629. Fatendum tamen est, vel nulla vel levissima saltem istiusmodi mutationis indicia, in sano homine, se unquam manifeste prodere: et bene notum est, quo vehementius fermentatum fuerit in ventriculo, eo fere hominem pejus et tardius concoquere.

630. Videtur igitur aliquid in ventriculo esse, quod istud incommodum impediat, neque sinat alimenta adeo vehementer fermentescere. Succus ipsius ventriculi proprius, copiosus secretus, hoc præstare videtur. Si vero diutius justo cibi in ventriculo detenti fuerint (quod sane vix acciderit si concoctio alioquin bona fuerit) hic succus non sufficit ad compescen-

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that aliments always ferment somewhat in the stomach of a man, although most healthy, and that the whole alimentary mass becomes acescent a few hours after a meal.

629. However, we must confess either that none, or at least very slight, signs of a change of this sort ever manifestly shew themselves in a healthy man, and it is well known, the more violently it has been fermented in the stomach, commonly the worse and the more slowly the person digests.

630. Therefore something seems to be in the stomach, which impedes that disadvantage, nor permits the aliments to ferment so vehemently. The proper juice of the stomach itself, secreted in abundance, seems to effect this. But if the food should be detained longer than proper in the stomach, (which indeed scarce will happen if the concoction should be otherwise good,)

dam istam alimentorum ad fermentandum proclivitatem, quæ tum sese manifestis signis prodit.

631. Quin et idem succus cibos solvit, neque facile ventriculus quos continet cibos prius intestinis tradiderit, quam probe soluti fuerint. Neque vis solvens in omnibus animalibus eadem est: sunt enim quæ carnes, sunt quæ fruges, facile solvunt, neque alterum genus omnino tangunt. Homo vero, et animalia omnivora, nempe quæ aliis animantibus et herbis promiscue vescuntur, utrumque genus pariter solvunt. Docent experimenta quædam extra corpus instituta, et melius adhuc et certius, quæ nuper in vivis animalibus, et quidem in ipso homine, facta sunt a variis auctoribus, præsertim a claris. Spallanzani et Stevens. Plurimæ autem fruges, tam duræ quam molles, neque solvuntur, nec ullo modo con-

cendam istam proclivitatem alimentorum ad fermentandum quæ tum prodit sese manifestis signis.

631. Quin et idem succus solvit cibos, neque ventriculus facile tradiderit cibos quos continet intestinis, priusquam fuerint probe soluti. Neque est solvens vis eadem in omnibus animalibus; enim sunt quæ facile solvunt carnes, sunt quæ fruges, neque omnino tangunt alterum genus. Vero homo, et omnivora animalia, nempe, quæ promiscue vescuntur aliis animantibus, et herbis, solvunt pariter utrumque genus. Quædam experimenta instituta extra corpus, docent, et adhuc melius et certius quæ facta sunt nuper in vivis animalibus, et quidem in homine ipso, a variis auctoribus, præsertim a clarissimo Spallanzani et Stevens. Autem plurimæ fruges, tam duræ quam molles, neque solvuntur,

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this juice does not suffice to restrain that tendency of the aliments to ferment, which then shows itself by manifest signs.

631. Moreover the same juice dissolves the food, nor will the stomach easily deliver the foods which it contains to the intestines before that they have been well dissolved. Nor is the solvent power the same in all animals: for there are those which easily dissolve flesh, there are those which dissolve grain, nor do they at all touch the other kind. But man, and omnivorous animals, namely, which promiscuously feed upon other animals, and vegetables, dissolve alike either kind. Some experiments instituted without the body, shew, and still better and more certainly which have been made lately upon living animals, and even upon man himself, by different authors, especially by the very celebrated Spallanzani and Stevens. But a great many vegetables, as well hard as soft, neither are dissolved, nor are concocted

nec concoquuntur ullo modo ab sanissimo homine, nisi fuerint prius confectæ dentibus, vel fractæ aut contusæ alio modo.

632. Neque cibi jam quodammodo soluti, ostendunt ulla indicia (saltem in sano corpore) acoris, postquam demissi sunt in intestina, et si permansissent in ventriculo brevi acquisituri insignem acorem. Succus intestinorum, haud dissimilis succo ventriculi, fortasse obstat, et copiosus latex pancreatis, simillimus salivæ, sed præ omnibus fel ipsum delatum a jecinore, quod non sinit massam alimentorum amplius fermentescere, neque accedere proprius ad acidam naturam, et sane mirabiliter corrigit acorem jam existentem. Quin et fel videtur promovere solutionem alimentorum miscendo probe oleosa cum aquosis; et quoque incitare intestina ad justam contractionem.

coquuntur ab homine sanissimo, nisi prius dentibus confectæ, vel alio modo fractæ aut contusæ fuerint.

632. Neque cibi jam quodammodo soluti, et insignem acorem, si permansissent in ventriculo, brevi acquisituri, postquam in intestina demissi sunt, ulla (saltem in sano corpore) acoris indicia ostendunt. Obstat fortasse succus intestinorum, ventriculi succo haud dissimilis, et copiosus pancreatis latex, salivæ simillimus, sed, præ omnibus, fel ipsum a jecinore delatum, quod non sinit massam alimentorum amplius fermentescere, neque propius ad acidam naturam accedere, et sane acorem jam existentem mirabiliter corrigit. Quin et solutionem alimentorum promovere videtur fel, oleosa cum aquosis probe miscendo; et intestina quoque incitare ad justam contractionem.

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in any way by the most healthy person, unless they have been first chewed by the teeth, or broken or bruised in some way.

632. Nor do the foods already in some degree dissolved shew any signs (at least in the healthy body) of tartness, after that they have been sent down into the intestines, although if they should have remained in the stomach, in a short time likely to acquire very great sourness. The juice of the intestines, not unlike the juice of the stomach, perhaps prevents it, and the abundant juice of the pancreas, very like to the saliva, but before all things the bile itself conveyed from the liver, which does not permit the mass of aliments farther to ferment, nor to approach nearer to an acid nature, and indeed wonderfully corrects the acidity already existing. Moreover the bile seems to promote the solution of the aliments by mixing thoroughly the oily with the watery; and also to excite the intestines to due contraction.

633. Actione igitur manducandi, et vi solvente humorum oris, et ventriculi, et intestinorum, et demum fellis, cibi in fluidam formam rediguntur, juvante forsitan ipsorum ad fermentescendum proclivitate, quæ vincula adhæsionis laxet. Humor vero nutriens, dum tota massa per intestina descendit, vasis lacteis pendulis vel hiantibus in intestina sorbetur, his per mesenterium repentibus ad ductum thoracicum defertur, et in sanguinem recipitur, postquam per pulmones iter absolverit in naturam animalem penitus mutatus. Plurimo vero affluente ex intestinis, jecore, pancreate, humore, massa quæ superest vix spissescit, donec ad crassa intestina pervenitur: tum vero parcius diluta, et multo decedente humore, stercoris tandem formam induit, sæpe firmi, et vestigia cellularum coli retinentis.

634. Multum vero abest ut ple-

633. Igitur cibi redi guntur in fluidam formam actione manducandi, et solvente vi humorum oris, et ventriculi, et intestinorum, et demum fellis, proclivitate ipsorum ad fermentescendum forsitan juvante, quæ laxet vincula adhæsionis. Vero nutriens humor, dum tota massa descendit per intestina, sorbetur lacteis vasis pendulis vel hiantibus in intestina, defertur ad thoracicum ductum his repentibus per mesenterium, et recipitur in sanguinem, penitus mutatus in animalem naturam postquam absolverit iter per pulmones. Vero plurimo humore affluente ex intestinis, jecore, pancreate, massa quæ superest vix spissescit donec pervenitur ad crassa intestina: vero tum parcius diluta, et multo humore decedente, tandem induit formam stercoris, sæpe firmi et retinentis vestigia cellularum coli.

634. Vero multum abest

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633. Therefore the foods are reduced into the fluid form by the action of chewing, and by the solvent power of the fluids of the mouth, and stomach, and intestines, and finally of the bile, the tendency of themselves to be fermented perhaps assisting, which may loosen the bonds of adhesion. But the nourishing juice, whilst the entire mass is descending through the intestines, is absorbed by the lacteal vessels pendulous or opening into the intestines, is conveyed to the thoracic duct by these creeping through the mesentery, and is received into the blood, entirely changed into an animal nature after it has performed the passage through the lungs. But a great deal of fluid flowing forth from the intestines, liver, and pancreas, the mass which remains scarcely thickens until it arrives at the large intestines: but then more sparingly diluted, and much fluid going off, at length puts on the character of fæces, often firm and retaining traces of the cells of the colon.

634. But much is wanting that we have a perfect knowledge of the changes

ut habeamus plenam notitiam mutationum quas cibi subeunt in ventriculo aut intestinis. Enim natura et vires fermentationis, fortasse etiam varia genera ejûs, adhuc parum intelliguntur, neque potest ratio concoctionis ciborum reddi ex eâ. Neque mera solutio solvet nodum: enim cibi non modo soluti, sed multum mutati, que nacti sibi novas dotes, deferuntur in sanguinem sub formâ chyli. Lac ipsum, simplicissimus cibus et simillimus chylo, primo cogitur in ventriculo, deinde concoquitur, et solvitur, et ut alii cibi, vertitur in chylum priusquam fuerit idoneo nutrimento corpori.

635. Motus intestinorum est simplicissimus in sanitate, et vocatur peristalticus. Alia portio cietur post aliam ad contractionem, partim acrimoniâ, partim mole alimentariæ massæ, quæ, tandem propulsa in intestinum rec-

nam mutationum, quas cibi in ventriculo aut intestinis subeunt, notitiam habeamus. Natura enim et vires fermentationis, fortasse etiam varia ejus genera, parum adhuc intelliguntur, neque ex ea concoctionis ciborum ratio reddi potest. Neque mera solutio nodum solvet: cibi enim non modo soluti, sed multum mutati, novasque sibi nacti dotes, sub forma chyli in sanguinem deferuntur. Lac ipsum, simplicissimus et chylo simillimus cibus, cogitur primo in ventriculo, deinde concoquitur, et solvitur, et in chylum ut alii cibi vertitur, priusquam idoneo corpori nutrimento fuerit.

635. Motus intestinorum in sanitate simplicissimus est, et peristalticus vocatur. Portio alia post aliam ad contractionem cietur, partim acrimonia, partim mole alimentariæ massæ, quæ tandem in intestinum rectum propulsa hanc

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which the aliments undergo in the stomach or intestines. For the nature and powers of fermentation, perhaps even the various kinds of it, as yet are little understood, nor can an explanation of the concoction of the food be rendered from it. Nor will mere solution loose the knot: for the aliments not only dissolved, but much changed, and having acquired to themselves new properties, are conveyed into the blood under the form of chyle. Milk itself, the most simple food and most like to chyle, first is coagulated in the stomach, then it is digested, and is dissolved, and like other food, is converted into chyle before that it could be proper nutriment to the body.

635. The motion of the intestines is very simple in health, and is called peristaltic. One portion is excited after another to contraction, partly by the acrimony, partly by the bulk of the alimentary mass, which, at length driven forward into the intestinum rectum, stimulates this part, brings on a

partem stimulat, desidendi cupiditatem inducit, et intestinum ipsum, et, quæ cum eo consentiunt, musculos abdominis et septum transversum, ad contractionem ciet, qua, superato renixu musculi qui anum claudit, e corpore demum excernitur.

636. Alias revera bene multas concoctionis rationes reddere conati sunt philosophi et medici; alii maximam partem calori, alii agitationi et triturae, alii fermentationi tribuentes; quamvis haud satis validis argumentis tuiti sint varias quas amplecterentur sententias. Neque tamen omnem quam impendebant huic rei operam perdiderunt. Rationem saltem reddiderunt multarum affectionum, quibus sæpe corrumpitur utilissima hæcce functio, et idonea itaque adversus eas remedia indicarunt.

637. Cibi alii facile alii ægerrime concoquuntur. Mira autem

tum, stimulat hanc partem, inducit cupiditatem desidendi, et ciet intestinum ipsum, et musculos abdominis et transversum septum, quæ consentiunt cum eo, ad contractionem, quâ, renixu musculi qui claudit anum superato, excernitur e corpore.

636. Philosophi et medici conati sunt, revera reddere bene multas alias rationes concoctionis: alii tribuentes maximam partem calori, alii agitationi et triturae, alii fermentationi; quamvis haud tuiti sint varias sententias quas amplecterentur argumentis satis validis. Neque, tamen, perdiderunt omnem operam quam impendebant huic rei. Saltem, reddiderunt rationem multarum affectionum quibus hæcce utilissima functio sæpe corrumpitur, et itaque indicarunt remedia idonea adversus eas.

637. Alii cibi concoquuntur facile, alii æger-

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desire going to stool, and excites the intestine itself, and the muscles of the abdomen and diaphragm, which consent with it, to contraction, by which, the resistance of the muscle which closes the anus being overcome, it is excreted from the body.

636. Philosophers and physicians have endeavoured, indeed, to render a great many other explanations of digestion: some attributing the greatest part to heat, others to agitation and trituration, others to fermentation; although they have not defended the various opinions which they embraced by arguments sufficiently valid. Nor, notwithstanding, have they lost all the labour which they expended upon this subject. At least, they have rendered an account of many affections by which this very useful function often is corrupted, and therefore have pointed out the remedies proper against them.

637. Some aliments are digested easily, others very difficultly; but there

rime: autem mira diversitas hominum de hac re, et vis consuetudinis adhuc magis mira, ita ut quod fuerit huic cibo, illi fere veneno. Quin et, dura ilia messorum aliquando concoxerint fere lapideum cibum cui assueverint facilius quam delicatissimum.

638. Fere omnes cibi quibus utimur mitescunt, et molliuntur flammâ: mistura quoque, et fermentatio, et plurima condimenta, aliá atque aliâ ratione reddunt cibos faciliores solutu et concoctu. Hoc modo coquinaria ars non modo grata sed fere necessaria assuetis: vero eadem nimis culta, et miscens atque confundens contraria et dissociabilia, imprimis nocet; et sane potissimum hac ratione, quod invitat homines ad ingluviem: neque, profecto, aut qualitas aut mistura ciborum, (quamvis hæc sane aliquando noceat haud parum, sicubi faciat

de hac re hominum diversitas, et magis adhuc mira vis consuetudinis; ita ut quod huic cibo, illi fere veneno fuerit. Quin et dura messorum ilia, lapideum fere cui assueverint cibum, facilius quam delicatissimum aliquando concoxerint.

638. Omnes fere quibus utimur cibi mitescunt flamma, et molliuntur: mistura quoque, et fermentatio, et condimenta plurima, alia atque alia ratione, cibos solutu et concoctu faciliores reddunt. Hoc modo ars coquinaria non grata modo, sed fere necessaria assuetis: eadem vero nimis culta, et contraria et dissociabilia miscens atque confundens, imprimis nocet; et sane hac potissimum ratione, quod homines ad ingluviem invitat; neque profecto aut qualitas, aut mistura ciborum (quamvis hæc sane haud parum aliquando noceat, sicubi totam massam nimis cito et

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is a wonderful difference of men upon this subject, and the force of habit is still more wonderful, so that what would be to this one food, would be to that almost a poison. Moreover, the hard bowels of mowers sometimes will digest the almost stony food to which they have accustomed themselves more easily than the most delicate.

638. Almost all the foods which we use grow mild, and are softened by fire: mixture also, and fermentation, and many condiments, in a different manner render the aliments easier to be dissolved and to be digested. In this manner the cookery art is not only agreeable, but almost necessary to those accustomed to it: but the same too much cultivated, also mixing and confounding contrary and discordant things, especially hurts; and indeed chiefly for this reason, that it invites men to gluttony; nor, indeed, does either the quality or mixture of foods, (although this truly sometimes may

vehementer fermentescere faciat) helluoni tantum nocet, quantum ingens copia quam ingurgitat. Homo enim sanus, neque famelicus, unius et simplicis cibi generis raro plus justo sumet: varietate autem, et condimentis, et exquisita coqui arte illectus, triplo plus quam debet sese onerabit.

639. Cibi plerique duri, aut sale, fumo, pipere, aromaticis, conditi et indurati, aut glutinosi, et oleosi, cum fruges, tum quoque carnes, difficiliores solent esse concoctu: carnes quoque juniorum animalium, et carnes avium, quam quadrupedum, difficilius, ut videtur, concoquuntur.

640. Tanta autem vis est edacis humoris jejuni ventriculi, in aliis atque aliis animalium generibus, ut non modo olea, gluten, cartilaginem, sed ossa demum, et durissimum ebur, solvat et concoquat. Dicitur quoque ventriculum ipsum

totam massam fermentescere nimis cito et vehementer) nocet helluoni tantum quantum ingens copia quam ingurgitat. Enim, sanus homo neque famelicus, raro sumet plus justo uniûs et simplicis generis cibi: autem illectus varietate et condimentis, et exquisitâ arte coqui, onerabit sese plus triplo quam debet.

639. Plerique duri cibi, aut conditi et indurati sale, fumo, pipere, aromaticis, aut glutinosi et oleosi, cum fruges tum quoque carnes, solent esse difficiliores concoctu: carnes quoque juniorum animalium et carnes avium concoquuntur difficilius, ut videtur, quam quadrupedum.

640. Autem tanta est vis edacis humoris jejuni ventriculi, in aliis atque aliis generibus animalium, ut solvat et concoquat non modo olea, gluten, cartilaginem, sed demum ossa, et durissimum ebur. Dicitur, quoque aliquan-

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hurt not a little, since it may cause the whole mass to ferment too quickly and violently,) hurt the glutton so much as the immense quantity which he gorges. Moreover, a healthy man and not starved, seldom will take more than proper of a single and simple kind of food: but allured by variety and condiments, and the exquisite art of the cook, will load himself more by triple than he ought.

639. Most hard foods, or those seasoned and hardened by salt, smoke, pepper, spices, or glutinous and oily, as well vegetables as also flesh, are accustomed to be more difficult to be digested: the flesh also of younger animals and the flesh of birds are digested more difficultly, as it seems, than of quadrupeds.

640. But so great is the power of the solving juice of the empty stomach, in the different kinds of animals, that it can solve and digest not only oils,

do rodere ventriculum ipsum brevissimo tempore post mortem.

641. Ex his denique ratio potest reddi, cur concoctio tam sæpe vitiata, cur corruptio alimentorum in ventriculo, primo acida, dein putrida familiaris concoquentibus male; cur concoctio ciborum subito turbetur et corrumpatur, non modo variis morbis corporis, sed sæpe etiam gravi affectu animi: cur exercitatio corporis sæpe promoveat, vero aliquando impediat actionem ventriculi in cibos; cur cyathus meri prosit multis hominibus et juvet concoctionem, vero noceat multis, que corrumpat eandem.

aliquando rodere brevissimo post mortem tempore.

641. Ex his denique ratio reddi potest, cur concoctio tam sæpe vitiata, cur alimentorum in ventriculo corruptio, acida primo, dein putrida, male concoquentibus familiaris; cur subito turbetur et corrumpatur ciborum concoctio, non modo variis corporis morbis, sed sæpe etiam gravi animi affectu; cur corporis exercitatio sæpe promoveat, aliquando vero impediat, actionem ventriculi in cibos; cur cyathus meri multis hominibus prosit, et concoctionem juvet, multis vero noceat, eandemque corrumpat.

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gluten, cartilage, but even bones, and the hardest ivory. It is said, also sometimes to erode the stomach itself in a very short time after death.

641. From these at length the reason may be given, why digestion is so often disordered, why a corruption of the aliments in the stomach at first acid, afterwards putrid, is common to those digesting badly; why the concoction of the foods suddenly may be disturbed and corrupted, not only by various diseases of the body, but often even by a severe affection of the mind; why exercise of the body often may promote, but sometimes may impede the action of the stomach upon the food; why a glass of wine may benefit many persons and assist digestion, but may injure many, and may corrupt the same.

Cap. XIX.—*De vitiis concoctionis, variisque organorum quæ concoctioni inserviunt affectionibus morbosis.*

Cap. XIX.—*De vitiis concoctionis que variis morbosis affectionibus organorum quæ inserviunt concoctioni.*

642. Appetitus cibi sæpe deficit, cum a ventriculi, tum quoque a reliqui corporis, statu. Multorum itaque morborum Anorexia comes est et effectus; neque tamen semper morbosa habenda. Male enim de appetitus defectu conqueruntur helluones, quum corpus, mente sanius, cibum quo non eget fastidit et respuit.

642. Appetitus cibi sæpe deficit, cum a statu ventriculi, tum quoque a statu reliqui corporis. Anorexia, itaque, est comes et effectus multorum morborum; neque tamen semper habenda morbosa. Enim helluones male conqueruntur de defectu appetitûs, quum corpus, sanius mente, fastidit et respuit cibum quo non eget.

643. Nullus vel debilis est appetitus, sicubi ventriculus quem proxime sumpserat cibo se nondum liberaverit: hinc post crapulam, sæpe nullus, donec hæc bene exhalata fuerit. Deficit quoque, si quando concoctio alimentorum

643. Appetitus est nullus vel debilis sicubi ventriculus nondum liberaverit se a cibo quem sumpserat proxime: hinc sæpe nullus, post crapulam, donec hæc fuerit bene exhalata. Deficit quoque si quando concoctio ali-

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Chap. XIX.—*Of the disorders of digestion and the various morbid affections of the organs which are subservient to digestion.*

642. The appetite for food often fails, as well from the state of the stomach, as also from that of the rest of the body. Anorexia, therefore, is an attendant and effect of many diseases; nor notwithstanding always to be considered diseased. For gluttons wrongly complain of loss of appetite, when the body, sounder than the mind, loathes and rejects the food which it does not want.

643. The appetite is none or weak whenever the stomach has not yet freed itself from the food which it had taken last: hence often there is none, after a surfeit, until this has been thoroughly exhaled. It fails also when-

mentorum est prava; nam ventriculus tradiderit ægre crudum cibum intestinis. Sæpe deficit propter exercitationem neglectam, quâ totum corpus debuisset depleri, quamvis ventriculus ipse habeat se satis bene et concoctio fuerit bona. Fere deficit a exhalatione per cutem suppressâ; ab omni debilitate ventriculi, qualis sæpe inducitur subito; et demum, appetitus cibi est pravus in omni febre: neque, profecto, certius signum datur febris decedentis quam appetentia cibi redux. Quin et, multum abest ut defectus appetitûs, et inedia quæ sequitur inde, noceat ægris, præsertim decumbentibus acutis morbis, tantum quantum similis inedia noceret sano homini. Neque profecto prætereundum est silentio, fastidium cibi, quod æger habet primis diebus febris, sæpe cedere potius in salutem. Nimirum sapiens

prava est; nam ventriculus crudum cibum ægre intestinis tradiderit. Deficit sæpe propter exercitationem neglectam, qua totum corpus debuisset depleri (619) quamvis ventriculus ipse satis bene se habeat, et concoctio bona fuerit. Deficit fere a suppressa per cutem exhalatione; ab omni etiam ventriculi debilitate, qualis sæpe subito inducitur; et in omni demum febre appetitus cibi pravus est: neque profecto certius datur signum febris decedentis, quam cibi appetentia redux. Quin et multum abest, ut defectus appetitus, et quæ inde sequitur inedia, ægris, præsertim acutis morbis decumbentibus, tantum noceat, quantum similis inedia sano homini noceret. Neque profecto silentio prætereundum est, fastidium cibi, quod primis diebus febris æger habet, sæpe potius in salutem cedere. Sapiens nimirum Natura onus recusat,

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ever the concoction of the aliments is bad; for the stomach will deliver with difficulty crude food to the intestines. Often it fails on account of exercise being neglected, by which the whole body ought to have been depleted, although the stomach itself may have itself very well and digestion should be good. Generally it fails from the exhalation by the skin being suppressed; from every weakness of the stomach, such as often is induced suddenly; and lastly, the appetite for food is bad in every fever: nor, truly, is a more certain sign given of fever going off than the desire for food returning. Moreover, much is wanting that the loss of appetite, and the fasting which follows from thence, can hurt the sick, especially those lying down with acute diseases, so much as similar fasting would hurt a healthy person. Nor indeed must we pass over in silence, that the loathing of food, which the sick has in the first days of fever, often tends rather towards health.

quale neque concoquere potuisset, neque impune ferre.

644. Cibi appetitus etiam sanis admodum varius, nonnunquam mirum in modum intenditur, ita ut non immerito morbosus habeatur. Rarum mali genus, nonnunquam tamen observatum, et creditum oriri, vel a longa inedia, vel ab ingentibus exinanitionibus (ubi subsidio solito majore revera opus esset) vel ab acri quodam in ventriculo genito, aut in eum recepto, eundemque nimis stimulante, vel a læsa imaginatione, vel denique a prava consuetudine. Non dubium enim est, homines solo usu avidiores cibi et capaciores evadere.

645. Depravatio ejusdem appetitus, et rei insolitæ, parum idoneæ aut non esculentæ, desiderium, plerumque a læsa imaginatione oritur, sæpe a nimia indulgentia, præsertim ubi ad ventriculum diu

Natura recusat onus quale neque potuisset concoquere neque ferre impune.

644. Appetitus cibi varius etiam admodum sanis, nonnunquam intenditur in mirum modum, ita ut habeatur non immerito morbosus. Rarum genus mali, tamen nonnunquam observatum, et creditum oriri vel a longâ inediâ, vel ab ingentibus exinanitionibus, (ubi revera esset opus subsidio majore solito) vel ab quodam acri genito in ventriculo, aut recepto in eum, quc stimulante eundem nimis, vel a læsâ imaginatione, vel denique a pravâ consuetudine. Enim est non dubium homines evadere avidiores et capaciores cibi usu solo.

645. Depravatio ejusdem appetitûs et desiderium insolitæ parum idoneæ aut non esculentæ rei, plerumque oritur a læsâ imaginatione, sæpe a nimiâ indulgentiâ, præsertim ubi attenditur plus justo

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Doubtless wise Nature refuses a burthen such as she neither could have been able to digest nor bear with impunity.

644. The appetite for food is various even in the very healthy, sometimes it is increased to a wonderful degree, so that it may be considered not undeservedly morbid. A rare kind of disorder, nevertheless sometimes observed, and believed to arise either from long fasting, or from large evacuations, (when truly there was need of a supply greater than usual,) or from some acrid thing, generated in the stomach, or admitted into it, and stimulating the same too much, or from diseased imagination, or finally from a bad habit. For it is not doubtful that men become more greedy and more capable of food by use alone.

645. A depravation of the same appetite and a desire of an unusual, little suitable or not esculent thing, generally arises from diseased imagination, often from too much indulgence, especially when we attend more than proper

ad ventriculum habentem se male. Hæc videtur esse ratio quod malum aliquando accidens naturâ mulieribus dum gerunt uterum scilicet quæ fere soleant laborare a ventriculo, ingravescat eo magis, et facessat plus molestiæ ipsis et aliis, quo indulgeant sibi plus: rarissimum ubi mos vetat indulgere ei, jubet celare talem abnormem appetitum; frequens et vehemens, neque semper directum ad res ullo modo esculentas, ubi fœminæ potius ducunt decorum sibi, et mos jubet omnem maritum indulgere gravidæ uxori, et sane metus cogat, ne uxor pariat monstrum pro filio; vel denique, si quid mali forte acciderit mulieri, aut abortu aut puerperio, ipse habeatur parricida suæ uxoris.

male se habentem plus justo attenditur. Hæc videtur esse ratio quod malum, mulieribus dum uterum gerunt natura aliquando accidens, scilicet quæ a ventriculo fere soleant laborare, eo magis ingravescat, et ipsis et aliis plus molestiæ facessat, quo sibi plus indulgeant: rarissimum ubi mos vetat ei indulgere, jubet celare talem appetitum abnormem; frequens et vehemens, neque semper ad res ullo modo esculentas directum, ubi fœminæ potius decorum sibi ducunt, et mos jubet omnem maritum gravidæ uxori indulgere, et sane metus cogat, ne pro filio monstrum pariat uxor; vel denique, si forte quid mali, aut abortu aut puerperio, mulieri acciderit, ipse suæ uxoris parricida habeatur.

646. Vehemens appetentia insolitæ quæ vix esculentæ rei nonnunquam observatur a certo statu ventriculi, quæ, tamen,

646. Nonnunquam appetentia vehemens rei insolitæ vixque esculentæ observatur, a certo statu ventriculi, quæ tamen, salubris esse

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to the stomach having itself badly. This seems to be the reason that the disorder sometimes happening by nature to women whilst they are pregnant as being those who generally are accustomed to suffer from the stomach, increases the more, and causes more trouble to themselves and others, as they indulge themselves more: it is very rare where the custom forbids to indulge it, orders to conceal such an irregular appetite; frequent and vehement, nor always directed to things in any way esculent, where women rather consider it becoming to them, and the custom orders every husband to indulge his pregnant wife, and indeed fear compels him, lest his wife should bring forth a monster instead of a son; or lastly, if any evil by chance should happen to the woman, either by abortion or in parturition, he himself should be considered the murderer of his wife.

646. A vehement longing for an unusual and scarcely esculent thing is sometimes observed from a certain state of the stomach, which, notwith-

potest : veluti cupiditas absorbentium, ut vocantur, a multo acore in ventriculo, vel acidorum et omnis herbæ in scorbuto, vel vini et similium in febre. Hujusmodi desideria, si iis modice indulgetur, sæpe prosunt, raro nocent.

647. Sitis, non secus ac fames, aliquando deficit, aliquando nimia observatur. Defectus ejus vix morbosus habendus est, dummodo valetudo cætera secunda fuerit, et concoctio cibi bona; nimirum, quia tunc verisimile est, corpus potu non egere. Sunt qui nunquam sitiunt; homines scilicet, constitutionis corporis humidæ, fluidoque cibo utentes, quibus copiosior oris humorum secretio nunquam sinit fauces arescere.

648. Sitis vero nulla, cum fauces aridæ, lingua scabra, aliaque signa testantur multo potu opus esse; ea demum vere morbosa est, et

potest esse salubris: veluti cupiditas absorbentium, ut vocantur, a multo acore in ventriculo, vel acidorum et omnis herbæ in scorbuto, vel vini et similium in febre. Desideria hujusmodi, si indulgetur modice iis sæpe prosunt, raro nocent.

647. Sitis, non secus ac fames, aliquando deficit, aliquando observatur nimia. Defectus ejus vix est habendus morbosus, dummodo cætera valetudo fuerit secunda, et concoctio cibi bona; nimirum quia tunc est verisimile corpus non egere potu. Sunt qui nunquam sitiunt; scilicet, homines humidæ constitutionis corporis, que utentes fluido cibo, quibus copiosior secretio humorum oris nunquam sinit fauces arescere.

648. Vero nulla sitis, cum aridæ fauces, scabra lingua, que alia signa testantur esse opus multo potu, ea demum est vere morbosa, et haud secundi

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standing may be healthy : as a desire of absorbents, as they are called, from much acid in the stomach, or of acids and every kind of vegetable in scurvy, or of wine and like things in fever. Desires of this sort, if they be moderately indulged, often benefit, seldom injure.

647. Thirst, in like manner as hunger, sometimes fails, sometimes is observed excessive. Defect of it scarcely is to be considered morbid provided the rest of the health should be good, and the digestion of the food healthy; truly because then it is probable that the body does not want drink. There are they who never thirst; namely, persons of a moist constitution of body, and using fluid food, in whom a more copious secretion of the fluids of the mouth never permits the fauces to grow dry.

648. But no thirst, when the dry fauces, the furred tongue, and other symptoms testify that there is need of much drink, that indeed is truly morbid, and of no favourable omen : for the most part to be referred to

ominis: fere referenda ad stuporem, delirium, cerebrum læsum aliquo modo; quo fit ut æger nequeat percipere stimulum quamvis validum.

haud secundi ominis; ad stuporem, delirium, læsum aliquo modo cerebrum, fere referenda; quo fit, ut æger stimulum, quamvis validum, nequeat percipere.

649. Nimia sitis, multo frequentius genus vitii, oritur vel ab inopiâ fluidarum partium in corpore, veluti si potus fuerit negatus diu; vel si corpus fuerit exhaustum suo humore validâ exercitatione, aut sudore, aut ingente profluvio alvi aut urinæ: vel ab aliquo acri admisso in corpus, quale provida Natura docet diluendum multo potu, ut fiat innocuum, veluti si sal, piper, saccharum, que alia condimenta, aut demum duriores et acriores cibi fuerint sumpta: vel a ventriculo habente se male, et gravato onere corrupti cibi que potûs, quod helluones et ebriosi solent satis experiri; vel a suppressâ aut minutâ secretione humorum oris, qualis sæpe observatur a ve-

649. Nimia sitis, frequentius multo vitii genus, oritur, vel ab inopia partium fluidarum in corpore veluti si potus diu negatus fuerit; vel si corpus valida exercitatione, aut sudore, aut alvi aut urinæ ingente profluvio, suo exhaustum fuerit humore; vel ab acri aliquo in corpus admisso, quale Natura provida docet multo potu diluendum esse, ut innocuum fiat, veluti si sal, piper, saccharum, aliaque condimenta, aut cibi demum duriores, et acriores, sumpta fuerint; vel a ventriculo ipso male se habente, et onere cibi potusque corrupti gravato, quod helluones et ebriosi satis solent experiri; vel a suppressa aut minuta oris humorum secretione, qualis a vehemente

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stupor, delirium, the brain injured in some way; by which it happens that the patient cannot perceive a stimulus, however strong.

649. Excessive thirst, a much more frequent kind of disease, arises either from dearth of the fluid parts in the body, as when drink has been denied for a long time; or when the body has been exhausted of its fluid by violent exercise, or sweating, or a severe discharge of the belly or of the urine: or from some acrid admitted into the body, such as provident Nature teaches us is to be diluted with much drink, that it may become harmless, as whenever salt, pepper, sugar, and other condiments, or even the harder and sharper foods have been taken: or from the stomach having itself badly, and oppressed with a load of corrupted food and drink, which gluttons and drunken persons are accustomed sufficiently to experience: or from suppressed or diminished secretion of the fluids of the mouth, such as often is observed

animi affectu, aut febre, aut spasmo, sæpe observatur; vel denique ab humoribus tenuibus alio versis, quamvis sat superque eorum in corpore fuerit; cujus hydrops omnigenus exemplum esse potest. Quin et variæ causæ quæ sitim intendunt in eodem ægro conjungi possunt, graviusque ideo malum inducere: veluti in febribus plerisque, quibus fere ingens sitis accidit, cum ob dissipatos corporis humores, tum ob calorem, tum ob minutam secretionem humorum quibus os debet madere, tum demum ob ventriculum pessime affectum, neque concoquentem rite, neque onus suum intestinis tradentem.

650. Ratio itaque in promptu erit, cur nimia sitis adeo frequens; interdum salutaris naturæ instinctus, interdum affectio prorsus inutilis; cur nunc plurimo potu sitiens egeat, eundemque ventriculus, statim fere ut haustus fuerit, sorbeat,

hemente affectu animi, aut febre, aut spasmo; vel denique ab tenuibus humoribus versis aliò, quamvis fuerit sat que super eorum in corpore; cujus omnigenus hydrops potest esse exemplum. Quin et variæ causæ quæ intendunt sitim, possunt conjungi in eodem ægro, que ideo inducere gravius malum: veluti in plerisque febribus quibus ingens sitis fere accidit tum ob humores corporis dissipatos, tum ob calorem, tum ob minutam secretionem humorum quibus os debet madere tum demum ob ventriculum pessime affectum neque concoquentem rite, neque tradentem suum onus intestinis.

650. Ratio, itaque, erit in promptu, cur nimia sitis adeo frequens; interdum salutaris instinctus Naturæ, interdum affectio prorsus inutilis: cur nunc sitiens egeat plurimo potu, que ventriculus, fere statim ut fuerit haustus, sorbeat

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from a violent affection of the mind, or from fever, or spasm; or lastly from the thin fluids turned elsewhere, although there should be sufficient and more than enough of them in the body; of which every kind of dropsy may be an example. Moreover the various causes which increase thirst, may be united in the same patient, and thus bring on a more severe disorder: as in most fevers in which great thirst mostly happens, as well on account of the fluids of the body being dissipated, as on account of heat, as also on account of the diminished secretion of the fluids with which the mouth ought to be moistened, as lastly on account of the stomach very badly affected, nor digesting properly, nor delivering its load to the intestines.

650. The explanation, therefore, will be in readiness, why excessive thirst is so frequent; why sometimes a salutary instinct of Nature, sometimes an affection wholly useless: why at one time the thirsting person may require a

eundem, deferendum quâ est opus; cur exigui haustus sæpe sufficiant et prosint magis, que ventriculus ne possit aut sorbere, aut tolerare, largiores sine incommodo; cur acida, acescentia, maturi fructus, demum pauxillum vini mixtum cum potu pellant sitim meliùs et certiùs purâ aquâ: et denique, cur sitis ne sedanda quidem nectare pellatur vomitorio medicamento.

651. Actio manducandi nonnunquam impeditur aut corrumpitur variis vitiis plurimorum organorum quæ inserviunt eidem dolore, tumore, inflammatione, ulcere, debilitate, rigiditate, spasmo, defectu dentium, maxillarum, buccarum, labiorum, linguæ.

652. Actio devorandi quæ debet succedere huic impeditur quoque similibus causis afficientibus vel os, vel guttur, vel gulam, veluti in anginâ, hydrophobiâ, paralysi; denique, summa debili-

qua opus est deferendum; cur sæpe exigui haustus sufficiant, et prosint magis, neque ventriculus largiores aut sorbere, aut sine incommodo tolerare possit; cur acida, acescentia, fructus maturi, pauxillum demum vini cum potu mixtum, sitim pura aqua melius et certius pellant; et denique cur sitis, ne nectare quidem sedanda, vomitorio medicamento aliquando pellatur.

651. Impeditur nonnunquam aut corrumpitur actio manducandi, variis vitiis plurimorum quæ eidem inserviunt organorum; dolore, tumore, inflammatione, ulcere, debilitate, rigiditate, spasmo, defectu dentium, maxillarum, buccarum, labiorum, linguæ.

652. Impeditur quoque similibus causis, vel os, vel guttur, vel gulam afficientibus, quæ huic succedere debet, actio devorandi, veluti in angina, hydrophobia, paralysi, summa denique debilitate, qualis

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great deal of drink, and the stomach, almost immediately that it has been swallowed, absorbs it, to be conveyed where there is need of it; why small draughts often suffice and avail more, and the stomach cannot either absorb, or bear larger ones without inconvenience; why acid, sour things, ripe fruits, in fine, a little wine mixed with the drink, drive off thirst better and more certainly than pure water, and lastly, why thirst, not to be assuaged even by nectar, may be driven off by an emetic medicine.

651. The action of chewing sometimes is impeded or is destroyed by the various disorders of the several organs which are subservient to the same pain, swelling, inflammation, ulcer, debility, rigidity, spasm, defect of the teeth, of the jaws, of the cheeks, of the lips, of the tongue.

652. The action of swallowing, which ought to succeed to the latter, is impeded also by similar causes affecting either the mouth, or throat, or

sub finem multorum morborum, præsertim febrium, accidit: signum tum pessimum, vix non lethale.

653. Ciborum vero jam in ventriculum receptorum concoctio sæpissime vitiatur, cum majore plerumque ægrotantis incommodo quam periculo.

654. Concoquitur male, imprimis, propter ipsos cibos, quantitate, qualitate, mixtura minus idoneis sumptos, neque ut decet in ore confectos; unde ventriculus, vel nimio onere distentus et gravatus, neque solvere neque propellere potest cibos quos continet; vel massa alimentaria, aut indissolubilis aut in corruptionem nimis prona, brevi fermentescit atque corrumpitur, viribus ventriculi, quæ istam alimentorum ad fermentandum proclivitatem temperare debent (630), parum valentibus.

655. Cibi vero optimi et con-

tate, qualis accidit sub finem multorum morborum, præsertim febrium: tum pessimum vix non lethale.

653. Vero jam concoctio ciborum receptorum in ventriculum sæpissime vitiatur, plerumque cum majore incommodo quam periculo ægrotantis.

654. Concoquitur male imprimis propter cibos ipsos sumptos quantitate, qualitate, mixturâ, minus idoneis, neque confectos, ut decet, in ore; unde ventriculus vel distentus et gravatus nimio onere, potest neque solvere neque propellere cibos quos continet: vel alimentaria massa aut indissolubilis aut nimis prona in corruptionem brevi fermentescit atque corrumpitur, viribus ventriculi, quæ debent temperare istam proclivitatem alimentorum ad fermentandum, parum valentibus.

655. Vero optimi cibi et

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gullet, as in angina, hydrophobia, paralysis; lastly, in extreme debility, such as occurs towards the termination of many diseases, especially fevers: then the worst sign scarcely not deadly.

653. But even the digestion of the aliments received into the stomach very often is vitiated, for the most part with greater annoyance than danger of the person sick.

654. Digestion goes on badly first of all on account of the foods themselves taken in quantity, quality, mixture, less suitable, nor chewed, as they ought, in the mouth; whence the stomach either distended and oppressed by too great a load, can neither dissolve nor propel the foods which it contains; or the alimentary mass either insoluble or too prone to corruption quickly begins to ferment and is corrupted, the powers of the stomach, which ought to moderate that tendency of the aliments, to ferment, not at all availing.

facillimi concoctu, sæpe concoquuntur ægrè, propter bene multa vitia ventriculi ipsius, et partium quæ præcipue consentiunt cum eo, vel denique universi corporis.

656. Defectus humorum ventriculi, varia vitia eorundem, debilitas fibrarum quibus ventriculus instruitur, quævis obstructio circa pylorum, qualis non sinit ventriculum tradere massam quam continet intestinis : tardior motus intestinorum, varii morbi ipsorum, generalis infirmitas corporis, sive a morbis, sive a gravibus affectibus animi, sive a neglectâ exercitatione ; demum, exhalatio per cutem suppressa vel minuta ab ignaviâ, vel a frigore, præsertim admoto pedibus, vel a frigidâ et humidâ constitutione aëris, sæpe corrumpunt concoctionem ciborum.

657. Innumera mala oriuntur a pravâ concoctione ciborum, neque le-

coctu facillimi, propter vitia bene multa ipsius ventriculi, et partium quæ præcipue cum eo consentiunt, vel denique universi corporis, ægre sæpe concoquuntur.

656. Defectus humorum ventriculi, varia eorundem vitia, debilitas fibrarum quibus ventriculus instruitur, obstructio quævis circa pylorum, qualis non sinit ventriculum massam quam continet intestinis tradere ; tardior intestinorum motus, varii ipsorum morbi, infirmitas corporis generalis, sive a morbis, sive a gravibus animi affectibus, sive a neglecta exercitatione ; suppressa demum, vel minuta per cutem exhalatio, ab ignavia, vel a frigore, pedibus præsertim admoto, vel a constitutione aëris frigida et humida, concoctionem ciborum sæpe corrumpunt.

657. A prava concoctione ciborum innumera oriuntur mala, neque

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655. But the best aliments and the most easy to be digested, often are digested with difficulty, on account of the very many disorders of the stomach itself, and of the parts which especially consent with it, or lastly of the whole body.

656. Deficiency of the juices of the stomach, various disorders of the same, debility of the fibres with which the stomach is furnished, any obstruction about the pylorus, such as does not permit the stomach to transmit the mass which it contains to the intestines : a slower motion of the intestines, various diseases of them, general infirmity of the body, whether from diseases, or from severe affections of the mind, or from neglected exercise ; in fine, the exhalation by the skin being suppressed or diminished by idleness, or by cold, especially applied to the feet, or from a cold and humid constitution of the air, often corrupt the digestion of the aliments.

levia, neque sanatu facilia, quamvis raro periculosa observentur; oppressio, anxietas, dolor ventriculi, ructus ab aëre inter fermentandum extricato, et ventriculum irritante, et per gulam erumpente: nausea et vomitus a ventriculo irritato et distento; alvus aliquando tarda, aliquando nimis liquida; defectus nutrimenti, generalis infirmitas, partes solidæ laxæ, fluidæ nimis tenues, omnes functiones impeditæ, dolor capitis, vertigo, syncope, asthma, palpitatio, spiritus valde demissi, præsertim si æger peculiaris constitutionis fuerit, interdum podagra, nonnunquam demum hydrops, vel febris lenta, qualis tandem lethalis esse potest.

via, neque facilia sanatu, quamvis raro observentur periculosa; oppressio, anxietas, dolor ventriculi, ructus ab aëre extricato inter fermentandum et irritante ventriculum, et erumpente per gulam; nausea et vomitus a ventriculo irritato et distento; alvus aliquando tarda aliquando nimis liquida; defectus nutrimenti, generalis infirmitas, solidæ partes laxæ, fluidæ nimis tenues, omnes functiones impeditæ, dolor capitis, vertigo, syncope, asthma, palpitatio, spiritus valde demissi, præsertim si æger fuerit peculiaris constitutionis, nonnunquam demum hydrops, vel lenta febris, qualis potest esse tandem lethalis.

658. Motus intestinorum aliquando deficit, aliquando nimius est. Hinc alvus astricta, vel nimis soluta.

658. Motus intestinorum aliquando deficit, aliquando est nimius. Hinc astricta, vel nimis soluta alvus.

659. Durities alvi, robustis et

659. Durities alvi sæpe

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657. Innumerable diseases arise from a bad digestion of the aliments, nor slight, nor easy to be cured, although they are seldom observed dangerous; oppression, anxiety, pain of the stomach, belching from air disengaged while fermenting and irritating the stomach, and breaking forth through the gullet; nausea and vomiting from the stomach being irritated and distended; the belly sometimes slow, sometimes too relaxed; want of nourishment, general infirmity, the solid parts relaxed, the fluid ones too thin, all the functions impeded, pain of the head, vertigo, syncope, asthma, palpitation, the spirits very depressed, especially if the patient should be of a peculiar constitution, sometimes even dropsy, or slow fever, such as may be at length fatal.

658. The motion of the intestines sometimes fails, sometimes is excessive. Hence a bound or too relaxed body.

familiaris robustis, et quidem sanis, gravior et diuturna demum est habenda morbus, ipse haud vacuus periculo, quoque comes et effectus et causa multorum morborum. Oritur a læsa fabrica intestinorum, veluti si fuerint constricta, aut conclusa, aut obstructa, spasmo, schirro, quâvis parte delapsâ in aliam, calculis, concretionibus formatis in iis, aut demum inflammatione; vel a stercore ipso, duro, sicco, ægre propellendo, a nimis solido genere cibi, et parco potu; vel a defectu humorum qui debent diluere alimentariam massam, que humectare et reddere intestina lubrica: vero hi secernuntur parcius justo vel ob vitia secernentium organorum sæpe parum intellecta veluti in fere omnibus febribus, saltem primis temporibus, vel propter sanguinem versum alio, veluti ad cutem; quod revera accidit a crebra et valida exercitati-

quidem sanis sæpe familiaris, gravior et diuturna morbus demum habenda est, ipse haud vacuus periculo, multorum quoque morborum comes, et effectus, et causa. Oritur vel a læsa fabrica intestinorum, veluti, si constricta, aut conclusa, aut obstructa fuerint, spasmo, schirro, parte quavis in aliam delapsa, calculis vel concretionibus in iis formatis, aut demum, inflammatione; vel a stercore ipso, duro, sicco, ægre propellendo, a cibi genere nimis solido et potu parco; vel a defectu humorum qui massam alimentariam diluere (634) intestinaque humectare et lubrica reddere debent; hi vero parcius justo secernuntur, vel ob vitia organorum secernentium sæpe parum intellecta, veluti in febribus fere omnibus, primis saltem temporibus, vel propter sanguinem alio versum, veluti ad cutem; quod revera accidit a crebra et valida exercitatione,

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659. Hardness of the belly often common to the robust, and indeed to the healthy, more severe and continued then at length is to be considered a disease, itself not free from danger, also the companion and effect and cause of many diseases. It arises from the injured structure of the intestines, as when they have been constricted, or shut up, or obstructed, by spasm, schirrus, by some part having slipped into another, calculi, concretions formed in them, or even inflammation; or from the fæces itself hard, dry, with difficulty to be propelled, from a too solid kind of food, and scanty drink; or from deficiency of the fluids which ought to dilute the alimentary mass, and to moisten and to render the intestines slippery: but these are secreted more sparingly than proper either on account of disorders of the secreting organs, often little understood as in almost all fevers, at least in the first stages, or on account of the blood directed elsewhere, as to the skin;

calore, sudore multo. Alvus quoque dura interdum observatur a debilitate, nonnunquam forsitan a paralysi fibrarum moventium intestinorum, vel denique, a defectu soliti stimuli, veluti fellis, quod in morbo regio supprimitur; vel a cibo nimis parco, neque adeo acri ut intestina more solito stimulet, et ad justam actionem excitet.

660. Excretio vero per alvum, utcunque putrida et acris videatur, præ omnibus aliis regitur consuetudine, et minore periculo pro tempore supprimi potest. Cibi plerumque spatio circiter unius diei per corpus transeunt: sæpe vero multo velocius aut tardius; sunt enim qui alvum vix ter in mense evacuarint, alioquin sani. Multum hic pendet ab ætate et constitutione singulorum hominum, et a genere cibi quo utuntur.

661. Ab alvo diu astricta tubus intestinorum primo afficitur, deinde

one, calore, multe sudore. Dura alvus interdum quoque observatur a debilitate, nonnunquam forsitan a paralysi moventium fibrarum intestinorum, vel denique a defectu soliti stimuli, veluti fellis, quod supprimitur in regio morbo; vel a nimis parco cibo, neque adeo acri ut stimulet intestina solito more, et excitet ad justam actionem.

660. Vero excretio per alvum, utcunque putrida et acris videatur, præ omnibus aliis regitur consuetudine, et potest supprimi pro tempore minore periculo. Cibi plerumque transeunt per corpus spatio circiter unius diei: vero sæpe multo velociùs aut tardiùs; enim sunt alioquin sani qui vix evacuarint alvum ter in mense: multum hic pendet ab ætate et constitutione singulorum hominum, et a genere cibi quo utuntur.

661. Tubus intestinorum primo, deinde totum cor-

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which truly occurs from frequent and violent exercise, heat, much sweating. A costive belly sometimes also is observed from debility, occasionally perhaps from paralysis of the moving fibres of the intestines, or finally from deficiency of the usual stimulus, as of the bile, which is suppressed in the royal disease (jaundice:) or from too spare diet, nor so sharp that it can stimulate the intestines in the usual manner, and excite them to a proper action.

660. But the excretion by the belly, however putrid and acrid it may seem, above all others is governed by habit, and may be suppressed for a time with less danger. The foods generally pass through the body in the space of about one day: but often much more quickly or more slowly; moreover there are some otherwise healthy who scarcely will evacuate the belly three times in a month; much here depends upon the age and constitution of the individual persons, and upon the kind of food which they use.

661. The tube of the intestines first, afterwards the whole body, is affected

pus afficitur ab alvo astrictâ diu. Ventriculus habet se male, concoquitur male, totum corpus præter solitum excitatur, et calet, quod est imprimis notabile in febribus; fortasse sanguis ipse etiam corrumpitur, putridâ materiâ delatâ ab intestinis. Sanguis fluit minus libere per viscera abdominis, unde sæpe abnormes congestiones, varices venarum effusiones sanguinis in intestina, que profluvium ejus ex ano: quod malum vocatur hæmorrhois. Quin et intestina ipsa, distenta et irritata plurimâ acri et acidâ materiâ, incitantur ad novos et validiores motus; qui si nequeunt superare obstructionem, sæpe inducunt insignem dolorem, et tormina, et colicam, et ileum, et inflammationem, et gangrænam brevi lethalem.

662. Vocatur fluxus alvi, seu diarrhœa, siquando alvus, liquidior justo, evacuatur nimis sæpe: profecto multiplex et fre-

totum corpus. Ventriculus male se habet, male concoquitur, totum corpus præter solitum excitatur, et calet, quod in febribus imprimis notabile est; fortasse etiam, putrida materia ab intestinis delata, sanguis ipse corrumpitur. Sanguis minus libere per viscera abdominis fluit; unde sæpe congestiones abnormes, varices venarum, sanguinis effusiones in intestina, ejusque profluvium ex ano: quod malum hæmorrhois vocatur. Quin et intestina ipsa, plurima materia acri et putrida distenta et irritata, ad novos et validiores motus incitantur; qui, si obstructionem superare nequeunt, insignem dolorem sæpe inducunt, et tormina, et colicam, et ileum, et inflammationem, et gangrænam brevi lethalem.

662. Alvi fluxus seu diarrhœa vocatur, siquando alvus liquidior justo nimis sæpe evacuatur: multiplex profecto, et frequentissimum

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from the belly being bound a long time. The stomach has itself badly, digestion goes badly, the whole body is unusually excited, and grows hot, which is especially remarkable in fevers; perhaps itself also is corrupted, by a putrid matter conveyed from the intestines. The blood flows less freely through the viscera of the abdomen, whence often irregular congestions, varices of the veins, effusions of blood into the intestines, and a discharge of it from the anus: which disorder is called hæmorrhoids. Moreover the intestines themselves, distended and irritated with a great deal of acrid and putrid matter, are excited to new and stronger motions; which, if they cannot overcome the obstruction, often bring on very great pain, and gripes, and colic, and iliac passion, and inflammation, and gangrene quickly fatal.

662. It is called a flux of the belly, or diarrhœa, whenever the belly, more liquid than proper is evacuated too often: truly a complicated and very

malum; aliquando primarius morbus, sæpius aliorum effectus; interdum salutaris naturæ conatus, qualem medicum sæpe decet imitari, et arte inducere. Quibusdam hominibus, præsertim infantibus, alvi fluxus familiaris est; et hi sane ab astricta alvo multum pati solent.

663. Oritur a variis causis: acri imprimis quovis in corpus recepto, aut in intestinis genito, massæ alimentariæ corruptione, cum acida tum putrida, aut felle præter solitum abundante aut acri, aut sanguine vel pure in intestinis effusis, ipsisque intestinis erosis, vel proprio muco orbatis, vel ab humoribus a superficie corporis pulsis partesque internas versus directis, veluti a frigore, præsertim pedibus admoto; vel a generali corporis corruptione, ut in phthisi, febre hectica, vel febre putrida, vel scorbuto, imprimis sub finem

quentissimum malum; aliquando primarius morbus, sæpius effectus aliorum; interdum salutaris conatus naturæ, qualem sæpe decet medicum imitari, et inducere arte. Fluxus alvi est familiaris quibusdam hominibus, præsertim infantibus; et hi sane solent pati multum ab astrictâ alvo.

663. Oritur a variis causis: imprimis, quovis acri recepto in corpus, aut genito in intestinis, corruptione, cum acidâ tum putridâ, alimentariæ massæ, aut felle abundante præter solitum aut acri, aut sanguine vel pure effusis in intestinis, que intestinis ipsis erosis, vel orbatis proprio muco, vel ab humoribus pulsis a superficie corporis que directis versus internas partes, veluti a frigore, præsertim admoto pedibus; vel a generali corruptione corporis, ut in phthisi, hecticâ febre, vel putridâ febre, vel scorbuto, imprimis sub finem

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frequent disorder: sometimes a primary disease, more often an effect of others; sometimes a salutary effort of nature, such as it often becomes the physician to imitate, and to induce by art. A flux of the belly is common to some persons, especially to infants; and the latter indeed are accustomed to suffer much from a bound belly.

663. It arises from various causes: first of all, any acrid thing received into the body, or generated in the intestines, corruption, as well acid as putrid, of the alimentary mass, or the bile abounding unusually or acrid, or from blood or pus effused in the intestines, and the intestines themselves corroded, or deprived of their proper mucus, or from the fluids being driven from the surface of the body and directed towards the internal parts, as by cold, especially applied to the feet; or from a general destruction of the frame, as in phthisis, hectic fever, or putrid fever; or in scurvy, especially

istorum morborum. Fluxus alvi, aliquando salutaris in febribus, vel penitus solvit morbum, vel reddit eum mitiorem, vero sæpius juvat nihil, que potius exhaurit vires ægri, ducens originem a putredine, si neque remedia idonea ad corrigendam hanc fuerint tempestive data, neque evacuantia remedia adhibita, qualia convenirent ad liberanda ventriculum et intestina plurimâ corruptâ materiâ quâ solent gravari in morbis istiusmodi. Denique, sunt qui habent intestina adeo debilia et mobilia, ut plectantur vehemente fluxu alvi, a levissimâ causâ, veluti frigore suscepto, aut animo præter solitum commoto. Postremo, qualiscunque fuerit prima origo mali, si perstiterit diu reddit viscera adeo debilia et irritabilia, ut morbus, quamvis sæpe depulsus, non secus ac multi alii morbi solent, recurrat levissimis causis, neque semper detegendis.

istorum morborum. In febribus aliquando salutaris alvi fluxus vel penitus solvit morbum, vel eum mitiorem reddit; sæpius vero nihil juvat, viresque ægri potius exhaurit, a putredine originem ducens, si neque idonea ad hanc corrigendam tempestive data fuerint remedia neque evacuantia remedia adhibita, qualia convenirent ad ventriculum et intestina liberanda plurima materia corrupta, qua in istiusmodi morbis gravari solent. Denique, sunt qui habent intestina adeo debilia et mobilia (363), ut a levissima causa, veluti frigore suscepto, aut animo præter solitum commoto, vehemente alvi fluxu plectantur. Postremo, qualiscunque prima origo mali fuerit, si diu perstiterit, viscera adeo debilia et irritabilia reddit, ut morbus, quamvis sæpe depulsus, levissimis, neque semper detegendis causis recurrat, non secus ac multi alii morbi solent (386).

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towards the close of those diseases. A flux of the belly, sometimes salutary in fevers, either entirely removes the disease, or renders it milder; but more often it assists in no way, and rather exhausts the strength of the patient, drawing its origin from putridity, if neither remedies proper for correcting this have been seasonably given, nor evacuating remedies administered, such as would suit for freeing the stomach and intestines from the great deal of corrupted matter with which they are accustomed to be oppressed in diseases of that kind. In fine, there are they who have the intestines so weak and irritable, that they are seized with a severe flux of the belly, from the slightest cause, as from cold being caught, or the mind unusually disturbed. Lastly, whatever may have been the first origin of the disorder, if it should continue long it renders the bowels so weak and irritable, that the disease, although often driven off, in like manner as many other diseases are accustomed, returns from the slightest causes, nor always to be detected.

664. Hinc ratio patet morbi vel sistendi vel sublevandi, medicamentis evacuantibus, diluentibus, glutinosis, gummosis, interdum quæ acorem, interdum quæ putredinem corrigunt, opio, astringentibus, aut aëre aut vestitu calidiore, vel sudore demum arte excitato.

665. Nocet multum alvi fluxus, impedito imprimis nutrimento corporis ob pravam cibi concoctionem, (nam ventriculus fere laborat), massamque alimentorum tam subito per viscera transeuntem, ut neque concoqui possit, neque nutrimentum ex ea per vasa lactea rite sorberi, ut in sanguinem recipiatur.

666. Nocet præterea vehemens istiusmodi exinanitio, exhausto scilicet corpore profluvio, quod multum materiæ nutrientis e sanguine detrahat; neque profecto sola alimentorum massa citius justo excernitur, sed magna simul copia

664. Hinc ratio patet vel sistendi vel levandi morbi, evacuantibus, diluentibus, glutinosis, gummosis medicamentis, quæ corrigunt, interdum acorem, interdum putredinem, opio, astringentibus, aut calidiore aëre aut vestitu, vel demum sudore excitato arte.

665. Fluxus alvi nocet multum, imprimis nutrimento corporis impedito ob pravam concoctionem cibi (nam ventriculus fere laborat,) que massam alimentorum transeuntem tam subito per viscera, ut neque possit concoqui, neque nutrimentum ex eâ sorberi rite per lactea vasa, ut recipiatur in sanguinem.

666. Præterea, vehemens exinanitio istiusmodi nocet, scilicet corpore exhausto profluvio, quod detrahat multum nutrientis materiæ e sanguine; neque profecto massa sola alimentorum excernitur citiùs justo, sed simul magna copia

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664. Hence a reason is laid open either of stopping or of relieving the disease, by evacuating, by diluting, by glutinous, by gummy medicines, which correct, sometimes acidity, sometimes putrescency, by opium, by astringents, or warmer air or clothing, or finally by sweat excited by art.

665. The flux of the belly hurts much, first of all by the nutriment of the body being impeded because of the bad digestion of the food, (for the stomach generally suffers,) and the mass of the aliments passing so suddenly through the viscera, that neither can it be digested, nor can the nutriment from it be absorbed properly by the lacteal vessels, that it may be received into the blood.

666. Besides violent evacuation of that sort hurts, namely by the body being exhausted by the discharge, which takes away much of the nutrient matter from the blood; nor indeed is the mass alone of the aliments excreted

humorum qui secernuntur in intestinis. Quin et totum corpus brevi participat debilitatem intestinorum.

667. Aliquando vehemens et diuturnus fluxus alvi ingravescit eoùsque ut cibi transeant per corpus parum vel nihil mutati: quod genus mali vocatur Lienteria. Chylus ipse, instar lactis, nonnunquam, quamvis raro, a simili causa, excernitur cum stercore, vel ab mesentericis glandulis que aliis viis, quibus itur, in sanguinem obstructis. Hoc malum vocatur Cæliacus fluxus.

668. Est morbus cui nomen Dysenteria imponitur, ubi immania tormina ventris urgent, et frequens cupiditas desidendi adest, et inanes conatus fiunt, qui fere excernunt nihil præter mucum intestinorum vel pauxillum sanguinis; magnâ debilitate et putredine et febre sæpe comitantibus. Vi-

humorum qui in intestinis secernuntur. Quin et totum corpus intestinorum debilitatem brevi participat.

667. Aliquando alvi fluxus vehemens et diuturnus eo usque ingravescit, ut cibi parum vel nihil mutati per corpus transeant: quod mali genus Lienteria vocatur. Nonnunquam, quamvis raro, a simili causa, vel ab obstructis glandulis mesentericis aliisque viis quibus in sanguinem itur, chylus ipse, instar lactis, cum stercore excernitur. Malum hoc fluxus Cæliacus vocatur.

668. Morbus est cui nomen Dysenteria imponitur, ubi immania tormina ventris urgent, et frequens desidendi cupiditas adest, et conatus inanes fiunt, qui nihil fere præter intestinorum mucum, vel pauxillum sanguinis, excernunt; magna debilitate, et sæpe putredine, et febre comitantibus. Videtur oriri

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more quickly than proper, but at the same time a great abundance of the fluids which are secreted in the intestines. Moreover the whole body shortly participates the debility of the intestines.

667. Sometimes a violent and continued flux of the belly increases to that pitch that the aliments pass through the body little or not at all changed: which kind of disease is called Lientery. The chyle itself, like milk, sometimes, though rarely, from a similar cause, is excreted with the fæces, or from the mesenteric glands and other ways, by which there is a passage into the blood being obstructed. This disease is called the cæliac flux.

668. There is a disease to which the name Dysentery is given, where dreadful gripings of the belly urge, and a frequent desire of going to stool is present, and vain efforts are made, which mostly excrete nothing except the mucus of the intestines or a little blood; great debility and putridity and

a constricta parte intestinorum, et quodammodo inflammata, inferiore; quo fit ut hæc, quamvis multum irritata, nihil fere demittere possint. Neque facile prius solvitur morbus, quam idoneis medicamentis alvus probe purgata fuerit.

669. Tenesmus vocatur frequens, inexplebilis, inanis desidendi cupiditas, cum magno nixu, qui tamen parum omnino exprimat. Irritatio omnis, vel ipsius intestini recti, vel partium vicinarum, acria quædam in corpus recepta, medicamenta fortiora, alöe imprimis, quæ lente omnino solvi solet, et ad rectum intestinum usque parum mutata pervenire, alvi fluxus gravior et pertinacior, dysenteria, hæmorrhois, vermes, fistula ani, calculus, vel ulcus in vesica, vel in urethra, &c. tenesmum sæpe inducunt. Haud parum sæpe nocet, cum insigni quam ægro facessit molestia, tum viribus ejus exhaustis, fre-

detur oriri a inferiore parte intestinorum constrictâ, et quodammodo inflammatâ; quo fit ut hæc, quamvis multum irritata, possint demittere fere nihil. Neque morbus facilè solvitur priusquam alvus fuerit probe purgata idoneis medicamentis.

669. Frequens, inexplebilis, inanis cupiditas desidendi, cum magno nixu, qui, tamen, exprimat omnino parum vocatur tenesmus. Omnis irritatio, vel intestini recti ipsius, vel vicinarum partium, quædam acria recepta in corpus, fortiora medicamenta, imprimis aloë, quæ solet solvi omnino lentè, et pervenire usque ad intestinum rectum parum mutata, gravior et pertinacior fluxus alvi, dysenteria, hæmorrhois, vermes, fistula ani, calculus, vel ulcus in vesicâ, vel in urethrâ, &c. sæpe inducunt tenesmum. Sæpe nocet haud parum, cum insigni molestiâ quam facessit ægro, tum viribus

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fever often accompanying. It seems to arise from the lower part of the intestines being constricted, and in some degree inflamed; whence it happens that they, although greatly irritated, can void almost nothing. Nor is the disease easily resolved before that the belly has been well purged by suitable medicines.

669. A frequent, insatiable, fruitless desire of going to stool, with great straining, which, however, forces out very little, is called tenesmus. Every irritation, either of the intestinum rectum itself, or of the neighbouring parts, certain acrids received into the body, stronger medicines, especially aloes, which is accustomed to be dissolved very slowly, and to arrive even at the intestinum rectum ittle changed, more severe and more obstinate flux of the belly, dysentery, hæmorrhoids, worms, fistula of the anus, calculus, or ulcer in the bladder, or in the urethra, &c. often bring on tenesmus. It often hurts not a little, as well by the great trouble which it causes to the patient, as by the strength of him being exhausted, by the

ejus exhaustis, frequente et inani nixu, tum quoque prolapsu ani inducto ipso nixu, et gravi irritatione communicatâ cum vicinis partibus, vesicâ, &c.

670. Motus intestinorum sæpe observatur inversus, ita ut propellant res quas continent, ab inferioribus ad superiores partes. Inversio hujusmodi, quamvis levior, subest, siquando aër, extricatus per minus sanam concoctionem, volvitur in abdomine, surgit ad ventriculum, vel incipiens in ventriculo, aperit superius ostium ejus, et expellitur per gulam et os, inverso motu ventriculi, quod vocatur ructus.

671. Vero gravior affectio istiusmodi paulatim rejicit, non modo aëra, sed crudos et corruptos cibos, vel quicquid demum fuerit in stomacho. Sunt quibus talis affectio est familiaris. Sunt qui norunt imitari, et inducere eundem motum ad

quente et inani nixu, tum quoque isto nixu, prolapsu ani inducto, et gravi irritatione cum partibus vicinis, vesica, &c. communicata.

670. Inversus intestinorum motus sæpe observatur, ita ut res quas continent ab inferioribus ad superiores partes propellant. Hujusmodi inversio, quamvis levior, subest, siquando aër, per concoctionem minus sanam extricatus, in abdomine volvitur, ad ventriculum surgit, vel in ventriculo incipiens, ostium ejus superius aperit, et inverso ventriculi motu per gulam et os expellitur, quod ructus vocatur.

671. Gravior vero istiusmodi affectio, non aëra modo, sed cibos crudos et corruptos, vel quicquid demum in stomacho fuerit, paulatim rejicit. Sunt quibus talis affectio familiaris est. Sunt qui eundem motum, levi conatu, ad

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frequent and fruitless straining, as also by prolapsus ani being brought on by that straining, and by the severe irritation communicated to the neighbouring parts, the bladder, &c.

670. The motion of the intestines often is observed inverted, so that they propel the matters which they contain, from the inferior to the superior parts. An inversion of this sort, although slighter, exists, whenever air, disengaged during an unhealthy digestion, is rolled in the abdomen, rises to the stomach; or beginning in the stomach, opens the upper aperture of it, and is expelled by the œsophagus and mouth, by the inverted motion of the stomach, which is called belching.

671. But a more severe affection of the same sort by degrees rejects, not only air, but crude and corrupted food, or whatever indeed shall be in the stomach. There are some to whom such an affection is common. There

arbitrium imitari et inducere norunt, et sic instar bovis ruminari.

672. Simili, ut videtur, modo, sine molestia aut gravi nixu, infantes lac quod nimium suxerint facile et subito evomunt.

673. Sæpissime vero ventriculus male affectus ingratissimum sensum dat, quem nauseam vocamus. Hanc sæpe vertigo comitatur (267, 271). Ingravescente nausea, non modo motus ventriculi inversus est, sed sæpe magnæ partis intestini quod proximum est; et tandem, septo transverso, et musculis abdominis, per consensum qui ea inter et ventriculum intercedit, in motum raptis, abdomen totum, et ventriculus imprimis, veluti in prelo comprimuntur; quo tandem auxilio, quicquid in eo fuit insigni vi per gulam et os ejicitur. Vomitum præcedere solet magnus humorum oris fluxus, et interdum labii inferioris tremor; eumque co-

arbitrium, levi conatu, et sic ruminari instar bovis.

672. Infantes facile et subito, ut videtur, evomunt lac quod suxerint nimium, simili modo, sine molestiâ aut gravi nixu.

673. Vero ventriculus male affectus, sæpissime dat ingratissimum sensum, quem vocamus nauseam. Vertigo sæpe comitatur hanc. Nauseâ ingravescente, non modo motus ventriculi est inversus, sed sæpe magnæ partis intestini quod est proximum; et tandem, transverso septo et musculis abdominis, raptis in motum, per consensum qui intercedit inter ea et ventriculum, totum abdomen, et imprimis ventriculus, comprimuntur veluti in prelo; quo auxilio, quicquid fuit in eo tandem rejicitur per gulam et os insigni vi. Magnus fluxus homorum oris solet præcedere vomitum; interdum, et, tremor inferioris labii; que plena

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are some who know how to imitate, and to bring on the same motion at pleasure, by a slight effort, and so to ruminate like an ox.

672. Infants easily and suddenly, as it seems, vomit up the milk which they have sucked to excess, in a similar manner, without trouble or great effort.

673. But the stomach badly affected, very often produces a very unpleasant sensation, which we call nausea. Vertigo often accompanies this. The nausea increasing, not only the motion of the stomach is inverted, but often that of a great portion of the intestine which is next; and at length, the transverse septum and muscles of the abdomen, being hurried into motion, by the consent which exists between them and the stomach, the whole abdomen, and especially the stomach, are compressed as if in a press; by which assistance, whatever was in it at length is rejected through the œsophagus and mouth with great force. A great flow of the fluids of the

et valida expiratio comitatur eum, quâ cavetur ne quid intret laryngem et asperam arteriam.

674. Nausea et vomitus, frequentissima mala, agnoscunt fere innumeras causas, tum quæ afficiunt ventriculum ipsum, tum quæ remotissimas partes corporis: irritationes vel affectiones quarum qualescunque fuerint, multum afficiunt ventriculum, secundum leges consensûs.

675. Igitur omnis irritatio ventriculi, distentio, veluti ab onere crudi cibi, prava concoctio, obstructio circa inferius ostium, omnia acria recepta in eum, morbi jecoris, intestinorum, renum, uteri, capitis, pedum, universæ cutis, et sane universi corporis; inflammatio, calculus, regius morbus, scirrhus, apoplexia, compressio, fractura calvariæ, vertigo, syncope, immanis dolor, podagra, imprimis repulsa, febres, affectus animi, demum, imagines

mitatur plena et valida expiratio, qua cavetur, ne quid laryngem et asperam arteriam intret.

674. Nausea et vomitus, frequentissima mala, innumeras fere causas agnoscunt, tum quæ ventriculum ipsum afficiunt, tum quæ remotissimas corporis partes; quarum irritationes, vel affectiones qualescunque fuerint, secundum consensus leges, ventriculum multum afficiunt.

675. Ventriculi igitur irritatio omnis, distentio, veluti ab onere cibi crudi, prava concoctio, obstructio circa ostium inferius, acria omnia in eum recepta, morbi jecoris, intestinorum, renum, uteri, capitis, pedum, universæ cutis, et sane universi corporis; inflammatio, calculus, morbus regius, schirrus, apoplexia, compressio, fractura calvariæ, vertigo, syncope, dolor immanis, podagra, repulsa imprimis, febres, animi affectus,

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mouth is accustomed to precede vomiting; sometimes, also, a trembling of the lower lip; and a deep and strong expiration accompanies it, by which it is provided lest anything enters the larynx and aspera arteria.

674. Nausea and vomiting, very frequent disorders, acknowledge almost innumerable causes, as well which affect the stomach itself, as those which affect the remotest parts of the body; the irritations or affections of which, whatever kind they may be, greatly affect the stomach, according to the laws of sympathy.

675. Therefore every irritation of the stomach, distention, as by a load of crude food, depraved digestion, obstruction about the lower orifice, all acrids received into it, diseases of the liver, of the intestines, kidneys, uterus, head, feet, of the whole skin, and indeed of the whole body: inflammation, calculus, jaundice, scirrhus, apoplexy, compression, fracture of the skull, vertigo, syncope, intense pain, gout, especially the repelled,

imagines demum vel descriptiones fastidiendæ, nauseam et vomitum sæpe inducunt.

676. Ratio ergo in promptu erit, cur malum adeo frequens, sæpe primarius morbus, sæpius aliorum morborum effectus; cur sæpe salutaris naturæ conatus, summa medici ope promovendus; interdum vero inutilis prorsus et ineptus, ideoque compescendus quamprimum, veluti in febribus, ubi aliquando morbum solvit, sæpius vero ejus effectus et pars est, eundemque intendit, vel saltem ægri vires multum frangit.

677. Prodest etiam vomitus, vel nausea, sæpe non modo ventriculo ipsi, quem onere insigni liberet, sed aliis quoque partibus, vel denique universo corpori. Sputum multum promovet, sicubi pulmo vel suo gravatus fuerit muco, vel sanguine, sero, pure, aqua; et sudorem quoque, et liberam sanguinis ad cor-

vel descriptiones fastidiendæ, sæpe inducunt nauseam et vomitum.

676. Ergo ratio erit in promptu, cur malum adeo frequens, sæpe primarius morbus, sæpius effectus aliorum morborum; cur sæpe salutaris conatus naturæ, promovendus summa ope medici; vero interdum prorsus inutilis et ineptus, que ideo compescendus quamprimum, veluti in febribus, ubi aliquando solvit morbum, vero sæpius est effectus et pars ejûs, que intendit eundem, vel saltem multum frangit vires ægri.

677. Vomitus etiam, vel nausea, sæpe prodest non modo ventriculo, ipsi, quem liberet insigni onere, sed quoque aliis partibus vel denique universo corpori. Promovet multum sputum, sicubi pulmo fuerit gravatus, vel suo muco vel sanguine, sero, pure, aquâ; promovet sudorem, et quoque liberam distri-

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fevers, affections of the mind, lastly, notions or descriptions to be loathed, often bring on nausea and vomiting.

676. Therefore the reason will be at hand, why it is a disorder so frequent, often a primary disease, more often an effect of other diseases; why often a salutary effort of nature, to be promoted by the utmost effort of the physician; but sometimes altogether useless and unsuited, and therefore to be restrained as soon as possible, as in fevers, where sometimes it resolves the disease, but more often it is an effect and part of it, and increases the same, or at least greatly breaks down the strength of the patient.

677. Vomiting also, or nausea, often benefits not only the stomach itself, which it relieves from a great load, but also other parts or even the whole body. It promotes much spitting, as when the lung shall be oppressed, either by its own mucus or blood, serum, pus, water; it promotes sweating, and also the free distribution of the blood to the surface of the body, partly

butionem sanguinis ad superficiem corporis, partim fortasse, magno nixu qui comitatur vomitum, magis tamen, ut videtur, mirabili consensu qui intercedit inter cutem et ventriculum. Hinc vomitus præstantissimum remedium in multis morbis.

678. Aliquando nocet, si fuerit vel nimis vehemens, vel nimis frequens; partim ventriculo debilitato et facto mobiliore, qui nequit tolerare impune vehementem et abnormem motum; partim violento nixu, qui fatigat ægrum, et inducit prolapsum, aut herniam, aut abortum, aut profluvia sanguinis, vel ab ventriculo ipso, vel denique a pulmone, aut capite, propter longam et validam expirationem, quod, tamen, rarissime accidit. Porro, diuturnus et vehemens et frequens vomitus, non secus ac fluxus alvi, debilitat, exhaurit totum corpus, et corrumpit debitam secretionem humorum

poris superficiem distributionem promovet, partim fortasse magno nixu qui vomitum comitatur, magis tamen, ut videtur, mirabili consensu qui inter cutem et ventriculum intercedit. Hinc in multis morbis vomitus præstantissimum remedium.

678. Nocet aliquando, si vel nimis vehemens vel nimis frequens fuerit; partim debilitato et mobiliore facto ventriculo, qui vehementem et abnormem motum impune tolerare nequit; partim violento nixu, qui ægrum fatigat, et prolapsum, aut herniam, aut abortum, aut sanguinis profluvia inducit, vel ab ipso ventriculo, vel denique a pulmone, aut capite, propter longam et validam expirationem; quod tamen rarissime accidit. Porro, vomitus diuturnus, et vehemens, et frequens, non secus ac alvi, fluxus, totum corpus debilitat, exhaurit, et debitam humorum

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perhaps, by the great effort which accompanies vomiting, more however, as it seems, by the wonderful sympathy which exists between the skin and the stomach. Hence vomiting is the most immediate remedy in many diseases.

678. Sometimes it hurts, if it should be either too violent or too frequent; partly by the stomach being debilitated and rendered more irritable, which cannot bear with impunity a violent and irregular motion; partly by the violent effort, which wearies the patient, and brings on prolapsus, or hernia, or abortion, or discharges of blood, either from the stomach itself, or indeed from the lungs, or head, on account of the long and powerful expiration, which, however, very seldom happens. Moreover, continued and violent and frequent vomiting, in like manner as the flux of the belly, debilitates, exhausts the whole body, and corrupts the due secretion of the fluids of the stomach, from whence a depraved digestion of the food, and whatever evils flow out of it.

ventriculi secretionem corrumpit: unde prava cibi concoctio, et quot-quot ex ea profluunt mala.

679. Inversus aliquando omnium intestinorum motus, ab ano ad os usque, observatur: malum pessimi ominis, cui nomen ileus plerumque datur. Oritur frequentius ab obstructione aliqua massæ alimentorum vel stercoris descensum impediente; spasmo, schirro, inflammatione intestinorum, alvi duritie colicam inducente, cujus ileus pars est et effectus. Aliquando vero observatus est perfectissimus ileus, cum nulla in intestinis obstructio fuisset; et sic lotiones interdum per anum infusæ per os redditæ sunt, et ægri nihilominus, post plures dies talis morbi, tandem convaluerunt.

680. Incipit plerumque ileus torminibus ventris, nausea, vomitu, frequente ructu, aëre nimirum primum ascendente: postea

ventriculi, unde prava concoctio cibi, et quot-quot mala profluunt ex eâ.

679. Inversus motus omnium intestinorum, ab ano usque ad os, aliquando observatur; malum pessimi ominis, cui nomen ileus plerumque datur. Oritur frequentius ab aliquâ obstructione impediente descensum massæ alimentorum vel stercoris, spasmo, schirro, inflammatione intestinorum, duritie alvi, inducente colicam, cujus ileus est pars et effectus. Vero perfectissimus ileus aliquando observatus est cum fuisset nulla obstructio in intestinis; et sic lotiones infusæ per anum redditæ sunt interdum per os, et ægri nihilominus, post plures dies talis morbi, tandem convaluerunt.

680. Ileus plerumque incipit torminibus ventris, nauseâ, vomitu, frequente ructu, nimirum aëre ascendente primum; postea æger eructat pluri-

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679. An inverted motion of all the intestines, from the anus quite to the mouth, sometimes is observed; a disease of the worst omen, to which the name ileus generally is given. It arises more frequently from some obstruction preventing the descent of the mass of the aliments or of the fæces, spasm, schirrus, inflammation of the intestines, hardness of the belly, bringing on colic, of which ileus is a part and effect. But the most complete ileus sometimes has been observed when there has been no obstruction in the intestines; and thus lavements injected by the anus have been returned sometimes by the mouth, and the patients notwithstanding, after several days of such a disease, at length have recovered.

680. Ileus for the most part begins with gripes of the belly, nausea, vomiting, frequent eructation, that is, the air ascending first; afterward the patient belches a great deal of brown, black, bilious, corrupted matter: at

mam fuscam, atram, biliosam, corruptam materiam; tandem evomit pleno ore, cum frequente et valido nixu, et immani dolore viscerum: alvus simul pertinaciter astricta, transmittit nihil; neque ventriculus, agitatus importunissimâ nauseâ et vomitu, fere retinet quidquam. Vires ægri collabuntur multum et subito, et ipse versatur in summo periculo; nam morbus solet brevi inducere inflammationem, et hæc, gangrænam.

plurimam materiam fuscam, atram, biliosam, corruptam, æger eructat: tandem pleno ore evomit, cum frequente et valido nixu, et immani viscerum dolore: alvus simul pertinaciter astricta nihil transmittit, neque ventriculus, importunissima nausea et vomitu agitatus, quidquam fere retinet. Vires ægri multum et subito collabuntur, et ipse in summo periculo versatur; nam morbus brevi solet inflammationem, et hæc gangrænam inducere.

681. Profecto levior affectio istiusmodi, scilicet, inversus motus superioris partis intestini, accidit ab omni vehemente et diuturno vomitu, veluti a maritimâ jactatione, vel ab nimis valido vomitorio medicamento hausto; enim, plurimum fel sæpe ascendit hoc modo in ventriculum ab intestino, et tandem vomitur ex ore.

681. Levior profecto istiusmodi affectio, superioris scilicet intestini partis motus inversus, ab omni vomitu vehemente et diuturno accidit, veluti a jactatione maritima, vel ab hausto nimis valido vomitorio medicamento; sæpe enim plurimum fel hoc modo ab intestino in ventriculum ascendit, et tandem ex ore vomitur.

682. Ingens vomitus et

682. Ingens simul vomitus et

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length he vomits with a full mouth, with a frequent and strong effort, and severe pain of the bowels; the belly, at the same time obstinately bound, transmits nothing; nor does the stomach, disturbed with the most urgent nausea and vomiting, commonly retain anything. The strength of the patient collapses much and suddenly, and he himself is involved in very great danger; for the disease is accustomed quickly to bring on inflammation, and this, gangrene.

681. Indeed a slighter affection of this sort, that is, an inverted motion of the upper portion of the intestine, happens from all violent and continued vomiting, as from sea tossing, or from a too powerful emetic medicine being swallowed; moreover, a great deal of bile often ascends by this mode into the stomach from the intestine, and at length is vomited from the mouth.

682. A great vomiting and flux of the belly at the same time, is called

alvi fluxus Cholera vocatur. Oritur a valida tubi intestinorum irritatione, ubi nulla obstructio in eo est; plerumque a felle nimio, aut nimis acri; unde nomen habet: quamvis ab aliis quoque acribus similis affectio oriatur, veluti medicamento nimis forti, aut fructibus maturis nimia copia assumptis. Malum sæpe violentissimum, ægrum valde debilitat; nonnunquam, nisi idonea adhibita fuerint remedia, brevi extinguit.

fluxus alvi simul vocatur cholera. Oritur a validâ irritatione tubi intestinorum, ubi est nulla obstructio in eo; plerumque a nimio, aut nimis acri felle; unde habet nomen: quamvis similis affectio oriatur ab aliis acribus quoque, veluti nimis forti medicamento, aut maturis fructibus assumptis nimia copiâ. Sæpe violentissimum malum, valde debilitat, nonnunquam, nisi idonea remedia fuerint adhibita, brevi extinguit, ægrum.

Cap. XX.—*De secretione et excretione; earumque varietatibus et vitiis.*

Cap. XX.—*De secretione et excretione; que varietatibus et vitiis earum.*

683. A massa sanguinis qualis per aortam ad omnes corporis par-

683. Plurimi humores, diversi a sanguine, diversi inter se, secernun-

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cholera. It arises from severe irritation of the tube of the intestines, when there is no obstruction in it; generally from too much or too acrid bile; whence it has its name: although a similar affection may arise from other acrids also, as a too powerful medicine, or ripe fruits taken in excessive quantity. Often a very violent disorder; it greatly debilitates, sometimes, unless proper remedies have been applied, it quickly destroys, the patient.

Chap. XX.—*Of secretion and excretion; and the varieties and disorders of them.*

683. Many fluids, differing from the blood, differing among themselves, are secreted from the mass of blood such as is distributed by the aorta to all

tur a massâ sanguinis qualis diffunditur per aortam ad omnes partes corporis; alii quorum inserviunt variis usibus in corpore ipso, alii, superflui vel noxii, expelluntur assidue ex eodem, alii demum, sunt necessarii ad propagandum genus que alendum novum animal, quum primo editur in lucem.

684. Saliva, que alii humores oris, succus ventriculi et intestinorum, et pancreatis, fel, ille halitus qui irrorat atque humectat cava corporis, sive magna sive parva, adeps, sevum seu unguen cutis, mucus viarum, quas aër, vel cibus, vel urina debent subire, lachrymæ, aquosus humor oculorum, et cerumen, ut vocatur, aurium, pertinent ad primum genus.

685. Ad secundum genus pertinet halitus pulmonis, quamvis hic sane derivetur ab pulmonali arteriâ potius quam ab aortâ, et halitus cutis, et sudor, et urina.

tes diffunditur, plurimi humores, diversi a sanguine, diversi inter se, secernuntur (8); quorum alii variis in ipso corpore usibus inserviunt, alii, superflui vel noxii, ex eodem assidue expelluntur, alii demum, ad genus propagandum, novumque animal, quum primo in lucem editur, alendum, necessarii sunt.

684. Ad primum genus pertinent saliva, aliique oris humores, succus ventriculi, et intestinorum, et pancreatis, fel, halitus ille qui cava corporis, sive magna sive parva, irrorat atque humectat, adeps, sebum seu unguen cutis, mucus viarum, quas aër, vel cibus, vel urina, subire debent, lachrymæ, humor aquosus oculorum, et cerumen, ut vocatur, aurium.

685. Ad secundum genus pertinent halitus pulmonis, quamvis hic sane ab arteria pulmonali potius quam ab aorta derivetur, et halitus cutis, et sudor, et urina.

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parts of the body; some of which serve to various uses in the body itself, others, superfluous or noxious, are expelled constantly from the same; others, finally, are necessary to propagate the race and support the new animal, when first it is put forth into the light.

684. The saliva, and other fluids of the mouth, the juice of the stomach and of the intestines, and pancreas, the gall, that exhalation which bedews and moistens the cavities of the body, whether great or small, the fat, the tallow or oily liquor of the skin, the mucus of the passages, which the air, or food, or urine ought to pass, the tears, aqueous humour of the eyes, and the cerumen, as it is called, of the ears, belong to the first kind.

685. To the second class belongs the exhalation of the lung, although this indeed is derived from the pulmonary artery rather than from the aorta, also the exhalation of the skin, and the sweat, and the urine.

686. Ad tertium demum genus pertinent semen masculinum, liquor lacteus glandulæ prostatæ, liquor bullarum seu ovorum quæ in ovariis fœminarum reperiuntur, liquor amnii fortasse, aliique humores quotquot fœminæ ad generationem conferunt; et demum lac mammarum, quod certo post partum tempore secernitur copiosissimum.

686. Demum, ad tertium genus pertinent masculinum semen, lacteus liquor prostatæ glandulæ, liquor bullarum, seu ovorum, quæ reperiuntur in ovariis fœminarum, fortasse liquor amnii, que alii humores fœminæ, quotquot conferunt ad generationem; et demum lac mammarum, quod copiosissimum secernitur certo tempore post partum.

687. Dividuntur ab auctoribus sæpe humores secreti, et in classes rediguntur secundum ipsorum qualitates.

687. Secreti humores sæpe dividuntur ab auctoribus, et rediguntur in classes, secundum qualitates ipsorum.

688. Aquosi humores dicuntur halitus pulmonis cutisque, urina, saliva, succus pancreatis, lachrymæ, humor aquosus oculi.—Mucosi sunt humores tenaces, et quasi gummosi, qui vias quas aër, vel cibus, vel urina, subeunt, oblinunt, et ab omni acri defendunt. His quoque annumerantur semen, et humor lacteus glandulæ pros-

688. Halitus pulmonis que cutis, urina, saliva, succus pancreatis, lachrymæ, aquosus humor oculi, dicuntur aquosi humores. Mucosi humores sunt tenaces, et quasi gummosi, qui oblinunt et defendunt vias quas aër, vel cibus, vel urina subeunt, ab omni acri. Semen, et lacteus humor prostatæ glandulæ annumerantur quo-

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686. Lastly, to the third class belong the male semen, the milky liquor of the prostrate gland, the liquor of the bullæ, or ova, which are found in the ovaries of women, perhaps the liquor amnii, and the other fluids of the woman, whatever contribute to generation; and indeed the milk of the breasts, which is in great abundance secreted at a certain time after parturition.

687. The secreted fluids often are divided by authors, and are reduced into classes, according to the qualities of them.

688. The vapour of the lungs and skin, the urine, saliva, juice of the pancreas, tears, aqueous humour of the eye, are called the watery fluids. The mucous humours are tenacious, and as it were gummy, which anoint and defend the passages which the air, or food, or urine pass through, from every acrid thing. The semen, and milky humour of the prostate gland are enumerated also with these. The fluids are called glutinous, which

que his. Humores vocantur glutinosi, qui irrorant varia cava corporis, et liquor amnii, et fortasse ovorum, quæ reperiuntur in ovariis mulierum. Oleosi humores, præter adipem, et medullam ossium, dicuntur sevum seu unguen cutis, et fel et cerumen aurium: scilicet quæ continent multum olei, et probe siccata inflammantur facile et vehementer.

689. Quin et hi humores sæpe miscentur, nec obtinentur facile sinceri. Os madet salivâ et muco simul; nares muco et lachrymis; sudor constat ex aquoso halitu cutis, et adipe et unguine ejusdem, et succus ventriculi et intestinorum, et artuum et omnium cavorum, constat ex oleo, et muco, et glutine, et aquâ. Lac, denique, quum primo secernitur, habet multum aquæ, olei, muci, et glutinis, ut notissima experimenta docent. Demum, oleosi humores ipsi, quum

tatæ.—Glutinosi vocantur humores qui varia corporis cava irrorant, et liquor amnii, et fortasse ovorum quæ in ovariis mulierum reperiuntur.—Oleosi humores dicuntur, præter adipem et medullam ossium, sevum seu unguen cutis, et fel, et cerumen aurium, scilicet quæ multum olei continent, et probe siccata facile et vehementer inflammantur.

689. Quin et hi humores sæpe miscentur, nec facile sinceri obtinentur. Os madet saliva simul et muco; nares muco et lachrymis; sudor ex halitu aquoso cutis, et adipe, et unguine ejusdem constat, et succus ventriculi, et intestinorum, et artuum, et omnium cavorum, ex oleo, et muco, et glutine, et aqua constat. Denique, lac, quum primo secernitur, habet multum aquæ, olei, muci, et glutinis, ut notissima experimenta docent. Ipsi demum oleosi, quum primum

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bedew the various cavities of the body, and the liquor amnii, and perhaps of the ova, which are found in the ovaries of women. The oily fluids, besides the fat, and the marrow of the bones, are called the tallow or fat of skin, and the gall and the wax of the ears: as being things which contain much oil, and well dried are set fire to easily and violently.

689. Moreover these fluids often are mixed, nor are they obtained easily pure. The mouth is moist with saliva and mucus at the same time; the nostrils with mucus and tears: sweat consists of the watery vapour of the skin, and the fat and ointment of the same, and the juice of the stomach and of the intestines, and joints and of all the cavities, consists of oil, and mucus, and gluten, and water. Milk, indeed, when first it is secreted, contains much water, oil, mucus, and gluten, as well known experiments prove. Lastly, the oily fluids themselves, when first they are formed, are in no small degree watery.

formantur humores, haud parum aquosi sunt.

690. Porro, alia animalia plures humores habent, quorum plerique nostris humoribus similes sunt, veluti albumen ovi in omnibus oviparis; alii haud parum diversi, veluti humor acidus insectorum, venena apum aut serpentum, atramentum sepiæ.

691. Quidam ex humoribus secretis in ipso sanguine fere perfecti reperiuntur, ita ut simplicissima secretio seu separatio fere sat fuerit ad ipsos puros et sinceros producendos; cujusmodi sunt, halitus pulmonis et cutis, saliva, succus pancreatis, lachrymæ, humor oculi aquosus, urina, halitus, qui omnia cava humectat, scilicet qui vel ex pura aqua constant, vel ex aqua cum pauxillo glutinis salisve, qualia sanguini insunt.

692. Alii vero humores diversæ prorsus naturæ sunt, neque ipsi

primum formantur, sunt haud parum aquosi.

690. Porro, alia animalia habent plures humores, plerique quorum sunt similes nostris humoribus, veluti albumen ovi in omnibus oviparis; alii haud parum diversi, veluti acidus humor insectorum, venena apum aut serpentum, atramentum sepiæ.

691. Quidam ex secretis humoribus reperiuntur fere perfecti in sanguine ipso, ita ut simplicissima secretio seu separatio fuerit fere sat ad producendos ipsos puros et sinceros; cujusmodi sunt, halitus pulmonis et cutis, saliva, succus pancreatis, lachrymæ, aquosus humor oculi, urina, halitus qui humectat omnia cava, scilicet qui constant vel ex purâ aquâ, vel ex aquâ cum pauxillo glutinis ve salis; qualia insunt sanguini.

692. Vero alii humores sunt naturæ prorsus di-

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690. Moreover, other animals have many fluids, most of which are similar to our own fluids, as the albumen of the egg in all oviparous animals; others are not a little different, as the acid fluid of insects, the poisons of bees or serpents, the ink of the cuttle fish.

691. Some of the secreted fluids are found almost perfect in the blood itself, so that the most simple secretion or separation would have been almost sufficient to produce them pure and unmixed; of which sort are, the exhalation of the lungs and skin, the saliva, the juice of the pancreas, the tears, the aqueous humour of the eye, the urine, the exhalation which moistens all the cavities, as being which consist either of pure water, or of water with a little gluten or salt, such as are in the blood.

692. But other fluids are of a nature altogether different, neither similar

versæ, neque similes sanguini ipsi, nec ullis partibus quæ reperiuntur in eo; quales sunt adeps, medulla, sebum, fel, cerumen aurium, mucus, et denique, semen ipsum, mirabilis humor, scatens minutissimis animalibus.

693. Alii denique, constant partim ex elementis, qualia reperiuntur in sanguine, vero partim ex aliis, quæ ostenduntur ægre in sanguine, veluti lac, glutinosa pars cujus, coagulo admixto, cogitur, et præbet caseum, habet multa communia cum sero sanguinis, si hoc fuerit dilutum multâ aquâ; vero nihil ostenditur in sanguine simile oleosæ parti, et saccharo lactis, quæ præbent butyrum et serum.

694. Vero omnis humor jam secretus, potest resorberi plus minus, vel naturâ vel morbo, et redire in sanguinem, que nonnihil corrumpere eundem, et tum forsitan secerni

sanguini, nec ullis quæ in eo reperiuntur partibus (492, 499) similes; quales sunt, adeps, medulla, sebum, fel, cerumen aurium, mucus, et denique semen ipsum, mirabilis humor, minutissimis animalibus scatens.

693. Alii denique constant partim ex elementis qualia in sanguine reperiuntur, partim vero ex aliis, quæ ægre in sanguine ostenduntur; veluti lac, cujus pars glutinosa, quæ admisto coagulo cogitur et caseum præbet, multa habet communia cum sero (498) sanguinis si hoc multa aqua dilutum fuerit; nihil vero in sanguine ostenditur simile parti oleosæ, et saccharo lactis, quæ butyrum et serum præbent.

694. Omnis vero humor jam secretus, vel natura, vel morbo, plus minus resorberi potest, et in sanguinem redire, eundemque nonnihil corrumpere, et tum for-

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to the blood itself, nor to any parts which are found in it; such are fat, marrow, sebaceous matter, gall, wax of the ears, mucus, and lastly, the semen itself, a wonderful fluid, abounding with very minute animals.

693. Others in fine, consist partly of elements, such as are found in the blood, but partly of others, which are shewn with difficulty in the blood, as milk, the glutinous part of which, rennet being mixed, is coagulated, and affords cheese, has many things common with the serum of the blood, if this should be diluted with much water; but nothing is shewn in the blood similar to the oily part, and sugar of milk, which afford butter and whey.

694. But every fluid already secreted, may be reabsorbed more or less, either by nature or from disease, and return into the blood, and somewhat corrupt the same, and then perhaps be secreted again, or at least pass through organs not their own.

sitan per organa non sua rursus secerni, vel saltem transire.

695. Hoc modo semen masculinum multorum animalium totum corpus suo fœtore inficit: et fel, in morbo regio repressum, in sanguinem redit, cutemque flavam facit, et cum urina e corpore exit: et demum, urina repressa, et in sanguinem resumpta, totum corpus inundat, et in ipsum aliquando cerebrum effunditur.

696. Nondum vero prolata sunt exempla humoris cujusvis secreti, in organo non suo formati; nam alia prorsus ratio est humoris jam formati, inque massam sanguinis denuo resumpti, et tandem ad aliena organa cum sanguine delati.

697. Nulla secretionis ratio aut explicatio hactenus data est; neque profecto fabrica organorum secernentium hactenus satis nota est; neque conjecturæ bene multæ, quas medici, tum mathematici, tum

rursus, vel saltem transire per organa non sua.

695. Hoc modo masculinum semen multorum animalium inficit totum corpus suo fœtore, et fel repressum in regio morbo, redit in sanguinem, que facit flavam cutem, et exit e corpore cum urinâ; et demum, urina repressa, et resumpta in sanguinem, inundat totum corpus, et aliquando effunditur in cerebrum ipsum.

696. Vero exempla nondum prolata sunt cujusvis secreti humoris formati in organo non suo; nam ratio humoris jam formati, que resumpti denuo in massam sanguinis, et tandem delati cum sanguine ad aliena organa, est prorsus alia.

697. Nulla ratio aut explicatio secretionis hactenus data est; neque profecto est fabrica secernentium organorum hactenus satis nota: neque bene multæ conjecturæ quas medici, tum mathematici,

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695. In this manner the male semen of many animals infects their whole body with its fœtor; and the bile obstructed in jaundice, returns into the blood, and causes the yellow skin, and goes out of the body with the urine; and lastly, the urine obstructed, and taken back into the blood, inundates the whole body, and sometimes is effused into the brain itself.

696. But examples have not yet been set forth of any secreted fluid formed in an organ not its own; for the case of a fluid already formed, and taken up again into the mass of the blood, and at length conveyed with the blood to different organs, is wholly different.

697. No reason or explanation of secretion hitherto has been given; nor truly is the structure of the secreting organs hitherto sufficiently known; nor the very many conjectures which physicians, as well mathematical, as the

tum chemici, proposuerunt de officio atque actione eorum, habent multum verisimilis.

698. Secernens organum videtur formari ex vasis vehentibus sanguinem, tum arteriis tum venis, hiantibus in cavum, vel habentibus ductus continuos sibi, qui deferant secretum humorem quo debet. Tale organum, formatum in certam figuram cum reticulatâ telâ, et obductum firmiore membranâ ejusdem telæ, vocatur glandula: qualia sunt jecur, renes, testes, prostata, mammæ, tonsillæ, parotides, et cætera organa quæ secernunt humores oris, cryptæ, seu folliculi qui continent mucum aut unguen, &c. Splen quoque, et cerebrum ipsum, propter similitudinem fabricæ, solent annumerari inter glandulas, seu secernentia organa; recte an secus nondum constat; neque profecto melius constat de conglobatis glandulis resorben-

chemici, de eorum officio atque actione proposuerunt, multum verisimilis habent.

698. Organum secernens formari videtur ex vasis sanguinem vehentibus, tum arteriis tum venis, in cavum hiantibus, vel ductus sibi continuos habentibus, qui humorem secretum quo debet deferant. Tale organum in certam figuram cum tela reticulata formatum, et firmiore ejusdem telæ membrana obductum, glandula vocatur: qualia sunt jecur, renes, testes, prostata, mammæ, tonsillæ, parotides, et cætera quæ oris humores secernunt organa, cryptæ, seu folliculi qui mucum aut unguen continent, &c. Splen quoque, et cerebrum ipsum, propter fabricæ similitudinem, inter glandulas seu organa secernentia, annumerari solent: recte an secus nondum constat; neque profecto melius constat de glandulis conglobatis vasorum re-

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chemical, have advanced about the office and action of them, have much of probable in them.

698. A secerning organ seems to be formed of vessels carrying blood, as well arteries as veins, opening into a cavity, or having ducts continuous with themselves, which convey the secreted fluid where it ought. Such an organ, formed into a certain figure with cellular tissue, and covered with a firmer membrane of the same tissue, is called a gland: such as are the liver, kidneys, testicles, the prostate, the mammæ, tonsils, parotids, and the other organs which secrete the fluids of the mouth, the folds, or follicles which contain the mucus or oily liquor, &c. The spleen also, and the brain itself, on account of the similarity of structure, are accustomed to be ranked among the glands, or secreting organs: whether rightly or otherwise is not yet determined: nor truly is it better established concerning the conglobate

sorbentium (440, 441), num hæ quoque inter organa secernentia recenseri debeant, necne.

699. Magna copia sanguinis ad plerasque glandulas mittitur, si cum mole ipsius organi comparata fuerit. Arteriæ quoque organorum secernentium, et vena portarum, quæ fere pro arteria habenda est, multo validiores sunt quam aliæ corporis arteriæ. Venæ autem quæ his respondent, et sanguinem post factam secretionem ad cor reducunt, præter solitum amplæ, tenues, laxæ, et debiles observantur.

700. Nonnulli medici putarunt hujusmodi plerisque glandulis fabricam dari hoc potissimum consilio, ut sanguis quam plurimus earum actioni subjiciatur, quo copiosior humoris secretio fiat; ut arteriæ, insolita vi præditæ eo melius valeant ad partes tenues massæ sanguinis exprimendas, sive

tium vasorum, num hæ quoque debeant recenseri inter secernentia organa, necne.

699. Magna copia sanguinis mittitur ad plerasque glandulas, si fuerit comparata cum mole organi ipsius. Arteriæ quoque secernentium organorum, et vena portarum quæ est habenda fere pro arteriâ, sunt multo validiores quam aliæ arteriæ corporis. Autem venæ quæ respondent his, et reducunt sanguinem ad cor, post secretionem factam observantur præter solitum amplæ, tenues, laxæ, et debiles.

700. Nonnulli medici putarunt fabricam hujusmodi dari plerisque glandulis, potissimum hoc consilio, ut sanguis plurimus quam subjiciatur actioni earum, quo copiosior secretio humoris fiat; ut arteriæ, præditæ insolita vi, valeant eo melius ad exprimendas tenues partes massæ sangui-

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glands of the absorbing vessels, whether these also ought to be reckoned amongst the secerning organs, or not.

699. A great quantity of blood is sent to most glands, if it should be compared with the bulk of the organ itself. The arteries also of secreting organs, the vena portæ which is to be considered almost as an artery, are much stronger than the other arteries of the body. But the veins which correspond to them, and bring back the blood to the heart, after secretion being completed, are observed unusually large, thin, lax, and weak.

700. Some physicians have supposed that a structure of this sort was given to most of the glands, principally with this design, that as much blood as possible may be subjected to the action of them, in order that a more copious secretion of fluid may be made; that the arteries, endowed with unusual power, may be able the better to press out the thin parts of the mass of blood, whether the secreted humour itself should be thick or thin; and

nis, sive secretus humor ipse fuerit crassus sive tenuis; et demum, ut vis arteriæ sit quam maxima, et renixus venæ quam minimus, quo secretio humoris fiat facilior, et reditus reliqui sanguinis in venas expeditior. Autem fidendum est parum omnino his, et commentis hujusmodi.

crassus sive tenuis fuerit ipse humor secretus; et demum, ut vis quam maxima arteriæ sit, et renixus quam minimus venæ, quo facilior humoris secretio fiat, et expeditior reliqui sanguinis in venas reditus. His autem et hujusmodi commentis parum omnino fidendum est.

701. Enim motus sanguinis est valde tardus in quibusdam secernentibus organis, veluti in jecore et testibus: in illo, nimirum, secretio fit a sanguine venarum; autem in his tenues arteriæ, currentes longe, dantes multos ramos, et ipsæ nonnihil dilatatæ, et sæpe multum convolutæ, deferunt languidum flumen humoris ad testes. Neque est credibile hoc fieri sine consilio, præsertim quum similis fabrica observetur in fere omnibus animalibus.

701. In quibusdam enim organis secernentibus, veluti in jecore et testibus, motus sanguinis valde tardus est: in illo, nimirum, a sanguine venarum secretio fit; in his autem, tenues arteriæ, longe currentes, multos ramos dantes, ipsæque nonnihil dilatatæ et sæpe multum convolutæ, languidum humoris flumen ad testes deferunt. Neque credibile est hoc sine consilio fieri, præsertim quum similis in omnibus fere animalibus fabrica observetur.

702. Quin et, nonnullæ secretiones, et profecto copiosæ, perficiuntur sine

702. Quin et secretiones nonnullæ, et copiosæ profecto, sine

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finally, that the power of the artery may be the greatest possible, and the resistance of the vein the least possible, that the secretion of humour may become easier, and the return of the remaining blood into the veins more quick. But we must trust little at all to these, and conjectures of this kind.

701. Moreover the motion of the blood is very slow in certain secreting organs, as in the liver and testes: in the former, truly, the secretion is made from the blood of the veins: but in the latter, slender arteries, running far, giving off many branches, and they somewhat dilated, and often much convoluted, convey a languid stream of fluid to the testes. Nor is it credible that this takes place without design, especially since a similar structure is observed in almost all animals.

702. Moreover, some secretions, and indeed copious ones, are accomplished

glandulis perficiuntur; nullæ saltem quæ iis inserviunt glandulæ hactenus sunt detectæ; halitus nimirum pulmonis et cutis, sudor, adeps, et humor glutinosus, qui varia corporis cava humectat, sine glandulis secernuntur. Hi igitur humores videntur per minutas arterias, vel in cava corporis, vel in pulmonem, vel in cutem hiantes, a sanguine decedere, et fortasse mutari, vel omnino formari, vi nondum satis explorata. Adeps enim sincerus vix, ac ne vix quidem, in sanguine cernitur: neque cum eo, aut halitu glutinoso cavorum corporis, aut aquoso cutis halitu, aut demum sudore, sal, qui plurimus sanguini inest, tenuissimus, et probe solutus, in sano corpore unquam miscetur.

703. Nec melius intelligitur quomodo in veris glandulis sanguis subigatur, mutetur, et in alios humores vertatur; vel quomodo hi ex

glandulis; saltem nullæ glandulæ, quæ inserviunt iis, detectæ sunt hactenus; nimirum halitus pulmonis et cutis, sudor, adeps, et glutinosus humor, qui humectat varia cava corporis, secernuntur sine glandulis. Igitur, hi humores videntur decedere a sanguine, et fortasse mutari per minutas arterias hiantes vel in cava corporis, vel in pulmonem, vel in cutem, vel omnino formari vi nondum satis exploratâ. Enim sincerus adeps vix, ac ne quidem vix, cernitur in sanguine: neque sal, qui inest plurimus, tenuissimus, et probe solutus in sanguine, unquam miscetur in sano corpore cum eo, aut glutinoso halitu cavorum corporis, aut aquoso halitu cutis, aut demum, sudore.

703. Nec melius intelligitur, quomodo sanguis subigatur, mutetur, et vertatur in alios humores in veris glandulis; vel

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without glands: at least no glands, which are subservient to them, have been detected hitherto; indeed the exhalation of the lungs and skin, sweat, fat, and the glutinous fluid, which bedews the various cavities of the body, are secreted without glands. Therefore, these humours seem to escape from the blood, and perhaps to be changed by minute arteries opening either into the cavities of the body, or into the lungs, or upon the skin, or wholly to be formed by a power not yet sufficiently explored. For pure fat scarcely, and not even scarcely, is seen in the blood: nor is the salt, which exists very abundant, very subtile, and well dissolved in the blood, ever mixed in the healthy body with it, or the glutinous exhalation of the cavities of the body, or watery exudation of the skin, or finally, the sweat.

703. Nor is it better understood, how the blood is reduced, is changed, and is converted into different humours in true glands; or how these are secreted from it, and at length go forth unmixed.

quomodo hi secernantur ex eo, et demum prodeant puri.

704. Iatro-mathematici finxerunt varias dotes sanguinis delati ad certa organa, que varias magnitudines, et figuras et densitates particularum; que varias densitates, attractiones, aperturas, figuras organorum et arteriarum quæ responderent his, que organa ipsa, instar colorum, quibus utimur ad purganda vel separanda multa fluida a se invicem, imbuta certo humore, ita ut trahant quasdam partes jam existentes in sanguine ad se, et vel transmittant vel detineant aliis atque aliis organis. Vero conjecturæ hujusmodi nituntur lubrico si ullo fundamento; enim neque constat sanguinem ullo modo diversum deferri ad diversa organa, nisi ad jecur, cui sanguis datur a venis; neque sane particulas variorum humorum existere in sanguine, priusquam subiverint actio-

eo secernantur, et puri demum prodeant.

704. Varias sanguinis ad certa organa delati dotes, variasque particularum magnitudines, et figuras, et densitates, finxerunt Iatromathematici; variasque quæ his responderent organorum et arteriarum densitates, attractiones, aperturas, figuras, ipsaque organa, colorum instar, quibus ad purganda, vel a se invicem separanda, multa fluida utimur, certo humore imbuta, ita ut partes quasdam in sanguine jam existentes trahant ad se, et aliis atque aliis organis vel transmittant vel detineant. Lubrico vero nituntur si ullo fundamento, hujusmodi conjecturæ; neque enim constat diversum ullo modo sanguinem ad diversa organa deferri, nisi ad jecur, cui sanguis a venis datur, neque sane variorum humorum particulas prius in sanguine existere quam organorum

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704. The Iatro-mathematicians have imagined various properties of the blood conveyed to certain organs, and the various magnitudes, and figures and densities of the particles; and the various densities, attractions, apertures, figures of the organs and arteries which answered to them, and that the organs themselves, like strainers, which we use to cleanse or separate many fluids from each other, are imbued with a certain humour, so that they may draw certain parts already existing in the blood to themselves, and either transmit or detain them in the different organs. But conjectures of this sort depend upon a slippery if upon any foundation; for neither is it established that blood in any manner different, is conveyed to the different organs, except to the liver, to which blood is supplied from the veins; not truly that the particles of the various humours exist in the blood, before that they have undergone the action of the secreting organs, nor that the

secernentium actionem subiverint, neque varias esse particularum figuras vasorumque aperturas; neque, si ita hæ res se habuissent, ullus potuisset unquam purus secerni humor; quoniam tenuiores semper (scilicet quorum particulæ minores essent, secundum opinionem eorum auctorum qui hanc doctrinam tuebantur) cum crassioribus elabentes, hos inquinassent; et sic, verbi gratia, urina cum bile, semine, muco, lacte, adipe, secreta, omnes istos humores corrupisset. Quin et crassissimi qui videntur humores, bilis, cerumen, mucus, multo tenuiores secreti, haustis per vasa absorbentia tenuioribus et aquosis ipsorum partibus, debitam tandem adipiscuntur crassitudinem. Porro fel ipsum, jam secretum et crassum factum, in sanguinem iterum resumptum, cum tenuissimo humore, urina scilicet, e corpore facillime elabitur.

nem secernentium organorum, neque figuras particularum que aperturas vasorum esse varias; neque, si hæ res habuissent se ita, potuisset ullus humor unquam secerni purus; quoniam tenuiores (scilicet, quorum particulæ essent minores secundum opinionem eorum auctorum qui tuebantur hanc doctrinam) elabentes cum crassioribus, semper inquinassent hos: et sic urina, verbi gratia, secreta cum bile, semine, muco, lacte, adipe, corrupisset omnes istos humores. Quin et, humores qui videntur crassissimi, bilis, cerumen, mucus, secreti multo tenuiores, tandem adipiscuntur debitam crassitudinem, tenuioribus et aquosis partibus ipsorum haustis per absorbentia vasa. Porro, fel ipsum, jam secretum et factum crassum, resumptum iterum in sanguinem, facillime elabitur e corpore cum tenuissimo humore, scilicet, urinâ.

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shapes of the particles and apertures of the vessels are various; nor, if these things had had themselves so, could any fluid ever be secreted pure: because the thinner (that is, of which the particles were less according to the opinion of those authors who defended this doctrine) escaping with the thicker, always would have adulterated them: and thus urine, for example, secreted with bile, semen, mucus, milk, fat, would have corrupted all those fluids. Moreover, the fluids which seem thickest, bile, ear wax, mucus, secreted much thinner, at length acquire the due thickness, by the thinner and watery parts of them being drank up by the absorbing vessels. Moreover, the gall itself, already secreted and become thick, taken up again into the blood, very easily escapes from the body with the thinnest fluid, namely, the urine.

705. Nor have the chemists advanced much who have entered upon an

705. Nec chemici profecerunt multum qui ingressi sunt omnino aliam viam, ut redderent rationem hujus rei. Nonnulli crediderunt sanguinem delatum ad secernentia organa, subire ibi quandam chemicam mutationem, quæ verteret ipsum in aliam naturam, non secus ac mustum vertuntur in vinum, et hoc in acetum; et quo hoc fieret melius, et certius, finxerunt quoddam fermentum insitum singulis glandulis, quale induceret certam et definitam mutationem humoris quicum misceretur. Vero nihil istiusmodi videtur inesse glandulis, neque, si fuerit, explicabit rem.

705. Nec multum profecerunt chemici, qui aliam omnino ingressi sunt viam, ut hujus rei rationem redderent. Crediderunt nonnulli sanguinem, ad organa secernentia delatum, mutationem quandam chemicam ibi subire, quæ ipsum in aliam naturam verteret, non secus ac mustum in vinum, et hoc in acetum vertuntur; et quo melius et certius hoc fieret, fermentum quoddam singulis glandulis insitum finxerunt, quale certam et definitam humoris quicum misceretur mutationem induceret. Nihil vero istiusmodi glandulis inesse videtur, neque, si fuerit, rem explicabit.

706. Est certissimum plurimos humores subire magnam et miram mutationem compositionis in secernentibus organis. Vero num hæc referatur recte ad effectum fermenti, ii judicent qui noverint naturam, et vires, que varias species fermentorum,

706. Magnam et miram compositionis mutationem in organis secernentibus humores plurimos subire, certissimum est. Hæc vero, num recte ad effectum fermenti referatur, judicent ii qui naturam, et vires, variasque species fermento-

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altogether different path, that they might render an explanation of this subject. Some believed that the blood conveyed to the secreting organs, undergoes there some chemical change, which changed it into another nature, in like manner as must is changed into wine, and this into vinegar; and in order that this might take place better, and more certainly, they supposed some ferment inherent in every gland, such as would induce a certain and definite change of the fluid with which it might be mixed. But nothing of that kind seems to exist in the glands, nor, if there should be, will it explain the matter.

706. It is very certain that most humours undergo a great and wonderful change of composition in the secreting organs. But whether this is referred rightly to the effect of a ferment, let them judge who know the nature, and powers, and various kinds of ferments, and understand the change itself

rum noverint, et ipsam mutationem intellexerint quam isti humores subeunt. Frustra enim de vocabulo disputatur. Probe autem memoria tenere oportet, mutationem istam pendere multum ab actione vasorum organi secernentis, et, prout hæc affecta fuerint, copiam humoris secreti multum variare, et qualitates ejus ita corrumpi nonnunquam, ut ipse in aliam fere videatur converti naturam. Quin et per secretionem semen producitur, mirabilis humor, vividis animalibus plenus, cujus rei neque mathematici neque chemici rationem facile reddiderint. Neque profecto dubitandi locus est, secretionem, pariter ac alias corporis functiones, quodammodo pendere a principio vitali, viribusque illis corpori vivo propriis, quamvis parum intellectis; neque ideo solis principiis mechanicis aut chemicis explicandam esse.

et intellexerint mutationem ipsam quam isti humores subeunt. Enim disputatur frustra de vocabulo. Autem oportet tenere probe memoriâ istam mutationem pendere multum ab actione vasorum secernentis organi, et, copiam secreti humoris variare multum, prout hæc fuerint affecta, et qualitates ejus nonnunquam corrumpi ita ut ipse videatur converti in fere aliam naturam. Quin et, semen producitur per secretionem, mirabilis humor, plenus vividis animalibus, cujus rei neque mathematici neque chemici facile reddiderint rationem. Neque, profecto, est locus dubitandi, secretionem pariter ac alias functiones corporis, pendere quodammodo a vitali principio, que illis viribus propriis vivo corpori, quamvis parum intellectis: neque ideo esse explicandam mechanicis aut chemicis principiis solis.

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which those humours undergo. For it is disputed by them in vain about a term. But it behoves to keep thoroughly in the memory that that change depends much upon the action of the vessels of the secreting organ, and, that the quantity of the secreted humour varies much, according as they shall be affected, and that the qualities of it sometimes are corrupted so that it seems to be converted into almost another substance. Moreover, the semen is produced by secretion, a wonderful humour, full of live animals, of which thing neither mathematicians nor chemists will easily render the explanation. Nor, truly, is there room for doubting, that secretion, equally as the other functions of the body, depend in some measure upon the vital principle, and those powers peculiar to the living body, although little understood: nor therefore to be explained upon mechanical or chemical principles alone.

707. Vero quamvis non detur explicare primariam mutationem quæ fit in secretione, tamen plurima, neque inutilia medicis, detecta sunt jam, de hac functione.

708. Multi humores, statim ut secernuntur, vel ejiciuntur e corpore, vel impenduntur propriis usibus intra corpus. Vero alii transeunt per excernentes, seu efferentes ductus, a suis glandulis in idonea receptacula; in quibus sæpe commorantur diu, et amplius mutantur. Enim, plurimus humor hauritur per resorbentia vasa: vero quod superest spissescit, et fit acrius, quo valeat melius ad sua munera. Porro, hoc modo copia secreti humoris quæ decet, colligitur vel ejicienda e corpore suo tempore, vel impendenda justo usui intra corpus. Exempla machinationis hujusmodi sunt, vesicæ urinæ, fellis, seminis, saltem ut plerique medici putarunt, et

707. Quamvis vero primariam, quæ in secretione fit, mutationem non detur explicare, plurima tamen, neque medicis inutilia, de hac functione jam detecta sunt.

708. Multi humores, statim ut secernuntur, vel ejiciuntur e corpore, vel propriis usibus intra corpus impenduntur. Alii vero, per ductus excernentes seu efferentes, a glandulis suis transeunt in idonea receptacula: in quibus sæpe diu commorantur, et mutantur amplius. Plurimus enim humor per vasa resorbentia hauritur; quod superest vero spissescit, et acrius fit, quo melius ad sua munera valeat. Porro, hoc modo copia quæ decet humoris secreti colligitur, suo tempore vel ejicienda e corpore vel justo usui intra corpus impendenda. Hujusmodi machinationis exempla sunt, vesicæ urinæ, fellis, seminis, saltem ut

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707. But although it may not be given to explain the primary change which occurs in secretion, nevertheless very many things, not useless to physicians, have been detected already, concerning this function.

708. Many humours, as soon as they are secreted, either are ejected from the body, or are applied to their proper uses within the body. But others pass by excreting or carrying ducts, from their glands into proper receptacles; in which they often remain a long time, and are further changed. Moreover, a great deal of fluid is drank up by the absorbing vessels: but what remains thickens, and becomes more acrid, that it may suit better for its functions. Moreover, in this manner the quantity of secreted fluid which ought, is collected either to be ejected from the body at its time, or to be expended to a proper purpose within the body. Examples of a mechanism of this sort are, the bladders of urine, of the bile, of the semen, at least as

plerique medici putarunt, et folliculi mucosi ubique corporis.

709. Auctus universi sanguinis impetus singulares secretiones parum auget, præter exhalationem per cutem et sudorem; hæc vero mirum in modum augentur, dummodo neque contractio neque alia obstructio vasorum minimorum cutis fuerint, neque frigus corpori admotum. Docent effectus bene noti corporis exercitationis, caloris, febrium, et multorum medicamentorum stimulantium.

710. Augetur vero omnis secretio, aucta sui organi vasorum actione, dummodo hæc non nimia, neque aliter valde morbosa fuerit. Hoc modo plurimæ secretiones incitantur omni stimulo earum organis admoto, vel in massam sanguinis recepto, et quasdam præ aliis partibus afficiente. Docent acre quodvis in oculum, aut sal in os receptum, et argentum vivum,

mucosi folliculi ubique corporis.

709. Auctus impetus universi sanguinis auget parum singulares secretiones, præter exhalationem per cutem et sudorem; vero hæc augentur in mirum modum, dummodo fuerint neque contractio neque alia obstructio minimorum vasorum cutis, neque frigus admotum corpori. Bene noti effectus exercitationis corporis, caloris febrium, et multorum stimulantium medicamentorum docent.

710. Vero omnis secretio augetur aucta actione vasorum sui organi, dummodo hæc non fuerit nimia, neque aliter valde morbosa. Hoc modo plurimæ secretiones incitantur omni stimulo admoto organis earum, vel recepto in massam sanguinis, et afficiente quasdam præ aliis partibus. Quodvis acre receptum in oculum, aut sal in os, et vivum argentum, que multa

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most physicians have supposed, and the mucous follicles in every part of the body.

709. The increased impetus of the whole blood increases little the individual secretions, except the exhalation by the skin and sweat; but these are increased in a wonderful degree, provided there be neither contraction nor other obstruction of the very minute vessels of the skin, nor cold applied to the body. The well-known effects of exercise of the body, of the heat of fevers, and of many stimulating medicines teach it.

710. But every secretion is increased by the increased action of the vessels of its own organ, provided this should not be excessive, nor otherwise very diseased. In this manner very many secretions are excited by every kind of stimulus applied to the organs of them, or received into the mass of the blood, and affecting some before other parts. Any acrid thing admitted into the eye, or salt into the mouth, and quicksilver, and many stimulating

stimulantia, imprimis diuretica, quomodocunque ingressa sint sanguinem, docent.

711. Porro, stimulus qui videretur generalis, et qui afficit universum corpus, vel forsitan animum ipsum, secundum leges consensus, sæpe intendit alias secretiones, minuit alias. Lachrymæ secernuntur copiosius solito mœrore, fel irâ: fauces sæpe arescunt utroque affectu. Saliva fluit esurienti ad conspectum vel cogitationem grati cibi; et pari ratione, plus seminis solito secernitur maribus multorum animalium ad conspectum vel odorem fœminæ pronæ in venerem; et sæpe viris a solâ imagine optatæ fœminæ, vel etiam a recordatione venerearum rerum.

712. Spasmus vel contractio, vel abnormis actio, qualiscunque fuerit, vasorum secernentis organi, aliquando impedit, aliquando auget, nonnunquam plane corrumpit, se-

multaque stimulantia, diuretica imprimis, quomodocunque sanguinem ingressa sint.

711. Porro, stimulus qui videretur generalis, et qui universum corpus, vel forsitan animum ipsum afficit, secundum consensus leges (361), secretiones alias intendit sæpe, alias minuit. Lachrymæ mœrore, fel ira, copiosius solito secernuntur: utroque affectu fauces sæpe arescunt. Saliva fluit esurienti ad conspectum vel cogitationem grati cibi; et pari ratione, seminis plus solito secernitur maribus multorum animalium, ad conspectum vel odorem fœminæ pronæ in venerem; et viris sæpe a sola imagine optatæ fœminæ, vel etiam a recordatione rerum venerearum.

712. Spasmus, vel contractio, vel actio abnormis, qualiscunque fuerit, vasorum organi secernentis, secretionem aliquando impedit, aliquando auget, nonnunquam

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things, especially diuretics, however they may have entered the blood, shew it.

711. Moreover, the stimulus which might seem general, and which affects the whole body or perhaps the mind itself, according to the laws of sympathy, often increases some secretions, diminishes others. The tears are secreted more copiously than usual from grief, the bile from anger; the fauces often grow dry in both affections. The saliva flows to a hungering person at the sight or thought of agreeable food: and, for a like reason, more semen than usual is secreted by the males of many animals at the sight or smell of the female disposed to venery: and often by men from the sole image of the desired woman, or even from the recollection of venereal matters.

712. Spasm or contraction, or an irregular action, whatever it may be, of the vessels of a secreting organ, sometimes impedes, sometimes increases, sometimes entirely depraves secretion. Spasm also of remote parts, (that

plane corrumpit. Spasmus quoque remotarum partium, (pulso scilicet sanguine a solitis, et in novas directo vias) (384, 486,) secretiones sæpe auget. Docent varii et miri urinæ et lactis affectus, ab hysteria, terrore, ira, frigore.

713. Augentur sæpe, aliquando fortasse inducuntur, secretiones quædam, stimulo, quamvis levi omnino, ductibus excernentibus admoto; sive is chemici sive mechanici generis fuerit. Ipsa manducandi actio salivam ciet, et sapor cibi, præsertim acrioris; medicamentum fortius fel movet; et infans non modo lac e mammis ducit sugendo, sed ejus secretionem promovet; aliquando etiam, ut videtur, ubi nullum fuit antea, lac venire facit.

714. Secretiones pleræque perpetuæ, et ad vitam et sanitatem necessariæ. Sunt tamen quædam, scilicet quæ generationi inserviunt,

cretionem. Spasmus quoque remotarum partium, (scilicet, sanguine pulso a solitis et directo in novas vias,) sæpe auget secretiones. Varii et miri affectus urinæ et lactis ab hysteriâ, terrore, irâ, frigore, docent.

713. Quædam secretiones sæpe augentur, aliquando fortasse inducuntur, stimulo, quamvis omnino levi, admoto excernentibus ductibus, sive is fuerit chemici sive mechanici generis. Actio ipsa manducandi ciet salivam, et sapor cibi, præsertim acrioris; fortius medicamentum movet fel; et infans sugendo, non modo ducit lac e mammis, sed promovet secretionem ejus; aliquando etiam, ut videtur, facit lac venire, ubi antea fuit nullum.

714. Pleræque secretiones perpetuæ, et necessariæ ad vitam et sanitatem. Tamen sunt quædam, scilicet, quæ inserviunt generationi, aut nutri-

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is, the blood being driven from the usual ones, and directed into new channels,) often increases the secretions. The various and wonderful affections of the urine and milk from hysteria, terror, anger, cold, shew it.

713. Some secretions often are increased, sometimes perhaps are induced, by a stimulus, although altogether slight, applied to the excreting ducts, whether it be of a chemical or mechanical kind. The action itself of chewing promotes the saliva, and the taste of food, especially the sharper; a stronger medicine excites bile; and the infant, by sucking, not only draws the milk from the breasts, but promotes the secretion of it; sometimes even, as it seems, causes milk to come, when before there was none.

714. Most of the secretions are constant, and necessary to life and health. However there are some, namely, which serve for generation, or the nutriment of the new animal, which begin and end at a certain time, and are

mento novi animalis, quæ incipiunt et desinunt certo tempore, et inducuntur certo stimulo. Masculinum semen, et genitalis humor fœminarum, si fuerit quis, vix secernuntur ante puberem ætatem; neque est vetulis genitalis vis, neque forsitan viris fere confectis senio. Lac, quoque, vix secernitur, nisi post partum: quod est tribuendum insigni consensui inter uterum et mammas.

aut nutrimento novi animalis, quæ certo tempore incipiunt et desinunt, et certo stimulo inducuntur. Semen masculinum, et genitalis humor, si quis fuerit, fœminarum, vix ante ætatem puberem secernuntur; neque vetulis vis genitalis est, neque forsitan viris senio fere confectis. Lac quoque vix secernitur nisi post partum; quod insigni inter uterum et mammas consensui tribuendum est.

715. Mirum æquilibrium observatur inter varias secretiones, ita ut aliæ augentur, fere pari ratione ac aliæ minuantur, quo est cautum ne corpus exhauriatur adeo facile et subito ut aliter fieret. Hoc est imprimis notabile inter halitum cutis et sudorem, et urinam et excretionem alvi; quamvis idem sæpe observetur in aliis secretionibus.

715. Mirum inter varias secretiones observatur æquilibrium, ita ut pari fere ratione ac aliæ augentur, aliæ minuantur, quo cautum est, ne corpus adeo facile et subito (523) ut aliter fieret exhauriatur. Hoc imprimis notabile est inter halitum cutis et sudorem, et urinam, et excretionem alvi; quamvis in aliis secretionibus idem sæpe observetur.

716. Aliis hominibus aliæ secretiones sunt, co-

716. Secretiones aliæ aliis hominibus copiosiores vel parciores,

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induced by a certain stimulus. The male semen, and the genital fluid of females, if there should be any, scarcely are secreted before the age of puberty: nor is there to old women a genital power, nor perhaps to men nearly worn out with old age. Milk, also, scarcely is secreted, except after parturition; which is to be attributed to the great sympathy between the uterus and mammæ.

715. A wonderful equilibrium is observed between the various secretions, so that some are increased, almost in an equal ratio as others are diminished, by which it is provided, lest the body be exhausted so easily and suddenly as otherwise would happen. This is especially remarkable between the exhalation of the skin and sweat, and the urine and the excretion of the belly; although the same often is observed in other secretions.

716. To some men, some secretions are more copious or more scanty,

blandiores vel acriores, sunt: et fere quo parciores, eo acriores evadunt. Infantibus omnes humores blandi et copiosi sunt, si cum iisdem humoribus in adulto homine comparati fuerint. Fœminis quoque nonnihil quam viris blandiores esse solent. Hujusmodi varietates in saliva, sudore, urina, felle, semine, sæpe observantur. Sunt quibus os semper madet, neque sitis ulla est. Sunt qui multum et fere semper sudant. Sunt quibus cutis arida est. Sunt qui multum patiuntur a felle nimis copioso aut acri. Urina aliis hominibus limpidior et blandior, aliis rubra et acris est. Semen ipsum quibusdam præter solitum olet.

717. Quamvis multum hic pendeat a prima corporis fabricatione, et varietatibus quas ætas facit, multum quoque pendet a vitæ genere, et victu quo homines utuntur.

718. Denique, status generalis

piosiores vel parciores, blandiores vel acriores; et fere quo parciores eo acriores evadunt. Infantibus omnes humores sunt blandi et copiosi, si fuerint comparati cum iisdem humoribus in adulto homine. Solent esse quoque nonnihil blandiores fœminis quam viris. Varietates hujusmodi sæpe observantur in salivâ, sudore, urinâ, felle, semine. Sunt quibus os semper madet, neque est ulla sitis. Sunt qui sudant multum, et fere semper. Sunt quibus cutis est arida. Sunt qui patiuntur multum a nimis copioso aut acri felle. Urina est limpidior et blandior aliis hominibus, rubra et acris aliis. Semen ipsum olet, præter solitum quibusdam.

717. Quamvis multum hic pendeat a primâ fabricatione corporis, et varietatibus quas ætas facit, multum quoque pendet a genere vitæ, et victu, quo homines utuntur.

718. Denique, generalis

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more bland or more acrid; and commonly the more scanty the more acrid they become. To infants all the fluids are bland and copious, if they be compared with the same fluids in an adult person. They are accustomed to be also somewhat more bland in women than men. Varieties of this kind often are observed in the saliva, sweat, urine, bile, semen. There are those in whom the mouth always is moist, nor is there any thirst. There are some who sweat much, and almost always. There are some to whom the skin is dry. There are some who suffer greatly from a too abundant or acrid bile. The urine is more limpid and bland in some persons, red and acrid in others. The semen itself smells strong, beyond what is usual in some.

717. Although much here may depend upon the original conformation of the body, and the changes which age causes, much also depends upon the kind of life, and the food which persons use.

status massæ sanguinis afficit, haud parum, humores qui derivantur ex eo. Post cibum et potum quidam humores secernuntur copiosiores, præsertim lac, et urina, et halitus cutis, et sudor. Lac, copiosissimus humor in nutrice, post inediam aliquot horarum, secernitur vel nullum, vel parcum et acre, quale infans respuerit, neque profecto suxerit impune. Vero idem fluit copiosum, et blandum, et nutriens, brevissimo spatio post cibum. Urina, quoque, fere statim ut multus potus fuerit haustus, imprimis frigidior, secernitur copiosa, quod nonnunquam observatur adeo subito, ut sit vix credibile potum ipsum pervenisse ad renes. Est probabile quendam stimulum dari renibus ipsis, per consensum quem habent cum ventriculo, et aliquem spasmum, forsan, induci remotioribus vasis, qualis dirigat plus sanguinis ad

massæ sanguinis, humores, qui ex eo derivantur, haud parum afficit. Post cibum et potum, copiosiores secernuntur humores quidam, lac præsertim, et urina, et halitus cutis, et sudor. Lac, copiosissimus in nutrice humor, post aliquot horarum inediam, vel nullum secernitur, vel parcum et acre, quale infans respuerit, neque profecto impune suxerit. Idem vero brevissimo post cibum spatio, copiosum, et blandum, et nutriens fluit. Urina quoque, statim fere ut multus potus haustus fuerit, imprimis frigidior, copiosa secernitur; quod adeo subito nonnunquam observatur, ut vix credibile sit ipsum potum ad renes pervenisse. Probabile est stimulum quendam ipsis renibus dari, per consensum quem cum ventriculo habent, et spasmum aliquem forsan induci vasis remotioribus, qualis plus sanguinis ad renes dirigat

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718. Indeed, the general condition of the mass of the blood affects not a little the fluids which are derived from it. After food and drink, certain fluids are secreted more copious, especially milk, and urine, and the exhalation of the skin, and sweat. Milk, a most abundant fluid in the nurse, after a fasting of some hours, is secreted either not at all, or sparing and acrid, such as the infant would reject, nor indeed would have sucked with impunity. But the same flows abundantly, and bland, and nutrient, in a very short time after food. The urine, also, almost as soon as much drink has been swallowed, especially the colder, is secreted abundant, which sometimes is observed so suddenly, that it can be scarcely credible that the drink itself has arrived at the kidneys. It is probable that some stimulus is given to the kidneys themselves, through the sympathy which they have with the stomach, and that some spasm, perhaps, is induced in the remoter vessels, such as may direct more blood to the kidneys, and increase the action of

(476), eorumque actionem intendat. Nec facile quisquam diu aut multum sudaverit, nisi vel humidæ admodum constitutionis fuerit, multumque humorem tenuem in venis habuerit, vel denique inter sudandum suos humores probe diluerit, corpusque impleverit, bibendo. Quin et hac ratione, diluendo nimirum, vel urinam vel sudorem movere possumus, prout corpus ipsum frigidum vel calidum servatum fuerit.

719. Postremo, inter somnum pleræque, fortasse omnes, secretiones minuuntur, scilicet quia tum motus sanguinis temperatior est, et organa secernentia, non secus ac universum corpus, minus sentiunt, et ægrius igitur et tardius ad solita munera excitantur. Quod si sudor inter somnum videtur augeri, hoc sine dubio tribuendum est vestitui calidiori, quo tum nosmet fovere solemus: multum enim abest ut

renes, que intendat actionem eorum. Nec quisquam facile sudaverit diu aut multum, nisi vel fuerit admodum humidæ constitutionis, que habuerit multum tenuem humorem in venis, vel denique probe diluerit suos humores inter sudandum, que impleverit corpus bibendo. Quin et hac ratione, nimirum, diluendo, possumus movere vel urinam vel sudorem, prout corpus ipsum fuerit servatum frigidum vel calidum.

719. Postremo, pleræque, fortasse omnes, secretiones minuuntur inter somnum, scilicet, quia tum motus sanguinis est temperatior, et secernentia organa, non secus ac universum corpus, minus sentiunt, et igitur excitantur ægrius, et tardius ad solita munera. Quod si sudor videtur augeri inter somnum, hoc, sine dubio, est tribuendum calidiori vestitui quo tum solemus fovere nosmet: enim

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them. Nor could any one easily sweat a long time or much, except either he were of a very moist constitution, and had much thin fluid in his veins, or indeed should properly dilute his fluids while sweating, and should fill the body by drinking. Moreover by this means, namely, by diluting, we can excite either the urine or sweat, according as the body itself shall be kept cold or warm.

719. Lastly, most, perhaps all, the secretions are diminished during sleep, that is, because then the motion of the blood is more moderate, and the secreting organs, in like manner as the whole body, are less sentient, and therefore are excited more difficultly, and more slowly to their usual functions. But if sweat seems to be increased during sleep, this, without doubt, is to be attributed to the warmer clothing with which then we are accustomed to warm ourselves: for much is wanting that we either sweat,

multum abest ut vel sudemus, vel calescamus, si dormimus tecti tantùm vestibus quibus vigilantes utimur.

720. Aliæ secretiones sunt copiosæ, aliæ omnino parcæ: vero quantitas singularum potest nullo modo reduci ad certas mensuras; quippe quævariet maxime, tum sano, sed multo magis morboso corpore, propter rationes memoratas. Enim, in plurimis exemplis, insignis et fere incredibilis copia salivæ, succi ventriculi, aut demum fellis, secreta est brevi tempore.

721. Neque facile judicatur de copiâ excretionum, nimirum, urinæ et sudoris, et halitus cutis et pulmonis, quamvis plurima experimenta fuerint instituta ad indagandam hanc rem, scilicet quam medici crediderint haud difficilem exploratu, et insignis utilitatis, cum ad tuendam sanitatem, tum quoque ad sanandos morbos.

vel sudemus vel calescamus, si vestibus tantum quibus vigilantes utimur tecti dormimus.

720. Secretiones aliæ copiosæ, aliæ parcæ omnino sunt: singularum vero quantitas nullo modo ad certas mensuras reduci potest; quippe quæ variet maxime tum sano, sed multo magis morboso corpore, propter rationes (716, 719) memoratas. Plurimis enim in exemplis insignis et fere incredibilis copia salivæ, succi ventriculi, aut demum fellis, brevi tempore secreta est.

721. Neque facile judicatur de copia excretionum, urinæ nimirum et sudoris, et halitus cutis et pulmonis, quamvis plurima experimenta instituta fuerint ad hanc rem indagandam, scilicet quam medici haud difficilem exploratu crediderint, et insignis utilitatis, cum ad tuendam sanitatem, tum quoque ad sanandos morbos.

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or become warm, if we sleep covered only with the clothes which when awake we use.

720. Some secretions are abundant, others altogether scanty: but the quantity of each can by no means be reduced to certain measures; as being which varies very much, even in the healthy, but much more in the diseased body, on account of the reasons mentioned. Moreover in very many examples, a remarkable and almost incredible quantity of saliva, of gastric juice, or indeed of bile, has been secreted in a short time.

721. Nor easily is judgment formed of the quantity of the excretions, for example, of the urine and sweat, and exhalation of the skin and lungs, although very many experiments have been instituted to investigate this subject, as being which physicians believed not difficult to be examined, and of great utility, as well to preserve health, as also to cure diseases.

722. Urina profecto ponderatur facile: variat autem insigniter secundum constitutionem, ætatem, vitæ genus, cibum potumque, quibus utimur; sed imprimis prout exhalatio per cutem copiosior fuerit parciorve, sive ab exercitatione aut ignavia, sive a calore aut frigore corpori admoto. Mirabile enim inter has binas excretiones observatur æquilibrium. Aliquando vix una libra urinæ, aliquando quatuor vel quinque, etiam a sano homine, quotidie redditæ sunt: in morbis vero sæpe duodecim libræ et amplius: media autem quantitas quam homo sanus reddiderit in die, erit a tribus libris ad tres cum semisse.

722. Profecto urina ponderatur facile: autem variat insigniter, secundum constitutionem, ætatem, genus vitæ, cibum que potum quibus utimur; sed imprimis prout exhalatio per cutem fuerit copiosior ve parcior, sive ab exercitatione aut ignaviâ, sive a calore aut frigore admoto corpori. Enim mirabile æquilibrium observatur inter has binas excretiones. Aliquando vix una libra urinæ, aliquando quatuor vel quinque redditæ sunt quotidie, etiam a sano homine; vero in morbis, sæpe duodecim libræ et amplius: autem media quantitas, quam sanus homo reddiderit in die, erit a tribus libris ad tres cum semisse.

723. Exhalatio per cutem et sudor pari ratione variant ac urina; sed haud ita facile vera eorum quantitas detegitur: scilicet, quia statera, excessum tantum humoris exhalati, supra eum qui eodem

723. Exhalatio per cutem et sudor variant pari ratione ac urina; sed vera quantitas eorum haud detegitur ita facile; scilicet, quia statera tantum ostendit excessum exhalati humoris, supra eum

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722. Indeed the urine is weighed easily: but it varies remarkably, according to the constitution, age, kind of life, the food and drink which we use: but especially according as the exhalation by the skin shall be more abundant or scanty, whether from exercise or idleness, or from heat or cold applied to the body. For a wonderful equilibrium is observed between these two excretions. Sometimes scarcely a single pound of urine, sometimes four or five have been voided daily, even by a healthy person: but in diseases, often twelve pounds and more: but the medium quantity, which a healthy person should void in the day, will be from three pounds to three and a half.

723. The exhalation by the skin and the sweat vary in a similar way as the urine; but the true quantity of them is not detected so easily; that is, because the balance only shews the excess of the exhaled fluid, above that which is swallowed in the same time. Nor are there wanting very certain

qui hauritur eodem tempore. Nec desunt certissima experimenta, quæ probant corpus sæpe, fortasse semper, haurire aliquid ab aëre, quod sane derogat multum Sanctorianis observationibus. Enim corpus, hoc modo, nonnunquam attrahit tantum ab aëre quantum æquaverit, vel etiam superaverit, copiam exhalationis: quod est imprimis notabile, siquis fuerit exhaustus valido labore et inediâ, vel ingente profluvio urinæ, vel hydrope recrudescente, postquam aqua fuisset educta arte.

tempore hauritur, ostendit. Nec desunt certissima experimenta quæ probant corpus sæpe, fortasse semper, haurire aliquid ab aëre: quod sane multum derogat observationibus Sanctorianis. Tantum enim hoc modo corpus ab aëre nonnunquam attrahit, quantum copiam exhalationis æquaverit, vel multum etiam superaverit: quod imprimis notabile est, siquis valido labore et inedia exhaustus fuerit, vel ingente urinæ profluvio, vel hydrope recrudescente, postquam aqua arte educta fuisset.

724. Omnis secretio, copiosior vel parcior justo, nocet, nimirum quia functio cui inservit aut impeditur tum aut saltem corrumpitur nonnihil. Sic olfactus, et gustus, et concoctio ciborum sæpe vitiantur, a nimiis aut nimis parcis humoribus narium, vel oris, vel ventriculi, vel intestinorum, vel jecoris. Excretio humoris

724. Nocet omnis secretio copiosior vel parcior justo (62); nimirum, quia tum functio, cui inservit, aut impeditur, aut saltem nonnihil corrumpitur. Sic olfactus, et gustus, et concoctio ciborum, vitiantur sæpe a nimiis aut nimis parcis narium, vel oris, vel ventriculi, vel intestinorum, vel jecoris, humoribus. Nocet quoque haud

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experiments which prove that the body often, perhaps always, absorbs something from the air, which indeed derogates much from the Sanctorian observations. For the body, in this manner sometimes attracts as much from the air as would have equalled, or even would have exceeded, the quantity of the exhalation: which is especially remarkable, if a person has been exhausted by hard labour and fasting, or a great flow of urine, or a dropsy increasing anew, after that the water had been drawn off by art.

724. Every secretion, more abundant or scanty than proper, hurts, doubtless, because the function to which it serves, either is impeded then, or at least is depraved somewhat. Thus smell, and taste, and the digestion of food often are vitiated, from the excessive or too scanty fluids of the nostrils, or of the mouth, or of the stomach, or intestines, or liver. The excretion

parum excretio humoris natura non excernendi: veluti salivæ, quam multi sæpe, non sine magno suo malo, movent præter naturam, variis quibus utuntur acribus medicamentis, et assidue exspuunt: sic corpus exhauritur exinanitione quæ omnino præter naturam est, et concoctio ciborum, deficiente quæ juvare debet saliva, ægrius perficitur.

naturâ non excernendi, quoque nocet haud parum: veluti salivæ quam multi sæpe movent præter naturam, variis acribus medicamentis quibus utuntur et assidue exspuunt, non sine suo magno malo: sic corpus exhauritur exinanitione omnino præter naturam, et concoctio ciborum perficitur ægrius, salivâ, quæ debet juvare, deficiente.

725. Quod si humores natura excernendi suppressi vel retenti fuerint, vel nimia copia excreti, urina præsertim, et halitus cutis, valetudo magis adhuc et citius afficitur (62).

725. Quod si humores, excernendi naturâ, fuerint suppressi vel retenti, vel excreti nimiâ copiâ, præsertim urina, et halitus cutis, valetudo afficitur adhuc magis et citius.

726. Exhalatio per cutem nimia fit, imprimis propter auctum sanguinis impetum (467, 468,) qui alias excretiones parum, hanc vero multum, afficit (709) vel propter solutam ipsius cutis compagem, ejusque vasa et foramina laxata et patefacta, veluti a calore, balneo

726. Exhalatio per cutem fit nimia, imprimis, propter auctum impetum sanguinis, qui afficit alias secretiones parum, vero hanc multum, vel propter solutam compagem cutis ipsius, que vasa et foramina ejus laxata et patefacta, veluti a

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of a fluid by nature not to be excerned, also hurts not a little: as of the saliva which many often excite unnaturally, by various acrid medicines which they use, and incessantly spit out, not without their own great injury: thus the body is exhausted by an evacuation wholly against nature, and the concoction of the food is performed difficultly, from the saliva, which ought to assist, being deficient.

725. But if fluids, to be excreted by nature, should be suppressed or retained, or excreted in excessive quantity, especially the urine, and exhalation of the skin, the health is affected still more and more rapidly.

726. The exhalation by the skin becomes excessive, in the first place, on account of the increased impetus of blood, which affects the other secretions little, but this a great deal, either on account of the loosened texture of the skin itself, and the vessels and the pores of it relaxed and open, as from

calore, calido balneo, laxa et flaccida constitutione corporis; vel denique, propter sanguinem dilutum multo tenui humore, quem facile dimittit atque exhalat. Hinc ratio haud obscura redditur, sudoris quarundam partium, dum aliæ arescunt, vel frigidi sudoris, qualis sæpe observatur viribus quæ movent sanguinem deficientibus, et sane haud secundo omine.

727. Excessus excretionis per cutem nocet, potissimum hac ratione, quod exhauriat debilitet, solvat corpus, laxet cutem, que reddat hominem debilem, et præter solitum sentientem, et obnoxium omnibus malis quæ proveniunt a frigore. Vero ingens sudor potest inducere syncopen, vel mortem ipsam, corpore exhausto subito, et soluto. Vero exempla haud facile ostenduntur sanguinis spissati, corrupti hoc modo, que

calido, constitutione corporis laxa et flaccida; vel denique propter sanguinem multo humore tenui dilutum, quem (715, 727,) facile dimittit atque exhalat. Hinc ratio haud obscura redditur sudoris quarundam partium dum aliæ arescunt, vel sudoris frigidi qualis sæpe observatur, deficientibus quæ sanguinem movent viribus, et sane haud secundo omine.

727. Excessus excretionis per cutem hac potissimum ratione nocet, quod corpus exhauriat, debilitet, solvat, cutem laxet, hominemque debilem et sentientem præter solitum, omnibus quæ a frigore proveniunt malis obnoxium reddat. Ingens vero sudor, exhausto subito et soluto corpore, syncopen, vel mortem ipsam, inducere potest. Haud facile vero ostenduntur exempla sanguinis hoc modo spissati, corrupti, hominum-

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heat, the warm bath, a lax and flaccid constitution of body; or lastly, on account of the blood diluted with much thin fluid, which it easily parts with and exhales. Hence a reason not obscure is rendered, of the sweat of some parts, whilst others grow dry, or of the cold sweat, such as often is observed, with the powers which circulate the blood failing, and truly with no favorable omen.

727. Excess of excretion by the skin hurts, principally for this reason, that it exhausts, debilitates, unbraces the frame, relaxes the skin, and renders a person weak, and unusually sensitive, and liable to all the mischiefs which proceed from cold. But great sweat may bring on syncope, or death itself, by the body being exhausted suddenly, and relaxed. But examples are not easily shewn of the blood being inspissated, corrupted in this manner, and of persons thus rendered disposed to fevers, inflammations, &c.

que ideo ad febres, inflammationes, &c. proclivium factorum.

728. Ingens quibusdam hominibus sudor familiaris, vixque morbosus habendus, neque sine gravi sæpe et instante periculo reprimendus. Copiosus quoque sudor multos morbos, præsertim febres, solvit: multorum vero signum et pars tantum est, scilicet qui neque solvat morbum, neque ullo modo in salutem cedat, sed, exhaustis corporis viribus, ægro potius noceat. Sola experientia docet, singulis morborum in exemplis, bonus an malus fuerit sudor qui acciderit. Scire tamen juvat eum plerumque non inutilem esse, qui generalis est, qui ad pedes usque libere fluit, tenuis, calidus, constans, qui corporis calorem temperat, quem æger bene fert, pulsusque arteriarum molliores, pleniores, tardiores, comitantur, et os et lingua humidiores, et anxietas minor, et

hominum ideo factorum proclivium ad febres, inflammationes, &c.

728. Ingens sudor est familiaris quibusdam hominibus, que vix habendus morbosus, neque reprimendus sine gravi, et sæpe instante periculo. Copiosus sudor quoque solvit multos morbos, præsertim febres: vero multorum est tantum signum et pars, scilicet qui neque solvat morbum, neque cedat in salutem ullo modo, sed potius noceat ægro, viribus corporis exhaustis. Experientia sola docet, in singulis exemplis morborum (an) sudor qui acciderit fuerit bonus an malus. Tamen, juvat scire, eum plerumque esse non inutilem, qui est generalis, qui fluit libere usque ad pedes, tenuis, calidus, constans, qui temperat calorem corporis, quem æger fert bene, que molliores, pleniores, tardiores pulsus arteriarum comitantur, et os et lingua humidiores, et anxietas

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728. Profuse sweating is common to some men, and scarcely to be considered diseased, nor to be repressed without great and often immediate danger. A copious sweat also resolves many diseases, especially fevers: but of many it is only a symptom and part, as being that which neither solves the disease, nor gives way towards health in any manner, but rather hurts the sick person, the powers of the body being exhausted. Experience alone teaches, in the individual examples of diseases, whether the sweat which has happened has been good or bad. However, it is useful to know, that, that for the most part is not injurious which is general, which flows freely down to the feet, thin, warm, constant, which moderates the heat of the body, which the patient bears well, and softer, fuller, slower pulsations of the arteries accompany, and the mouth and tongue moister, and the anxiety less, and alleviation of the general uneasiness, and the appetite for food renewed;

minor, et levamen universæ molestiæ, et appetitus cibi renovatus; contra, tenacem et glutinosum, frigidum, olidum sudorem, quarundam partium tantum veluti vultûs, aut cervicum, aut pectoris, dum reliquum corpus, et artus præsertim, arescunt, esse malum; qui multum exhaurit ægrum, neque levat morbum: nam talis exinanitio, nisi prodest, plerumque nocet. Denique, medici, edocti a Naturâ ipsâ, eliciunt arte copiosissimum sudorem, in multis morbis, sæpe cum insigni commodo ægrotantium; de quo agendum erit plenius postea suo loco.

729. Sudor que halitus cutis, haud raro observantur minutus vel suppressus. Hæ excretiones paulatim deficiunt, propter otiosum et sedentarium genus vitæ, graves affectus animi, qui valde minuunt impetum sanguinis, fere omnem debilitatem, frigidum et humidum cœlum

levamen universæ molestiæ, et cibi appetitus renovatus: contra, malum esse sudorem tenacem et glutinosum, frigidum, olidum, quarundam tantum partium, veluti vultus, aut colli, aut pectoris, dum reliquum corpus, et artus præsertim, arescunt; qui ægrum multum exhaurit, neque morbum levat: nam talis exinanitio, nisi prodest, plerumque nocet.—Denique, sudorem copiosissimum, in multis morbis, medici, a Natura ipsa edocti, arte eliciunt cum insigni sæpe ægrotantium commodo: de quo postea suo loco plenius agendum erit.

729. Minutus vel suppressus sudor halitusque cutis haud raro observantur. Deficiunt hæ excretiones paulatim propter vitæ genus otiosum et sedentarium, graves animi affectus (344, 346) qui impetum sanguinis valde minuunt, debilitatem fere omnem, cœlum aut tempus frigidum et humidum,

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on the other hand, that a tenacious and glutinous, cold, strong smelling sweat, of some parts only, as of the face, or shoulders, or breast, whilst the rest of the body, and the limbs especially, grow dry, is bad; which greatly exhausts the patient, nor relieves the disease: for such evacuation, unless it benefits, for the most part hurts. In fine, physicians, taught by Nature itself, elicit by art a most copious sweat, in many diseases often with remarkable advantage of the sick: of which we must treat more fully afterwards in its own place.

729. The sweat and exhalation of the skin, not unfrequently are observed diminished or suppressed. These excretions gradually fail, through an idle and sedentary kind of life, depressing passions of the mind, which greatly diminish the impetus of the blood, almost every kind of debility, a cold and humid climate or season, uncleanliness, a harder kind of diet, more

immunditiam, cibi genus durius, exhalatu difficilius, et demum propter plurima foramina cutis, et vasa minora, coarctata aut conclusa, veluti in senibus, quibus semper exhalatio per cutem parcior est, urina vero copiosior, pro rata parte, quam junioribus.

730. A tali defectu multa profluunt mala. Totum corpus plenum (nisi aucta alia secretio insolitam retentionem compensaverit) et hebes et languidum fit, et animus quoque demissus et tristis; nam hilaris et lætus animus exhalationem promovet, et a libera exhalatione quodammodo efficitur vicissim. Concoctio quoque ciborum vitiatur, et appetitus minuitur, propter insignem (357) inter cutem et ventriculum consensum. Denique, retenta diu materia putrescente, vel noxia saltem, quæ debuisset excerni, haud absimile est,

aut tempus, immunditiam, durius genus cibi, difficilius exhalatu, et demum, propter plurima foramina cutis, et minora vasa coarctata aut conclusa, veluti in senibus, quibus semper est parcior exhalatio per cutem, vero urina, pro ratâ parte, copiosior quam junioribus.

730. Multa mala profluunt a tali defectu. Totum corpus (nisi alia secretio aucta, compensaverit insolitam retentionem,) fit plenum, et hebes, et languidum, et animus quoque demissus et tristis; nam hilaris et lætus animus promovet exhalationem, et vicissim, quodammodo, efficitur a liberâ exhalatione. Concoctio, quoque, ciborum vitiatur, et appetitus minuitur, propter insignem consensum inter cutem et ventriculum. Denique, est haud absimile totam massam humorum corruptum iri paulatim, materiâ, quæ debuisset excerni, retenta

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difficult to be exhaled, and lastly, on account of the very many pores of the skin, and the smaller vessels being constricted or shut up, as in old men, to whom always there is a more scanty exhalation by the skin, but the urine, in proportion, is more plentiful than to younger persons.

730. Many disorders proceed from such a deficiency. The whole body, (unless some other secretion, being increased, should compensate the unusual retention,) becomes full, and dull, and languid, and the mind also cast down and sad; for a cheerful and joyful mind promotes exhalation, and in turn, in some measure, is produced by a free exhalation. The digestion, also, of the food is depraved, and the appetite is diminished, on account of the remarkable sympathy between the skin and stomach. In fine, it is not improbable that the whole mass of fluids would be corrupted gradually, by the matter, which ought to be excreted, being retained a long time, putrefying, or at least being noxious.

diu, putrescente, vel saltem noxiâ.

731. Autem sudor subito suppressus, nocet adhuc magis, et citius; non modo propter materiam quam oporteret exhalare, retentam, sed propter humores, fluentes libere ad superficiem corporis, pulsos inde, et directos in alias partes, validâ contractione vel spasmo inductis minutis vasis cutis. Hinc, febres, inflammationes, abnormes congestiones sanguinis, profluvia sanguinis, que aliæ excretiones, imprimis urinæ et alvi, auctæ et vitiatæ.

732. Exhalatio et sudor supprimuntur sæpe et subito; imprimis a frigore admoto corpori æstuanti, vel interdum a gravibus affectibus animi, que morbis generis spasmorum, veluti hysteriâ. Supprimuntur quoque aliqua contractione, ut videtur, minutis vasis cutis, inductâ quibusdam causis, veluti quæ faciunt febres,

totam massam humorum paulatim corruptum iri.

731. Subito autem suppressus sudor magis adhuc et citius nocet; non modo propter retentam materiam quam oporteret exhalare, sed propter humores ad superficiem corporis libere fluentes, inde pulsos, et in alias partes directos, valida contractione vel spasmo vasis minutis cutis inductis. Hinc sæpe febres, inflammationes, congestiones sanguinis abnormes, sanguinis profluvia, aliæque excretiones, urinæ et alvi imprimis, auctæ et vitiatæ.

732. Exhalatio et sudor sæpe et subito supprimuntur: imprimis a frigore corpori æstuanti admoto, vel interdum a gravibus animi affectibus, morbisque spasmorum generis, veluti hysteria. Supprimuntur quoque contractione aliqua, ut videtur, minutis vasis cutis inducta causis quibusdam, veluti

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731. But sweat suddenly suppressed, hurts still more, and more quickly; not only on account of the matter which it behoved to exhale being retained, but on account of the fluids, flowing plentifully to the surface of the body, being driven thence, and directed to other parts, by the strong contraction or spasm induced in the minute vessels of the skin. Hence, fevers, inflammations, irregular congestions of blood, fluxes of blood often proceed, and the other excretions, especially of the urine and bowels, increased and disordered.

732. Perspiration and sweat are suppressed often and suddenly; especially by cold applied to the body burning hot, or sometimes by depressing passions of the mind, and by diseases of the order spasms, for instance hysteria. They are suppressed also by some contraction, as it seems, in the minute vessels of the skin, induced by certain causes, as those which cause fevers,

quæ febres, tum intermittentes tum continuas, faciunt, quarum ratio parum hactenus intellecta est.

733. Urina quoque sæpe nimis copiosa est, sæpe diminuta, vel suppressa, vel ægre et cum dolore reddita, interdum etiam multum vitiata. Plurima redditur citra morbum multo humore tenui sanguinem diluente, aut plurimo sale eundem inficiente, et acriorem solito reddente, vel humoribus a corporis superficie pulsis, et in partes internas versis. Ingens sæpe urinæ profluvium oritur ab acri quovis sanguinem inficiente, et ad renes delato, ipsosque irritante; radice Scillæ maritimæ, aut Colchici autumnalis, &c. Sæpe etiam a spasmo, ut videtur, vasorum quæ sanguinem ad renes vehunt, sive ab ipsorum irritatione, veluti a calculo, sive a consensu cum aliis partibus, intestinis fortasse, aut cute, veluti in hysteria, urina lim-

tum intermittentes tum continuas, ratio quarum hactenus parum intellecta est.

733. Urina quoque est sæpe nimis copiosa, sæpe diminuta vel suppressa, vel reddita ægre, et cum dolore, interdum etiam multum vitiata. Redditur plurima, citra morbum, multo tenui humore diluente sanguinem, aut plurimo sale inficiente eundem, et reddente acriorem solito, vel humoribus pulsis a superficie corporis, et versis in internas partes. Ingens profluvium urinæ sæpe oritur, ab quovis acri inficiente sanguinem, et delato ad renes, que irritante ipsos, radice Scillæ maritimæ, aut Colchici autumnalis, &c. Sæpe, etiam, urina fluit limpida et copiosissima, a spasmo, ut videtur, vasorum quæ vehunt sanguinem ad renes, sive ab irritatione ipsorum, veluti a calculo, sive a consensu cum aliis partibus, fortasse intestinis, aut cute, veluti in

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as well intermitting as continued, the reason of which hitherto has been little understood.

733. The urine also is often too copious, often diminished or suppressed, or voided difficultly, and with pain, sometimes even much vitiated. It is voided in abundance, without disease, by much thin fluid diluting the blood, or a great deal of salt infecting the same, and rendering it more acrid than usual, or the fluids being drawn from the surface of the body, and directed to the internal parts. A great flow of urine often arises, from any acrid infecting the blood, and conveyed to the kidneys, and irritating them, by the root of the Scilla maritima, or of the Colchicum autumnale, &c. Often, also, the urine flows limpid and very copious, from spasm, as it seems, of the vessels which carry the blood to the kidneys, or from irritation of themselves, for instance from a calculus, or from sympathy with other

hysteria. Denique, a quodam vitio sæpe parum intellecto, sive renum sive aliarum partium, sive demum universi corporis, incredibilis fluxus urinæ aliquando observatus est, que ejus valde diversæ a sanâ urinâ, que continentis multum saccharum. Hoc genus morbi vocatur Diabetes, natura et causæ cujus sunt nondum plene deprehensæ: tamen, est probabile, præter vitia renum, spasmum, relaxationem, &c. quandam corruptionem universæ massæ sanguinis subesse, forsitan a pravâ concoctione, cum in ventriculo, tum quoque in pulmonibus; quoniam humor, adeo diversus a solito et naturali, derivatur a sanguine, que is, ut videtur, haud dissimilis alimentis nondum plene subactis justa concoctione.

pida et copiosissima fluit. Denique, a vitio quodam parum sæpe intellecto, sive renum, sive aliarum partium, sive demum universi corporis, incredibilis aliquando observatus est urinæ fluxus, ejusque a sana urina valde diversæ, multumque saccharum continentis. Hoc morbi genus vocatur Diabetes, cujus natura et causæ nondum plene deprehensæ sunt: tamen probabile est, præter renum vitia, spasmum, relaxationem, &c. corruptionem quandam universæ massæ sanguinis subesse, forsitan a prava concoctione, cum in ventriculo, tum quoque in pulmonibus: quoniam humor, a solito et naturali adeo diversus, a sanguine derivatur, isque, ut videtur, haud dissimilis alimentis nondum justa concoctione plene subactis.

734. Igitur ratio erit in aprico cur nimius fluxus urinæ noceat homini, nimirum viribus fractis,

734. Ratio igitur in aprico erit, cur nimius urinæ fluxus homini noceat, fractis nimirum viribus,

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parts, perhaps the intestines, or the skin, as in hysteria. In fine, from some disorder often little understood, whether of the kidneys or of other parts, or finally of the whole body, an incredible flow of urine sometimes has been observed, and of it very different from healthy urine, and containing much sugar. This kind of disease is named Diabetes, the nature and causes of which are not yet fully discovered: however, it is probable, besides the disorders of the kidneys, spasm, relaxation, &c. that some corruption of the whole mass of blood exists, perhaps from depraved concoction, as well in the stomach, as also in the lungs: because a fluid, so different from the usual and natural, is derived from the blood, and it, as it appears, not unlike to aliments not yet fully reduced by a due concoction.

734. Therefore the reason will be in the sum, why an excessive flow of urine hurts a person, truly by the strength being broken, the nutriment

impedito nutrimento, exhaustoque corpore. Neque profecto mirum est, quosdam tali morbo succubuisse; et affectionem vix intellectam ægerrime sanari, vel sæpe omnino insanabilem esse.

735. Urinæ autem profluvium, quamvis haud exiguum, plerumque levis omnino momenti est et fugax malum, hysteria, aliisque nervosi generis morbis laborantibus familiare. Juvabit quoque novisse nonnullos morbos, febres aliquando, et hydropem varii generis, tali profluvio solvi. Quocirca factum est, ut medicis fere solenne fuerit ad statum urinæ ægrotantium, imprimis febricitantium, respicere, multique operam dederint, ut ejus varietatum rationem rederent, variorumque eventuum quos crederent ex iis prædici. Multum vero abest ut medici nostris temporibus tantum hujusmodi signis confidant quantum majores

nutrimento impedito, que corpore exhausto. Neque, profecto est mirum quosdam succubuisse tali morb ; et affectionem vix intellectam sanari ægerrime, vel esse sæpe omnino insabilem.

735. Autem profluvium urinæ, quamvis haud exiguum, plerumque est omnino levis momenti, et fugax malum familiare laborantibus hysteriâ, que aliis morbis nervosi generis. Juvabit, quoque, novisse nonnullos morbos, febres allquando, et hydropem, varii generis, solvi tali profluvio. Quocirca factum est, ut fuerit fere solenne medicis respicere ad statum urinæ ægrotantium, imprimis febricitantium, que multi dederint operam ut redderent rationem varietatum ejus, que variorum eventuum quos crederent prædici ex iis. Vero multum abest ut medici, nostris temporibus, confidant tantum quantum majores confisi essent signis hujus-

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impeded, and the body exhausted. Nor, indeed, is it wonderful that some should have sunk under such a disease; and that an affection scarcely understood should be cured with great difficulty, or should be often wholly, incurable.

735. But a flow of urine, although not small, frequently is of altogether slight importance, and a transient disorder common to those suffering from hysteria, and other diseases of the nervous system. It will benefit, also, to know that some diseases, fevers sometimes, and dropsy, of various description, are resolved by such a flow. Wherefore it was established, that it was almost a statute with physicians to look to the state of the urine of sick persons, especially of feverish patients, and many bestowed labour that they might render an account of the varieties of it, and of the various events which they believed were predicted by them. But much is wanting that physicians, in our times, confide so much as our ancestors confided to signs

modi. Vero est non dubium, notitiam istarum varietatum fore interdum haud mediocris utilitatis sagaci et solerti medico, qui non spreverit vel minima.

736. Postremo, ratio suasit, et experientia satis comprobavit, movere urinam præter solitum, arte, esse non inutile, in plurimis morbis; ratio cujus rei est reddenda suo loco.

737. Urina sæpe supprimitur, cum insigni incommodo, et sane instante periculo ægrotantis, nisi secretio vel excretio ejus fuerit brevi restituta. Hoc malum, cui nomen Ischuria datur, alii solent distinguere bifariam, alii quadrifariam. Refert parum quot species morbi numeraverint, dummodo habeant bene perspectum multiplex malum interdum ducere originem a variis vitiis renum, ureterum, vesicæ, urethræ, que vicinarum aut conspirantium vitiis, interdum originem ducere. Sic irri-

confisi essent. Non dubium vero est, notitiam istarum varietatum sagaci et solerti medico, qui vel minima non spreverit, haud mediocris interdum utilitatis fore.

736. Postremo, ratio suasit, et experientia satis comprobavit, plurimis in morbis non inutile esse urinam præter solitum arte movere; cujus rei ratio suo loco reddenda est.

737. Urina sæpe supprimitur, cum insigni ægrotantis incommodo, et sane instante periculo, nisi brevi restituta fuerit ejus secretio vel excretio. Malum hoc, cui nomen Ischuria datur, bifariam alii, alii quadrifariam, distinguere solent. Parum refert quot morbi species numeraverint, dummodo bene perspectum habeant, multiplex malum, a variis renum, ureterum, vesicæ, urethræ, partiumque vicinarum aut conspirantium vitiis, interdum originem ducere. Sic irri-

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of this sort. But it is not doubtful, that the knowledge of those changes would be sometimes of no small utility to the sagacious and skilful physician, who will not despise even the most trifling things.

736. Lastly, reason has advised, and experience has sufficiently proved, that to excite the urine beyond usual, by art, was not useless in very many diseases; the reason of which thing is to be rendered in its own place.

737. The urine often is suppressed, with great disadvantage, and indeed the imminent hazard of the patient, unless the secretion or excretion of it shall be quickly restored. This disorder, to which the name Ischuria is given, some are accustomed to distinguish in a twofold, some in a fourfold manner. It matters little how many species of the disease they have enumerated, provided they have it clearly understood that this complicated disorder sometimes draws its origin from various diseases of the kidneys, of

tatio aliqua, vel obstructio, vel alterius, vel utriusque renis, vel ureteris, a calculo, sabulo, muco, sanguine, inflammatione, suppuratione, schirro, spasmo, partium vicinarum tumore et compressione, veluti a distentis visceribus et utero, aut ipso abdomine, a fœtu, vel stercore, vel aëre, vel aqua; vel non sinunt urinam secerni, vel parcius justo, et sæpe multum mutatam: vel denique ejusdem jam secretæ iter ad vesicam impediunt.

738. Quin et urina in vesicam jam delata ibi haud raro reprimitur, propter varia hujus organi vitia, irritationem sæpe, vel inflammationem, vel spasmum, veluti a calculo, aut acribus ingestis, aut consensu cum partibus vicinis; vel propter læsam ipsius vesicæ fabricam, veluti ab hernia aut laceratione, vel propter debilitatem aut paralysin ejus fibrarum, ut in pa-

tium partium. Sic aliqua irritatio vel obstructio vel alterius vel utriusque renis, vel ureteris, a calculo, sabulo, muco, sanguine, inflammatione, suppuratione, scirrho, spasmo, tumore, et compressione vicinarum partium, veluti a visceribus, et utero, aut abdomine ipso, distentis a fœtu, vel stercore, vel aëre, vel aquâ; vel non sinunt urinam secerni, vel parcius justo, et sæpe multum mutatam; vel, denique, impediunt iter ejusdem jam secretæ, ad vesicam.

738. Quin et urina jam delata in vesicam, haud raro reprimitur ibi, propter varia vitia hujus organi, sæpe irritationem, vel inflammationem, vel spasmum, veluti a calculo, aut acribus ingestis, aut consensu cum vicinis partibus; vel propter læsam fabricam vesicæ ipsius, veluti ab hernia aut laceratione, vel propter debilitatem, aut paralysin fibrarum ejus, vero nonnun-

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the ureters, of the bladder, urethra, and of the neighbouring or sympathising parts. Thus any irritation or obstruction either of one or both kidneys, or of the ureter, from calculus, sand, mucus, blood, inflammation, suppuration, scirrhus, spasm, swelling, and compression of the contiguous parts, as from the viscera, and uterus, or the abdomen itself, being distended by the fœtus, or fæces, or air, or water, either do not permit the urine to be secreted, or more sparingly than proper, and often much changed; or, finally, prevent the passage of the same already secreted, to the bladder.

738. Moreover the urine already conveyed into the bladder, not unfrequently is retained there, by reason of the various disorders of this organ, often irritation, or inflammation, or spasm, as from calculus, or acrid things being ingested, or sympathy with the neighbouring parts; or on account of the injured structure of the bladder itself, as from hernia or laceration, or on account of debility, or paralysis of the fibres of it, but sometimes from

quam a nimiâ distentione, citra paralysin cujusvis alius partis, ut observatur in generali paralysi; vel demum propter vesicam ipsam callosam, scirrhosam, ulceratam, vel propter plurimum pus, aut crassiorem sanguinem, ve mucum, vel calculum, obstruentia collum vesicæ, vel denique, propter haud pauca vitia urethræ, obstructæ, coarctatæ, vel concrescentis. Mala cujusmodi nonnunquam observata sunt, sine ullâ notâ causâ, vero sæpe post venereos morbos imperite tractatos, imprimis gonorrhœam virulentam, sanatam vel suppressam per varia medicamenta, præsertim astringentia et acria, vel etiam satis blanda, infusa in urethram.

ralysi generali, nonnunquam vero a nimia distentione, citra alius cujusvis partis paralysin, (324,) observatur; vel demum propter vesicam ipsam callosam, schirrosam, ulceratam, vel propter plurimum pus, aut sanguinem mucumve crassiorem, vel calculum, collum vesicæ obstruentia, vel denique propter vitia haud pauca urethræ, obstructæ, vel coarctatæ, vel concrescentis, cujusmodi mala nonnunquam observata sunt sine ulla nota causa, sæpe vero post morbos venereos imperite tractatos, gonorrhœam virulentam imprimis, per varia medicamenta, præsertim astringentia et acria, vel etiam satis blanda, in urethram infusa, sanatam vel suppressam.

739. Postremo, urina reprimitur in vesica a generali stupore, cerebro habente se male, veluti in quibusdam febribus, sicubi æger neque potest

739. Postremo, a stupore generali (143, 173) cerebro male se habente (295) veluti in febribus quibusdam, urina reprimitur in vesica, sicubi æger neque solitum

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excessive distention, without paralysis of any other part, as is observed in general paralysis; or even on account of the bladder itself being callous, scirrhous, ulcerated, or on account of a great deal of pus, or thicker blood, or mucus, or calculus, obstructing the neck of the bladder, or lastly, by reason of the no few diseases of the urethra, obstructed, constringed, or growing together. Diseases of which sort sometimes have been observed, without any known cause, but often after venereal diseases unskilfully treated, especially virulent gonorrhœa, cured or suppressed by various medicines, particularly astringent and acrid, or even sufficiently bland, injected into the urethra.

739. Lastly, the urine is retained in the bladder from general stupor, the brain having itself badly, as in certain fevers, whenever the patient neither can perceive the ordinary stimulus, nor even a much more powerful one,

stimulum, ne quidem multo graviorem percipere potest, neque fibræ ipsius vesicæ in contractionem cientur; quo fit ut hæc tandem adeo distendatur, ut paralytica facta, vix aut ne vix quidem ad justam contractionem iterum excitari possit. Signum in febribus, et sane omnibus morbis, semper malum, nonnunquam fere lethale.

740. A suppressa diu urina, quicquid demum ejus vitii causa fuerit, ingens oritur, et fere incredibilis aliquando, vesicæ distentio, oppressio, molestia, dolor, non ipsius modo, sed partium vicinarum, et sane universi corporis; et spasmus forsan, vel contractio insuperabilis musculi qui vesicæ ostium claudit, debilitas aut vera paralysis (324, 81) aliarum fibrarum quæ contrahentes eam deplere solent, ita ut ne quidem immissa fistula ad educendam urinam, hæc profluat;

percipere solitum stimulum, ne quidem multo graviorem, neque fibræ vesicæ ipsius cientur in contractionem; quo fit ut hæc tandem adeo distendatur, ut facta paralytica, possit vix, aut ne quidem vix, excitari iterum ad justam contractionem. Signum in febribus, et sane omnibus morbis, semper malum, nonnunquam fere lethale.

740. Ingens, et aliquando fere incredibilis distentio vesicæ, oppressio, molestia, dolor, non modo ipsius, sed vicinarum partium, et sane universi corporis, oritur a urinâ suppressâ diu, quicquid demum fuerit causa ejus vitii; et forsan spasmus, vel insuperabilis contractio musculi qui claudit ostium vesicæ, debilitas, aut vera paralysis aliarum fibrarum, quæ contrahentes solent deplere eam, ita ut fistulâ immissâ ad educendam urinam quidem, hæc ne pro-

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nor are the fibres of the bladder itself excited into contraction; whence it happens that this at length is so distended that, rendered paralytic, it can scarcely, or not even scarcely, be excited again to a due contraction. A symptom in fevers, and indeed all diseases, invariably bad, sometimes almost deadly.

740. A great, and sometimes almost incredible distention of the bladder, oppression, uneasiness, pain, not only of itself, but of the neighbouring parts, and indeed of the whole body, arises from the urine being suppressed a long time, whatever indeed may have been the cause of that disorder; and perhaps spasm, or an insuperable contraction of the muscle which closes the mouth of the bladder, debility, or true paralysis of the other fibres, which contracting are accustomed to empty it, so that on the catheter being introduced to draw off the urine even, this does not flow forth; inflammation

fluat; inflammatio vesicæ, et gangræna, aut laceratio; primo, gravis irritatio universi corporis, deinde nausea, vomitus, vertigo, generalis stupor, inundatio totius massæ sanguinis, humore instar urinæ, qui demum effunditur in varia cava corporis, et capitis ipsius, inducturus soporem, tremores, convulsiones, et brevi mortem.

741. Urina redditur ægre et cum dolore, ab iisdem, sed minus violentis, causis, scilicet, omni insolitâ irritatione, inflammatione, ulcere, callo, calculo, vesicæ, muco ejus abraso, aut facto morbido, quibusdam acribus medicamentis: morbis vicinarum partium; quod genus mali vocatur Dysuria. Urina, quoque, sæpe redditur rubra, nigra, sanguinolenta, purulenta, mucosa, sabulosa: ratio omnium quarum rerum est haud obscura.

742. Frequentissimum

inflammatio vesicæ, et gangræna aut laceratio; universi corporis gravis primo irritatio, deinde nausea, vomitus, vertigo, stupor generalis, inundatio totius massæ sanguinis humore instar urinæ (525, 526, 540) qui demum in varia cava corporis et capitis ipsius effunditur, soporem, tremores, convulsiones, et mortem brevi inducturus.

741. Ab iisdem causis, sed minus violentis, omni scilicet irritatione insolita, inflammatione, ulcere, callo, calculo, vesicæ, muco ejus abraso, aut morbido facto, acribus quibusdam medicamentis, morbis vicinarum partium, urina ægre et cum dolore redditur; quod mali genus Dysuria vocatur. Urina quoque sæpe rubra, nigra, sanguinolenta, purulenta, mucosa, sabulosa, redditur: quarum rerum omnium haud obscura est ratio.

742. Frequentissimum mingendi

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of the bladder, and gangrene, or laceration; at first, severe irritation of the whole body, afterwards nausea, vomiting, vertigo, general stupor, inundation of the whole mass of blood, with a fluid like urine, which at length is poured out into the different cavities of the body, and of the head itself, about to induce sopor, tremors, convulsions, and quickly death.

741. The urine is voided with difficulty and with pain, from the same, but less violent, causes, namely, every unusual irritation, inflammation, ulcer, callus, calculus of the bladder, the mucus of it being abraded, or rendered morbid, by certain acrid medicines: by diseases of contiguous parts; which kind of disorder is called Dysuria. The urine, also, often is voided red, black, bloody, purulent, mucous, sandy: the reason of all which things is not obscure.

742. A very frequent disorder of making water, happens when a trouble-

vitium accidit, ubi molesta fere perpetua et inexplebilis urinæ reddendæ cupiditas urget, quamvis paucæ tantum guttulæ excernantur, plerumque non sine dolore aliquo. Hoc malum Stranguria vocatur. Acria quædam, etiam in sano homine, hoc vitium sæpe inducunt; malum senibus familiare est, qui sæpe a renibus et vesica variis modis laborant; oritur sæpe a calculo vesicam irritante, aut ipsa vesica inflammata, ulcerata, suo muco orbata, vel hoc propriis vitiis corrupto, vel denique a morbis aut statu peculiari partium vicinarum, aut consentientium, veluti uteri, vaginæ, urethræ, glandulæ prostatæ, intestini recti, renum, inflammatione, tenesmo, calculo, prolapsu, graviditate.

743. Huic quodammodo affinis est alia, neque rara meiendi affectio, scilicet ubi lotium, ut decet,

vitium mingendi, accidit ubi molesta, fere perpetua, et inexplebilis cupiditas reddendæ urinæ, urget, quamvis tantum paucæ guttulæ excernantur, plerumque, non sine aliquo dolore. Hoc malum vocatur Stranguria. Quædam acria sæpe inducunt hoc vitium, etiam in sano homine; malum est familiare senibus, qui sæpe laborant a renibus et vesicâ, variis modis; sæpe oritur a calculo irritante vesicam, aut vesicâ ipsâ inflammatâ, ulceratâ, orbatâ suo muco, vel hoc corrupto propriis vitiis, vel denique a morbis, aut peculiari statu vicinarum aut consentientium partium, veluti uteri, vaginæ, urethræ, prostatæ glandulæ, intestini recti, renum inflammatione, tenesmo, calculo, prolapsu, graviditate.

743. Quodammodo affinis huic est alia, neque rara affectio meiendi, scilicet, ubi lotium nequit

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some, almost perpetual, and insatiable desire of voiding the urine, troubles, although only a few little drops are excreted, for the most part, not without some pain. This disorder is called Strangury. Certain acrids often bring on this disorder, even in a healthy person; the disorder is common to old men, who often suffer from the kidneys and bladder, in various ways; often it arises from a calculus irritating the bladder, or the bladder itself being inflamed, ulcerated, deprived of its mucus, or this being corrupted by its own disorders, or in fine by the diseases, or the peculiar state the neighbouring or sympathising parts, as of the uterus, of the vagina, urethra, prostate gland, intestinum rectum, kidneys from inflammation, tenesmus, calculus, prolapsus, pregnancy.

743. In some degree akin to this is another, nor rare affection of making urine, that is, when the urine cannot be retained as it ought, and be excreted

retineri ut decet, et excerni justâ copiâ et tempore, sed ægrotante vel nolente, vel prorsus inscio, redditur propriâ actione suorum organorum, nullo imperio voluntatis adhibito, ut solet in sanis; aliquando effluit assidue, et fere guttatim, ægro inscio, quod strictius vocatur incontinentia urinæ, vero interdum urina retinetur aliquamdiu, tandem profluxura, majore copiâ, quamvis ægrotante adhuc invito, vel saltem inscio.

744. Homo sæpe fit incontinens urinæ propter debilitatem, paralysin, ulcus, vulnus, gravem et diuturnam irritationem vesicæ, præsertim musculi qui præponitur ostio ejus, veluti a calculo, aut generali paralysi, aut difficili partu, inferente magnam vim vicinis partibus. Simile vitium observatur in plurimis morbis, imprimis in febribus, et hydrope capitis, ubi est tantus sopor, ut æger non percipiat propensionem,

retineri nequit, et justa copia et tempore excerni, sed vel nolente vel inscio prorsus ægrotante, propria suorum organorum actione redditur, nullo, ut in sanis solet, adhibito voluntatis imperio; et aliquando inscio ægro, assidue, fere guttatim effluit, quod strictius incontinentia urinæ vocatur; interdum vero urina retinetur aliquamdiu, majore copia, quamvis invito adhuc vel inscio saltem ægrotante, tandem profluxura.

744. Homo urinæ incontinens sæpe fit, propter debilitatem, paralysin, ulcus, vulnus, gravem et diuturnam irritationem vesicæ, præsertim musculi qui ostio ejus præponitur, veluti a calculo, aut paralysi generali, aut partu difficili magnam vim partibus vicinis inferente. Simile vitium in plurimis morbis observatur, imprimis in febribus et hydrope capitis, ubi tantus sopor est, ut æger propen-

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in the due quantity and time, but the sick person either being unwilling, or wholly unconscious, it is voided by the proper action of its own organs, no control of the will being applied, as is accustomed in healthy persons; sometimes it flows out constantly, and almost drop by drop, the patient being unconscious, which more strictly is called incontinence of urine, but sometimes the urine is retained for some time, at length to flow forth, in greater quantity, although the patient being as yet unwilling, or at least unconscious of it.

744. A person often becomes incontinent of urine on account of debility, paralysis, ulcer, wound, severe and continued irritation of the bladder, especially of the muscle which is set before the mouth of it, as from a calculus, or general paralysis, or difficult parturition, doing great violence to the contiguous parts. A similar disorder is observed in many diseases, especially in fevers, and dropsy of the head, where there is so much sopor,

sionem non percipiat, quamvis solito stimulo vesica ipsa, et qui cum eo consentiunt musculi respirationis, pareant. Par fere ratio est, cur multi pueri urinam non bene retinent, præsertim inter somnum, alioquin sanissimi: nimirum, quibus secretiones magis copiosæ sunt, et somni altiores haud adeo faciles ruptu, et fibræ omnes musculorum mobiliores, et igitur vesica amplificationis magis impatiens quam adultis. Urina nonnunquam ægre continetur propter tumores partium vicinarum vesicam comprimentes, veluti graviditatem. Aliquando præter naturam ejicitur violentissime, vel spasmis generalibus, vel vehementibus contractionibus musculorum respirationis, quales totum abdomen valde comprimunt, veluti in tussi, sternutatione, risu, partu, &c.

745. Denique, inter urinæ vitia annumerare oportet calculorum

quamvis vesica ipsa, et musculi respirationis qui consentiunt cum eo, pareant solito stimulo. Ratio est fere par cur multi pueri, alioquin sanissimi, non bene retinent urinam, præsertim inter somnum: nimirum quibus sunt secretiones magis copiosæ, et somni altiores, haud adeo faciles ruptu, et omnes fibræ musculorum mobiliores, et igitur vesica magis impatiens amplificationis quam adultis. Urina nonnunquam continetur ægre, propter tumores vicinarum partium comprimentes vesicam, veluti graviditatem. Aliquando ejicitur violentissime, præter naturam, vel generalibus spasmis, vel vehementibus contractionibus musculorum respirationis, quales valde comprimunt totum abdomen, veluti in tussi, sternutatione, risu, partu, &c.

745. Denique oportet annumerare, inter vitia urinæ, formationem cal-

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that the patient cannot perceive the propensity, although the bladder itself, and the muscles of respiration which sympathise with it, obey the usual stimulus. The reason is almost similar why many children, otherwise very healthy, do not well retain their urine, especially during sleep: as being persons to whom the secretions are more abundant, and the slumbers deeper, not so easy to be broken, and all the fibres of the muscles more irritable, and therefore the bladder more impatient of enlargement than in adults. The urine sometimes is retained with difficulty, because of tumours of the neighbouring parts compressing the bladder, as pregnancy. Sometimes it is ejected very violently, beyond nature, either by general spasms, or by violent contractions of the muscles of respiration, such as greatly compress the entire abdomen, as in cough, sneezing, laughing, parturition, &c.

745. In fine it behoves to reckon, amongst the disorders of the urine, the

culorum, quales solent facessere tot que tanta mala. Urina, præter aquam que sales, continet haud exiguam portionem terræ, et glutinosæ partis sanguinis, jam nonnihil corruptæ, et pronæ in ulteriorem corruptionem.

746. Hinc fit ut urina, etiam sanissimi hominis, dum frigescit, deponat copiosum sedimentum, quale solet brevi incrustare matulam. In sano homine urina demittit nihil istiusmodi intra corpus, vero si vel minimum frustum cujusvis solidæ materiæ fuerit immissum in vesicam, et relictum ibi, tegitur brevi tali crustâ, et paulatim crescit in magnam molem. Est probabile quædam vitia humorum, forsitan parum intellecta, aliquando subesse, et multum augere proclivitatem ad formandum calculum. Enim probe constat, non modo morbum sæpe observari congenitum et hereditarium

formationem, quales tot tantaque mala facessere solent (63). Urina, præter aquam salesque, portionem haud exiguam continet terræ et glutinosæ partis sanguinis, jam nonnihil corruptæ, et in ulteriorem corruptionem pronæ.

746. Hinc fit, ut sanissimi etiam hominis urina, copiosum, dum frigescit, sedimentum deponat, quale matulam brevi solet incrustare. In sano homine, urina intra corpus nihil istiusmodi demittit: si vero frustum vel minimum cujusvis materiæ solidæ in vesicam immissum, et ibi relictum fuerit, brevi tegitur tali crusta, et crescit paulatim in magnam molem. Probabile est, vitia quædam humorum, parum forsitan intellecta, aliquando subesse, et proclivitatem ad calculum formandum multum augere. Probe enim constat, morbum non modo congenitum sæpe, et hæreditarium observari, verum etiam

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formation of calculi, such as are accustomed to produce so many and such great diseases. The urine, besides water and salts, contains no small portion of earth, and of the glutinous part of the blood, already somewhat corrupted, and prone to farther corruption.

746. Hence it happens that the urine even of the most healthy person, whilst it is cooling, deposits a copious sediment, such as is accustomed quickly to incrust the urinal. In a healthy person the urine throws down nothing of that sort within the body, but if even the smallest fragment of any solid matter should be introduced into the bladder, and left there, it is covered quickly with such a crust, and gradually grows into a great bulk. It is probable that some diseases of the fluids, perhaps little understood, sometimes are present, and greatly increase the proneness to form the calculus. Moreover it is well established, not only that the disease often is observed

homines qui calculo laborant sæpius ventriculi morbis, acori imprimis, obnoxios esse, multosque eorum haud exiguum levamen accepisse a variis remediis, qualia acorem in ventriculo et intestinis vel impediant, vel ibi jam existentem corrigant. Porro, olim et nuper opinio fuit, aliud victus, et potus præsertim, genus, vina acida, vel vina e pomis parata, &c. homines calculosos facere, aliud, eos fere incolumes a tali morbo præstare. Quamvis hæc omnia minus firma sint, tamen non est negandum, urinam aliis atque aliis hominibus plus minus sabulosam esse, et vel plus materiæ concrescentis continere, vel eam quam continet facilius demittere, vel ipsam demum facilius in talem materiam converti.

rium, verum etiam homines qui laborant calculo esse sæpius obnoxios morbis ventriculi, imprimis acori, que multos eorum accepisse haud exiguum levamen a variis remediis, qualia vel impediant acorem in ventriculo et intestinis, vel corrigant jam existentem ibi. Porro, fuit olim et nuper opinio, aliud genus victûs, et præsertim potûs, acida vina, vel vina parata e pomis, &c. facere homines calculosos, aliud fere præstare eos incolumes a tali morbo. Quamvis omnia hæc sint minus firma, tamen est non negandum, urinam esse plus minus sabulosam aliis atque aliis hominibus, et vel continere plus concrescentis materiæ, vel facilius demittere eam quam continet, vel ipsam demum, facilius converti in talem materiam.

747. Præterea, a variis causis, quibusdam præ cæteris hominibus, nuclei in viis quas urina subit for-

747. Præterea, a variis causis, quibusdam hominibus præ cæteris, nuclei, quales fuerint fundamenta

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congenital and hereditary, but also that men who suffer from calculus are very often liable to diseases of the stomach, especially acidity, and that many of them have received no slight relief from different remedies, such as either prevent acidity in the stomach and intestines, or correct it already existing there. Moreover, it was formerly and lately the opinion, that one kind of food, and especially of drink, acid wines, or wines prepared from apples, &c. rendered men calculous, that a different one commonly preserves them safe from such a disease. Although all these things may be less established, however it is not to be denied, that the urine is more or less sandy in different persons, and either that it contains more of the concreting matter, or that it more easily throws down that which it contains, or that itself, in fine, more readily is converted into such a material.

747. Besides, from various causes, in some persons before others, the

calculorum, formabuntur in viis quas urina subit. Sic, mucus ipse renum, vel secretus, morbosus, propter vitia suorum organorum, puta inflammationem, vel jam secretus, spissatus, aut coactus in crassiorem massam, vel sanguis, vel gluten, vel pus, delapsa e vasis, propter relaxationem aut inflammationem, aut demum concretiones, vel minimæ formatæ in rene, dabunt nucleos.

748. Vero concretiones hujusmodi, utcunque exiguæ primo, indies crescunt, propter rationes memoratas. Sæpe descendunt sponte e renibus, sine magno dolore aut incommodo, neque commorantur in vesica, sed brevi excernuntur cum urinâ. Vero sæpius hærent in renibus donec adeptæ fuerint molem tantam, quanta descenderit ægre per ureterem. Aliquando latent diu in rene, nocentes parum, neque suspectæ primabuntur, quales fundamenta fuerint calculorum. Sic mucus ipse renum, vel morbosus secretus, propter vitia suorum organorum, puta inflammationem, vel jam secretus, spissatus, aut coactus in massam crassiorem, vel sanguis, vel gluten, vel pus, e vasis delapsa, propter relaxationem aut inflammationem; aut in rene demum concretiones vel minimæ formatæ, nucleos dabunt.

748. Hujusmodi vero concretiones, utcunque primo exiguæ, indies crescunt, propter rationes (746) memoratas. Sæpe descendunt e renibus sponte, sine magno dolore aut incommodo, neque in vesica commorantur, sed brevi cum urina excernuntur. Sæpius vero in renibus hærent, donec tantam adeptæ fuerint molem, quanta ægre per ureterem descenderit. Diu aliquando in rene latent, parum nocentes, neque prius sus-

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nuclei, such as may be foundations of calculi, will be formed in the passages which the urine passes through. Thus, the mucus itself of the kidneys, either secreted, diseased, on account of the disorders of its own organs, for instance inflammation, either already secreted, thickened, or congealed into a thicker mass, or blood, or gluten, or pus, having escaped from the vessels, by reason of relaxation or inflammation, or finally concretions, even the smallest formed in the kidney, will afford nuclei.

748. But concretions of this sort, however small at first, daily increase, by reason of the causes mentioned. Often they descend spontaneously from the kidneys, without great pain or inconvenience, nor do they remain in the bladder, but quickly are excreted with the urine. But more often they remain in the kidneys until they have acquired a size so great, as will descend with difficulty by the ureter. Sometimes they lie hid a long time

pectæ, quam in ureterem delapsæ hunc irritent et obstruant, renemque vel alterum vel utrumque per consensum afficiant, et totum corpus convellant. Hinc ingens et dira malorum cohors: dolor sæpe immanis ureteris, renum, partiumque vicinarum, nausea, vomitus, concoctio ciborum depravata, contractio ureteris, qui fibris moventibus instruitur, obstructio urinæ, gravis irritatio, sæpe inflammatio, aliquando suppuratio renis, stranguria, dysuria, ischuria, urina limpida interdum, sæpe mucosa, quasi purulenta, vel sanguinolenta, vel nigra, et febris aliquando vehemens; nonnunquam tabes renalis, mira aliquando corruptio, obstructio, tumor, macies, fere destructio renis, ita ut alter aliquando aperto cadavere defuisse visus fuerit. Sæpe etiam, dum calculus in uretere hæret, vel ægrius per eum descendit, dolor ad testem, vel

usquam delapsæ in ureterem, irritent et obstruant hunc, que afficiant vel alterum vel utrumque renem per consensum, et convellant totum corpus. Hinc ingens et dira cohors malorum: sæpe immanis dolor, ureteris, renum, que vicinarum partium, nausea, vomitus, depravata concoctio ciborum, contractio ureteris, qui instruitur moventibus fibris, obstructio urinæ, gravis irritatio, sæpe inflammatio, aliquando suppuratio renis, stranguria, dysuria, ischuria, urina interdum limpida, sæpe mucosa, quasi purulenta, vel sanguinolenta, vel nigra, et febris aliquando vehemens; nonnunquam renalis tabes, aliquando mira corruptio, obstructio, tumor, macies, fere destructio renis, ita ut alter aliquando visus fuerit, cadavere aperto defuisse. Sæpe, etiam, dum calculus hæret in uretere, vel descendit ægrius per eum, dolor propagatur ad tes-

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in the kidney, injuring little, nor suspected before that having fallen down into the ureter, they irritate and obstruct this, and affect either one or both kidneys by sympathy, and convulse the whole body. Hence a great and dreadful train of diseases; often severe pain, of the ureter, of the kidneys, and contiguous parts, nausea, vomiting, depraved concoction of the food, contraction of the ureter, which is furnished with moving fibres, obstruction of urine, severe irritation, often inflammation, sometimes suppuration of the kidney, strangury, dysuria, ischuria, the urine sometimes limpid, often mucus, as if purulent, or bloody, or black, and the fever sometimes intense; sometimes renal tabes, sometimes a wonderful corruption, obstruction, tumour, wasting, almost destruction of the kidney, so that the one sometimes has seemed, on the dead body being opened, to have been wanting. Often, also, whilst the calculus sticks in the ureter, or descends more difficultly through it, pain is propagated to the testicle, or leg of the same

tem, vel crus ejusdem lateris; vero ægri frequentius conqueruntur de stupore cruris, et sensu quasi testis esset retractus. Hæc signa, ipsa profecto levis momenti, ducentia originem a spermaticâ fune, jacente proxime sub uretere, compressâ, vel saltem a quibusdam ramulis, nervorum, forsan minutissimis, tendentibus per psoam musculum ad testem vel crus, irritatis vel compressis, sive ab meatu ipso urinæ distento plurimum, sive a isto musculo, propter viciniam atque consensum cum parte laborante, tumente, vel fortasse inflammato, tamen jure vindicant sibi attentionem medici, quatenus, plerumque, manifeste declarent naturam morbi, stipati signis cæteroquin nonnunquam ambiguis.

crus ejusdem lateris, propagatur: frequentius vero de stupore cruris, et sensu quasi testis retractus esset, conqueruntur ægri. Hæc signa, ipsa profecto levis momenti, a compressa fune spermatica, proxime sub uretere jacente, vel saltem a ramulis quibusdam, forsan minutissimis, nervorum per psoam musculum ad testem vel crus tendentibus, irritatis, vel compressis, sive ab ipso meatu urinæ plurimum distento, sive a musculo isto propter viciniam atque consensum (362) cum parte laborante, tumente, vel fortasse inflammato, originem ducentia, medici tamen attentionem jure sibi vindicant, quatenus naturam morbi, ambiguis cæteroquin signis nonnunquam stipati, manifeste plerumque declarent.

749. Causa tot malorum est satis in aprico: neque ratio obscura, quâ calculus paulatim descendat, lotio urgente, et meatu ipso

749. Causa tot malorum satis in aprico est; neque obscura ratio qua calculus paulatim descendat, urgente lotio, et distento aut re-

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side; but the patients more frequently complain of numbness of the leg, and a feeling as if the testicle was drawn up. These signs, themselves indeed of slight importance, deriving their origin from the spermacetic cord, lying close under the ureter, being compressed, or at least from some little branches, of nerves, perhaps very minute, going through the psoas muscle to the testicle or leg, being irritated or compressed, or from the meatus itself of urine being distended very much, or from that muscle, on account of the vicinity and sympathy with the part suffering, swelling, or perhaps being inflamed, nevertheless properly claim to themselves the attention of the physician, inasmuch as, for the most part, they manifestly announce the nature of a disease, accompanied with symptoms otherwise sometimes doubtful.

749. The cause of so many disorders is sufficiently evident: nor is the principle obscure, by which a calculus gradually descends, by the urine forcing

laxato ipso urinæ meatu: neque obscurior medendi ratio ad mitiganda singula mala quæ maxime urgent, vel expediendum calculi descensum, remediis quæ inflammationem et febrem summoveant vel temperent, quæ sensum minuant, irritationem tollant, contractionem ipsius meatus solvant, totum corpus laxent, intestina depleant, vomitum compescant, viasque quas urina subit eluant, ipsam urinam diluant, ejusque organa irritata et dolentia foveant et oblinant gummoso aut glutinoso humore, qui naturalis muci, vi morbi abrasi, officio fungatur.

750. Hoc modo ab instanti periculo præcavetur: parum vero proficitur, si in vesica calculus hæserit, quia tum paulatim crescens brevi excerni nequit, et gravem irritationem, dolorem tum vesicæ, sed magis adhuc ostii urethræ, stranguriam, dysuriam, ischuriam,

urinæ distento aut relaxato: neque ratio medendi obscurior, ad mitiganda singula mala quæ urgent maxime, vel expediendum descensum calculi, remediis quæ summoveant vel temperent inflammationem et febrem, quæ minuant sensum, tollant irritationem, solvant contractionem meatûs ipsius, laxent totum corpus, depleant intestina, compescant vomitum, que eluant vias quas urina subit, diluant urinam ipsam, que foveant irritata et dolentia organa ejus, et oblinant gummoso aut glutinoso humore, qui fungatur officio naturalis muci, abrasi vi morbi.

750. Hoc modo præcavetur ab instanti periculo: vero proficitur parum, si calculus hæserit in vesicâ, quia tum, crescens paulatim, nequit brevi excerni, et inducit gravem irritationem, tum dolorem vesicæ, sed adhuc magis ostii urethræ, stranguri-

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it, and the meatus itself of urine being distended or relaxed: nor is the method of curing more obscure, to mitigate the individual evils which urge most, or facilitate the descent of the calculus, by remedies which can remove or moderate inflammation and fever, which can lessen sensibility, carry off irritation, relax the contraction of the meatus itself, unbrace the whole body, empty the intestines, restrain vomiting, and wash out the channels which the urine passes, dilute the urine itself, and foment the irritated and painful organs of it, and anoint them with a gummy or glutinous fluid, which may perform the office of the natural mucus, carried off by the violence of the disease.

750. In this manner it is guarded from instant danger: but little is gained, if the calculus should stop in the bladder, because then, increasing by degrees, it cannot quickly be excreted, and brings on severe irritation, then pain of the bladder, but still more of the orifice of the urethra, strangury,

am, dysuriam, ischuriam, incontinentiam urinæ, inflammationem, suppurationem, ulcus, gangrænam, callum vesicæ, et tandem (nisi æger citius succumbat his malis,) viribus miseri exhaustis perpetuo dolore et irritatione, lentam febrem, hecticam, maciem et tabem, tarde fortasse, sed certe lethales.

751. Postremo, non prætereundum est silentio, secernentia organa, quæ strictius vocantur Glandulæ, esse, præ reliquis partibus corporis, obnoxia obstructioni, et quibusdam diris malis quæ profluunt ex eâ.

752. Hinc sæpe insignis tumor, et mira durities, non modo sine dolore, sed sæpe cum minuto sensu affectæ partis; quod genus mali vocatur Schirrhus. Idem aliquando manet diu sine dolore, vel sane ullâ molestiâ: vero ocyus serius incipit dolere, et quidem acerrime; paulatim abit in tardam atque ma-

incontinentiam urinæ, inflammationem, suppurationem, ulcus, gangrænam, callum vesicæ, inducit, et tandem (nisi his malis citius æger succumbat) exhaustis miseri viribus, perpetuo dolore et irritatione, febrem lentam, hecticam, maciem, et tabem, tarde fortasse, sed certe lethales.

751. Postremo, silentio non est prætereundum, organa secernentia, quæ strictius Glandulæ vocantur, obstructioni, et diris quibusdam quæ ex ea profluunt malis, præ reliquis partibus corporis obnoxia esse.

752. Hinc sæpe tumor insignis, et mira durities, non modo sine dolore, sed sæpe cum minuto partis affectæ sensu; quod mali genus Schirrhus vocatur. Idem diu aliquando manet sine dolore, vel sane ulla molestia: serius ocyus vero dolere incipit, et quidem acerrime; paulatim in suppurationem tardam

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dysuria, ischuria, incontinence of urine, inflammation, suppuration, ulcer, gangrene, callus of the bladder, and at length (unless the patient quickly yields to these evils,) the powers of the wretched person being exhausted by constant pain and irritation, slow fever, hectic, emaciation and wasting, slowly perhaps, but certainly fatal.

751. Lastly, we must not pass over in silence, that the secreting organs, which more strictly are called Glands, are, compared with the remaining parts of the body, liable to obstruction, and some terrible disorders which proceed from it.

752. Hence often great swelling, and wonderful hardness, not only without pain, but frequently with diminished sensibility of the affected part: which kind of disorder is called Schirrhus. The same sometimes remains a long time without pain, or truly any inconvenience: but sooner or later it begins

atque malignam abit, et tandem ulcus horrendum fit, non modo partem primo affectam consumens, sed vicinas omnes depascens, et totum corpus acerrimo et immedicabili veneno corrumpens. Hoc Carcinoma vocatur, nonnunquam subito lethale, erosa scilicet magna arteria aut vena, plerumque vero lentam et miserandam tabem, interdum cum febre hectica certissime exitiali, inducturum.

753. Ratio horrendi mali hactenus obscura est. Credibile tamen videtur, fabricam glandularum motum sanguinis in iis præter solitum languidum reddere: unde facilior obstructio, et imperfecta et maligna suppuratio. Porro, constitutio corporis peculiaris, sæpe congenita et hæreditaria, homines huic morbo opportunos reddit: constitutio scilicet debilis, et languida, et torpida. Strumosi quoque, diro huic morbo, præ aliis

lignam suppurationem, et tandem fit horrendum ulcus, primo non modo consumens affectam partem, sed depascens omnes vicinas, et corrumpens totum corpus acerrimo et immedicabili veneno. Hoc vocatur Carcinoma, nonnunquam subito lethale, scilicet magnâ arteriâ aut venâ erosâ, vero plerumque inducturum lentam et miserandam tabem, interdum cum hecticâ febre, certissime exitiali.

753. Ratio horrendi mali hactenus est obscura. Tamen, videtur credibile, fabricam glandularum reddere motum sanguinis præter solitum languidum in iis: unde obstructio facilior, et imperfecta et maligna suppuratio. Porro, peculiaris constitutio corporis, sæpe congenita et hæreditaria, reddit homines opportunos huic morbo: scilicet, debilis, et languida, et torpida constitutio. Strumosi, quoque, observantur esse, præ aliis

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to be painful, and indeed very acutely so; by degrees it goes off into slow and malignant suppuration, and at length becomes a horrible ulcer, at first not only consuming the affected part, but feeding upon all the contiguous parts, and corrupting the whole body with a very acrid and incurable poison. This is called Carcinoma, sometimes suddenly fatal, that is, by a large artery or vein being eroded, but generally about to bring on slow and miserable wasting, sometimes with hectic fever, most certainly fatal.

753. The cause of this horrid disease as yet is obscure. However, it seems credible, that the structure of the glands renders the motion of the blood unusually languid in them: whence obstruction is more easy, and there is an imperfect and malignant suppuration. Moreover, a peculiar constitution of body, often congenital and hereditary, renders persons liable to this disease: that is, a weak, and languid, and torpid constitution. Strumous persons, also, are observed to be, more than other persons, liable to this

hominibus, obnoxii huic diro morbo. Morbus est multo frequentior in vetulis quam junioribus, que in iis qui fuerint vel debilitati ignaviâ, vel exhausti nimio et perpetuo labore: et in iis, demum, qui tolerant vitam pravo victu, parum nutriente, difficili concoctu; vel, denique, quibus graves et diuturni affectus animi multum fregerint omnes vires, præsertim quæ movent sanguinem.

754. Schirrhus sæpe incipit sine notâ externâ causâ; aliquando accedit post inflammationem non bene resolutam; sæpius oritur a externâ vi illatâ parti refertæ glandulis; neque ratio harum rerum obscura, nimirum quæ lædant fabricam glandulæ, que sæpe obstruant eam. Hic, omnibus rite perpensis, non erit mirum morbum, etiam incipientem, difficillimum sanatu, tandem inveteratum, evadere insanabilem.

hominibus, obnoxii esse observantur. In vetulis quam junioribus multo frequentior est morbus, inque iis qui vel ignavia debilitati fuerint, vel nimio et perpetuo labore exhausti: et in iis demum qui victu pravo, parum nutriente, difficili concoctu, vitam tolerant, vel denique quibus animi affectus graves et diuturni, vires omnes, præsertim quæ sanguinem movent, multum fregerint.

754. Incipit sæpe schirrhus sine nota causa externa; aliquando post inflammationem non bene resolutam accedit; sæpius a vi externa parti glandulis refertæ illata oritur: neque harum rerum obscura ratio, nimirum quæ fabricam glandulæ lædant, eamque sæpe obstruant. His omnibus rite perpensis, non mirum erit morbum, etiam incipientem sanatu difficillimum, inveteratum tandem, insanabilem evadere.

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dreadful disease. The disease is by much more frequent in old women than in younger, and in those who have been either debilitated by idleness, or exhausted by excessive and constant labour: and in those, at length, who support their life with a depraved diet, no way nourishing, difficult to be digested: or, lastly, in whom severe and long continued affections of the mind have greatly broken down all the powers, especially those which circulate the blood.

754. Scirrhus often begins without a known external cause; sometimes it comes on after inflammation not well resolved; more frequently it arises from external violence done to a part full of glands; nor is the reason of these things obscure, as being which injure the structure of the gland, and often obstruct it. Here, all things being rightly considered, it will not be wonderful that the disease, even when beginning, is very difficult to be cured, at length inveterate, becomes incurable.

Cap. XXI.—*De generandi facultate in utroque sexu, variisque ejus et quæ ei inserviunt organorum affectionibus morbosis.*

755. Quoniam singuli, secundum Naturæ leges, homines, labentibus annis, senescunt et moriuntur; ne genus ipsum pereat, cautum est, mirabili facultate qua homo et omne animal fruitur, ex sese prolem sui similem gignendi (12, 13).

756. Quamvis nemo hominum hoc ultimum Naturæ arcanum hactenus perscrutatus sit, neque fortasse cuiquam mortalium rei adeo obscuræ penitus explorandæ aut explanandæ unquam facultas fuerit; tamen operæ pretium omnis medicus facturus est, qui res veras singulares, huc pertinentes, didi-

Cap. XXI.—*De facultate generandi in utroque sexu, que variis morbosis affectionibus ejûs, et organorum quæ inserviunt ei.*

755. Quoniam singuli homines, annis labentibus, senescunt et moriuntur, secundum leges Naturæ; cautum est, genus ipsum ne pereat, mirabili facultate quâ homo et omne animal fruitur gignendi prolem ex sese, similem sui.

756. Quamvis nemo hominum hactenus perscrutatus sit hoc ultimum arcanum Naturæ, neque fortasse unquam fuerit, cuiquam mortalium, facultas explorandæ aut explanandæ penitus rei adeo obscuræ; tamen, omnis medicus facturus est pretium operæ qui didicerit singulares res veras, perti-

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Chap. XXI.—*Of the faculty of generating in both sex, and the various diseased affections of it, and of the organs which are subservient to it.*

755. Because individual men, the years gliding on, grow old and die, according to the laws of Nature; it has been provided, that the race itself should not perish, by the wonderful faculty which man and every animal enjoys of generating an offspring from itself, like itself.

756. Although no one hitherto has thoroughly investigated this last secret of Nature, nor perhaps ever will there be, to any one of mortals, the power of examining or of explaining thoroughly a subject so obscure; nevertheless, every physician is about to reap the reward of his labour who will learn the individual truths pertaining to this subject, however scanty and imperfect, which either reason has taught, or observation has proved: especially since

nentes huc, utcunque exiguas et imperfectas, quas vel ratio docuit, vel observatio comprobavit; præsertim quum non modo functio ipsa, haud levis momenti, sit obnoxia suis vitiis, sed status quoque partium quæ inserviunt eidem, multum afficiat universum corpus, que sæpe vel inducat varios morbos, vel solvat jam urgentes.

757. Primâ ætate est nulla genitalis vis: vero, certâ ætate, plerumque circa decimum quartum annum, quum compago corporis, jam facta firmior, que quædam partes, ut videtur, appropinquantes ad justam formam et magnitudinem, dirigunt cursum sanguinis alio, masculina genitalia organa, prius inutilia et parva, et crescentia lente cum reliquo corpore, tantum pro rata parte, subito mutantur, crescunt, et evolvuntur, facta idonea ad propria munera. Tum pubes venit, que fœcundum secerit, utcunque exiguas et imperfectas, quas vel ratio docuit, vel observatio comprobavit: præsertim quum non modo ipsa haud levis momenti functio suis obnoxia sit vitiis, sed status quoque partium, quæ eidem inserviunt, universum corpus multum afficiat, variosque sæpe morbos vel inducat (52), vel jam urgentes solvat.

757. Prima ætate, nulla vis genitalis est: certa vero ætate, plerumque circa decimum quartum annum, quum jam compago corporis firmior facta, partesque, ut videtur, quædam ad justam formam et magnitudinem, appropinquantes, sanguinis cursum alio dirigunt, organa genitalia masculina prius inutilia, et parva, et lente, pro rata tantum parte, cum reliquo corpore crescentia, mutantur subito, crescunt, et evolvuntur, ad propria munera idonea facta. Tum pubes venit, semenque fœcundum

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not only the function itself, of no slight moment, is liable to its own disorders, but the condition also of the parts which are subservient to the same, may greatly affect the entire body, and often either induce various diseases, or resolve them already troubling.

757. At the first age there is no generative power: but, at a certain age, generally about the fourteenth year, when the frame of the body, now become more firm, and certain parts, as it seems, approaching to their due shape and size, direct the current of the blood elsewhere, the male generative organs, before useless and small, and growing slowly with the rest of the body, only in proportion to the part, suddenly are changed, grow, and are evolved, rendered fitted to their proper functions. Then the hair of the pubes comes, and a fruitful semen is secreted, by the stimulus of which the youth is excited to the agreeable functions of Venery.

secernitur, cujus stimulo adolescens ad grata Veneris munera incitatur.

758. Hoc stimulo quem multa juvant, multa augent, nimirum quæ imaginationem accendunt, secundum consensus leges, sanguinis cursus genitalia organa versus augetur, quo tandem sanguine copiosiore per arterias influente, quam per venas reducitur (422), inguen tumet, riget, et glans demum plurimo sanguine turgida acutissimum sensum adipiscitur (143, 170); ita ut levis ejusdem titillatio, qualis in Venere fuerit, vehementissimum sensum et voluptatem det, totumque genus nervosum mirum in modum convellat, musculosque præsertim vicinos, levatores ani dictos, ad contractionem cieat, qua tandem compressione vesiculæ seminales, ductusque deferentes exprimuntur atque deplentur. Semen quoque,

men secernitur, stimulo cujus adolescens incitatur ad grata munera Veneris.

758. Hoc stimulo, quem multa juvant, multa augent, nimirum, quæ accendunt imaginationem, secundum leges consensûs, cursus sanguinis versus genitalia organa augetur, quo sanguine tandem influente per arterias, copiosiore quam reducitur per venas, inguen tumet, riget, et glans, demum, turgida plurimo sanguine, adipiscitur acutissimum sensum; ita ut levis titillatio ejusdem, qualis fuerit in Venere, det vehementissimum sensum et voluptatem, que convellat totum nervosum genus in mirum modum, que præsertim cieat vicinos musculos, dictos levatores ani, ad contractionem, quâ compressione, tandem, vesiculæ seminales que deferentes ductus exprimuntur, atque deplentur. Semen, quoque, ut videtur,

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758. By this stimulus, which many things assist, many increase, namely, which inflame the imagination, according to the laws of sympathy, the current of the blood towards the genital organs is increased, by which blood at length flowing in by the arteries, more copious than it is brought back by the veins, the yard swells, stiffens, and the gland, in fine, turgid with a great deal of blood, acquires a very acute sensibility; so that a slight tickling of the same, such as may be in Venery, produces a most exquisite sensation and pleasure, and agitates the whole nervous system to a wonderful degree, and especially excites the contiguous muscles, named levatores ani, to contraction, by which compression, at length, the vesiculæ seminales and excretory ducts are squeezed, and are emptied. The semen also, as it seems, is secreted more copious, at the same time, in the testicles them-

secernitur copiosius, eodem tempore, in testibus ipsis, per auctam actionem vasorum quæ efficiunt eos ex maximâ parte; et effunditur ex his in urethram: vero ibi effusum vel recta ex testibus, vel ex vesiculis seminalibus, dat novum stimulum, cui accelerator musculus voluntarii motûs in reddendâ urina, organum inviti motûs in expellendo semine, paret, validâ et repetitâ contractione cujus semen ejicitur tandem insigni vi, nimirum quanta fuerit sat ad projiciendum fœcundum humorem qua debet penetrare, vel saltem in uterum.

ut videtur, eodem tempore copiosius in ipsis testibus secernitur, per auctam actionem vasorum quæ eos maxima ex parte efficiunt; et ex his in urethram effunditur: ibi vero vel recta ex testibus, vel ex vesiculis seminalibus, effusum, novum dat stimulum, cui musculus accelerator paret, in reddenda urina voluntarii motus, in expellendo semine inviti motus organum, cujus contractione valida et repetita, semen tandem ejicitur insigni vi, quanta nimirum sat fuerit ad humorem fœcundum, qua debet penetrare, vel saltem in uterum, projiciendum.

759. Neque accelerator musculus solus convellitur: plerumque levis tremor aut convulsio, vero aliquando vehementissima convulsio omnium musculorum, observatur in venere: hinc anhelatio, palpitatio, syncope, nonnunquam epilepsia, vel

759. Neque solus accelerator musculus convellitur; levis plerumque tremor aut convulsio, aliquando vero vehementissima convulsio omnium musculorum, in Venere observatur: hinc anhelatio, palpitatio, syncope, epilepsia nonnunquam, vel demum subita mors,

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selves, by the increased action of the vessels which form them for the greatest part; and is poured out from these into the urethra: but there poured out either directly from the testicles, or from the vesiculæ seminales, gives a new stimulus, which the accelerator, a muscle of voluntary motion in voiding the urine, an organ of involuntary motion in expelling the semen, obeys, by the powerful and repeated contraction of which the semen is ejected at length with great force, truly as much as is sufficient to propel the fruitful fluid where it ought to penetrate, or at least into the uterus.

759. Nor is the accelerator muscle alone convulsed: generally a slight tremor or convulsion, but sometimes a very violent convulsion of all the muscles, is observed during venery: hence panting, palpitation, syncope,

quæ nonnullos Veneris cultu occupatos, nec tale quidquam timentes, abripuit.

760. Finito opere, corpus nonnihil semper languet, aliquando diu: inguen detumet, sanguine parciore affluente, copiosiore per venas resumpto; cupido pacatur, irritatio summovetur, corpus solvitur, et somnus facilius obrepit.

761. Tardius pubescunt homines in regionibus frigidis, maturius in calidis. Pubertas quoque tardior venit pueris valido labore occupatis, et victu parco et tenui utentibus; maturior fere laute viventibus et luxuriosis. Eadem sæpe festinatur non bene, colloquiis aut cogitationibus quæ imaginationem accendunt, vel turpi usu partium, priusquam Veneris arma vibrare fas sit.

762. Neque sola genitalia organa mutantur pubertate: totum corpus graves, et sæpe saluberrimas, mu-

demum subita mors, quæ abripuit nonnullos occupatos cultu Veneris nec timentes quidquam tale.

760. Opere finito, corpus semper languet nonnihil, aliquando diu; inguen detumet, sanguine affluente parciore, resumpto copiosiore per venas; cupido pacatur, irritatio summovetur, corpus solvitur, et somnus obrepit facilius.

761. Homines pubescent tardius in frigidis regionibus, maturius in calidis. Pubertas quoque venit tardior in pueris occupatis valido labore et utentibus parco et tenui victu; maturior fere viventibus laute et luxuriosis. Eadem sæpe festinatur non bene colloquiis aut cogitationibus quæ accendunt imaginationem, vel turpi usu partium priusquam sit fas vibrare arma Veneris.

762. Neque genitalia organa sola mutantur pubertate; totum corpus subit graves et sæpe salu-

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sometimes epilepsy, or even sudden death, which has snatched away some engaged in the worship of Venus nor fearing any such thing.

760. The work being finished, the body always is languid in some degree, sometimes for a long time; the penis subsides, the blood flowing more sparing, being taken up more copious by the veins; the desire is appeased, irritation is removed, the body is relaxed, and sleep steals on more easily.

761. Men arrive at puberty more slowly in cold regions, more early in warm ones. Puberty also comes on slower in boys occupied in hard labour and using a scanty and thin diet; earlier commonly in those living sumptuously and in the luxurious. The same often is hastened not advantageously by conversation or thoughts which inflame the imagination, or by a base use of the parts before that it is permitted to brandish the arms of Venus.

berrimas mutationes. Barba pullulat, vox fit gravis et magis sonora, corpus evadit firmius et validius, et sæpe crescit multum et subito, que multi morbi provenientes vel a nimiâ laxitate solidarum partium, vel a mobilitate nervosi generis, convulsiones, struma, &c. sæpe evanescunt suâ sponte. Quin et nova vis accedit æque animo ac corpori, que puerilibus moribus exutis juvenis brevi induit viriles. Vero nihil hujusmodi accidit eunucho; neque vox mutatur, neque barba venit; et corpus manet debile, et raro adipiscitur justam formam; et ipsi fere sunt languidi, que levis, mollis, effœminati animi. Igitur est non dubium istas mutationes que similes sed adhuc majores quæ observantur in aliis animalibus quodammodo pendere a pubertate et secretione seminis, quacunque ratione demum fiant. Refert parum sive semen fuerit

tationes subit. Barba pullulat, vox fit gravis et magis sonora, corpus firmius et validius evadit, et sæpe multum et subito crescit, multique morbi, vel a nimia laxitate partium solidarum, vel a mobilitate generis nervosi provenientes, convulsiones, struma, &c. sæpe sua sponte evanescunt. Quin et nova vis animo æque ac corpori accedit, moribusque puerilibus exutis, juvenis brevi viriles induit. Eunucho vero nihil hujusmodi accidit: neque vox mutatur, neque barba venit: et corpus debile manet, et raro justam formam adipiscitur; et ipsi fere languidi sunt, animique levis, mollis, effœminati. Non dubium igitur est, istas mutationes, similesque sed majores adhuc, quæ in aliis animalibus observantur, a pubertate et secretione seminis quodammodo pendere, quacunque demum ratione fiant. Parum refert, sive retentum

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702. Nor are the genital organs alone changed at puberty: the whole body undergoes serious and often very healthy changes. The beard shoots out, the voice becomes grave and more sonorous, the body becomes firmer and more powerful, and often grows much and suddenly, and many diseases proceeding either from excessive laxity of the solid parts, or from irritability of the nervous system, convulsions, struma, &c. often vanish of their own accord. Moreover a new vigour comes as well to the mind as to the body, and the boyish habits being put off the youth quickly puts on manly ones. But nothing of that sort happens to the eunuch; nor is the voice changed, nor does the beard come; and the body remains weak, and rarely acquires a proper shape; and they themselves generally are languid, and of a light, soft, effeminate mind. Therefore it is not doubtful that those changes and the similar but still greater ones which are observed in other animals in some degree depend upon puberty and the secretion of the semen, in what-

fuerit diu, sive justa Venere exhaustum semen. Hæc vero nimis culta valde nocet, præsertim junioribus, quorum animos pariter ac corpora multum degenerat: cujus rei ratio haud obscura erit, siquis secum reputaverit quanta vis universo corpori, et generi nervoso imprimis, inferatur Venere.

763. Florente ætate, et virili, homines ad Venerem optime valent. Prima senectute apti adhuc, sed pigriores ad Veneris prælia. Summa vero senectute Venus aut nulla est, aut sterilis, et elumbi et exsucco corpori gravis, neque fere impune toleranda; nimirum quia senibus sensus omnis deficit, et vis nervosa minor est, et sanguinis motus languidior, et secretiones fere parciores, imprimis seminis, musculique qui hoc ejiciunt debiles, et fere paralytici, propter innumera horum organum partiumque vicinarum mala, quibus senectus obnoxia est

retentum diu sive exhaustum justâ venere, Vero hæc nimis culta valde nocet, præsertim junioribus, animos quorum pariter ac corpora multum degenerat: ratio cujus rei erit haud obscura siquis reputaverit secum quanta vis inferatur universo corpori et imprimis nervosi generi venere.

763. Homines optime valent ad venerem florente et virili ætate. Primâ senectute adhuc apti sed pigriores ad prælia Veneris. Vero summa senectute Venus aut est nulla aut sterilis; et gravis elumbi et exsucco corpori, neque fere toleranda impune; quia nimirum omnis sensus deficit senibus et nervosa vis est minor et motus sanguinis languidior, et secretiones, fere parciores imprimis seminis, que musculi qui ejiciunt hoc, debiles et fere paralytici, propter innumera mala horum organorum que vicinarum partium, qui-

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ever manner indeed they happen. It matters little whether the semen have been retained for a long time or exhausted by proper venery. But this too much cultivated greatly hurts, especially young persons, the minds of whom, alike as the bodies, it greatly degenerates: the cause of which thing will not be obscure if one will consider how much force is thrown into the whole body and especially to the nervous system by venery.

763. Men are best able for venery in flowering and manly age. In commencing old age, they are still fit but more sluggish for the battles of Venus. But in ripe old age, Venus either is none or sterile, and oppressive to the loin-less and sapless frame, nor scarcely to be endured with impunity; because indeed every sense fails in old men, and the nervous power is less, and the motion of the blood more languid, and the secretions commonly more scanty, especially of the semen, and the muscles which eject this, weak and almost paralytic, on account of the numberless diseases of these

bus senectus est obnoxia. Autem differentia hominum de his rebus magna; enim exempla decantantur senum merentium strenuissime in castris Veneris postquam compleverant centum annos; neque sane dubium, aut adeo rarum octogenarium fieri patrem.

(715). Magna autem de his rebus hominum differentia: decantantur enim exempla senum, in castris Veneris strenuissime merentium, postquam centum annos compleverant: neque sane dubium, aut adeo rarum octogenarium patrem fieri.

764. Facultas generandi aliquando deficit maribus, et est nulla cupido, neque inguen unquam arrigit neque semen emittitur, propter vitia organorum fere ignota, puta, pravam fabricam, derivatam ab naturâ ipsâ, vel defectum sensûs vel secretionis. Vero talis impotentia sæpius oritur ab aliis morbis genitalium partium, lue venereâ, vel fabricâ læsâ a contusione aut vulnere; haud raro visa est oriri a nimiâ, præsertim solitariâ venere, scilicet cui est nullus modus.

764. Deficit aliquando maribus generandi facultas, et nulla cupido est, neque unquam arrigit inguen, neque semen emittitur, propter vitia fere ignota organorum, puta pravam ab ipsa natura derivatam fabricam, vel defectum sensus vel secretionis. Sæpius vero talis impotentia oritur ab aliis partium genitalium morbis, lue venerea, vel læsa fabrica a contusione aut vulnere: haud raro oriri visa est a nimia venere, præsertim solitaria, scilicet, cui nullus modus est.

765. Est verisimile viros aliquando esse steriles a vitio seminis, quamvis

765. Verisimile est, viros aliquando steriles esse a vitio seminis,

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organs and of the neighbouring parts, to which old age is liable. But the difference of men on these things is great; for examples are related of old men serving very vigorously in the camps of Venus after that they had completed a hundred years; nor indeed is it doubtful, or so uncommon that the octogenarian becomes a father.

764. The faculty of generating sometimes fails in males, and there is no desire, nor does the penis ever rise up, nor is the semen emitted, on account of defects of the organs commonly unknown, for instance, a depraved structure, derived from nature itself, or a defect of feeling or of secretion. But such impotence more frequently arises from other diseases of the genital organs, as lues venerea, or the structure being injured by contusion or a wound; not unfrequently it has seemed to arise from excessive, especially solitary venery, namely to which there is no moderation.

quamvis nulla organorum vitia appareant, et ipsi ad Venerem probe valeant; multaque exempla ostenderunt, non omnem virum cum omni fœmina fœcundum esse, quamvis uterque cum aliis satis foret fœcundus.

766. Nonnunquam inguen pertinaciter et cum dolore arrigit, vel citra cupidinem, vel cum ingente et inexplebili libidine. Rarum vitii genus, cui nomina Tentigo, Priapismus, Satyriasis dantur. Oritur fere a gravi irritatione ipsius membri, vel partium vicinarum, vesicæ præsertim, vel acribus medicamentis, veluti cantharidibus, sumptis, stimulatæ, vel multa et acriore urina distentæ: hinc levior tentigo expergiscentibus, alioquin sanissimis, neque libidinosis, familiaris: hinc quoque inguen sæpe riget infantibus puerisque impuberibus, quamvis nondum ita evolva-

nulla vitia organorum appareant, et ipsi probe valeant ad venerem, quæ multa exempla ostenderunt omnem virum esse non fœcundum cum omni fœminâ, quamvis uterque foret satis fœcundus cum aliis.

766. Inguen nonnunquam arrigit pertinaciter et cum dolore, vel citra cupidinem, vel cum ingente et inexplebili libidine. Rarum genus vitii, cui nomina Tentigo, Priapismus, Satyriasis, dantur. Oritur fere a gravi irritatione membri ipsius, vel vicinarum partium, præsertim vesicæ, vel stimulatæ acribus medicamentis, veluti cantharidibus, sumptis, vel distentæ multâ et acriore urinâ: hinc levior tentigo familiaris expergiscentibus, alioquin sanissimis, neque libidinosis: hinc quoque inguen sæpe riget infantibus quæ pueris impuberibus, quamvis fabrica ejus nondum ita evolvatur ut

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765. It is probable that men sometimes are sterile from a fault of the semen, although no disorders of the organs may appear, and they themselves may be quite competent for venery, and many examples have shewn that, every man is not fruitful with every woman, although each would be sufficiently fruitful with others.

766. The penis sometimes is obstinately erect, and with pain, or without desire, or with great and insatiable lust. A rare kind of disorder, to which the names Tentigo, Priapism, Satyriasis, are given. It arises mostly from severe irritation of the member itself, or of the contiguous parts, especially of the bladder, either stimulated by acrid medicines, as cantharides, being taken, or distended with much and very acrid urine: hence the slighter erection common to persons waking, otherwise very healthy, nor lustful: hence also the penis often stiffens in children and boys under puberty

tumeat et arrigat, sicut solet viris.

767. Fere eâdem ætate quâ pueri pubescunt, puellæ solent fieri nubiles: genitalia organa evolvuntur, et valent ad propria munera: pubes venit, mammæ efflorescunt, nova venustas accedunt ori, nova elegantia universæ formæ. Valetudo, quoque, siquando fuisset antea infirmior, sæpe et subito vertitur in meliorem, non secus ac accidit adolescentibus alterius sexûs. Vero multum abest ut tanta mutatio universi corporis accidat fœminis quanta observetur in viris. Enim neque vox mutatur, neque barba venit, neque eadem vis et robur contingunt aut corpori aut animo: et nunc demum differentia sexuum, quod ad constitutionem corporis, in infantibus fere nulla, in pueris atque puellis obscura, neque semper observanda, manifeste prodit se.

tur ejus fabrica, ut tumeat et arrigat, sicut viris solet.

767. Eadem fere ætate qua pueri pubescunt, puellæ solent nubiles fieri: genitalia organa evolvuntur, et ad propria munera valent; pubes venit, mammæ efflorescunt, nova venustas ori, nova elegantia universæ formæ accedunt. Valetudo quoque, siquando antea infirmior fuisset, sæpe et subito in meliorem vertitur, non secus ac adolescentibus alterius sexus accidit. Multum vero abest ut tanta universi corporis mutatio fœminis accidat, quanta in viris observetur. Neque enim vox mutatur, neque barba venit, neque eadem vis et robur aut corpori aut animo contingunt: et nunc demum differentia sexuum, quod ad corporis constitutionem, in infantibus fere nulla, in pueris atque puellis obscura neque semper observanda, manifeste se prodit.

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although the structure of it may not yet be so evolved that it can swell and erect itself, as is accustomed to men.

767. Almost at the same age in which boys arrive at puberty, girls are accustomed to become marriageable: the genital organs are evolved, and are adequate to their proper functions: the hair of the pubes comes, the breasts shoot forth, a new beauty comes to the face, a new grace to the whole figure. The health, also, if it had been previously more infirm, often and suddenly is changed into better, in like manner as happens to young persons of the other sex. But much is wanting that so great a change of the whole body befalls women as is observed in men. For neither is the voice changed, nor does the beard come, nor do the same strength and vigour befall either body or the mind: and now at length the difference of the sexes, as to the constitution of the body, in infants almost none, in boys and girls obscure, nor always to be observed, manifestly exhibits itself.

768. Gravissima autem in intimis puellæ visceribus mutatio absolvitur, qua uterus, prius inutile organum, pauxillum sanguinis singulis mensibus effundat, et idoneus evadat ad prolem suscipiendam, et gestandam, et alendam, donec suo tempore in auras lucemque prodeat.

769. Multum disputatum est inter medicos, quo pacto menses evenirent, et quo consilio rerum magna Parens solis fœminis adeo iniquam ut videtur legem tulisset. Nondum enim constat, num aliis quoque animalibus menses contingant; si ullis, certe paucissimis, iisque tantum quæ generi humano simillima sunt.

770. Nemo sanus conatus fuerit rationem reddere, cur talis fœminis, iisque solis, fabrica data fuerit, qualis hujusmodi fluxum efficiat: neque medici est istiusmodi arcana perscrutari. Sat erit si quænam ista fabrica sit, explicaverit, et

768. Autem gravissima mutatio absolvitur in intimis visceribus puellæ, quâ uterus, prius inutile organum, effundat pauxillum sanguinis singulis mensibus, et evadat idoneus ad suscipiendum, et gestandam et alendam prolem, donec prodeat, suo tempore, in auras que lucem.

769. Multum disputatum est inter medicos quo pacto menses evenirent, et quo consilio magna Parens rerum tulisset legem adeo iniquam, ut videtur, fœminis solis. Enim nondum constat num menses contingant aliis animalibus quoque; si ullis certe paucissimis, que iis tantum quæ sunt simillima humano generi.

770. Nemo sanus conatus fuerit reddere rationem cur talis fabrica qualis efficiat fluxum hujusmodi, data fuerit fœminis, que iis solis: neque est medici perscrutari arcana istiusmodi. Erit sat si explicaverit quænam ista fabrica

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768. But the most important change is effected in the innermost viscera of the girl, by which the uterus, before a useless organ, pours forth a little blood every month, and becomes fitted to receive, and carry and nourish an offspring, until it come forth, at its due time, into the air and light.

769. It has been much disputed among physicians by what means the menses came forth, and with what design the great Parent of nature had imposed a law so unjust, as it appears, upon women alone. For it is not yet established whether the menses happen to other animals also; if to any certainly to very few, and to those only which are most like the human race.

770. No sensible person will endeavour to offer an explanation why such a mechanism as can cause a flow of this sort, should have been given to women, and to them alone: nor is it the duty of the physician to investigate secrets of that sort. It will be sufficient if he should explain what that

sit, et ostenderit quomodo fluxus mensium fiat, quibus usibus inserviat, quibus causis vitietur, quâ ratione vitiatus noceat, et quibus remediis vitia ejus corrigantur. Autem plurima desiderantur adhuc ut ratio talis menstrui fluxus reddatur.

771. Quum corpore crescente indies, quædam partes adeptæ sint fere justam molem et figuram et firmitatem, videntur quodammodo dirigere cursum sanguinis versus alias partes, laxiores, et nondum evolutas, sed aptas per suam fabricam, ut, propriis vitalibus viribus corporis juvantibus, tandem crescant et evolvantur certâ ratione. Est verisimile quoque ovaria ipsa, evoluta hoc modo, que tandem valentia ad suum munus, secernere quosdam fœcundos humores, qui demum plurimum afficiant uterum que vicinas partes per suum stimulum, que invitent sanguinem imprimis in arterias ipsarum.

ostenderit quomodo mensium fluxus fiat, quibus usibus inserviat, quibus causis vitietur, qua ratione vitiatus noceat, et quibus remediis ejus vitia corrigantur. Plurima autem desiderantur adhuc, ut talis fluxus menstrui ratio reddatur.

771. Quum, corpore indies crescente partes quædam justam fere adeptæ sint molem, et figuram, et firmitatem, sanguinis cursum quodammodo dirigere videntur alias partes versus, laxiores, et nondum evolutas, sed per suam fabricam aptas, ut juvantibus propriis corporis viribus vitalibus (47) certa tandem ratione crescant et evolvantur. Verisimile quoque est ovaria ipsa, hoc modo evoluta, ad suumque tandem munus valentia, humores quosdam fœcundos secernere, qui demum per suum stimulum uterum, partesque vicinas, plurimum afficiant, sanguinemque imprimis in ipsarum arterias invitent (475).

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mechanism is, and should show how the flow of the menses takes place, what purposes it serves, from what causes it is vitiated, in what manner when vitiated it injures, and by what remedies the disorders of it may be corrected. But very many things are required as yet, that an account of such a menstrual discharge can be rendered.

771. When by the body growing daily, certain parts have acquired almost their due size, and shape and strength, they seem in some degree to direct the course of the blood towards other parts, more lax, and not yet evolved, but so fitted by their own structure, that, by the proper vital powers of the body assisting, at length they grow and are evolved in a certain manner. It is probable also that the ovaries themselves, evolved in this manner, and at length competent to their function, secrete some fruitful fluids, which indeed greatly affect the uterus and neighbouring part by their stimulus and invite the blood first of all into the arteries of themselves.

772. Fœminis vero, præ viris arteriæ omnes capaces et laxæ cum venis comparatæ, observantur: aorta descendens imprimis, ejusque rami præsertim qui ad uterum tendunt, præ cæteris capaces et laxi sunt. Porro, rami arteriarum uteri, ampli, flexuosi, serpentini, ad congerendum sanguinem aptissimi videntur: congesto vero sanguine turgidi, in uterum multis osculis hiant, sanguinemque in eum fundunt, per vaginam brevi elapsurum.

773. Probabile igitur est, fœminas, præ viris, ad sanguinis plenitudinem proclives esse; quod sane plurima confirmant, præsertim, quum, lentius crescente corpore, humor nutriens qui paratur non omnis nutrimento ejus impenditur; probabile quoque est, nimiam sanguinis copiam in arteriis præcipue congeri, et imprimis in ramis laxioribus, qui facillime distenduntur,

772. Vero omnes arteriæ comparatæ cum venis observantur capaces et laxæ fœminis præ viris: imprimis descendens aorta, que præsertim rami ejus qui tendunt ad uterum sunt præ cæteris capaces et laxi. Porro rami arteriarum uteri ampli, flexuosi, serpentini, videntur aptissimi ad congerendum sanguinem; vero turgidi congesto sanguine hiant in uterum multis osculis, que fundunt sanguinem in eum, elapsurum brevi per vaginam.

773. Igitur est probabile fœminas esse præ viris proclives ad plenitudinem sanguinis; quod sane plurima confirmant præsertim quum corpore crescente lentius, omnis nutriens humor qui paratur non impenditur nutrimento ejus; est quoque probabile nimiam copiam sanguinis congeri præcipue in arteriis et imprimis laxioribus ramis qui distenduntur facillime, que ideo in

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772. But all the arteries compared with the veins are observed capacious and lax in women more than men: in the first place the descending aorta and especially the branches of it which go to the uterus are above the others capacious and lax. Moreover the branches of the arteries of the uterus being large, flexuous, serpentine, seem best fitted to congest the blood: but when turgid with congested blood they open into the uterus with many small mouths, and pour the blood into it, to escape in a short time by the vagina.

773. Therefore it is probable that women are more than men liable to fulness of blood; which indeed many things confirm, especially when the body growing more slowly, all the nutritious fluid which is prepared is not expended in the nutrition of it; it is also probable that an excessive quantity of blood is congested principally in the arteries and chiefly in the

vasis uteri. Vero hæc distenta et irritata incitantur ad novos et validiores motus, que exprimunt humorem primo tenuem vix coloratum per oscula, jam nonnihil patefacta, hiantia in uterum vero postea fundunt rubrum sanguinem.

ideoque in vasis uteri. Hæc vero distenta et irritata ad novos et validiores motus incitantur, humoremque, primo tenuem vix coloratum, per oscula in uterum hiantia jam nonnihil patefacta exprimunt, postea vero rubrum sanguinem fundunt.

774. Quamvis omnia hæc videantur quodammodo obscura et incerta; tamen confirmantur haud parum observatione multorum signorum quæ præcedunt et comitantur menses erumpentes. Cujus modi sunt fluxus albidi humoris e vaginâ, recurrens incertis, sæpe longis intervallis, per unum ve alterum annum ante plenam pubertatem; insolita lassitudo, dolor lumborum et capitis, vertigo, nausea, tumor et aliquando dolor mammarum, recrudescentia per intervalla donec tandem sincerus sanguis prorumpat; quod simul fit hæc mala evanescunt, reditura, vero quamvis incerto

774. Quamvis hæc omnia quodammodo obscura et incerta videantur; tamen haud parum confirmantur observatione multorum signorum, quæ erumpentes menses præcedunt et comitantur. Cujusmodi sunt fluxus humoris albidi e vagina, incertis intervallis, sæpe longis, recurrens, per annum unum alterumve ante plenam pubertatem; lassitudo insolita, dolor lumborum et capitis, vertigo, nausea, mammarum tumor et aliquando dolor, per intervalla recrudescentia, donec tandem sanguis sincerus prorumpat; quod simul fit, hæc mala evanescunt, reditura vero,

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laxer branches which are distended most easily, and consequently in the vessels of the uterus. But these distended and irritated are excited to new and more powerful motions, and press out a fluid, at first thin scarcely coloured, by small mouths, now somewhat expanded, opening into the uterus, but afterward pour out red blood.

774. Although all these things seem in some degree obscure and uncertain, yet they are confirmed not a little by the observation of many symptoms which precede and accompany the menses breaking forth. Of which sort are a flow of a white fluid from the vagina recurring at uncertain, often long intervals, for one or a second year before complete puberty; unusual lassitude, pain of the loins and of the head, vertigo, nausea, swelling and sometimes pain of the breasts, recurring at intervals until at length pure blood bursts forth; as soon as which happens, these disorders vanish, to

quamvis incerto tempore. Sic puellis nondum plene puberibus menses sæpe longis et incertis intervallis redeunt: paulatim vero ad intervallum menstruum reducendi, præcedentibus fere signis jam recensitis, nunc levioribus nunc gravioribus.

775. Ratio intervalli adeo æqualis nulla hactenus reddita est: habent tamen sua tempora pleræque res, quibus incipiunt et absolvuntur: vis consuetudinis (317) nonnihil hic facere videtur. Neque tamen intervallum adeo æquale fœminis est, quin multis, alioquin sanissimis, per breviora aut longiora spatia, menses redeant. Rarissima sunt exempla mulierum bene valentium, quæ nullos menses habent, et rariora adhuc, sine mensibus, fœcunditatis: puellæ quædam vero prius matres factæ sunt, quam menses erupissent: postea vero more solito profluxuri.

tempore. Sic menses sæpe redeunt longis et incertis intervallis puellis nondum plene puberibus; vero paulatim reducendi ad menstruum intervallum, signis jam recensitis, nunc levioribus nunc gravioribus, fere præcedentibus.

775. Nulla ratio intervalli adeo æqualis reddita est hactenus; pleræque res tamen habent sua tempora quibus incipiunt et absolvuntur; vis consuetudinis videtur facere nonnihil hic. Neque tamen est intervallum adeo æquale fœminis, quin menses redeant multis, alioquin sanissimis, per breviora aut longiora spatia. Exempla mulierum, quæ habent nullos menses, bene valentium sunt rarissima, et fœcunditatis sine mensibus adhuc rariora: vero quædam puellæ factæ sunt matres priusquam menses erupissent: vero postea profluxuri solito more.

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return indeed, although at an uncertain period. Thus the menses often return at long and uncertain intervals in girls not yet fully ripe; but gradually to be reduced to the menstrual interval, the symptoms already enumerated, sometimes slighter, sometimes more severe, commonly preceding.

775. No explanation of an interval so regular has been given hitherto; most things, however, have their own periods in which they begin and are completed: the force of habit seems to do something here. Nor, however, is the interval so regular in women, but that the menses may return in many, otherwise very healthy, at shorter or longer periods. Examples of women who have no menses being in good health are very rare, and, of fecundity without the menses, still more rare: but some girls have become mothers before that the menses had broken forth: but afterwards about to flow in the usual manner.

776. Vero annis labentibus in nostris regionibus vix ante quadragesimum, et fere ante quinquagesimum annum ætatis, menses desinunt et cum iis fœcunditas. Quo citius incipiunt fere eo maturius desinunt. Neque plerumque reprimuntur subito; aliquando redeunt et ingente copiâ, insolitis intervallis, sive brevioribus sive longioribus justo sæpe cum gravibus morbis uteri que partium vicinarum et conspirantium, imprimis fluore albo, neque mediocri discrimine valetudinis. Ratio harum rerum videtur esse firmitas et rigiditas totius corporis, præsertim arteriarum, crescentes indies et tandem superantes vim venarum. Hinc ultima plenitudo arteriarum in laxissimâ parte; paulatim tardior, sed inordinata, et tandem nulla. Nonnunquam quamvis rarissime, menses et fœcunditas simul manent ultra quinquagesi-

776. Labentibus vero annis, nostris in regionibus vix ante quadragesimum, et fere ante quinquagesimum ætatis annum, menses desinunt, et cum iis fœcunditas. Quo citius incipiunt, eo fere maturius desinunt. Neque subito plerumque reprimuntur: aliquando insolitis intervallis, sive brevioribus sive longioribus justo, redeunt, et ingente copia; cum gravibus sæpe uteri partiumque vicinarum et conspirantium morbis, fluore albo imprimis, neque mediocri valetudinis discrimine. Harum rerum ratio videtur esse totius corporis, arteriarum præsertim, firmitas et rigiditas, indies crescentes, et vim venarum tandem superantes. Hinc ultima arteriarum plenitudo in parte laxissima; paulatim tardior, sed inordinata, et tandem nulla. Nonnunquam, quamvis rarissime, menses simul et fœcunditas ultra quinquagesimum an-

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776. But the years gliding on, in our climate scarcely before the fortieth, and mostly before the fiftieth year of age, the menses cease, and with them fecundity. The earlier they begin, commonly the earlier they cease. Nor generally are they repressed suddenly; sometimes they return, and in great quantity, at unusual intervals, either shorter or longer than proper, often with severe diseases of the uterus and of the parts contiguous, and acting in concert, especially fluor albus, nor with slight danger of the health. The cause of these things seems to be the firmness and rigidity of the whole body, especially of the arteries, increasing daily, and at length overcoming the strength of the veins. Hence the last fulness of the arteries occurs in the laxest part: gradually slower, but irregular, and at length none. Sometimes, although very rarely, the menses and fecundity together remain beyond the fiftieth year. But for the most part, if an old woman have the menses it is a diseased matter.

num manent. Plerumque vero, si vetula menses habet, morbosum est.

777. Menses igitur, ut videtur, mulieribus contingunt hac potissimum ratione, quod universam corporis fabricationem, ad plenitudinem seu sanguinis abundantiam comparandam, aptam habent, et idoneum organum in promptu est, per quod sanguis excernatur. Viri cæteraque animalia haud ita facile sanguine nimis pleni fiunt, neque si ita facti fuerint simile organum habent. Deficiunt vetulis, quia fabrica uteri haud parum mutatur, præsertim firmitas ejus arteriarum. Porro, dum mulier uterum gerit, menses nullos fere habet, quia pars uteri unde profluere solent a placenta occupatur: neque per plures menses, dum infantem alit mulier, fluunt menses, nimirum quia ad aliam partem, cui mirus cum utero consensus est, sanguis divertitur.

mum annum. Vero plerumque, si vetula habet menses est morbosum.

777. Igitur menses contingunt mulieribus, potissimum ut videtur hac ratione, quod habent universam fabricationem corporis aptam ad comparandam plenitudinem seu abundantiam sanguinis, et idoneum organum est in promptu, per quod sanguis excernatur. Viri que cætera animalia haud fiunt nimis pleni sanguine ita facile, neque si facti fuerint ita, habent simile organum. Deficiunt vetulis, quia fabrica uteri mutatur haud parum, præsertim firmitas arteriarum ejus. Porro, dum mulier gerit uterum fere habet nullos menses, quia pars uteri unde solent profluere occupatur a placentâ; neque menses fluunt per plures menses dum mulier alit infantem, nimirum quia sanguis divertitur ad aliam partem cui est mirus consensus cum utero.

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777. Therefore the menses happen to women, principally as it appears from this cause, that they have the entire mechanism of their body fitted to acquire a plenitude or abundance of blood, and a fit organ is at hand, by which the blood can be excreted. Men and other animals do not become too full of blood so easily, nor if they should have become so, have they a similar organ. They fail to old women, because the structure of the uterus is changed not a little, especially the strength of the arteries of it. Moreover, whilst a woman is pregnant generally she has no menses, because the part of the uterus whence they are accustomed to flow forth is occupied by the placenta; nor do the menses flow during the many months whilst the woman nourishes the infant, doubtless because the blood is diverted to another part, to which there is a wonderful sympathy with the uterus.

778. Menses conducunt parum vel nihil ad cupidinem. Auctus fluxus sanguinis versus genitalia organa, pubere ætate, que nonnulli humores, ut creditur, assidue secreti, possunt non non stimulare et calefacere. Autem fœminæ feruntur in venerem minore impetu quam viri, et fœminæ fere omnium animalium quam mares; neque sane hi in quibusdam generibus animalium subigunt suas fœminas sine quâdam vi. Vero major ve minor cupido venerearum rerum facit nihil ad fœcunditatem. Fœminæ calidioris constitutionis aliquando observantur steriles; dum frigidissimæ, quibus sæpe gaudia veneris fere nulla, sunt mirâ fœcunditate. Vero effrænata et inexplebilis libido, est demum morbus in fœminis non secus ac in viris, aliquando vere corporeus, inductus forsan a vitiis genitalium organorum, irritatione, nimio fluxu sanguinis, nimiâ

778. Menses parum vel nihil ad cupidinem conducunt. Auctus, ætate pubere, genitalia organa versus sanguinis fluxus, humoresque, ut creditur nonnulli (634), assidue secreti, non possunt non stimulare et calefacere. Fœminæ autem quam viri, et omnium fere animalium fœminæ quam mares, minore impetu in Venerem feruntur; neque hi sane in quibusdam animalium generibus, sine vi quadam suas fœminas subigunt. Nihil vero ad fœcunditatem facit major minorve cupido rerum venerearum. Fœminæ aliquando calidioris constitutionis steriles observantur; dum frigidissimæ sæpe, quibus Veneris gaudia fere nulla, mira fœcunditate sunt. Effrænata vero et inexplebilis libido, in fœminis non secus ac in viris, morbus demum est, aliquando vere corporeus, forsan a vitiis genitalium organorum, irritatione, nimio san-

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778. The menses conduce little or not at all to desire. The increased flow of blood towards the genital organs, at ripe age, and some fluids, as it is believed, constantly secreted, cannot but stimulate and heat. But women are disposed for venery with a less impetus than men, and the females of almost all animals than the males; nor indeed do the latter in some species of animals subdue their females without some force. But a greater or less desire of venereal matter contributes in no way to fecundity. Women of a warmer constitution sometimes are observed sterile; whilst of the coldest, to whom often the pleasures of venery are almost none, are of a wonderful fecundity. But an unbridled and insatiable desire is indeed a disease in women in like manner as in men, sometimes a truly corporeal one, induced perhaps by diseases of the genital organs, by irritation, excessive flux of

guinis fluxu, nimia humorum fœcundorum secretione, inductus; sæpius vero a læsa et corrupta imaginatione originem ducens.

779. In fœcunda Venere probabile est, non modo clitoridem cæterasque partes exteriores genitalium organorum fœminarum, sed intimas quoque, tubas imprimis Fallopianas, influente sanguine turgere et erigi; hasque tubas ad ovaria admoveri, eademque suis fimbriis amplecti, semenque masculinum ad ea deferre, ovumque vel separatum ex ovario, postquam semine masculino fœcundatum fuerit, vel forsitan rupti tantum ovi humorem, cum semine mixtum, in uterum deducere.

780. Hæc vero num ita fiunt, vel quo demum tempore, parum adhuc constat: scilicet, quia observandi occasiones in hominibus raræ admodum sunt, multaque vetant adhibere fidem plurimis, quas

secretione fœcundorum humorum; vero sæpius ducens originem a læsâ et corruptâ imaginatione.

779. In fœcundâ venere est probabile non modo clitoridem que cæteras exteriores partes genitalium organorum fœminarum, sed quoque intimas imprimis Fallopianas tubas, turgere et erigi sanguine influente; que has tubas admoveri ad ovaria que amplecti eadem suis fimbriis, que deferre masculinum semen ad ea, que vel deducere ovum separatum ex ovario postquam fuerit fœcundatum, masculino semine, vel forsitan tantum humorem rupti ovi mixtum cum semine, in uterum.

780. Vero adhuc parum constat num hæc fiunt ita, vel demum quo tempore; scilicet quia occasiones observandi sunt admodum raræ in hominibus, que multa vetant adhibere fidem plurimis observatio-

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blood, excessive secretion of fecundating humours; but more often deriving its origin from a diseased and corrupted imagination.

779. In a fruitful coition it is probable not only that the clitoris and other more external parts of the genital organs of females, but also the inmost, especially the Fallopian, tubes, grow turgid and are erected by the blood flowing in; and that these tubes are applied to the ovaries and that they embrace the same with their fimbriæ, and convey the male semen to them, and either bring down the ovum separated from the ovarium after it has been fecundated by the male semen, or perhaps only the fluid of the ruptured ovum mixed with the semen, into the uterus.

780. But as yet it is not decided whether these things take place so, or even at what time; truly because the opportunities of observing are very rare in men, and many things forbid us to give credit to the many observa-

nibus, quas varii auctores protulerunt. Vero quantum possit colligi ex inspectionibus animalium institutis a peritissimis medicis, vel, denique, paucarum mulierum, cadavera quarum fuerit facultas inspiciendi brevi tempore post conceptum, neque fœtus neque ovum possunt detegi ante viginti dies post conceptum; tenax, glutinosus, pellucidus humor tantum conspicitur in utero aut tubis; qui, tamen, continet primordia novi animalis, quamvis fugientia aciem oculi, etiam armati optimis vitris. Vero quam primum partes crudi fœtus adeptæ sunt tantum firmitatis et coloris ut possint distingui, tum ovum observatur, constans ex molli et tenui membranâ, et continens pellucidam aquulam, in quâ novum animal natat, incurvum, pendulum per funem umbilici a placentâ et membranâ ovi deforme, capite pro ratâ parte ingente, corpore parvo, ad-

varii auctores protulerunt, observationibus. Quantum vero ex inspectionibus animalium, a peritissimis medicis institutis, vel denique paucarum mulierum, quarum cadavera brevi post conceptum tempore inspiciendi facultas fuerit, colligi possit, neque fœtus, neque ovum, ante viginti dies post conceptum, detegi possunt: humor tantum tenax, glutinosus, pellucidus in utero aut tubis conspicitur; qui tamen primordia novi animalis continet, quamvis oculi, etiam armati optimis vitris, aciem fugientia. Quamprimum vero tantum firmitatis et coloris adeptæ sunt partes crudi fœtus, ut possint distingui, tum ovum observatur ex molli et tenui membrana constans, et aquulam pellucidam continens, in qua novum animal, incurvum, per funem umbilici a placenta et membrana ovi pendulum, deforme, ingente pro rata parte capite, parvo

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tions which various authors have set forth. But as far as can be collected from the inspections of animals instituted by the most skilful physicians, or, finally, of the few women, the dead bodies of whom there has been a possibility of examining a short time after conception, neither fœtus nor ovum can be detected before twenty days after conception: a tenacious, glutinous, pellucid fluid only is seen in the uterus or tubes; which, however, contains the rudiments of the new animal, although baffling the sharpness of the eye, though armed with the best glasses. But as soon as the parts of the crude fœtus have acquired so much firmness and colour that they can be distinguished, then the ovum is observed, consisting of a soft and thin membrane, and containing a pellucid little water, in which the new animal swims, bent, pendulous by the cord of the navel from the placenta and membrane of the ovum shapeless, with the head in proportion large, the

corpore, nullis adhuc artubus instructum, natat, mollissimum hactenus et fere fluidum.

781. Semen masculinum ad ovaria fœminarum, per tubas Fallopianas quodammodo penetrare, aliquid ad generationem necessarium ex ovariis derivari, et per easdem tubas descendere ad uterum, docent sterilitas a conclusis tubis, corpora lutea ut vocantur in ovariis semper post conceptum, nunquam ante, reperta, fœtusque demum, vel in ovariis, vel in tubis hærentes, vel ruptis tubis in abdomen delapsi.

782. Primordia novi animalis ex utroque parente pariter derivari, suadet similitudo parentum, vel alterius tantum, vel utriusque mixta, in liberis reviviscens: ita tamen ut liberorum, qui mixtam similitudinem habent, alii ad patrem, alii magis ad matrem, inclinent; et constitutio singularis patris vel

huc instructum nullis artubus, hactenus mollissimum, et fere fluidum.

781. Sterilitas a conclusis tubis, corpora lutea, ut vocantur, reperta in ovariis semper post, nunquam ante, conceptum, que demum fœtus hærentes vel in ovariis, vel tubis vel delapsi in abdomen ruptis tubis, docent masculinum semen penetrare, quodammodo, per Fallopianas tubas ad ovaria fœminarum, aliquid necessarium ad generationem derivari ex ovariis, et descendere per easdem tubas ad uterum.

782. Similitudo parentum, vel alterius tantum, vel mixta utriusque, reviviscens in liberis, suadet primordia novi animalis derivari pariter ex utroque parente: ita, tamen, ut alii liberorum, qui habent mixtam similitudinem, inclinent ad patrem, alii magis ad matrem: et singularis constitutio patris

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body small, as yet furnished with no limbs, as yet very soft, and almost fluid.

781. The sterility from shut up tubes, corpora lutea, as they are called, found in the ovaries always after, never before, conception, and finally fœtuses sticking either in the ovaries, or in the tubes or having fallen into the abdomen from the ruptured tubes, prove that the male semen penetrates, in some way, through Fallopian tubes to the ovaries of females, that something necessary to generation is derived from the ovaries, and descends by the same tubes to the uterus.

782. The likeness of the parents, either of the one only, or a mixed one of both, reviving in the children, persuades that the rudiments of the new animal are derived equally from each parent: so, however, that some of the children, which have a mixed likeness, incline to the father, others more to

renascatur, vel pura, vel mixta et correcta in filio, et sic proclivitas ad suscipiendos multos morbos transeat a parentibus in prolem, aliquando nihil imminuta, immo, forsan facta gravior, vero sæpe mitior et levior, et paulatim delenda, si tanta cura impenderetur generationi hominum quanta datur propagandis equis, et juvencis, et catulis. Maxima varietas quæ observatur in humano genere, scilicet, inter Æthiopes et Europæos, post aliquot generationes, ut fertur quatuor, deletur penitus, et evanescit, nec unquam renascitur si mixta proles habuerit nuptias cum altero genere tantum. Autem plurimæ varietates, multo minus notabiles, Temperamenta ut dicuntur, statura et forma corporis, lineamenta vultûs, color oris, capillorum, oculorum, miscentur facillime in humanâ gente, et sæpe latent diu: sed usque vigent in stirpe; nunquam

pura renascatur in filio, vel mixta et correcta, et sic proclivitas ad multos morbos suscipiendos a parentibus in prolem transeat, aliquando nihil imminuta, immo forsan gravior facta, sæpe vero mitior et levior, et paulatim delenda, si tanta hominum generationi impenderetur cura, quanta equis, et juvencis, et catulis propagandis datur.—Maxima quæ in genere humano observatur varietas, scilicet inter Æthiopes et Europæos, post aliquot generationes, quatuor ut fertur, deletur penitus, et evanescit, nec unquam renascitur, si mixta proles cum altero tantum genere nuptias habuerit. Plurimæ autem varietates, multo minus notabiles, Temperamenta ut dicuntur, statura et forma corporis, lineamenta vultus, color oris, capillorum, oculorum, in gente humana miscentur facillime, et sæpe diu latent: sed vigent usque in stirpe;

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the mother; and the peculiar constitution of the father revives, either pure, or mixed and corrected in the son, and thus a tendency to take on many diseases may pass from parents to their offspring, sometimes nothing diminished, nay, perhaps become more severe, but often milder and lighter, and gradually to be obliterated, if as great care were expended on the generation of men as is given in propagating horses, and bullocks, and whelps. The very great difference which is observed in the human race, namely, between the Æthiopians and Europeans, after some generations, as it is said four, is obliterated entirely, and disappears, nor does it ever revive if the mixed offspring should contract marriage with one race only. But very many varieties, much less remarkable, Temperaments as they are called, stature and shape of the body, lineaments of the countenance, colour of the face, of the hair, eyes, are mixed very easily in the human race, and often lie dormant for a long time; but constantly prevail in the progeny; never

nunquam penitus delendæ. Summo enim neque obscuro consilio, multas fortasse post generationes, identidem prodeunt minutæ illæ hominum varietates, non minus puræ quam ante triginta secula extiterant: alioquin singuli homines a se invicem vix aut ne vix quidem secerni possent et internosci.

penitus delendæ. Enim illæ minutæ varietates hominum prodeunt identidem, summo neque obscuro consilio, fortasse post multas generationes, non minus puræ quam extiterant triginta secula ante; alioquin singuli homines possent vix, aut ne quidem vix secerni et internosci invicem a se.

783. Parum vero profecerunt hactenus qui conati sunt rationem reddere variarum partium quas uterque parens ad generationem conferret. Nec melius intelligitur quænam virtus seminis masculini, quisnam minutissimorum quæ ibi scatent animalium usus, aut quid ex ovario aut corpore luteo depromatur.—Non dubium vero est, fabricam quandam, utcunque imperfectam, novi animalis, ab ipso conceptu subesse, quamvis nostris non obviam sensibus: nimirum, quia simul conspici potest, fœtus cere-

783. Vero profecerunt parum hactenus, qui conati sunt reddere rationem variarum partium quas uterque parens conferret ad generationem. Nec melius intelligitur quænam virtus masculini seminis, quisnam usus minutissimorum animalium quæ scatent ibi, aut quid depromatur ex ovario, aut corpore luteo. Vero est non dubium quandam fabricam, utcunque imperfectam, novi animalis, subesse ab conceptu ipso, quamvis non obviam nostris sensibus; nimirum, quia simul potest con-

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wholly to be destroyed. For those minute varieties of men go forth occasionally, with the most profound nor obscure wisdom, perhaps after many generations, not less pure than they had existed thirty ages before; otherwise individual men could scarcely, or not even scarcely be separated and be distinguished in turn from each other.

783. But they have effected little hitherto, who have endeavoured to give an explanation of the various parts which each parent contributed to generation. Nor is it better understood what is the virtue of the male semen, what the use of the very minute animals which abound there, or what is drawn out from the ovarium, or corpus luteum. But it is not doubtful that a certain structure, however imperfect, of the new animal, exists from conception itself, although not obvious to our senses; indeed, because so soon as it can be seen, the fœtus has a brain, and heart, and

spici, fœtus habet cerebrum, et cor, et aortam, et actionem cordis, et motum sanguinis, quamvis nondum rubri, et ideo actionem cerebri; neque quisquam facile contenderit nihil istiusmodi adfuisse pridie quam tota fabrica facta esset visibilis nostris oculis.

brum habet, et cor et aortam, et actionem cordis, et motum sanguinis, quamvis nondum rubri, et ideo actionem cerebri (359); neque facile quisquam contenderit nihil istiusmodi adfuisse pridie quam tota fabrica nostris oculis visibilis facta esset.

784. Autem nemo est qui dixerit unde variæ partes, quæ sunt omnino necessariæ ad vitam, veniant, et quando et quo ordine perficiantur, aut quomodo talis conditio datur, ut videtur rudi que indigestæ massæ, qualis fecerit eandem idoneam ut distendatur certo modo, et tandem crescat in pulcherrimam formam.

784. Variæ autem partes quæ ad vitam omnino necessariæ sunt, unde veniant, et quando et quo ordine perficiantur, nemo est qui dixerit, aut quomodo talis conditio rudi indigestæque, ut videtur, massæ detur, qualis eandem idoneam fecerit, ut certo modo distendatur, et crescat tandem in pulcherrimam formam.

785. Tamen, juvabit novisse talem fabricam subesse a principiis vitæ, evolvendam certo tempore et ordine, et magnam et constantem vim quæ distendat, et compagem fœtûs mollissimam, et ideo

785. Juvabit tamen novisse talem, a principiis vitæ, subesse fabricam, certo tempore et ordine evolvendam, et magnam et constantem vim quæ distendat, et compagem fœtus mollissimam, et

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aorta, and action of the heart, and motion of the blood, although not yet red, and consequently action of the brain; nor could any one easily contend that nothing of that sort was present the day before that the whole structure became visible to our eyes.

784. But there is no one who could say whence the various parts, which are absolutely necessary to life, come, and when and in what order they are perfected, or by what means such a condition is given, as it seems, to the rude and undigested mass, as should render the same fit that it be distended in a certain manner, and at length grow into a most beautiful shape.

785. However, it will benefit to know that such a conformation exists from the beginning of life, to be evolved in a certain time and order, also that there is a great and constant force which distends it: and that the frame of the fœtus is very soft, and therefore very fit for extension.

ideo ad extensionem aptissimam (81, 84.)

786. Vis distendens est actio cordis et arteriarum humores quaquaversum per totum corpusculum propellens: hæc vis, ut videtur, a primo qui conspicitur cordis ventriculo incipiens, aortam evolvit, extenditque primo in simplicem tubum, paulatim in ramulos dividendum, qui venas sibi respondentes inveniant, vel aperiant, vel evolvant.

787. Hæc vis, prima, ut videtur, corporis fabricatione, varia proportione in alia atque alia organa dirigitur, et hæc igitur certo ordine crescunt, et sane admodum inæqualiter. Sic caput grande efficitur, et thymus et jecur ingentia magnam thoracis partem occupantia, cum pulmo adhuc exiguus est, et artus nulli apparent. Hi vero suo ordine veniunt, et prius superiores pullulant.

aptissimam ad extensionem.

786. Distendens vis est actio cordis et arteriarum, propellens humores quaquaversum per totum corpusculum: hæc vis, incipiens, ut videtur, a primo ventriculo cordis qui conspicitur, evolvit aortam, quæ extendit primo in simplicem tubum, dividendum paulatim in ramulos, qui inveniant, vel aperiant, vel evolvant venas respondentes sibi.

787. Hæc vis, ut videtur, dirigitur primâ fabricatione corporis in alia atque alia organa, variâ proportione, et hæc igitur crescunt, et sane admodum inæqualiter. Sic caput efficitur grande, et thymus et jecur ingentia, occupantia magnam partem thoracis, cum pulmo adhuc est exiguus, et nulli artus apparent. Vero hi veniunt suo ordine, et superiores pullulant prius.

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786. The distending force is the action of the heart and arteries, driving the fluids in every direction through the whole of the little body: this force, beginning, as it seems, from the first ventricle of the heart which is seen, evolves the aorta, and extends it first into a simple tube, to be divided gradually into little branches, which find, or open, or evolve the veins answering to them.

787. This force, as it seems, is directed by the first construction of the body to the different organs, in various proportion, and these therefore grow, and indeed very unequally. Thus the head is rendered large, and the thymus and liver great, occupying a large proportion of the thorax, when the lung as yet is small, and no limbs appear. But these come in their proper order, and the upper ones shoot forth first.

788. Totus homunculus quum primo potest conspici, vix major formicâ, et pendens unum ve alterum granum, natat in ovo, quod facile contineat duas ve tres uncias aquæ: vero quo plus ovum crescit, eo minus aquæ, pro rata parte, est in eo, et fœtus qui habitat major; donec, tandem, sub finem graviditatis, fere impleat ingens ovum, aquâ relictâ parcâ, ipse tum sesquipedalis, et pendens circiter octo libras.

788. Totus homunculus, quum primo conspici potest, vix formica major, et granum unum alterumve pendens, natat in ovo, quod facile duas tresve aquæ uncias contineat: quo plus vero crescit ovum, eo minus pro rata parte aquæ in eo est, et fœtus qui habitat major; donec tandem, sub finem graviditatis, ingens ovum fere impleat, parca relicta aqua, ipse tum sesquipedalis, et circiter octo libras pendens.

789. A primis diebus funis prodit ex umbilico, constans ex binis arteriis, quibus unica vena respondet, et format placentam quæ tecta concavam partem intimâ membranâ ovi, convexam externâ, plerumque adnectitur ovo et utero prope superiorem partem utriusque et efficit commeatum inter matrem que fœtum, nimirum ducens sanguinem ab alterâ ad alterum que reducens.

789. A primis diebus funis ex umbilico prodit, ex binis arteriis constans, quibus unica vena respondet, et placentam format, quæ intima ovi membrana tecta concavam partem, externa convexam, ovo et utero plerumque prope partem superiorem utriusque adnectitur, et commeatum inter matrem fœtumque efficit, sanguinem nimirum ab altera ad alterum ducens reducensque.

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788. The whole little man, when first it can be seen, scarce larger than an ant, and weighing one or a second grain, swims in the ovum, which easily can contain two or three ounces of water: but the more the ovum grows, the less water, in proportion, there is in it, and the fœtus which inhabits it is larger: until, at length, towards the end of pregnancy, it nearly fills up the great ovum, the water being left scanty, itself then a foot and a half long, and weighing about eight pounds.

789. From the first days a cord proceeds from the navel, consisting of two arteries, to which a single vein answers, and forms the placenta which, covered as to its concave portion with the inmost membrane of the ovum, on its convex with the external, generally is connected with the ovum and uterus near the upper part of both, and effects a communication between the mother and fœtus, namely, carrying the blood from the one to the other and bringing it back.

790. Nondum profecto constat apud medicos, quo modo hic commeatus absolvatur, sive per vasa sanguinem vehentia continua, iter a matre ad fœtum sit, sive sanguis ex utriusque vasis effundatur in cavernulas, per vasa hiantia denuo resorbendus. Lis ipsa, experiendo non argumentando dirimenda, parum ad usum medicum pertinet. Oportet tamen meminisse, auctum sanguinis in vasis uteri impetum placentam sæpe separare, et ideo abortum inducere, et hanc quocunque modo separatam, sive partu naturali, sive abortu, sive magna vi funi umbilici admota, veluti ab imperita obstetrice post partum, aliquem semper sanguinis fluxum, nonnunquam ingentem et lethalem, efficere.

790. Profecto nondum constat apud medicos quo modo hic commeatus absolvatur, sive iter a matre ad fœtum sit per continua vasa vehentia sanguinem, sive sanguis effundatur in cavernulas ex vasis utriusque, resorbendus denuo per hiantia vasa. Lis ipsa dirimenda experiendo non argumentando, pertinet parum ad medicum usum. Tamen, oportet meminisse auctum impetum sanguinis in vasis uteri sæpe separare placentam et ideo inducere abortum, et hanc quocunque modo separatam, sive naturali partu, sive abortu, sive magnâ vi admota funi umbilici, veluti ab imperitâ obstetrice post partum semper efficere aliquem, nonnunquam ingentem et lethalem fluxum sanguinis.

791. Singularis sanguinis in fœtu cursus, ab eo qui in adulto observatur longe diversus, nimirum per foramen ovale, et ductum arterio-

791. Singularis cursus sanguinis in fœtu longe diversus ab eo qui observatur in adulto, nimirum, per foramen ovale, et duc-

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790. Indeed it is not yet agreed among physicians by what means this communication is effected, whether the passage from the mother to the fœtus be by continuous vessels carrying blood, or whether blood be poured out into little cells from the vessels of each, to be absorbed again by open vessels. The dispute itself to be removed by experimenting not by arguing, pertains little to medical practice. However, it is necessary to remember that the increased impetus of the blood in the vessels of the uterus often separates the placenta, and on that account brings on abortion; and that this in whatever way separated, whether by natural parturition, or by abortion, or by great force applied to the umbilical cord, as by an unskilful obstetrician after delivery, always causes some, sometimes a great and fatal flow of blood.

791. A particular course of the blood in the fœtus, far different from that which is observed in the adult, namely, through the foramen ovale, and

tum arteriosum, inter pulmonalem arteriam et aortam, et umbilicales arterias et placentam, et umbilicalem venam et ductum venosum, jam descriptus est; neque igitur repetendus fusius hic.

792. Parum constat de origine variarum tunicarum quæ formant ovum, sive formentur ex fœcundis liquoribus utriusque sexûs non secus ac fœtus ipse, sive deriventur ab utero. Saltem exterior membrana chorii, dicta decidua, videtur esse ab utero nimirum quæ fertur adfuisse in utero quum fœtus que ovum hærerent in Fallopianâ tubâ.

793. Uterus ipse crescit in mirum modum dum mulier est gravida, factus fere quinquagies capacior quam fuerat in virgine. Neque fit ideo tenuior! scilicet vasa vehentia sanguinem evolvuntur, et continent plurimum sanguinem, et forsan reticulata tela, quæ nectit mus-

sum inter arteriam pulmonalem et aortam, et arterias umbilicales et placentam, et venam umbilicalem et ductum venosum, jam descriptus est (417); neque igitur hic fusius repetendus.

792. Parum constat de origine variarum quæ ovum formant tunicarum, sive ex liquoribus fœcundis utriusque sexus formentur, non secus ac ipse fœtus, sive ab utero deriventur. Exterior saltem membrana chorii, decidua dicta, ab utero videtur esse, nimirum quæ in utero adfuisse fertur, quum fœtus ovumque in tuba Fallopiana hæreret.

793. Uterus ipse, dum mulier gravida est, mirum in modum crescit, quinquagies fere capacior factus quam in virgine fuerat. Neque ideo tenuior fit; vasa scilicet sanguinem vehentia evolvuntur, et plurimum sanguinem continent, et tela forsan reticulata, quæ

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ductus arteriosus, between the pulmonary artery and aorta, and the umbilical arteries and placenta, and the umbilical vein and ductus venosus, has already been described; nor therefore to be repeated more at large here.

792. Little is established concerning the origin of the different tunics which form the ovum, whether they be formed of the fecundating liquors of both sex in like manner as the fœtus itself, or whether they be derived from the uterus. At least the external membrane of the chorion, named the decidua, seems to be from the uterus, as being one which is said to have been in the uterus when the fœtus and ovum were sticking in the Fallopian tube.

793. The uterus itself grows in a wonderful degree whilst the woman is pregnant, becoming nearly fifty times more capacious than it had been in the virgin. Nor does it become on that account thinner: because the vessels carrying blood are evolved, and contain a great deal of blood, and perhaps the cellular tissue, which connects the muscular fibres, grows also.

fibras musculosas nectit, crescit quoque

794. Nonnullæ mulieres, ut fertur, statim ut conceperint, id norunt, certo sensu, qualis a sterili venere abfuit, et horrore aliquo illico ingruente, et nausea postridie fortasse, vel saltem paucis diebus, accedente. Plerisque mulieribus, dum uterum gerunt, os ejus clauditur, et menses nulli sunt, et hoc potissimum signo norunt se concepisse. Neque tamen adeo rarum est, gravidam primis mensibus solitum fluxum habere.

795. Multæ a conceptu ad partum usque a stomacho laborant, et importunissima nausea, et vomitu, præsertim horis matutinis, vexantur: paucæ quidem ab his malis omnino immunes sunt, ita ut vix morbosa habeantur. Abnormis cibi potusque appetitus, qualis Malacia (615) vocatur, nonnunquam gravidis accidit. Hujusmodi

culosas fibras, crescit quoque.

794. Nonnullæ mulieres, ut fertur, statim ut conceperint, norunt id certo sensu, qualis abfuit a sterili venere, et aliquo horrore ingruente illico, et nauseâ accedente postridie fortasse, vel saltem paucis diebus. Plerisque mulieribus dum gerunt uterum, os ejus clauditur, et sunt nulli menses, et norunt potissimum hoc signo se concepisse. Neque tamen est adeo rarum gravidam habere solitum fluxum primis mensibus.

795. Multæ laborant a stomacho usque a conceptu ad partum, et vexantur importunissimâ nauseâ et vomitu, præsertim matutinis horis; paucæ quidem sunt omnino immunes ab his malis, ita ut vix habeantur morbosa. Abnormis appetitus cibi que potûs, qualis vocatur Malacia, nonnunquam accidit gravidis. Mala hujusmodi oriuntur

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794. Some women, as it is said, as soon as they have conceived, know it by a certain feeling, such as was absent from a barren embrace, and by some shivering attacking thereupon, and nausea coming on the following day perhaps, or at least in a few days. In most women whilst they carry the uterus, the mouth of it is closed, and there are no menses, and they know chiefly by this sign that they have conceived. Nor however is it so uncommon that a pregnant woman should have the usual flow in the first months.

795. Many suffer from the stomach incessantly from conception till delivery, and are teased with the most urgent nausea and vomiting, especially in the morning time; few indeed are wholly exempt from these evils, so that they scarcely can be considered diseased. An irregular appetite for food and drink, such as is called Malacia, sometimes happens to gravid women. Disorders of this sort arise from the sympathy between the

a consensu inter stomachum et uterum, quæ ne ab mole hujus organi comprimente reliqua viscera: quippe quia sæpe incipiunt prius quam uterus tumeat, et aliquando desinunt vel sublevantur ultimis mensibus graviditatis, cum uterus est amplissimus.

796. Haud pauca alia incommoda quoque aliquando oriuntur a graviditate, præsertim tumor pedum et crurum, hæmorrhois et quædam vitia urinæ; ratio quarum rerum est haud obscura. Vero nonnullæ mulieres dum sunt plenæ fruuntur optimâ et firmissimâ valetudine: ita ut graviditas sæpe fuerit his remedio multorum morborum.

797. Finis graviditatis est nono mense: mulier rarissime gerit uterum ultra decem menses. Partus sex mensium superstites rarissime observantur; vero septem et octo mensium sæpe, et quo pro-

mala a consensu inter stomachum et uterum oriuntur, neque ab hujus organi mole reliqua viscera comprimente: quippe quia prius incipiunt sæpe, quam uterus tumeat et aliquando desinunt, vel sublevantur, ultimis mensibus graviditatis, cum uterus amplissimus est.

796. Alia quoque haud pauca a graviditate aliquando oriuntur incommoda; pedum præsertim et crurum tumor, hæmorrhois, et quædam urinæ vitia (743, 744); quarum rerum ratio haud obscura est. Nonnullæ vero mulieres, dum plenæ sunt, optima et firmissima valetudine fruuntur: ita ut his graviditas multorum sæpe morborum remedio fuerit.

797. Finis graviditatis nono mense est: rarissime ultra decem menses uterum gerit mulier. Partus sex mensium rarissime superstites observantur; septem vero et octo mensium sæpe, et quo propius

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stomach and uterus, and not from the bulk of the latter organ compressing the remaining viscera: inasmuch as they often begin before that the uterus can swell, and sometimes cease or are relieved in the last months of pregnancy, when the uterus is largest.

796. Not a few other inconveniences also sometimes arise from pregnancy; especially swelling of the feet and legs, hemorrhoids and certain disorders of the urine; the reason of which things is not obscure. But some women whilst they are full, enjoy the best and firmest health; so that pregnancy often may be to them a remedy of many diseases.

797. The end of pregnancy is in the ninth month: a woman very seldom carries the uterus beyond ten months. Births of six months that survive, very seldom are observed; but of seven and eight months often, and the

ad justum tempus ventum fuit, eo infans validior, et in meliore spe.

798. Justo demum tempore, quum fœtus tandem adeptus est debitam molem et vigorem, et liquor amnii pro rata parte multo parcior factus est (788), uterusque igitur, pondere et motu infantis magis stimulatur, dolores puerperii adoriuntur, juvante sæpe, ut videtur, molimine naturali ad menses producendos.

799. Isti dolores paulatim frequentius recrudescentes uterum ipsum, et qui cum eo consentiunt respirationis musculos, ad validam contractionem excitant, quæ tandem os uteri patefaciat, membranasque ovi per hoc in vaginam propellat: ibi vel vi contractionis, vel arte externa, ruptæ vel laceratæ, liquorem amnii cum pauxillo sanguinis effundunt, qui partes, per quas fœtus exire debet, laxet atque emolliat.

pius ventum fuit ad justum tempus, eo validior infans, et in meliore spe.

798. Demum, justo tempore, quum fœtus tandem adeptus est debitam molem et vigorem, et liquor amnii factus est pro ratâ parte multo parcior, que igitur uterus magis stimulatur pondere et motu infantis, dolores puerperii adoriuntur, naturali molimine ad producendos menses, ut videtur, sæpe juvante.

799. Isti dolores paulatim recrudescentes frequentius excitant uterum ipsum, et musculos respirationis, qui consentiunt cum eo ad validam contractionem, quæ tandem patefaciat os uteri, que propellat membranas ovi per hoc in vaginam: ibi ruptæ vel laceratæ vel vi contractionis, vel externâ arte, effundunt liquorem amnii cum pauxillo sanguinis, qui laxet atque emolliat partes per quas fœtus debet exire.

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nearer they have approached to the proper time, the stronger the infant is, and in better hope.

798. Finally, at the due time, when the fœtus at length has acquired its proper bulk and vigour, and the liquor amnii has become in proportion much more scanty, and therefore the uterus is more stimulated by the weight and motion of the infant, the pains of labour arise, the natural endeavour to produce the menses, as it seems, often assisting.

799. Those pains by degrees recurring more frequently, excite the uterus itself, and the muscles of respiration, which cooperate with it, to powerful contraction, which at length can open the os uteri, and propel the membranes of the ovum through it into the vagina: there ruptured or lacerated either by the violence of the contraction, or by external art, they pour out the liquor amnii with a little blood, which may relax and soften the parts through which the fœtus ought to go out.

800. Tum dolores fere mitescunt paulisper, autem redituri brevi vehementiores, que tandem expulsuri infantem, præcipitem, cum immani cruciatu, et tremore totius corporis aliquando etiam convulsione nonnunquam forsan lethali: vero quam primum caput ejus exiverit reliquum corpus facile sequitur.

801. Brevi post partum placenta separatur ab utero, et expellitur cum reliquis partibus ovi, plerumque non sine magnâ jacturâ sanguinis, qualis sæpe non caruerit periculo, præsertim si aliqua vis fuerit admota ad separandam placentam. Vero plerumque fluxus sanguinis brevi compescitur, vel saltem temperatur subitâ et validissimâ contractione uteri: ita ut fluxus, qui vocatur lochia, brevi evadat parcior et pallidior, et tandem omnino serosus. Idem serius ocyus reprimitur penitus, se-

800. Tum dolores paulisper fere mitescunt, brevi autem vehementiores redituri, tandemque cum immani cruciatu, et totius corporis tremore, aliquando etiam convulsione, forsan lethali nonnunquam, infantem præcipitem expulsuri: quam primum vero caput ejus exiverit, reliquum corpus facile sequitur.

801. Brevi post partum, placenta ab utero separatur, et cum reliquis ovi partibus expellitur, non sine magna plerumque sanguinis jactura, qualis sæpe periculo non caruerit, præsertim si vis aliqua ad separandam placentam admota fuerit. Plerumque vero sanguinis fluxus brevi compescitur, vel temperatur saltem, subita et validissima uteri contractione: ita ut fluxus, qui lochia vocatur, brevi parcior et pallidior, et tandem serosus omnino evadat. Idem serius ocyus reprimitur penitus,

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800. Then the pains generally moderate a little, but about to return shortly more violent, and at length to expel the infant, head foremost, with severe torture, and tremor of the whole body, sometimes even with a convulsion occasionally perhaps fatal: but as soon as the head of it has gone forth the rest of the body easily follows.

801. Shortly after birth the placenta is separated from the uterus, and is expelled with the rest of the parts of the ovum, for the most part not without great loss of blood, such as often would not be free from danger, especially if some force should be applied to separate the placenta. But generally the flow of blood quickly is suppressed, or at least is moderated by the sudden and very strong contraction of the uterus: so that the flux, which is called lochia, soon becomes more scanty and paler, and at length altogether serous. The same later or sooner is repressed entirely, according to the

secundum puerperæ constitutionem, et vitæ rationem: nonnullis die uno vel altero, nonnullis vero vix intra mensem; recurrit quoque interdum, quum primo puerpera ad solita munera redit.

802. Corpus, doloribus, et nixu, et sanguinis jactura, exhaustum et debilitatum, non illico vires recuperat, et partim propter infirmitatem, partim propter auctam mobilitatem et sensum, levibus sæpe causis multum et male afficitur. Neque sane absurda omnis quæ puerperis datur cura: multum vero erraverunt, qui omnem puerperam pro morbosa habentes, eas nimia solicitudine custodire voluerunt, et non modo a gravi irritatione, aut frigore defendere, sed perpetuo calore fovere, vel fortasse remedia adhibere ad sudorem excitandum: scilicet, quia talis tractandi ratio ipsa periculo non caret, et corpus magis magisque debilitat,

cundum constitutionem puerperæ et rationem vitæ: nonnullis uno vel altero die, vero nonnullis vix intra mensem; recurrit quoque interdum quum puerpera primo redit ad solita munera.

802. Corpus debilitatum et exhaustum doloribus, et nixu, et jacturâ sanguinis, non recuperat illico vires, et partim propter infirmitatem, partim propter infirmitatem, partim propter auctam mobilitatem et sensum, afficitur multum et male sæpe levibus causis. Neque sane omnis cura quæ datur puerperis absurda: vero erraverunt multum qui, habentes omnem puerperam pro morbosâ, voluerunt custodire eas nimiâ solicitudine, et non modo defendere a gravi irritatione, aut frigore, sed fovere perpetuo calore, vel fortasse adhibere remedia ad excitandum sudorem; scilicet quia talis ratio ipsa tractandi non caret periculo, et debilitat corpus magis

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constitution of the puerperal woman and the manner of life: in some on the first or second day, but in some scarcely within the month; it recurs also, sometimes when the puerperal woman first returns to her usual duties.

802. The body, debilitated and exhausted with pains, and straining, and the loss of blood, does not recover immediately its strength, and partly because of weakness, partly through increased mobility and sensibility, is affected much and badly, often from slight causes. Nor indeed is all the care which is given to puerperal women absurd: but they have erred much who, considering every puerperal woman as a diseased one, wished to guard them with too much care, and not only to defend them from great irritation or cold, but to heat them with constant heat, or perhaps to exhibit remedies to excite sweating; truly because such a method itself of treating

que magis, et reddit aptius ad suscipiendos morbos.

803. Incerto tempore post partum sanguis, pulsus contractione uteri, ab eo fertur majore copiâ versus mammas quæ brevi tument, et incipiunt secernere lac. Tantus fluxus sanguinis ad mammas aliquando accidit, ut ipsæ multum turgeant et nonnunquam inflammentur et suppurentur, et sic vel secretio lactis impediatur, vel lac jam secretum nequeat exsugi præ dolore et tumore fere obruente papillam mammæ. Aliquando etiam mulieres, alioquin sanæ, habent nullum lac; quod tamen est multo rarius vitium quam vulgo dictum est. Plerumque si infans admovetur mammæ paucis horis post partum, ut Natura ipsa docet esse faciendum, neque lac deficit neque venit nimis subito, neque vehemens tumor, neque inflammatio mammarum neque

et ad morbos suscipiendos aptius reddit.

803. Incerto post partum tempore, sanguis, uteri contractione ab eo pulsus, mammas versus majore copia fertur, quæ tument brevi, et lac incipiunt secernere. Aliquando tantus sanguinis ad mammas fluxus accidit, ut ipsæ multum turgeant, et nonnunquam inflammentur et suppurentur, et sic vel lactis secretio impediatur, vel lac jam secretum exsugi nequeat præ dolore, et tumore mammæ papillam fere obruente. Aliquando etiam mulieres, alioquin sanæ, nullum lac habent; quod tamen multo rarius vitium est, quam vulgo dictum est. Plerumque, si infans paucis post partum horis mammæ admovetur, ut ipsa Natura faciendum esse docet, neque lac deficit, neque nimis subito venit, neque vehemens tumor, neque inflammatio mamma-

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is not devoid of danger, and debilitates the body more and more, and renders it more fitted to take on diseases.

803. At an uncertain period after parturition, the blood, driven by the contraction of the uterus from it is conveyed in greater quantity towards the mammæ, which shortly swell, and begin to secrete milk. So great a flow of blood to the breasts sometimes occurs, that they become greatly turgid and sometimes are inflamed and suppurate, and thus either the secretion of milk is impeded, or the milk already secreted cannot be sucked out, for the pain and the swelling almost burying in the nipple of the breast. Sometimes even women, in other respects healthy, have no milk; which however is by much a rarer defect than commonly has been said. Generally, if the infant be put to the breast a few hours after delivery, as Nature herself teaches ought to be done, neither

rum, neque febris, accidunt, et sanguinis ab utero fluxus eo citius reprimitur.

804. Lac, quale primum post partum secernitur, tenue est, et parum nutriens, et, ut vulgo fertur, infantem deorsum purgat magis quam aliud lac; quod tamen minus certum est; paulatim vero crassius fit et magis nutriens. Si mulier suum infantem alit, menses plerumque non redeunt per majorem partem anni, vel fortasse per annum integrum; neque hoc tempore nutrix facile gravida fit, quamvis a venere non abstinuerit; sin minus, menses redire solent menstruo fere post partum spatio.

805. Si nutrix infantem nutrire pergit, lac manebit forsitan per plures annos. Si vero infans a mamma depulsus fuerit, secretio lactis brevi reprimetur. Observatur lac, instantibus mensibus, infantem plerumque male afficere,

febris accidunt, et eo citius fluxus sanguinis ab utero reprimitur.

804. Lac, quale primum secernitur post partum, est tenue et parum nutriens, et ut vulgo fertur, purgat infantem deorsum magis quam aliud lac; quod tamen est minus certum; vero paulatim fit crassius et magis nutriens. Si mulier alit suum infantem menses plerumque non redeunt per majorem partem anni, vel fortasse per integrum annum; neque nutrix facile fit gravida hoc tempore, quamvis non abstinuerit a venere: sin minus, menses solent redire fere menstruo spatio post partum.

805. Si nutrix pergit nutrire infantem, lac manebit forsitan per plures annos. Vero si infans fuerit depulsus a mammâ secretio lactis reprimetur brevi. Observatur lac, mensibus instantibus, plerumque male afficere in-

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does the milk fail, nor does it come too suddenly, nor do the violent swelling, nor the inflammation of the breasts, nor the fever come on, and the more quickly the flow of blood from the uterus is restrained.

804. Milk, such as it is first secreted after delivery, is thin and no way nutrient, and as is commonly said, purges the infant downwards more than other milk; which however is less certain; but gradually it becomes thicker and the more nutrient. If a woman suckles her child, the menses generally do not return for the greater part of the year, or perhaps for a whole year; nor does the nurse easily become gravid at this period, although she should not have abstained from venery; but if not, the menses are accustomed to return nearly at the menstrual interval after delivery.

805. If the nurse continues to suckle the infant, the milk will remain perhaps for several years. But if the infant should be driven from the

fantem, quamvis dum fluunt sæpe non noceat eidem.

806. Quædam mulieres exhauriuntur alendo infantem, et habent se male. Vero pleræque hoc tempore fruuntur optimâ sanitate: appetunt cibum præter solitum, et concoquunt bene, et dormiunt bene, et sunt boni coloris, et sæpe pinguescunt. Neque profecto est rarum plures morbos, præsertim quales ducunt originem a abnormi distributione sanguinis, arceri vel depelli, donec mulier gerat uterum, vel postea alat infantem.

807. Postremo, est dignum observatu, quamvis periculum haud fuerit exiguum in puerperio fœcundas vivere diutius et sanius quam steriles que eas quæ nupserant primâ juventute, et fuerant fœcundissimæ quam eas quæ factæ erant matres serius. Est verisimile nonnullos morbos quibus amabilis

quamvis dum fluunt, eidem sæpe non noceat.

806. Quædam mulieres infantem alendo exhauriuntur, et male se habent. Pleræque vero optima hoc tempore sanitate fruuntur: cibum præter solitum appetunt, et bene concoquunt, et bene dormiunt, et boni coloris sunt, et sæpe pinguescunt. Neque profecto rarum est, plures morbos, præsertim quales a distributione sanguinis abnormi (474, 478) originem ducunt, arceri, vel depelli, donec mulier uterum gerat, vel postea infantem alat.

807. Postremo observatu dignum est, quamvis periculum in puerperio haud exiguum fuerit, fœcundas quam steriles, easque quæ prima juventute nupserant, et fœcundissimæ fuerant, quam eas quæ serius matres factæ erant, diutius et sanius vivere. Verisimile est, nonnullos quibus amabi-

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breast, the secretion of milk will be suppressed in a short time. It is observed that milk, the menses approaching, generally disorders the child, although whilst they are flowing often it does not hurt the same.

806. Some women are exhausted by suckling the child, and feel themselves badly. But most at this time enjoy the best health: they desire food beyond the usual, and digest well, and sleep well, and are of a good colour, and often grow fat. Nor indeed is it uncommon that many diseases, especially such as derive their origin from an irregular distribution of the blood, are prevented or driven away, while a woman is pregnant, or afterwards nurses the infant.

807. Lastly, it is worthy to be observed, although the danger be not trifling in child-bearing, that fruitful live longer and more healthily than barren women, and those who had married in early youth, and had been

lis sexus plectitur morbos, qui non modo ipsa genitalia organa afficiunt, sed totam valetudinem sæpe labefactant, vel induci virginitate, vel multum ingravescere; scilicet, ad quam non natæ sunt fœminæ: neque incredibile est, eosdem sæpe morbos, haud obscura ratione, connubio sanatum iri.

808. Cuncta demum munera muliebri sexui propria sæpe vitiantur, non sine gravi incommodo, et magno valetudinis periculo.

809. Vitium plane est, si menses solita ætate non profluxerint: ætas qua puellæ menses habere incipiunt variat multum, salva adhuc sanitate; scilicet, qui maturius fere accidunt in regionibus calidis, puellisque bene pastis, et luxuriosis, et desidibus, iisque quæ subito crescunt, et justam corporis formam cito adipiscuntur; tardius vero, etiam citra morbum, in regionibus frigidis, et puellis debili-

sexus plectitur, qui non modo afficiunt genitalia organa ipsa sed sæpe labefactant totam valetudinem, vel induci vel multum ingravescere virginitate; ad quam scilicet, fœminæ sunt non natæ: neque est incredibile eosdem morbos sæpe sanatum iri connubio ratione haud obscurâ.

808. Demum cuncta numera propria muliebri sexui sæpe vitiantur, non sine gravi incommodo et magno periculo valetudinis.

809. Est plane vitium, si menses non profluxerint solitâ ætate: ætas quâ puellæ incipiunt habere menses variat multum, sanitate adhuc salvâ; scilicet qui fere accidunt maturius in calidis regionibus, que puellis bene pastis et luxuriosis, et desidibus que iis quæ crescunt subito, et cito adipiscuntur justam formam corporis; vero tardius, etiam citra morbum in frigidis regionibus, et pu-

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most fruitful, than they who had become mothers later. It is probable that some diseases with which the lovely sex is attacked, which not only affect the genital organs themselves but often undermine the whole health, either are induced or greatly increase by virginity; for which truly, women are not born: nor is it incredible that the same diseases often would be cured by marriage, for a reason no way obscure.

808. In fine, all the functions peculiar to the female sex often are vitiated, not without serious inconvenience and great danger of health.

809. It is evidently a disease, if the menses should not have flowed forth at the usual age: the age at which girls begin to menstruate varies much, the health being still good; as being which commonly come on earlier in hot climates, and in girls well fed and luxurious, and indolent, and those who grow suddenly, and quickly attain the due form of body; but more slowly,

ellis debilibus crescentibus lente, tolerantibus vitam tenui victu, et assuetis valido labori.

810. Vero plerumque, si menses non prorumpunt justo tempore, valetudo multum afficitur. Omnis vigor perit, fere singulæ functiones corporis impediuntur plus ve minus, appetentia cibi deficit aut vitiatur, concoctio ejus corrumpitur, totum corpus solvitur, flaccescit, pallet, marcescit, sanguis ipse evadit tenuis et pallidus, et sic via sternitur plurimis morbis. Talis defectus mensium dicitur Emansio apud medicos. Lenta valetudo oriunda ex eâ vocatur chlorosis.

811. Vero sæpe postquam menses profluxerint diu justis intervallis ut decet, vel non redeunt solito tempore, citra graviditatem, vel jam fluentes subito reprimuntur. Hoc genus mali vocatur Amenorrhœa seu suppressio mensium.

bus, lente crescentibus, victu tenui vitam tolerantibus, et valido labori assuetis.

810. Plerumque vero, si menses justo tempore non prorumpunt, valetudo multum afficitur. Vigor omnis perit, singulæ fere corporis functiones plus minusve impediuntur, appetentia cibi deficit aut vitiatur, concoctio ejus corrumpitur, totum corpus solvitur, flaccescit, pallet, marcescit, sanguis ipse tenuis et pallidus evadit, et sic plurimis morbis via sternitur.—Talis mensium defectus Emansio apud medicos dicitur. Lenta valetudo ex ea oriunda Chlorosis vocatur.

811. Sæpe vero, postquam menses diu, ut decet, justis intervallis profluxerint, vel solito tempore, citra graviditatem, non redeunt, vel jam fluentes subito reprimuntur. Hoc mali genus Amenorrhœa vocatur, seu Suppressio Mensium.

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even without disease in cold countries, and in girls weakly, growing slowly, supporting life on slender diet, and accustomed to hard labour.

810. But generally, if the menses do not break forth at the proper time, the health is much affected. All vigour perishes, nearly all the functions of the body are impeded more or less, the desire for food fails or is vitiated, the concoction of it is corrupted, the whole body is relaxed, grows flaccid, grows pale, wastes, the blood itself becomes thin and pallid, and thus the way is paved for many diseases. Such a defect of the menses is called Emansio by physicians. The lingering disease arising from it, is called chlorosis.

811. But often after that the menses have flowed a long time at the proper intervals as is proper, either they do not return at the usual period, without pregnancy, or already flowing suddenly are suppressed. This kind of disease is called Amenorrhœa, or suppression of the menses.

812. Plurima hinc mala; varia autem secundum constitutionem ægræ, multasque res externas concurrentes: plenitudo primo vasorum sanguinem vehentium uteri, postea universi corporis, distributio sanguinis abnormis, et auctus ejus impetus, febris, congestiones sanguinis in variis partibus, sanguinis fluxus a naribus, pulmonibus, ventriculo, ano, in quibusdam ut fertur exemplis, ab omni fere corporis parte: dolor lumborum, capitis, pectoris, ventriculi, vertigo, nimia mobilitas, hysteria aliquando, tandem debilitas generalis, omnesque functiones impeditæ, et valetudo ab omni parte labefacta.

813. Variæ sunt causæ mensium vel suppressorum, vel nunquam profluentium, eo magis attentione dignæ, quod ex earum natura bene perspecta, morbi sanatio et fluxus revocatio potissimum pendent.

812. Hinc plurima mala; autem varia secundum constitutionem ægræ que multas externas concurrentes res: primo plenitudo vasorum uteri vehentium sanguinem, postea universi corporis, abnormis distributio sanguinis et auctus impetus ejus, febris, congestiones sanguinis in variis partibus, fluxus sanguinis a naribus, pulmonibus, ventriculo, ano, in quibusdam exemplis, ut fertur, ab fere omni parte corporis; dolor lumborum, capitis, pectoris, ventriculi, vertigo, nimia mobilitas, aliquando hysteria, tandem generalis debilitas, omnes functiones impeditæ, et valetudo labefacta ab omni parte.

813. Variæ causæ mensium vel suppressorum vel nunquam profluentium sunt eo magis dignæ attentione quod sanatio morbi et revocatio fluxûs potissimum pendent ex naturâ earum bene perspectâ.

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812. Hence many diseases; but varying according to the constitution of the patient and many external concurring things: first, fulness of the vessels of the uterus carrying blood, afterwards of the whole body, irregular distribution of the blood and increased impetus of it, fever, congestions of blood in different parts, fluxes of blood from the nose, lungs, stomach, anus, in some examples, as it is said, from almost every part of the body; pain of the loins, head, breast, stomach, vertigo, excessive irritability, sometimes hysteria, at length general debility, all the functions impeded, and the health undermined from every part.

813. The various causes of the menses either being suppressed or never flowing forth, are the more worthy attention, because the cure of the disease and the recall of the discharge, principally depend upon the nature of them being well understood.

814. Menses deficiunt aliquando fortasse, sed rarissime, propter pravam fabricam uteri quâ minus valeat ad congerendum, et effundendum sanguinem; interdum etiam, quamvis haud multo frequentius sanguis effusus in uterum reprimitur ibi, viâ scilicet, ex utero impeditâ præter naturam.

815. Vero sæpius, fabricâ organorum omnino salva, menses non prorumpunt solita ætate ob defectum istius conditionis, ovariorum unde secretio fœcundorum humorum qui videntur esse stimulo utero pendet; vel propter corpus non bene nutritum aut exhaustum gravi labore aut valetudine, vel denique valde debilitatum quâcunque causâ, ita ut vel nulla abundantia sanguinis possit fieri, vel si qua fuerit facta nulla vis adsit quæ invitet sanguinem ad uterum, vel propellat per vasa ejus. Ex iisdem causis menses sæpe sup-

814. Deficiunt aliquando fortasse menses, sed rarissime, propter pravam uteri fabricam, qua minus valeat ad sanguinem congerendum et effundendum; interdum etiam, quamvis haud multo frequentius, sanguis in uterum effusus ibi reprimitur, via scilicet ex utero præter naturam impedita.

815. Sæpius vero, salva omnino organorum fabrica, menses solita ætate non prorumpunt, ob defectum istius conditionis ovariorum, unde secretio humorum fœcundorum qui utero stimulo videntur esse (571) pendet; vel propter corpus non bene nutritum, aut gravi labore aut valetudine exhaustum, vel denique quacunque causa valde debilitatum, ita ut vel nulla sanguinis abundantia fieri possit, vel siqua facta fuerit, vis nulla adsit quæ sanguinem ad uterum invitet, vel per ejus vasa propellat. Ex iisdem causis, menses sæpe suppri-

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814. The menses fail sometimes perhaps, though very seldom, through a depraved structure of the uterus, by which it is less adequate to accumulate and pour out the blood; sometimes also, although not much more frequently, the blood poured out into the uterus is retained there, the passage, indeed, from the uterus being unnaturally impeded.

815. But more often, the structure of the organs being altogether sound, the menses do not break forth at the usual age, through a want of that condition of the ovaries, whence the secretion of the fecundating fluids which seem to be a stimulus to the uterus depends; or on account of the body not being well nourished, or exhausted by severe labour or disease, or in fine greatly debilitated by whatever cause, so that either no abundance of blood can take place, or if any should be produced no force is present which can invite the blood to the uterus, or propel it through the vessels of it.

muntur fœminis, quæ antea eos naturali modo habuissent.

816. Sæpe etiam impediuntur jam instantes menses, vel subito sistuntur, dum fluunt, variis causis, quales vel istiusmodi debilitatem, vel contractionem, aut spasmum utero ejusque arteriis inducere, vel sanguinem alio divertere possint: cujusmodi sunt vehementes animi affectus, sive excitantes sive deprimentes, frigus, præsertim pedibus admotum, magnæ exinanitiones, medicamenta fortiora, varii demum morbi. Menses quoque eo facilius impediuntur instantes, vel reprimuntur fluentes, causis quæ viderentur levissimæ, suppressique eo magis nocent, quod insolita, dum instant vel fluunt, universi corporis mobilitas viget.

817. Hinc ratio in promptu erit, cur plurima, et admodum diversa remedia, aut inducant aut revocent menses, aut mala sublevent ex

primuntur fœminis quæ ante habuissent eos naturali modo.

816. Sæpe etiam menses jam instantes impediuntur, vel dum fluunt subito sistuntur variis causis quales possint inducere vel debilitatem istiusmodi, vel contractionem, aut spasmum utero que arteriis ejus, vel divertere sanguinem alio: cujusmodi sunt vehementes affectus animi, sive excitantes sive deprimentes, frigus præsertim admotum pedibus, magnæ exinanitiones, fortiora medicamenta, demum varii morbi. Menses quoque instantes impediuntur, vel fluentes reprimuntur eo facilius causis quæ viderentur levissimæ, que suppressi nocent eo magis quod dum instant vel fluunt insolita mobilitas universi corporis viget.

817. Hinc ratio erit in promptu cur plurima et admodum diversa remedia aut inducant aut revocent menses, aut sublevent

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From the same causes the menses often are suppressed in women who before had them in the natural way.

816. Often also the menses now approaching are impeded, or whilst they are flowing, suddenly are stopped by various causes, such as may bring on either debility of that kind, or contraction, or a spasm upon the uterus and the arteries of it, or divert the blood elsewhere: of which kind are violent affections of the mind, whether exciting or depressing, cold especially applied to the feet, large evacuations, stronger medicines, in fine, various diseases. The menses also impending are impeded, or while flowing are suppressed the more easily by causes which seem the slightest, and suppressed hurt the more, because whilst they approach or are flowing, an unusual irritability of the whole body prevails.

817. Hence the reason will be in readiness why very many and very different remedies either may induce or recall the menses, or relieve the

mala provenientia ex suppressione eorum; nimirum quæ impleant, depleant, roborent laxent stimulent sopiant corpus, ve dirigant sanguinem versus uterum: qualia sunt lautior victus, detractio sanguinis, stimulantia medicamenta, veluti niger helleborus, aut calida gummi, electrica aura, exercitatio, balneum, fomenta, opium, &c. neque erit mirum omnia, etiam laudatissima remedia sæpe fallere spem medici; neque sane credibile quodvis remedium unquam repertum iri, vel casu vel ratione, quod fuerit semper utile, que sanaverit morbum qui agnoscat tot que tam varias causas, que noceat corpori tot que tam diversis modis.

818. Porro menses haud raro vel profluunt nimiâ copia vel redeunt nimis frequenter: que alterum sæpe jungitur cum altero vitio; nimirum quia utrumque agnoscit fere similes causas.

eorum suppressione provenientia; nimirum, quæ corpus impleant, depleant, roborent, laxent, stimulent, sopiant, sanguinemve uterum versus dirigant: qualia sunt victus lautior, sanguinis detractio, stimulantia medicamenta, veluti helleborus niger, aut gummi calida, aura electrica, exercitatio, balneum, fomenta, opium, &c. neque mirum erit omnia, etiam laudatissima remedia, spem medici sæpe fallere; neque sane credibile, remedium quodvis, vel casu vel ratione unquam repertum iri, quod semper utile fuerit, morbumque sanaverit, qui tot tamque varias agnoscat causas, corporique tot tamque diversis modis noceat.

818. Porro, menses haud raro vel nimia copia profluunt, vel nimis frequenter redeunt: alterumque cum altero vitio sæpe jungitur; nimirum, quia utrumque similes fere causas agnoscit.

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disorders proceeding from the suppression of them; as being things which can replete, deplete, strengthen, relax, stimulate, lull the body, or direct the blood towards the uterus: such are more sumptuous fare, abstraction of blood, stimulating medicines, as black hellebore, or the warm gums, the electric spark, exercise, the bath, fomentations, opium, &c. nor will it be wonderful that all, even the most celebrated remedies often deceive the hope of the physician; nor indeed is it credible that any remedy ever will be found, either by accident or research, which will be always useful, and will cure a disease which acknowledges so many and so varied causes, and hurts the body in so many and such different ways.

818. Moreover, the menses not unfrequently either flow forth in too great quantity or return too frequently: and the one often is joined with the other disorder; doubtless because both acknowledge nearly similar causes.

819. Causæ talis vitii frequentissimæ sunt, nimia sanguinis abundantia, auctusque impetus, præsertim uterum versus directus, vel stimulantibus huic partibusque vicinis admotis, vel spasmo seu contractione aliqua aliis et remotis partibus inductis (475, 476); impeditus sanguinis ex utero per venas reditus, propter varias obstructiones; laxitas et debilitas uteri ejusque arteriarum a crebra graviditate aut frequente abortu; vel demum varia uteri vitia, ulcus, erosio, carcinoma.

819. Frequentissimæ causæ talis vitii sunt nimia abundantia sanguinis, que auctus impetus præsertim directus versus uterum, vel stimulantibus admotis huic que vicinis partibus, vel spasmo, seu aliquâ contractione inductis aliis et remotis partibus; impeditus reditus sanguinis per venas ex utero, propter varias obstructiones; laxitas et debilitas uteri que arteriarum ejus a crebra graviditate aut frequente abortu; vel demum varia vitia uteri, ulcus, erosio, carcinoma.

820. Ratio igitur in aprico erit, cur multiplex vitium, varia, et quæ videantur contraria, medicamenta aliquando postulet; veluti sanguinis detractionem, tenuem diætam, laxantia, roborantia, refrigerantia, anodyna, &c.

820. Igitur ratio erit in aprico, cur multiplex vitium aliquando postulet varia, et quæ videantur contraria medicamenta, veluti detractionem sanguinis, tenuem diætam, laxantia, roborantia, refrigerantia, anodyna, &c.

821. Tale prŏfluvium corpus exhaurit, solidas partes laxat, fluidas attenuat, uterum debilitat, fluorem

821. Tale profluvium exhaurit corpus, laxat solidas partes, attenuat fluidas debilitat uterum, in-

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819. The most frequent causes of such a disease are too great abundance of blood, and increased impetus of it especially directed towards the uterus, or stimulants applied to it and the neighbouring parts, or by spasm, or by some contraction brought on other and remote parts: impeded return of blood by the veins from the uterus, on account of various obstructions; laxity and debility of the uterus and of the arteries of it, from frequent pregnancy or frequent abortion; or, in fine, various diseases of the uterus, ulcer, erosion, cancer.

820. Therefore the reason will be evident, why a complicated disease sometimes should require different, and what may seem opposite medicines, as detraction of blood, thin diet, relaxing, strengthening, refrigerating medicines, anodynes, &c.

821. Such a discharge exhausts the body, relaxes the solid parts, atte-

ducit fluorem album, reddit mulieres vel steriles vel proclives ad abortum et demum impedit omnes functiones, labefactat universam valetudinem, raro subito lethale, vero aliquando origo et causa morborum fere insanabilium.

822. Aliud vitium, familiare et molestissimum muliebri sexui, quod vocatur Fluor Albus, videtur quodammodo affine huic: scilicet fluxus albidi humoris e vaginâ.

823. Hoc vitium sæpe comitatur profluvium mensium, que tum fere præcedit et consequitur eos; nimirum, quum arteriæ que foramina hiantia in uterum, nondum ita dilatantur, ut possint transmittere crassum et rubrum sanguinem; tenuior pars sola ejus transit, et nonnihil spissata per remoram, que fortasse aliter mutata, et mixta cum muco, elabitur e vaginâ; que, pari ratione, postquam eadem vasa et

album inducit, mulieres vel steriles reddit, vel ad abortum proclives, et demum omnes functiones impedit, universam valetudinem labefactat, raro subito lethale, aliquando vero insanabilium fere morborum origo et causa.

822. Huic quodammodo affine videtur aliud vitium, sexui muliebri familiare et molestissimum, quod Fluor Albus vocatur: fluxus scilicet humoris albidi e vagina.

823. Mensium profluvium hoc vitium sæpe comitatur, eosque tum fere præcedit et consequitur; nimirum, quum arteriæ, foraminaque in uterum hiantia, nondum ita dilatantur, ut crassum et rubrum sanguinem transmittere possint; pars ejus tenuior sola transit, et spissata nonnihil per remoram, aliterque fortasse mutata, et cum muco mixta, e vagina elabitur: parique ratione, postquam eadem vasa et foramina aliquantum con-

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nuates the fluids, weakens the uterus, brings on fluor albus, renders women either barren or subject to abortion, and at length impedes all the functions, undermines the whole health, seldom suddenly fatal, but sometimes the origin and cause of diseases almost incurable.

822. Another disease, common and very troublesome to the female sex, which is called Fluor Albus, seems in some degree akin to this: namely, a flow of whitish fluid from the vagina.

823. This disorder often accompanies a flux of the menses, and then commonly precedes and follows them; that is, when the arteries and foramina opening into the uterus, are not yet so dilated that they can transmit the thick and red blood; the thinner part alone of it passes, and somewhat thickened during its delay, and perhaps otherwise changed, and mixed with mucus, escapes from the vagina; and, for a like reason, after that the same

stricta cruorem cohibent, tenuis adhuc et albidi humoris fluxus paulisper superest. Ingravescens vero malum constans fit, totumque mensium intervallum occupat.

824. Hoc malum non secus ac mensium profluvium uterum debilitat, corpus exhaurit, mulierem sæpe sterilem facit, et universam valetudinem labefactat. Frequentissime a profluvio mensium, uterum debilitante, totum corpus laxante, sanguinem attenuante, originem ducit; ex iisdem fere causis oritur (819), similibusque sæpe remediis reprimitur. Haud raro tamen oritur a suppressis vel deficientibus mensibus. Mulieres, quæ tali morbo laborant, haud ita facile ac sanæ gravidæ fiunt, vel, si conceperint, crudus fœtus sæpe brevi effluit. Quod si prospere uterum gesserit talis mulier, morbus quo prius laboraverat fere reprimitur,

foramina, aliquantum constricta, cohibent cruorem, fluxus tenuis et albidi humoris adhuc superest paulisper. Vero malum ingravescens, fit constans, que occupat totum intervallum mensium.

824. Hoc malum, non secus ac profluvium mensium, debilitat uterum, exhaurit corpus, sæpe facit mulierem sterilem, et labefactat universam valetudinem. Frequentissime ducit originem a profluvio mensium debilitante uterum, laxante totum corpus, attenuante sanguinem; oritur ex fere iisdem causis, que sæpe reprimitur similibus remediis. Tamen, oritur haud raro a mensibus suppressis vel deficientibus. Mulieres quæ laborant tali morbo, haud fiunt gravidæ ita facile ac sanæ, vel, si conceperint, crudus fœtus sæpe effluit brevi. Quod si talis mulier prospere gesserit uterum, morbus quo prius laboraverat fere reprimitur, fortasse

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vessels and foramina, somewhat constricted, restrain the cruor, the flow of the thin and whitish humour still remains for a little. But the disorder increasing, becomes constant, and occupies the whole interval of the menses.

824. This disorder, in like manner as the flux of the menses, weakens the uterus, exhausts the body, often renders a woman barren, and undermines the whole health. Very frequently it derives its origin from a flux of the menses weakening the uterus, relaxing the whole body, attenuating the blood; it arises from nearly the same causes, and often is repressed by similar remedies. However, it arises not unfrequently from the menses being suppressed or deficient. Women who suffer from such a disease, do not become pregnant so easily as healthy ones, or, if they should conceive, a crude fœtus often escapes in a short time. But if such a woman should prosperously carry the uterus, the disease from which she had previously

nunquam rediturus: præsertim si fuerit idonea ratio vitæ post partum.

825. Demum, est vitium, si menses, quamvis neque suppressi neque profluentes nimis copiose, tamen erumpunt solitis et naturalibus intervallis ægre, et cum dolore uteri, lumborum, capitis, que gravi perturbatione totius corporis. Multæ fœminæ quæ expertæ erant nulla vel admodum levia incommoda hujusmodi primis puberibus annis, adhuc florente ætate, que ipsæ vegetæ, et alioquin sanæ, fere ægrotant hoc modo, quoties menses debent fluere. Incommodum oriundum vel a crescente firmitate solidarum partium, vel a nimiâ contractione arteriarum et foraminum uteri, sublevatur optime laxantibus remediis et anodynis: neque confugiendum est temere ad calefacientia, stimulantia, aut cardiaca remedia, qualia mulierculæ amant præcipere;

fortasse nunquam rediturus; præsertim si post partum idonea vitæ ratio fuerit.

825. Vitium demum est, si menses, quamvis neque suppressi neque nimis copiose profluentes, ægre tamen et cum dolore uteri, lumborum, capitis, gravique totius corporis perturbatione, solitis et naturalibus intervallis erumpunt. Multæ fœminæ, quæ nulla vel levia admodum hujusmodi, primis puberibus annis, expertæ erant incommoda, florente adhuc ætate, ipsæque vegetæ, et alioquin sanæ, hoc modo fere ægrotant, quoties menses debent fluere. Incommodum vel a crescente solidarum partium firmitate, vel a nimia arteriarum et foraminum uteri contractione oriundum, remediis laxantibus et anodynis optime sublevatur: neque temere ad calefacientia, stimulantia, aut cardiaca remedia, qualia mulierculæ amant præcipere, con-

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suffered generally is repressed, perhaps never to return: especially if there should be a proper kind of life after parturition.

825. In fine, it is a disorder, if the menses, although neither suppressed nor flowing too copiously, notwithstanding break forth at the usual and natural intervals with difficulty, and with pain of the uterus, loins, head, and great perturbation of the whole system. Many women who had experienced none or very slight inconveniences of this sort in the first ripe years, yet in flourishing age, and themselves fresh, and otherwise healthy, mostly get ill in this manner, as often as the menses ought to flow. An inconvenience arising either from the increasing firmness of the solid parts, or from excessive contraction of the arteries and foramina of the uterus, is relieved best by relaxing remedies and anodynes: nor must we have recourse rashly to heating, stimulating, or cordial remedies, such as little women like to prescribe; although, truly, remedies of this sort may, no doubt, by the motion

fugiendum est; quamvis istiusmodi profecto remedia, incitato nimirum sanguinis motu, renixum illum a firmitate uteri ejusque arteriarum contractione ortum superare, mensesque promovere, possint.

826. Vitium quoque est, si mulier, ætate qua debet esse fœcunda, sterilis est. Hoc aliquando fit propter pravam uteri, aut tubarum, aut ovariorum, fabricam, qualis, in nonnullis quamvis admodum raris exemplis, inspectione cadaverum detecta fuerit; neque sivisset semen masculinum ad ovaria penetrare, vel muliebre quicquid fuerit ad generationem necessarium cum eo misceri, vel justum cum utero commeatum habere; puta, uterum obstructum, aut scirrhosum, vel tubas conclusas, vel ovaria hydropica facta, &c.

827. Sæpius vero a vitiis mensium, suppressione, profluvio, fluore albo, mulieres steriles fiunt; scilicet

quamvis, profecto, remedia istiusmodi, possint nimirum, motu sanguinis incitato, superare illum renixum ortum a firmitate uteri que contractione arteriarum ejus, que promovere menses.

826. Est quoque vitium, si mulier est sterilis ætate quâ debet esse fœcunda. Hoc aliquando fit propter pravam fabricam uteri, aut tubarum, aut ovariorum, qualis detecta fuerit inspectione cadaverum, in nonnullis, quamvis admodum raris exemplis; neque sivisset masculinum semen penetrare ad ovaria, vel muliebre, quicquid fuerit, necessarium ad generationem misceri cum eo, vel habere justum commeatum cum utero; puta obstructum aut scirrhosum uterum, vel tubas conclusas, vel ovaria facta hydropica, &c.

827. Vero mulieres sæpius fiunt steriles a vitiis mensium, suppressione, profluvio, fluore albo; sci-

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of the blood being quickened, overcome that resistance arising from the firmness of the uterus and contraction of the arteries of it, and promote the menses.

826. It is also a disease, if a woman is barren at an age in which she ought to be fruitful. This sometimes happens on account of a depraved structure of the uterus, or of the tubes, or of the ovaries, such as has been detected by the inspection of dead bodies, in some, although very rare examples: and had not permitted the male semen to penetrate to the ovaria, or the female, whatever it might be, necessary for generation to be mixed with it, or to have a proper communication with the uterus; as for instance, an obstructed or scirrhous uterus, or the tubes closed up, or the ovaries become dropsical, &c.

827. But women more often become barren from the diseases of the

licet quæ vel non sinunt eas concipere, vel ejiciunt fœtum adhuc fluidum, vel impediunt justum et naturale nutrimentum ejus per placentam, et vasa umbilici.

828. Humores ipsi, quotquot fœminæ debent conferre ad generationem, possunt corrumpi, non secus ac virile semen, et fieri parum fœcundi. Venus quoque, nimis culta, solet facere fœminas steriles.

829. Fœcunditas pendet multum a primâ et congenitâ constitutione corporis; quippe quæ observetur mira, et fere constans, in quibusdam familiis, dum quædam antiquæ stirpes tulerint unicum filium per plures generationes.

830. Ignavia et luxus vel paulatim reddunt omnes homines steriles, vel producunt debilem atque morbosam prolem, qualis superaverit infantiam ægre, et raro attigerit virilem ætatem. Sic fere

quæ eas vel non sinunt concipere, vel fœtum adhuc fluidum ejiciunt, vel justum et naturale nutrimentum ejus per placentam et vasa umbilici impediunt.

828. Humores ipsi, quotquot fœminæ ad generationem conferre debent, corrumpi possunt, non secus ac semen virile (765), et parum fœcundi fieri. Venus quoque nimis culta fœminas solet steriles facere.

829. Fœcunditas pendet multum a prima et congenita corporis constitutione; quippe quæ mira et fere constans in quibusdam familiis observetur, dum stirpes quædam antiquæ unicum per plures generationes filium tulerint.

830. Ignavia et luxus omnis homines vel steriles paulatim reddunt, vel prolem producunt debilem atque morbosam, qualis infantiam ægre superaverit, et raro virilem ætatem attigerit. Sic rustici fere omnes

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menses, as suppression, immoderate flow, fluor albus; as being things which either do not permit them to conceive, or eject the fœtus as yet fluid, or prevent the due and natural nourishment of it by the placenta, and the vessels of the umbilicus.

828. The fluids themselves, whatever women ought to contribute to generation, may be corrupted, like as the male semen, and become little fruitful. Venery also, too much indulged, is accustomed to render women barren.

829. Fecundity depends much upon the original and congenital constitution of the body; as being what is observed wonderful, and almost constant, in some families, whilst some ancient races have borne a single offspring through several generations.

830. Idleness and luxury either gradually render all persons sterile, or produce a weak and diseased offspring, such as will pass over infancy with

fœcundi sanæ et vegetæ prolis: urbani vero, sæpe vel steriles, vel miserandæ progeniei parentes. Solum quidem rus ferax hominum, quos non sibi soli educat, sed urbibus quoque, quæ aliter brevi inanes forent: rara enim exempla familiarum artificum quæ per quatuor generationes floruerunt. Quin et nobilissimæ et antiquissimæ gentes optimatum et principum indies minuuntur, et pereunt: ita ut nulla brevi nobilitas superesset, nisi cum plebe nuptiæ fierent, et novi homines ad summos honores evecti, antiquis familiis adscriberentur; quamvis non dubium sit, longe alium ac nuptiæ demonstrarent patrem, nobilem stirpem, vitiis et morbis animi et corporis viginti atavorum, onustam, multum sæpe emendasse, et aliquando renovasse perituram.

831. Quamvis utriusque parentis constitutio, luxu et ignavia cor-

omnes rustici fœcundi sanæ et vegetæ prolis; vero urbani sæpe vel steriles, vel parentes miserandæ progeniei. Rus solum, quidem, ferax hominum, quos educat non sibi soli, sed urbibus quoque, quæ aliter brevi forent inanes: enim exempla, familiarum artificum quæ floruerunt per quatuor generationes rara. Quin et, nobilissimæ et antiquissimæ gentes optimatum et principum minuuntur indies, et pereunt: ita ut brevi nulla nobilitas superesset, nisi nuptiæ fierent cum plebe, et novi homines evecti ad summos honores, adscriberentur antiquis familiis; quamvis sit non dubium, patrem longe alium ac nuptiæ demonstrarent, sæpe multum emendasse nobilem stirpem, onustam vitiis et morbis animi et corporis viginti atavorum, et aliquando renovasse perituram.

831. Quamvis constitutio utriusque parentis,

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difficulty, and seldom will reach virile age. Thus almost all country persons are fruitful of sound and vigorous offspring; but townspeople often either are sterile, or the parents of a miserable progeny. The country alone, indeed, is fruitful of men, whom she brings up not for herself alone, but for the cities also, which otherwise quickly would be empty: for examples of the families of artificers which have flourished for four generations are rare. Moreover, the most noble and ancient races of grandees and princes are diminished daily, and are perishing: so that in a short time no nobility would remain, unless marriages were made with the common people, and commoners raised to the highest dignities, were enrolled with the old families; although it is not doubtful, that a father far different from what nuptials would point out often has greatly amended a noble race, loaded with the vices and diseases of mind and body of twenty great grandfathers, and sometimes has revived it when about to perish.

corrupta luxu et ignaviâ, possit conferre ad hanc degenerationem aut sterilitatem; tamen satis constat maximum vitium et causam sterilitatis sæpe esse in fœminis, scilicet quæ solvuntur, et multum debilitantur, et fiunt nimis plenæ sanguine tali genere vitæ; et ideo habent menses copiosiores quam rusticæ et robustæ fœminæ solent habere, et laborant sæpe fluore albo, sæpe profluvio, sæpe suppressione mensium.

832. Expulsio crudi fœtus vocatur abortus; sane frequentissimum vitium; accidens sæpius tertio mense; repetitum aliquoties facile transiens in consuetudinem, difficillimè rumpendam: fere eo periculosius quo propius fuerit ventum ad justum tempus.

833. Agnoscit fere easdem causas ac profluvium mensium, cujus sæpe est pars et effectus; plerumque, si oritur a interno vitio, accidens tempore

rupta, ad hanc degenerationem aut sterilitatem conferre possit; tamen satis constat, maximum sæpe vitium et causam sterilitatis in fœminis esse, scilicet, quæ tali vitæ genere solvuntur, et debilitantur multum, et sanguine nimis plenæ fiunt; et menses ideo copiosiores habent, quam rusticæ et robustæ mulieres habere solent, et sæpe fluore albo, sæpe profluvio, sæpe suppressione mensium, laborant.

832. Abortus vocatur crudi fœtus expulsio; vitium sane frequentissimum; sæpius tertio mense accidens; aliquoties repetitum facile in consuetudinem transiens, difficillime rumpendam: eo fere periculosius quo propius ad justum tempus ventum fuerit.

833. Easdem fere agnoscit causas ac mensium profluvium, cujus sæpe pars est et effectus; plerumque, si a vitio interno oritur, tempore mensium accidens, et, ut vi-

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831. Although the constitution of either parent, corrupted by luxury and idleness, may contribute to this degeneracy or sterility; nevertheless it is sufficiently established that the greatest fault and cause of sterility often is in the women, as being persons who are relaxed, and are much debilitated, and become too full of blood by such a kind of life; and therefore have the menses more copious than rustic and robust women are accustomed to have, and suffer often from fluor albus, often from a flux, often suppression of the menses.

832. The expulsion of the crude fœtus is called abortion; indeed a very frequent disorder; happening more often in the third month; repeated several times easily passing into a habit, very difficultly to be broken: commonly the more dangerous the nearer it has approached to the proper time.

833. It acknowledges nearly the same causes as a discharge of the menses, of which often it is a part and effect; generally, if it arises from an internal

detur, a solito naturæ molimine ad eos producendos originem ducens. Quicquid præterea commeatum inter matrem et fœtum (789, 790), rumpit, vel uterum stimulat, debilitat, vel ullo modo lædit, vel genus nervosum convellit, vel corpus calefacit, abortum inducere potest: auctus scilicet sanguinis impetus, præsertim in uteri vasis; febris vehemens, quæ sane raro gravidis accidit, neque fere sine abortus periculo, vel vitæ ipsius discrimine; exercitatio valida, defatigatio, nixus ingens, vis externa corpori, præsertim ventri, illata, Venus immodica, irritatio partium vicinarum, veluti a fortibus medicamentis; graves animi affectus, sive excitantes sive deprimentes, ingens debilitas, vel generalis, vel uteri tantum, vel syncope demum, veluti ab enormibus exinanitionibus; et vitia denique nonnulla fœtus ipsius, mole vel figura monstrosi, ejusque

mensium, et ducens originem, ut videtur, a solito molimine naturæ ad producendos eos. Præterea, quicquid rumpit commeatum inter matrem et fœtum, vel stimulat, debilitat, vel ullo modo lædit uterum, vel convellit nervosum genus, vel calefacit corpus, potest inducere abortum: scilicet, auctus impetus sanguinis, præsertim in vasis uteri; vehemens febris, quæ sane raro accidit gravidis, neque fere sine periculo abortûs, vel discrimine vitæ ipsiûs; valida exercitatio, defatigatio, ingens nixus, externa vis illata corpori, præsertim ventri, immodica venus, irritatio vicinarum partium, veluti a fortibus medicamentis; graves affectus animi, sive excitantes sive deprimentes, ingens debilitas, vel generalis, vel tantum uteri, vel demum, syncope, veluti ab enormibus exinanitionibus; et denique, nonnulla vitia fœtus ipsius, monstrosi mole

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disease, happening at the time of the menses, and deriving its origin, as it seems, from the usual endeavour of nature to produce them. Besides, whatever breaks the communication between the mother and fœtus, or stimulates, weakens, or in any manner injures the uterus, or convulses the nervous system, or heats the body, may bring on abortion: namely, increased impetus of blood, especially in the vessels of the uterus; intense fever, which indeed seldom happens in the pregnant, nor commonly without the hazard of abortion, or danger of life itself; strong exercise, fatigue, great straining, external violence done to the body, especially to the belly, immoderate venery, irritation of the neighbouring parts, as from strong medicines; severe affections of the mind, whether exciting or depressing, great debility, either general, or only of the uterus, or in fine, syncope, as from excessive evacuations; and lastly, some faults of the fœtus itself,

vel figurâ, que minus idoneus situs ejus in utero, vel morbi qui faciunt circuitum sanguinis per placentam languere, vel denique mors, quæ sistit omnem motum humorum per placentam, que rumpit commercium cum matre.

minus idoneus in utero situs, vel morbi qui circuitum sanguinis per placentam languere faciunt, vel mors denique, quæ omnem humorum per placentam motum sistit, commerciumque cum matre rumpit.

834. Igitur, ratio præcavendi ab instante malo, haud erit obscura, detractione sanguinis, decumbendo, quiete animi et corporis, anodynis remediis frigore admoto variis modis, que aliis remediis adhibitis prout res postulaverint. Neque aut mulier semper facit abortum, aut infans perit, quamvis nonnihil aquæ vel sanguinis etiam effluxerit, nimirum quia placenta, si fuerit aliquantum separatæ, potest rursus concrescere cum utero, et liquor amnii iterum suppleri.

834. Ratio igitur haud obscura erit ab instante malo præcavendi, sanguinis detractione, decumbendo, quiete animi et corporis, anodynis remediis, frigore variis modis admoto, aliisque remediis, prout res postulaverint, adhibitis. Neque semper aut mulier abortum facit, aut infans perit, quamvis aquæ nonnihil, vel sanguinis etiam, effluxerit, nimirum quia placenta, si separata aliquantum fuerit, cum utero rursus concrescere potest, et liquor amnii iterum suppleri.

835. Vero quum sit jam ventum ad justum tempus, partus sæpe fit difficilis et laboriosus, aut pe-

835. Quum vero jam ad justum tempus ventum sit, partus sæpe difficilis, et laboriosus, aut pericu-

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monstrous in bulk or shape, and a less suitable position of it in the uterus, or diseases which cause the circulation of the blood through the placenta to languish, or finally death, which stops all motion of fluids through the placenta, and breaks the communication with the mother.

834. Therefore, the method of guarding against the threatening evil, will not be obscure, by detraction of blood, by lying down, by tranquillity of mind and body, anodyne remedies, by cold applied in various ways, and other remedies administered according as circumstances shall require. Nor does either the woman always abort, or the infant perish, although some water or blood even should flow out, truly because the placenta, though it should be somewhat separated, may again grow together with the uterus, and the liquor amnii again be supplied.

835. But when it is already come to the full time, parturition often becomes difficult and laborious, or dangerous, on account of many causes, to

losus, fit, propter plurimas causas, quas speciatim perpendere, et idonea singularum auxilia excogitare, obstetricis est. Sat erit hic memorasse, partum naturalem et felicissimum, neque dolore neque periculo quodam penitus carere: periculum vero et dolorem pariter fere majora esse, puellis junioribus, fœminisque annosis, primiparis, nimirum, quia illis, nondum justa est magnitudo, aut conformatio, aut robur, partium quæ in puerperio patiuntur; et his contra nimia omnium rigiditas transitum fœtus difficiliorem reddit; maximum vero periculum instare, si prava vel uteri vel ossium pelvis fabrica fuerit, ita ut hæc partum transmittere nequeant, nec ille justam vim edere, neque eam sine lacerationis periculo tolerare. Mulieres quoque delicatæ, debiles, valde mobiles, doloris impatientes, morbis exhaustæ, quam sanæ et validæ, ma-

riculosus, propter plurimas causas, perpendere quas speciatim, et excogitare idonea auxilia singularum, est obstetricis. Erit sat hic memorasse, naturalem et felicissimum partum, penitus carere neque dolore neque quodam periculo: vero periculum et dolorem pariter esse fere majora junioribus puellis, que annosis fœminis, primiparis, nimirum quia illis est nondum justa magnitudo, aut conformatio, aut robur partium quæ patiuntur in puerperio; et contra, nimia rigiditas omnium reddit transitum fœtus difficiliorem his; vero maximum periculum instare, si fabrica vel uteri vel ossium pelvis fuerit prava, ita ut hæc nequeant transmittere partum, nec ille edere justam vim, neque tolerare eam sine periculo lacerationis. Quoque delicatæ, debiles, valde mobiles mulieres, impatientes doloris, exhaustæ morbis,

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consider which particularly, and to think of the proper aids for each, is the duty of the obstetrician. It will be sufficient here to state, that natural and the most prosperous parturition, is entirely free from neither pain nor from some danger: but that the danger and pain alike are commonly greater in young girls, than in oldish women, on first deliveries, truly because to the former there is not as yet the due size, or conformation, or strength of the parts which suffer in childbirth; and again on the contrary, too much rigidity of all renders the transit of the fœtus more difficult in the latter; but that the greatest danger threatens, if the structure either of the uterus or of the bones of the pelvis should be bad, so that they cannot transmit the fœtus, nor the former put forth the due force, nor bear it without the danger of laceration. Also delicate, weak, very irritable women, impatient of pain, exhausted by diseases, are in greater danger than healthy and strong women. Moreover, various disorders of the fœtus, of the placenta, and of

versantur majore periculo quam sanæ et validæ. Porro, varia vitia fœtus, placentæ, que funis, sæpe reddunt partum difficilem, aliquando prorsus impediunt: veluti deformitas fœtus, ingens caput, monstrosus situs; placenta concrescens insolitæ parti uteri, nimis longa funis, contorta præternaturam circa fœtum, &c. Plurima vitiorum hujusmodi possunt concurrere simul, que igitur efficere varias et inexpectatas difficultates pariendi.

836. Denique, lochia sæpe, post partum, aut fluunt nimiâ copiâ, aut subito supprimuntur: ratio et damnum utriusque vitii intelligentur facile ex dictis, præsertim si attendamus animum ad hoc, nimirum, corpus, exhaustum et debilitatum doloribus puerperii, et jacturâ sanguinis, fieri valde mobile et irritabile; que uterum ipsum, delicatissimum organum, multum irritatum, reddi

jore periculo versantur. Porro, varia fœtus, placentæ, funisque vitia, partum sæpe difficilem reddunt, aliquando prorsus impediunt; veluti deformitas fœtus, ingens caput, situs monstrosus; placenta insolitæ parti uteri concrescens, funis nimis longa, præter naturam circa fœtum contorta, &c. Hujusmodi vitiorum plurima simul concurrere possunt, variasque igitur et inexpectatas pariendi difficultates efficere.

836. Denique, lochia post partum sæpe aut nimia copia fluunt, aut subito supprimuntur: utriusque vitii ratio et damnum facile intelligentur, ex dictis (811), præsertim si animum ad hoc attendamus, nimirum, corpus, doloribus puerperii et sanguinis jactura exhaustum et debilitatum, valde mobile et irritabile fieri; uterumque ipsum, delicatissimum organum, multum irritatum, ad inflammationem procli-

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the cord, often render the delivery difficult, sometimes wholly impede it: as deformity of the fœtus, a large head, preternatural position: the placenta growing to an unusual part of the uterus, too long a cord, twisted unnaturally about the fœtus, &c. Very many of the disorders of this sort may occur together, and therefore cause various and unexpected difficulties of child-bearing.

836. Lastly, the lochia often, after delivery, either flow in too great quantity, or suddenly are suppressed: the cause and injury of each disease will be understood easily from what has been said, especially if we apply the mind to this, namely, that the body, exhausted and debilitated by the pains of childbirth, and by loss of blood, becomes very mobile and irritable; and that the uterus itself, a most delicate organ, much irritated, is rendered disposed to inflammation: by which it happens that the slightest causes

vem reddi: quo fit ut levissimæ causæ puerperas sæpe male afficiant, febremque vehementem, aut inflammationem uteri ad vicina viscera aliquando serpturam, et in gangrænam facile desituram, accendant. Vitiorum lactis post partum secernendi, maxime frequentium, ratio jam (703) reddita est.

837. Observandum est, quo plus pariendi et lactandi negotium Naturæ committitur, eo fere utrumque felicius succedere; quod peritissimi qui obstetricis munus susceperunt medici nunc demum agnoscunt, et qui soli opem ferre norunt, parum arti, plurimum Naturæ, confidunt; nisi in raris exemplis jam (835) recensitis.

proclivem ad inflammationem: quo fit ut levissimæ causæ sæpe male afficiant puerperas, que accendant vehementem febrem, aut inflammationem uteri, serpturam aliquando ad vicina viscera, et desituram facile in gangrænam. Ratio maxime frequentium vitiorum secernendi lactis, post partum, jam est reddita.

837. Est observandum, quo plus negotium pariendi et lactandi committitur Naturæ, eo felicius utrumque fere succedere; quod peritissimi medici qui susceperunt munus obstetricis nunc demum agnoscunt, et qui soli norunt ferre opem confidunt parum arti, plurimum Naturæ; nisi in raris exemplis jam recensitis.

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often badly affect puerperal women, and excite intense fever, or inflammation of the uterus, about to creep sometimes to the neighbouring viscera, and to terminate easily in gangrene. An account of the most frequent disorders of secreting milk, after delivery, has already been given.

837. It is to be observed, the more the affair of parturition and of suckling is intrusted to Nature, that the more prosperously do both generally succeed; which the most skilful physicians who have undertaken the duty of the obstetrician now at length acknowledge, and who alone know how to render assistance, trust little to art, a great deal to Nature; except in the rare examples already enumerated.

CAP. XXII.—*De nutrimento, incremento, statu, imminutione, et morte corporis; que morbis qui solent comitari et affligere varias ætates.*

838. EN aliud arcanum Naturæ, vix minus mirabile generatione ipsâ, neque eo melius intellectum quod perficitur magis aperte. Nimirum infans, parvus, debilis, impotens pariter animi ac corporis, crescit paulatim, et adipiscitur pulcherrimam et perfectam formam, tandem factus compos omnium facultatum animi que corporis.

839. Humanum corpus viget aliquamdiu perfectissimum formâ, sanitate, viribus; vero annis labentibus, dilabitur lenta ruina; ille flos juventæ perit, et vis animi et vigor

CAP. XXII.—*De corporis nutrimento, incremento, statu, imminutione, et morte; morbisque qui varias ætates comitari et affligere solent.*

838. EN aliud Naturæ arcanum, ipsa generatione vix minus mirabile, neque eo melius intellectum quod magis aperte perficitur. Infans nimirum, parvus, debilis, animi pariter ac corporis impotens, paulatim crescit, et pulcherrimam et perfectam formam adipiscitur, omnium tandem animi corporisque facultatum compos factus (14).

839. Aliquamdiu corpus humanum viget, forma, sanitate, viribus, perfectissimum; labentibus vero annis, lenta ruina dilabitur (12); flos ille juventæ perit, et vis animi,

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CHAP. XXII.—*Of the nutrition, growth, full age, decay, and death of the body: and of the diseases which are accustomed to accompany and to afflict the various ages.*

838. BEHOLD another secret of Nature, scarcely less wonderful than generation itself, nor the better understood because it is performed more openly. That the infant, small, weak, impotent alike of mind and body, grows by degrees, and acquires a very beautiful and perfect shape, at length rendered possessed of all the faculties of mind and of body.

839. The human body flourishes for some time most perfect in shape, health, strength; but the years rolling on, it decays in a slow ruin; that flower of youth perishes, also the strength of mind and vigour of body.

et vigor corporis. Robustissmum quemque invida ætas minuit, immedicabili morbo, qui omnes mortales eodem cogit. Et profecto, tantis tamque continuis malis senectus premitur, ut mors ipsa, tot ærumnarum finis optata, si saperent homines, omnibus veniret.

840. Philosophi et medici conati sunt rationem reddere harum rerum, et explicare quomodo corpus suum nutrimentum accipiat, cur certo tempore crescat, cur crescere tandem desinat, et demum suo tempore decrescat. Quamvis multum hic subsit obscuri et incerti adhuc, tamen oportet novisse, quid de gravissimo argumento propositum fuerit, quid stabilitum, quid fictum: præterea, plurimi morbi ab ætate pendent, scilicet qui a mutationibus quas corpus variis ætatibus subit oriuntur; horum igitur naturam et causas medicum decet intelligere (22, 51).

corporis. Invida ætas minuit quemque robustissimum immedicabili morbo, qui cogit omnes mortales eodem. Et profecto senectus premitur tantis que tam continuis malis, ut mors ipsa, si homines saperent, veniret omnibus, optata finis tot ærumnarum.

840. Philosophi et medici conati sunt reddere rationem harum rerum, et explicare quomodo corpus accipiat suum nutrimentum, cur certo tempore crescat, cur tandem desinat crescere, et demum decrescat suo tempore. Quamvis subsit adhuc multum obscuri et incerti hic, tamen oportet novisse quid fuerit propositum de gravissimo argumento, quid stabilitum, quid fictum: præterea, plurimi morbi pendent ab ætate, scilicet, qui oriuntur a mutationibus quas corpus subit variis ætatibus; igitur, decet medicum intelligere naturam et causas horum.

Envious age consumes every strongest person by incurable disease, which collects all mortals in the same place. And truly old age is pressed by so many and so continued evils, that death itself, if men were wise, would come to all, wished for as the termination of so many miseries.

840. Philosophers and physicians have endeavoured to render an account of these things, and explain how the body receives its nourishment, why at a certain time it grows, why at length it ceases to grow, and finally decreases at its proper time. Although there be as yet much of obscurity and of uncertainty here, nevertheless it behoves to know what has been advanced concerning this very weighty subject, what established, what imagined; besides, many diseases depend upon the age, namely, those which arise from the changes which the body undergoes at the various ages; therefore, it becomes the physician to understand the nature and causes of them.

841. Constat, certissimis et simplicissimis experimentis, omnes partes corporis, solidas pariter ac fluidas, assidue dissipari et deteri variis functionibus vivi hominis. Neque est dubium alimenta quæ sumimus reparare hanc jacturam. Vero hæc primo confecta, et soluta, et concocta in ore et ventriculo, et intestinis, postea forsitan amplius mutata in pulmone, demum vertuntur in sanguinem, gluten cujus, (scilicet, fibrina, albumen, et gelatina,) ut videtur, est nutrimento solidis partibus.

842. Humores corporis posse reparari tali subsidio, facile intelligitur; vero ratio quâ solidæ partes reficiantur multo obscurior.

843. Sunt auctores, neque profecto parvi nominis, qui credunt particulas solidarum partium, vasorum, fibrarum, ossium, reticulatæ telæ,

841. Certissimis et simplicissimis experimentis constat, omnes corporis partes, solidas pariter ac fluidas, variis functionibus vivi hominis assidue dissipari et deteri. Neque dubium est alimenta quæ sumimus hanc jacturam reparare. Hæc vero primo in ore, et ventriculo, et intestinis, confecta, et soluta, et concocta (615, 616), postea forsitan in pulmone amplius mutata (566), in sanguinem demum vertuntur (494, 505), cujus gluten (fibrina, scilicet, albumen, et gelatina) ut videtur, solidis partibus nutrimento est.

842. Facile intelligitur humores corporis tali subsidio reparari posse: multo vero obscurior ratio qua solidæ partes reficiantur.

843. Sunt qui credunt, neque profecto parvi nominis auctores, particulas solidarum partium, vasorum, fibrarum, ossium, telæ reticulatæ, variis vitæ muneribus detri-

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841. It is established, by the most certain and simple experiments, that all parts of the body, solid as well as fluid, constantly are dissipated and worn down by the various functions of the living man. Nor is it doubtful, that the aliments which we take repair this loss. But these first chewed, and dissolved, and concocted in the mouth and stomach, and intestines, afterwards, perhaps further changed in the lungs, at length are changed into blood, the gluten of which, (that is, the fibrine, albumen, and gelatine,) as it appears, is nourishment to the solid parts.

842. That the fluids of the body may be replenished by such a supply, is easily understood: but the manner by which the solid parts are recruited is much more obscure.

843. There are authors, nor indeed of small reputation, who believe that the particles of the solid parts, vessels, fibres, bones, cellular tissue, worn

tas, scrobes seu fossulas relinquere; hasque fossulas, puta in intima superficie vasis cujusdam sanguinem vehentis, humore glutinoso qui præterfluit impleri, crassam ejusdem humoris partem attrahere sibi, tenuem demittere, juvante et exprimente perpetuo quo omnes partes agitantur motu et compressione; si fossula non penitus impleta esset, minorem quæ tunc superesset scrobem, pari ratione, plus glutinis sibi attrahere et detinere; si vero plus justo hoc modo glutinis receptum esset, ita ut frustum vel minimum excresceret et emineret in medium vas, hoc brevi præterfluente rivo deteri, donec superficies interna ut antea levis et æqualis facta esset. Crediderunt porro hi auctores partes vasorum externas, et telam reticulatam, et fibras nervorum et musculorum, et ossa demum simili fere modo nutriri, vel per vasa minuta gluten

detritas variis muneribus vitæ, relinquere scrobes seu fossulas; que has fossulas, puta, in intima superficie cujusdam vasis vehentis sanguinem, impleri glutinoso humore qui præterfluit, attrahere crassam partem ejusdem humoris sibi, demittere tenuem, perpetuo motu et compressione quo omnes partes agitantur juvante et exprimente; si fossula esset non penitus impleta, minorem scrobem quæ tunc superesset, pari ratione, attrahere sibi et detinere plus glutinis; vero si plus glutinis justo esset receptum hoc modo, ita ut vel minimum frustum excresceret et emineret in medium vas, hoc brevi deteri rivo præterfluente, donec interna superficies esset facta levis et æqualis ut antea. Porro, hi auctores crediderunt externas partes vasorum, et reticulatam telam, et fibras nervorum et musculorum, et demum ossa, nutriri

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out by the various functions of life, leave behind furrows or trenches; and that these trenches, for instance, in the inmost surface of any vessel carrying blood, are filled with the glutinous fluid which flows through it, that they attract the thick part of the same fluid to themselves, send off the thin, the constant motion and compression by which all the parts are agitated, assisting and expressing; if the fossa were not completely filled up, that the smaller indentation which then would remain, for a similar reason, attracts to itself and detains more gluten; but if more gluten than proper were admitted in this manner, so that even the smallest fragment grew out and stood out into the middle of the vessel, that this was quickly worn down by the current flowing by, until the internal surface were rendered smooth and equal as before. Moreover, these authors believed, that the external parts of the vessels, and cellular tissue, and fibres of the nerves and muscles,

fere simili modo, vel per minuta vasa vehentia et apponentia gluten et terram, vel per glutinosum humorem exhalatum, qui irrorat omnia cava corporis: que tandem, tenuiore parte nutrientis humoris expressâ, et exhalatâ, et resumptâ, solidam materiam demum relinqui tantam et talem qualis detrita fuerat.

et terram vehentia et apponentia, vel per exhalatum humorem glutinosum (437) qui omnia cava corporis irrorat: tandemque, expressa, et exhalata, et resumpta, tenuiore parte humoris nutrientis, solidam demum relinqui materiam, tantam et talem, qualis detrita fuerat.

844. Crediderunt se conspexisse exemplum et demonstrationem nutrimenti hujusmodi in concretione vulneris, veluti parvæ arteriæ, quæ coalescit suâ sponte, et fere hac ratione, quod brevi obturatur glutine effuso, et concrescente in massam, quæ compescat fluxum sanguinis, que resarciat arteriam ipsam, ita ut post paucas horas, humores fluant iterum per eam solito more, nequidem guttulâ elabente; quicquid nimirum glutinosæ massæ emineret in arteriam, rivus humorum rapuit secum; quod su-

844. Hujusmodi nutrimenti exemplum et demonstrationem crediderunt se conspexisse, in concretione vulneris, veluti parvæ arteriæ, quæ sua sponte coalescit, et fere hac ratione, quod brevi obturatur glutine effuso et concrescente in massam quæ sanguinis fluxum compescat, arteriamque ipsam resarciat, ita ut post paucas horas, humores iterum per eam more solito fluant, ne guttula quidem elabente: quicquid nimirum massæ glutinosæ in arteriam emineret, humorum rivus secum ra-

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and in fine, the bones were nourished almost in a similar manner, either by minute vessels carrying and depositing gluten and earth, or by a glutinous fluid being exhaled, which bedews all the cavities of the body: and at length, the thinner part of the nutritious fluid being expressed, and exhaled, and taken up, that the solid matter at last, was left so much and such as it had been worn down.

844. They believed that they had seen an example and demonstration of a nutriment of this kind in a growing together of a wound, as of a small artery, which coalesces of its own accord, and commonly in this way, that it is quickly plugged up by gluten being effused, and growing together into a mass, which restrains the flow of blood, and repairs the artery itself, so that after a few hours, the fluids flow again through it in the usual manner, not even a small drop escaping; whatever indeed of the glutinous mass

puit; quod superesset motus compressit in firmam substantiam, humoremque expressum vasa resorbentia hausiverunt. Massa vero glutinosa quæ circa sauciam arteriam formatur, haud ita subito abraditur: quamvis hæc quoque paulatim fere minuitur et evanescit, præsertim si vulnus leve fuisset: aliquando tamen, imprimis a graviore vulnere, fabrica vasorum aliarumque partium quæ vulnerata fuerant, ita læditur, ut nunquam bene resarciatur, et cicatrix major minorve, fortasse nunquam penitus delenda, immo ingravescens interdum, relinquatur.

845. Verum enimvero multum abest, ut hæc et hujusmodi commenta nutrimentum corporis bene explanent. Quamvis non dubium sit, humorem nutrientem per arterias ad omnes corporis partes deferri, et varios earum et musculorum motus, ipsas arterias partesque

peresset, motus compressit in firmam substantiam, que resorbentia vasa hausiverunt expressum humorem. Vero glutinosa massa quæ formatur circa sauciam arteriam haud abraditur ita subito; quamvis hæc quoque paulatim fere minuitur et evanescit, præsertim si vulnus fuisset leve: aliquando, tamen, imprimis a graviore vulnere, fabrica vasorum que aliarum partium, quæ fuerant vulnerata, ita læditur, ut nunquam benè resarciatur, et cicatrix major ve minor, fortasse nunquam delenda penitus, immo interdum ingravescens, relinquatur.

845. Verum enimvero multum abest ut hæc, et commenta hujusmodi, bene explanent nutrimentum corporis. Quamvis sit non dubium nutrientem humorem deferri per arterias ad omnes partes corporis, et varios motus earum et musculorum, usque comprimere arterias

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projected into the artery, the current of the fluids hurried off along with it; what remained, the motion compressed into a firm substance, and the absorbing vessels drank up the expressed fluid. But the glutinous mass which is formed about the wounded artery is not rubbed off so suddenly; although this, also, by degrees, generally is diminished and disappears, especially if the wound had been slight: sometimes, however, especially from a more severe wound, the structure of the vessels and of the other parts, which had been wounded, is so injured, that it never is well repaired, and a cicatrix greater or less, perhaps never to be destroyed entirely, nay, even sometimes increasing, is left behind.

845. But, truly, much is wanting, that these, and comments of this sort, thoroughly explain the nourishment of the body. Although, it is not doubtful that the nutritive fluid is conveyed by the arteries to all parts of the body, and that the various motions of them and of the muscles, con-

ipsas que vicinas partes, et sane omnes partes; tamen non bene intelligitur quomodo materia adeo diversa, constans quodammodo ex diversis elementis, habens prorsus diversam fabricam et qualitates, apponatur variis partibus, dentibus, ossibus, nervis, musculis, cartilaginibus, ligamentis, reticulatæ telæ, &c.

846. Enim, plurima terra inest ossibus, cujus parum omnino reperitur in aliis partibus. Neque fere ossa comprimuntur tantum ac quædam molles partes, veluti arteriæ. Quin et, a vitio, raro profecto, sed interdum observato parum istius terræ deponitur in ossibus, uæ ideo molliuntur; et nterdum, contra, ossea substantia deponitur in alienis partibus, musculis, visceribus, &c. ita ut miser ita affectus, si vixisset, forsitan factus esset totus os.

847. Præterea minuta, et delicatissima fabrica

vicinas, et sane omnes partes, usque comprimere; tamen non bene intelligitur quomodo materia adeo diversa, ex diversis quodammodo elementis constans, diversam prorsus fabricam et qualitates habens, variis partibus, dentibus, ossibus, nervis, musculis, cartilaginibus, ligamentis, telæ reticulatæ, &c. apponatur.

846. Plurima enim ossibus inest terra, cujus parum omnino in aliis partibus reperitur. Neque ossa fere tantum comprimuntur ac partes quædam molles, veluti arteriæ. Quin et a vitio, raro profecto, sed interdum observato, parum istius terræ in ossibus deponitur, quæ ideo molliuntur: et interdum contra, substantia ossea in alienis partibus, musculis, visceribus, &c. deponitur, ita ut miser ita affectus, si vixisset, forsitan totus os factus esset.

847. Præterea, minuta et deli-

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tinually compress the arteries themselves and contiguous parts, and indeed all parts; notwithstanding it is not well understood, how a matter so different, consisting in some measure of different elements, having an altogether different structure and qualities, should be deposited in the various parts, the teeth, bones, nerves, muscles, cartilages, ligaments, cellular tissue, &c.

846. Moreover, a great deal of earth is in the bones, of which little at all is found in the other parts. Nor generally are the bones compressed so much as some soft parts, as the arteries. Besides, from disease, rarely indeed, but sometimes observed, little of that earth is deposited in the bones, which therefore are softened: and sometimes, on the other hand, osseous matter is deposited in unsuitable parts, the muscles, viscera, &c. so that the wretch thus affected, if he should live, perhaps would become all bone.

catissima organorum, puta musculorum nervorumque, fabrica, inter nutriendum conservatur, ita ut singulis suæ constent dotes vitales, quod vix fieret, tali artificio quale auctores finxerint; nimirum, quod massam rudem et indigestam sufficeret in locum pulcherrimæ fabricæ detritæ et dilabentis.

848. Crediderunt alii summi viri nutrimentum per nervos, non per arterias, fieri; glutenque sanguinis in cerebro secretum, attenuatum, ab omni sale qui corrumperet purgatissimum, per nervos quodammodo percolari, adque varias partes deferri, juvante et propellente fluido quodam subtilissimo, mobilissimo, præstantissimo, quod in nervis inesse opinati sunt. Simili fere modo herbas nutriri multi opinantur, quamvis sane nondum de his bene constet, multaque potius ostendant eas longe diversa ratione suum nutrimentum accipere. Ne-

organorum, puta, musculorum ve nervorum, conservatur inter nutriendum, ita ut suæ vitales dotes constent singulis, quod vix fieret tali artificio quale auctores finxerint, quod nimirum sufficeret rudem et indigestam massam in locum pulcherrimæ fabricæ detritæ et dilabentis.

848. Alii summi viri crediderunt nutrimentum fieri per nervos non per arterias; que gluten sanguinis secretum in cerebro, attenuatum, purgatissimum ab omni sale qui corrumperet, percolari quodammodo per nervos que deferri ad varias partes, quodam subtilissimo, mobilissimo, præstantissimo fluido, quod opinati sunt inesse in nervis, juvante et propellente. Multi opinantur herbas nutriri fere simili modo quamvis sane nondum bene constet de his, que multa potius ostendant eas accipere suum nutrimentum longe diver-

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847. Besides, the minute and very delicate structure of the organs, for example, of the muscles or nerves, is preserved while nourishing, so that their own vital properties remain to each, which scarce would happen by such a contrivance as authors have imagined, which, indeed, would substitute a rude and confused mass, in the place of the very beautiful structure worn out and decaying.

848. Other very celebrated men believed, that nutrition was accomplished through the nerves, not through the arteries; and that the gluten of the blood being secreted in the brain, attenuated, very well freed from every salt which could corrupt it, was strained in some degree through the nerves, and was conveyed to the different parts, by a certain very subtile, mobile, exquisite fluid, which they supposed to exist in the nerves, assisting and propelling. Many suppose that herbs are nourished almost in a similar manner, although, indeed, it is not yet well determined about these, and

sâ ratione. Neque profecto hactenus constitit cerebrum secernere ullum humorem, aut ullum fluidum inesse in nervis, aut tenue et purum gluten percolari per eos: nam neque tument ligati, neque secti fundunt ullum humorem; neque subtilissimam auram, qualem nuper et olim fuit opinio inesse iis, posse propellere talem humorem saltem crassiorem aqua; neque demum nutrimentum fieri per nervos; nam ovum et placenta et umbilici funis nutriuntur et crescunt sine nervis, et fœtus satis bene aliti nati sunt sine capite, et in animalibus frigidi sanguinis, multo tenacioribus vitæ quam homo, artus, puta crus et femur bene alitur, neque marcescit, magno nervo qui adit eum secto. Neque demum melius intelligitur quo pacto sua materia daretur singulis organis, sua fabrica singulis, per nervos potius quam per arterias.

que profecto hactenus constitit, cerebrum ullum secernere humorem, aut fluidum ullum in nervis inesse, aut tenue et purum gluten per eos percolari; nam neque tument ligati, neque secti ullum humorem fundunt; neque subtilissimam auram, qualem inesse iis nuper et olim opinio fuit, talem humorem, aqua saltem crassiorem, propellere posse; neque demum nutrimentum per nervos fieri; nam ovum, et placenta, et funis umbilici, sine nervis nutriuntur et crescunt, et fœtus sine capite nati sunt satis bene aliti, et in animalibus frigidi sanguinis, vitæ multo quam homo tenacioribus, artus, puta crus et femur, bene alitur, neque marcescit, secto magno qui eum adit nervo. Neque demum melius intelligitur quo pacto per nervos, potius quam per arterias, sua singulis organis materia (845) sua singulis fabrica daretur.

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many things rather shew that they receive their nourishment in a far different manner. Nor, indeed, hitherto, has it been decided that the brain secretes any fluid, or that any fluid exists in the nerves, or that a thin and pure gluten was strained through them: for they neither swell when tied, nor when cut do they pour out any fluid; nor that a very subtile vapour, such as lately and formerly was the opinion existed in them, could propel such a fluid at least thicker than water; nor, in fine, that nutrition took place through the nerves; for the ovum, and placenta, and umbilical cord, are nourished and grow without nerves, and fœtuses sufficiently well nourished have been born without a head, and in animals of cold blood, much more tenacious of life than man, a limb, for example a leg and thigh, is well nourished, nor does it waste, the great nerve which supplies it being cut. Nor, in fine, is it better understood by what means their own matter

849. Utcunque hæc se res habuerit, scire semper juvabit, nutrimentum multum affici, et vel promoveri vel impediri, non modo statu et actione arteriarum nervorumque, sed plurimis aliis rebus de quibus melius constat. Obstructo vel imminuto sanguinis per arteriam motu, artus quem hæc adibat, friget, torpet, et simul marcescit, donec motus sanguinis vel per solitas vias restituatur, vel per novas, forsan per ramos communicantes, quas brevi sibi legit: aliquando tamen artus, post talem obstructionem, nunquam ut antea torosus fit. Plurimo quoque detracto sanguine, totum corpus marcescit.

850. Sæpe quoque a paralysi, vel generali vel partis cujuslibet, partes affectæ marcescunt; quod signum semper malum est, morbumque vel prorsus insanabilem, vel sanatu difficillimum, indicat.

849. Utcunque hæc res habuerit se, semper juvabit scire nutrimentum affici multum, et vel promoveri vel impediri non modo statu et actione arteriarum que nervorum sed plurimis aliis rebus de quibus melius constat. Motu sanguinis per arteriam obstructo vel imminuto, artus quem hæc adibat friget, torpet, et simul marcescit, donec motus sanguinis restituatur vel per solitas vias, vel per novas, forsan per communicantes ramos quas brevi legit sibi; aliquando tamen artus post talem obstructionem nunquam fit torosus ut antea. Plurimo sanguine quoque detracto, totum corpus marcescit.

850. Affectæ partes quoque sæpe marcescunt a paralysi vel generali, vel cujuslibet partis quod est semper malum signum; que indicat morbum vel prorsus insanabilem, vel difficillimum

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could be given to the individual organs, its proper structure to each, through the nerves, rather than by the arteries.

849. However this matter should have itself, it will always benefit to know that nutrition is affected much, and either is promoted or impeded, not only by the condition and action of the arteries and nerves, but by a great many other things concerning which it is better established. The motion of the blood through an artery being obstructed or diminished, the limb which it supplied grows cold, is torpid, and at the same time wastes, until the motion of the blood can be restored, either through the usual channels or through new ones, perhaps by communicating branches which it quickly chooses for itself: sometimes, however, the limb, after such an obstruction never becomes brawny as before. Very much blood, also, being drawn off, the whole body wastes.

850. The affected parts, also, often emaciate from paralysis, either

sanatu. Talis tabes paralytici artus potest fieri, vel propter vim arteriarum, simul cum vi musculorum pereuntem aut labefactam, quod aliquando accidit; vel propter perpetuam quietem artûs, quæ facit omnes partes præsertim musculosas marcescere, citra paralysin, vel vitium motus sanguinis, vel sane ullum morbum, non secus ac justus usus reddit eas torosas; vel denique propter vim ipsam, quæ reparat jacturam solidarum partium novis particulis appositis, deficientem et corruptam, si hæc est sita in nervis. Quædam partes quoque marcescunt, nunquam fortasse recuperaturæ pristinam molem aut vigorem, a magnâ jacturâ sanguinis aut gravi vulnere aut ulcere infestante eas diu.

Talis artus paralytici tabes fieri potest, vel propter vim arteriarum simul cum vi musculorum pereuntem aut labefactam, quod aliquando accidit; vel propter perpetuam artus quietem, quæ citra paralysin, vel vitium motus sanguinis, vel sane morbum ullum, partes omnes, præsertim musculosas, marcescere facit, non secus ac justus usus eas torosas reddit: vel, denique, propter vim ipsam quæ jacturam solidarum partium novis appositis particulis reparat, deficientem et corruptam, si hæc in nervis sita est. Marcescunt quoque partes quædam, fortasse nunquam pristinam recuperaturæ molem aut vigorem, a magna sanguinis jactura, aut ulcere eas diu infestante.

851. Nutrimentum pendet multum a quantitate nec minus a qualitate ciborum quos sumimus, eadem moles et pondus

851. Nutrimentum pendet multum a quantitate, nec minus a qualitate ciborum quos sumimus, nimirum quorum eadem moles et

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general, or of any part: which is always a bad sign; and indicates a disease, either altogether incurable, or very difficult to be cured. Such a wasting of a paralytic limb may occur, either on account of the force of the arteries, together with the power of the muscles perishing or destroyed, which sometimes happens; or on account of constant rest of the limb, which causes all parts, especially the muscular, to waste, without paralysis, or disorder of the motion of the blood, or indeed any disease, just as proper exercise renders them brawny; or, lastly, on account of the power itself, which repairs the loss of the solid parts by new particles being deposited, failing and being corrupted if it is placed in the nerves. Some parts also waste, never perhaps to recover their former size or vigour, from great loss of blood, or a severe wound or an ulcer infesting them for a long time.

851. Nutrition depends much upon the quantity, nor less upon the quality of the foods which we take, the same bulk and weight of which, indeed, con

pondus plus minus materiei nutrientis continent. Multum quoque pendet a concoctione bona vel imperfecta cibi qui sumptus fuerit.

852. Ut homo qui secunda fruitur valetudine fere bene nutritur, dummodo sat habuerit cibi idonei; sic qui adversa valetudine laborant plerumque male nutriuntur, et sæpe et subito marcescunt: scilicet, quia dum ægrotat quisquam cibum raro bene appetit, rarius adhuc bene concoquit, et sæpe insolito dispendio exhauritur, dissipatis nimirum ultra modum fluidis corporis partibus, et solidis multum detritis vehementiore cui subjiciuntur motu; quod in febribus omnibus imprimis notabile est. Neque profecto absurda videtur opinio, plurimos morbos, præsertim quos auctus sanguinis impetus comitatur, ipsi nutrimento obstare, impedita novarum particularum appositione.

quorum nimirum continent plus minus nutrientis materiei. Multum quoque pendet a bonâ vel imperfectâ concoctione cibi qui fuerit sumptus.

852. Ut homo qui fruitur secundâ valetudine fere nutritur bene, dummodo habuerit sat idonei cibi: sic qui laborant adversâ valetudine plerumque nutriuntur male, et sæpe subito marcescunt: scilicet quia dum quisquam ægrotat raro appetit cibum bene, adhuc rarius concoquit bene, et sæpe exhauritur insolito dispendio, nimirum fluidis partibus corporis dissipatis ultra modum et solidis multum detritis vehementiore motu cui subjiciuntur; quod est imprimis notabile in omnibus febribus. Neque profecto opinio videtur absurda, plurimos morbos, præsertim quos auctus impetus sanguinis comitatur, obstare nutrimento ipsi, appositione novarum particularum impeditâ.

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tain more or less of nutritive matter. Much also depends upon the good or imperfect concoction of the food which may have been taken.

852. As the man who enjoys good health generally is nourished well, provided he have sufficient of proper food, so they who suffer from bad health generally are nourished badly, and often suddenly waste: truly, because, whilst a person is sick, he seldom desires food much, still less frequently digests well, and often is exhausted by unusual loss, namely, by the fluid parts of the body being dissipated beyond bounds, and the solid being much worn away by the more violent motion to which they are subjected; which is especially remarkable in all fevers. Nor indeed does the opinion appear absurd, that many diseases, especially those which an increased impetus of blood accompanies, oppose nutrition itself, by the apposition of the new particles being impeded.

853. Est non dubium maximam partem ponderis quod ægroti amittunt esse adipem, qui consumitur facillime et sæpe reparatur brevi. Vero quædam exempla ostenderunt omnes partes, pariter solidas ac fluidas, interdum consumi; nimirum, deteri et dissipari citius quam novæ particulæ apponerentur.

853. Non dubium est maximam partem quod amittunt ægroti ponderis adipem esse, (101, et seqq.) qui facillime consumitur, et brevi sæpe reparatur. Quædam vero exempla ostenderunt, omnes partes, solidas pariter ac fluidas, interdum consumi; deteri nimirum et dissipari citius quam novæ particulæ apponerentur.

854. Certâ ætate nutrimur accurate sine incremento aut imminutione: scilicet, quotidiana jactura reparatur quotidiano nutrimento. Autem primâ ætate crescimus multum et subito; provectiore ætate non crescimus, sed pinguescimus; ultima decrescimus iterum et contrahimur, que ipsa ossa nostrorum corporum videntur diminui.

854. Certa ætate accurate nutrimur sine incremento aut imminutione; quotidiana scilicet jactura quotidiano nutrimento reparatur. Prima autem ætate, multum et subito crescimus: provectiore non crescimus, sed pinguescimus; ultima decrescimus iterum et contrahimur, ipsaque corporum nostrorum ossa diminui videntur.

855. Neque profecto ratio harum rerum adeo difficilis aut obscura ac explicatio nutrimenti ipsius. Enim vi seu facultate existente quæ apponat no-

855. Neque profecto adeo difficilis aut obscura harum rerum ratio, ac nutrimenti ipsius explicatio. Existente enim vi seu facultate quæ novam materiam

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853. It is not doubtful that the greatest part of the weight which the sick lose is fat, which is consumed very easily, and often is repaired quickly. But some examples have proved that all parts, alike solid and fluid, sometimes were consumed; that is, were worn away and dissipated more quickly than the new particles were deposited.

854. At a certain age we are nourished accurately without increase or diminution; that is, the daily loss is repaired by the daily nutrition. But at the first age, we grow much and suddenly; in more advanced age we do not increase, but we grow fat; in the last, we decrease again, and are contracted, and the very bones of our bodies seem to be diminished.

855. Nor indeed is the reason of these things so difficult or obscure as the explanation of nutrition itself. For the power or faculty existing which deposits new matter in the body, and wears away and ejects the old, it may

corpori apponat, vetustamque deterat et ejiciat, a statu corporis variis ætatibus quodammodo intelligi potest, hoc aliquamdiu auctam iri, certo vero tempore desiturum crescere, tandemque incepturum decrescere, et indies minutum iri, donec vita ipsa, impeditis prorsus functionibus, deficiat.

856. Prima scilicet ætate, (neque aliter res se habet dum in utero latet homunculus,) corpus mollissimum est et aptum extendi, et magna vis adest, fere a centro corporis incipiens, quæ totum distendat; cor scilicet multo grandius pro rata parte quam in adulto viro, multo magis irritabile, multoque frequentius micans. Vasa quoque quæ sanguinem vehunt adsunt numerosiora, molliora, magisque irritabilia, quam provecta ætate.

857. Hac vi omnes arteriæ, et quotquot cum iis connectuntur

vam materiam corpori, que deterat et ejiciat vetustam, potest intelligi quodammodo a statu corporis variis ætatibus, hoc aliquamdiu auctum iri, vero certo tempore desiturum crescere, que tandem incepturum decrescere, et indies minutum iri donec vita ipsa deficiat, functionibus prorsus impeditis.

856. Primâ ætate scilicet, (neque habet res se aliter dum homunculus latet in utero,) corpus est mollissimum et aptum extendi, et magna vis adest incipiens fere a centro corporis, quæ distendat totum; scilicet, cor multo grandius pro rata parte quam in adulto viro, multo magis irritabile, que micans multo frequentius. Vasa quoque quæ vehunt sanguinem adsunt numerosiora, molliora, que magis irritabilia quam provectâ ætate.

857. Hac vi omnes arteriæ et quotquot partes connectuntur cum iis, sci-

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be understood in some degree from the condition of the body at the various ages, that it for sometime will be increased, but at a certain time will cease to increase, and at length will begin to decrease, and daily will be diminished until life itself fails, the functions being altogether impeded.

856. At the first age, indeed, (nor has the thing itself otherwise whilst the puny man lies hid in the uterus,) the body is very soft and fit to be extended, and a great force is present, beginning almost from the centre of the body, which distends the whole; that is, the heart much larger in proportion than in the adult man, much more irritable, and beating much more frequently. The vessels also which carry the blood are present more numerous, softer, and more irritable than at advanced age.

857. By this power all the arteries and whatever parts are connected with them, that is, the whole body, are somewhat distended one hundred and fifty

licet totum corpus, aliquantum distenduntur centies et quinquagies millies quotidie, neque est solidis partibus corporis adhuc mollis et teneri tanta vis resiliendi ut recuperent statim pristinum situm et molem: autem novâ materiâ apposita dum distenduntur, non modo extenduntur, sed usque crescunt, que induratæ perpetuâ compressione, fiunt firmiores et validiores, et renituntur magis, in posterum extendendæ ægrius: præsertim quum vis ipsa quæ distendit non æque augeatur: præterea ista vis impensa majori moli, quamvis firmitas ejus fuisset eadem, valet eo minus, quod omnis frictio et renixus a pondere partium quæ debent moveri, augeantur simul cum mole corporis.

858. Sic corpus crescit aliquamdiu sed fere indies lentius. Novem mensibus quos homunculus transit in utero, acquirit, statu-

partes, totum scilicet corpus, centies et quinquagies millies quotidie aliquantum distenduntur, neque tanta solidis partibus corporis adhuc mollis et teneri vis resiliendi est, ut pristinum situm et molem statim recuperent: nova autem dum distenduntur apposita materia, non modo extenduntur, sed crescunt usque, perpetuaque compressione induratæ, firmiores et validiores fiunt, et renituntur magis, ægrius in posterum extendendæ; præsertim quum vis ipsa quæ distendit non æque augeatur, præterea, ista vis majori moli impensa, quamvis firmitas ejus eadem fuisset, eo minus valet, quod frictio omnis, et renixus a pondere partium quæ debent moveri, augeantur simul cum mole corporis.

858. Sic corpus aliquamdiu crescit, sed indies fere lentius. Novem mensibus quos in utero transit homunculus, staturam pedis cum

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thousand times every day, nor is there to the solid parts of the body as yet soft and tender so great a power of rebounding that they should recover immediately their former position and bulk: but new matter being deposited whilst they are distended, they not only are extended, but continually grow, and, hardened by the constant compression, they become firmer and stronger, and resist more, for the future to be extended with more difficulty; especially when the force itself which distends is not equally increased: besides that force expended upon the greater bulk, although the firmness of it should be the same, is available the less, because all the friction and resistance from the weight of the parts which ought to be moved, are increased together with the bulk of the body.

858. Thus the body grows for some time but almost every day more slowly. In the nine months which the homunculus passes in the womb, it

semisse acquirit; trium annorum spatio, quadruplo scilicet istius temporis, infans alium pedem cum semisse adipiscitur; quindecim autem vel viginti annos mox sequentibus, si tamdiu creverit, juvenis plenam staturam jam adeptus vix ultra sex pedes habet.

859. Neque tamen omnes partes crescunt pariter; quædam in fœtu mature formatæ, et magnam, quum ex latebris suis prodit infans, molem jam adeptæ, aut lentius in posterum crescunt, aut plane minuuntur; dum aliæ bene multæ, thorax nimirum, et pulmones, et artus, præsertim inferiores, multum, et subito, et plus quam aliæ partes, crescunt.

860. Sic variæ trunci corporis et artuum proportiones variis ætatibus contingunt; quod pictores et sculptores bene norunt, ita ut colossus centum pedes altus infantem trimestrem expresserit; et imago di-

ram pedis cum semisse; spatio trium annorum, scilicet, quadruplo istius temporis, infans adipiscitur alium pedem cum semisse; autem quindecim vel viginti annis mox sequentibus, si creverit tamdiu, juvenis jam adeptus plenam staturam vix habet ultra sex pedes.

859. Neque tamen omnes partes crescunt pariter; quædam formatæ mature in fœtu, et jam adeptæ magnam molem quum infans prodit ex suis latebris, aut crescunt lentius in posterum aut plane minuuntur; dum bene multæ aliæ, thorax nimirum, et pulmones, et artus, præsertim inferiores, crescunt multum et subito et plus quam aliæ partes.

860. Sic variæ proportiones trunci corporis et artuum contingunt variis ætatibus; quod pictores et sculptores bene norunt; ita ut colossus centum pedes altus expresserit infantem trimestrem; et

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acquires the stature of a foot and a half; in the space of three years, that is, in the quadruple of that time, the infant acquires another foot and a half; but in the fifteen or twenty years next following, if it should grow so long, the youth having now attained its full stature scarcely has beyond six feet.

859. Nor nevertheless do all the parts grow equally; some formed early in the fœtus, and having already acquired a large size when the infant goes forth from its hiding places, either grow more slowly for the future or evidently are diminished; whilst a great many others, the thorax for instance, and the lungs, and the limbs, especially the lower ones, grow much and suddenly and more than the other parts.

860. Thus various proportions of the trunk of the body and of the limbs belong to various ages; which painters and sculptors well know: so that a

longa dimidium pollicem imago repræsentaverit adultum et procerum virum.

861. Caput imprimis in crudo fœtu tertia vel fortasse dimidia pars totius homunculi, in infante quinta vel sexta pars, in puero septima, in viro perfectissimæ formæ erit vix nona pars totius longitudinis. Vero quo citius quævis pars evolvitur per primam fabricationem corporis, et crescit in justam molem et formam, eo maturius adipiscitur tantam firmitatem et vim resiliendi ut recuset distendi amplius, et igitur dirigat cursum sanguinis versus alias partes renitentes minus, et aptiores distendi. Hinc, (ex aliquâ parte saltem,) pubertas utriûsque sexus, et aliquando mirum et subitum incrementum, imprimis artuum, eodem tempore quo superiores partes, et præsertim caput, fere desinant crescere.

862. Porro, corpus non

midium pollicem longa virum adultum et procerum repræsentaverit.

861. Caput imprimis, in crudo fœtu tertia vel fortasse dimidia pars totius homunculi, in infante quinta vel sexta pars, in puero septima, in viro perfectissimæ formæ, vix nona pars totius longitudinis erit. Quo citius vero pars quævis per primam corporis fabricationem evolvitur, et crescit in justam molem et formam, eo maturius tantam firmitatem et vim resiliendi adipiscitur, ut amplius distendi recuset, et sanguinis cursum igitur dirigat alias partes versus minus renitentes, et aptiores distendi. Hinc (aliqua saltem ex parte) pubertas utriusque sexus, et mirum aliquando et subitum incrementum, imprimis artuum, eodem tempore quo partes superiores, et caput præsertim, fere desinant crescere.

862. Porro, corpus non statim

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colossus an hundred feet high may represent an infant three months old; and an image half an inch long may represent an adult and tall man.

861. The head in the first place is in the crude fœtus a third or perhaps a half part of the whole homunculus, in the infant a fifth or sixth part, in a boy a seventh, in a man of the most perfect shape it will be scarcely a ninth part of the whole length. But the more quickly any part is evolved by the first fabrication of the body, and grows into a proper size and shape, the earlier it acquires so much firmness and elasticity that it refuses to be distended farther, and therefore directs the course of the blood towards other parts resisting less, and more suited to be distended. Hence, (in some part at least,) the puberty of both sex, and sometimes the wonderful and sudden increase, especially of the limbs, at the same time in which the upper parts, and especially the head, almost cease to grow.

quoquoversum crescit. Justam et plenam staturam juvenis forsan adipiscitur decimo octavo vel vigesimo ætatis anno, sed gracilis adhuc, et forma adulto viro dissimilis, et viribus impar. Paulatim vero aliud incrementum, et aliam adipiscitur formam, et quadratus fit et torosus, et thoracem ampliorem, humeros latiores, ossa grandiora, juncturasque artuum validiores habet.

863. Verisimile est singulas corporis partes primo in longitudinem crescere, quia vis distendens secundum axes vasorum agit maxime, donec hæc multum distenta, et firmiora facta, magis magisque indies renitantur, neque amplius se patiantur distendi. Tum vero eadem vis distendens quoquoversum diffunditur per ramos e magnis truncis prodeuntes, qui ideo extenduntur ipsi, partesque quibuscum connectuntur extendunt simul.

statim crescit quoquoversum. Juvenis forsan adipiscitur justam et plenam staturam decimo octavo vel vigesimo anno ætatis, sed adhuc gracilis, et dissimilis forma adulto viro, et impar viribus. Vero paulatim adipiscitur aliud incrementum et aliam formam, et fit quadratus et torosus, et habet ampliorem thoracem, et latiores humeros, grandiora ossa, et juncturas artuum validiores.

863. Est verisimile singulas partes corporis crescere primo in longitudinem, quia distendens vis agit maxime secundum axes vasorum, donec hæc, multum distenta et facta firmiora, renitantur magis que magis indies, neque patiantur se distendi amplius. Vero tum eadem distendens vis diffunditur quoquoversum per ramos prodeuntes e magnis truncis, qui ipsi ideo extenduntur, que simul extendunt partes cum quibus connectuntur.

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862. Moreover, the body does not immediately grow in every direction. The youth perhaps acquires a proper and complete height at the eighteenth or twentieth year of his age, but still slender, and unlike in shape to the adult man, and unequal in strength. But gradually he attains another growth and another shape, and becomes square and brawny, and has a more ample chest, and broader shoulders, larger bones, and the joints of the limbs more powerful.

863. It is probable that the individual parts of the body grow at first in length, because the distending power acts chiefly according to the axes of the vessels, until they, greatly distended and rendered more firm, resist more and more every day, nor do they suffer themselves to be distended more. But then the same distending force is diffused in every direction through the branches proceeding from the great trunks, which themselves therefore are extended, and at the same time extend the parts with which they are connected.

864. Plurimæ aliæ res primâ ætate concurrunt, quæ multum promovent incrementum corporis. Quædam abundantia sanguinis videtur subesse, profecto minime morbosa, quæ probe impleat atque distendat vasa vehentia sanguinem, præsertim arterias, quoniam hac ætate venæ pollent multo majore vi quam arteriæ; quin et, hæc abundantia sanguinis non modo distendit vasa, sed quoque suggerit plus nutrimenti quam, sine incremento, fuerit necessarium ad reparandum corpus; neque est dubium plerosque infantes fore plenissimos, nisi vel abundantia sanguinis quam habent impenderetur huic usui, vel ipsi exercerent semet plurimum; quippe qui sumant, pro ratâ parte, multo plus cibi quam adulti homines, et fere concoquant optime, et dormiant multum, et existant laxi, et ideo proclives ad plenitudinem.

864. Plurimæ aliæ res prima ætate concurrunt, quæ incrementum corporis multum promovent. Abundantia quædam sanguinis subesse videtur, minime profecto morbosa, quæ vasa sanguinem vehentia probe impleat atque distendat, præsertim arterias, quoniam hac ætate venæ multo majore vi quam arteriæ pollent (444); quin et hæc sanguinis abundantia non modo vasa distendit, sed plus quoque nutrimenti suggerit, quam ad corpus sine incremento reparandum necessarium fuerit: neque dubium est plerosque infantes plenissimos fore, nisi vel huic usui impenderetur sanguinis abundantia quam habent, vel plurimum ipsi semet exercerent; quippe qui multo plus pro rata parte quam adulti homines cibi sumant, et optime fere concoquant, et multum dormiant, et laxi, et ideo ad plenitudinem proclives, existant.

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864. Very many other things at the first age concur, which greatly promote the growth of the body. A certain abundance of blood seems to be present, indeed by no means morbid, which properly fills and distends the vessels carrying blood, especially the arteries, since at this age the veins are endowed with much greater power than the arteries; moreover, this abundance of blood not only distends the vessels, but also supplies more nourishment than, without growth, would be necessary to repair the body; nor is it doubtful that most infants would be very full, unless either the abundance of blood which they have applied to this use, or they themselves exercised themselves a great deal; as being who take, in proportion, much more food than adult persons, and generally digest excellently well, and sleep much, and are lax, and on that account disposed to plethora.

865. Et profecto, quamvis ista plenitudo, dum crescunt pueri, minime noceat, dummodo non ingens fuerit, quamprimum desinunt crescere, manifestissimis signis sæpe se prodit, nec raro, si debilioris constitutionis adolescens fuerit, gravissimos morbos inducit.

866. Finem incremento imponunt aucta moles, auctaque rigiditas universi corporis, et imprimis arteriarum perpetua actione et compressione rigescentium, et firmitas ossium, et, ut clari quidam auctores opinantur, ingens renixus cartilaginum fines eorum tegentium, jam multum crescentibus ossibus compressarum, neque ulteriorem compressionem tolerantium.

867. Justo demum inter vim distendentem et renixum, interque arterias et venas, æquilibrio stabilito, corpus aliquamdiu neque crescit amplius neque minuitur. Postea vero aliud minus verum nutrimen-

865. Et profecto quamvis ista plenitudo, dum pueri crescunt, minime noceat, dummodo fuerit non ingens, quamprimum desinunt crescere, sæpe prodit se manifestissimis signis, nec raro, si adolescens fuerit debilioris constitutionis, inducit gravissimos morbos.

866. Aucta moles que aucta rigiditas universi corporis imponunt finem incremento et imprimis arteriarum rigescentium perpetuâ actione et compressione, et firmitas ossium, et ut quidam clari auctores opinantur ingens renixus cartilaginum tegentium fines eorum, jam multum compressarum ossibus crescentibus, neque tolerantium ulteriorem compressionem.

867. Demum, justo æquilibrio stabilito inter distendentem vim et renixum, que inter arterias et venas, corpus aliquamdiu neque crescit amplius, neque minuitur. Vero postea acquirit aliud mi-

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865. And indeed although that plethora, while children are growing, by no means hurts, provided it be not great, as soon as they cease to grow, it often shews itself by the most manifest symptoms, not unfrequently, if the young man should be of a weaker constitution, brings on very severe diseases.

866. The increased bulk and increased rigidity of the whole body put an end to the increase, and first of all of the arteries becoming stiff from the constant action and compression, and the firmness of the bones, and as some celebrated authors imagine the great resistance of the cartilages covering the extremities of them, now much compressed by the growing bones, nor enduring farther compression.

867. At length, a proper equilibrium being established between the distending force and resistance, and between the arteries and veins, the body for some time neither grows any more, nor is diminished. But afterwards it

nus verum nutrimentum, scilicet, plurimo adipe secreto, et collecto sub cute, et in abdomine, et inter musculos, ratio cujus jam est reddita suo loco.

868. Vero corpus paulatim marcescit iterum, non modo adipe resumpto, sed fere omnibus partibus male nutritis. Nimirum, omnes solidæ partes, et maximæ arteriæ, indies rigescunt, et hæ quoque fiunt arctiores, et plurimæ minores concluduntur penitus, et renixus ubique corporis est major, et motus sanguinis languidior, et aliquatenus impeditus, et cor et arteriæ facta minus irritabilia, micant quoque lentius et debilius, et plus sanguinis æquo congeritur venis, minus in arteriis, et plurimæ functiones impediuntur, et omnes vires deficiunt, et tota machina dilabitur ab omni parte.

869. Igitur, est non dubitandum quin vita ipsa, citius vel serius, foret

tum acquirit, plurimo scilicet secreto et collecto adipe sub cute, et in abdomine, et inter musculos, cujus ratio suo loco jam reddita est (101, et seqq).

868. Paulatim vero corpus marcescit iterum, non modo resumpto adipe, sed omnibus fere partibus male nutritis. Rigescunt indies nimirum omnes partes solidæ, et maxime arteriæ, et hæ quoque arctiores fiunt, et plurimæ minores penitus concluduntur, et renixus ubique corporis major est, et sanguinis motus languidior, et aliquatenus impeditus, et cor et arteriæ minus irritabilia facta, lentius et debilius quoque micant, et plus æquo sanguinis in venis congeritur, minus in arteriis, et plurimæ functiones impediuntur, et vires omnes deficiunt, et tota machina ab omni parte dilabitur.

869. Non est igitur dubitandum, quin vita citius vel serius mortis

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acquires another less true nourishment, namely, a great deal of fat being secreted, and collected under the skin, and in the abdomen, and between the muscles, the reason of which has already been given in its proper place.

868. But the body gradually emaciates again, not only by the fat being taken up again, but almost all the parts being badly nourished. Indeed, all the solid parts, and the large arteries, daily become rigid, and the latter also become more contracted, and many of the smaller ones are closed entirely, and the resistance every where of the body is greater, and the motion of the blood more languid, and somewhat impeded, and the heart and arteries become less irritable, pulsate also more slowly and weakly, and more of blood than proper is congested in the veins, less in the arteries, and most of the functions are impeded, and all the powers fail, and the whole machine decays from every part.

869. Therefore, it is not to be doubted but that life itself, sooner or later,

causa foret. Pauci vero hac naturali et inevitabili morte senili absumuntur: innumeri enim qui vitæ semitam obsident morbi, maximam gentis humanæ partem semper rapuerunt, ita ut vix decimus quisque septuaginta, vix millesimus quisque nonaginta annos compleverit; et ex iis qui senium attigerint, longe maxima pars non mera senectute, sed variis, quibus ætas illa opportuna facta est, morbis absumpti fuerunt.

870. Languente tandem propter rigiditatem omnium partium solidarum, et torporem et debilitatem virium moventium, sanguinis motu, cordeque non amplius ad proprium munus valente, sanguinis motus in partibus corporis extremis primo perit, in pectore, et trunco, et capite adhuc superstes. Idem in pulmone jam deficiens, anhelationem quandam, et respirationem laboriosam inducit (600), ad promo-

causa mortis. Vero pauci absumuntur hac naturali et inevitabili senili morte: enim innumeri morbi qui obsident semitam vitæ, semper rapuerunt maximam partem humanæ gentis, ita ut vix quisque decimus compleverit septuaginta, vix quisque millesimus nonaginta annos; et longe maxima pars ex iis qui attigerint senium fuerunt absumpti, non merâ senectute, sed variis morbis quibus illa ætas facta est opportuna.

870. Motu sanguinis tandem languente, propter rigiditatem omnium solidarum partium, et torporem et debilitatem moventium virium, que corde non amplius valente ad proprium munus, motus sanguinis perit primo in extremis partibus corporis, adhuc superstes in pectore, et trunco, et capite. Idem, jam deficiens in pulmone, inducit quandam anhelationem, et laboriosam

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would be a cause of death. But few are taken off by this natural and inevitable senile death: for the innumerable diseases which beset the path of life, always have snatched away the greatest part of the human race, so that scarcely every tenth person has completed seventy, scarcely every thousandth ninety years; and by far the greatest part of those who have reached old age have been taken away, not by mere old age, but by the various diseases to which that age has been rendered liable.

870. The motion of the blood at length languishing, on account of the rigidity of all the solid parts, and the torpor and debility of the moving powers, and the heart no longer availing for its proper function, the motion of the blood ceases first in the extreme parts of the body, while yet remaining in the breast, and trunk, and head. The same, now failing in the lungs, brings on a certain panting, and laborious respiration, to promote the

respirationem, ad promovendum transitum sanguinis per pulmonem. Hoc conatu tandem valente parum, que viribus penitus exhaustis, longa, plena expiratio succedit, suâ sponte, ultimæ inspirationi; que omnibus functionibus necessariis ad vitam simul cessantibus, hæc facile, et sine convulsione, commutatur cum morte.

vendum sanguinis transitum per pulmonem. Hoc tandem conatu parum valente, viribusque penitus exhaustis, ultimæ inspirationi, expiratio longa, plena, sua sponte succedit; omnibusque functionibus ad vitam necessariis simul cessantibus, hæc facile et sine convulsione cum morte commutatur.

871. Autem varia genera mortis existunt, præter hanc senilem et naturalem, quæ est habenda fere rarissima omnium; nimirum causæ sunt variæ, et prope innumeræ, quæ possint corrumpere que tandem perducere ad finem machinam adeo delicatam atque compositam, et conservatam tot functionibus ac humanum corpus; præsertim quum variæ partes que functiones ejus ita conjunguntur ut aliæ plane sustineantur ab aliis; et igitur siquid mali acciderit cuivis earum, vires non so-

871. Varia autem, præter hanc senilem et naturalem, quæ omnium fere rarissima habenda est (869), existunt mortis genera; variæ nimirum, et prope innumeræ causæ sunt, quæ machinam adeo delicatam atque compositam, totque functionibus conservatam ac corpus humanum, corrumpere possint, et tandem ad finem perducere; præsertim quum variæ ejus partes variæque functiones ita conjunguntur, ut aliæ ab aliis plane sustineantur; et igitur siquid cuivis earum acciderit mali, non ejus so-

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passage of the blood through the lungs. This effort at length availing little, and the strength being entirely exhausted, a long deep expiration succeeds, of its own accord, to the last inspiration; and all the functions necessary to life at the same time ceasing, it easily, and without a struggle, is exchanged for death.

871. But various kinds of death exist, besides this senile and natural one, which is to be considered almost the rarest of all; indeed the causes are various, and almost innumerable, which may corrupt and at length bring to an end a machine so delicate and complicated, and preserved by so many functions as the human body; especially as the various parts and functions of it are so conjoined that some evidently are sustained by others; and therefore if any evil should happen to any of them, the powers not only of it, but perhaps of the whole machine, collapse at the same time.

lum, sed totius fortasse machinæ vires simul collabantur.

872. Omnes vero istiusmodi causas enumerare, neque res ipsa postulat, neque operis hujus propositum sinit. Sat fuerit monuisse eas numerosissimas esse, et ab omni parte instare; plerumque tamen (fortasse semper, nisi propter summam mortis celeritatem observandi locus plane desit), qualiscunque fuerit origo seu causa remotior mali, aliquam functionum vitalium, actionem nempe cerebri nervorumque, aut sanguinis circuitum, aut respirationem, prius impediri aut lædi, aut aliquo demum modo præter solitum affici, quam vita penitus extinguatur. Quoniam vero, ut jam expositum est, arctissimus has inter functiones intercedit nexus (411, et seqq.) læsa una alterave earum, omnes plerumque simul laborant.

873. Perspicuum quoque est ex

lum ejus, sed fortasse totius machinæ, collabantur simul.

872. Vero neque res ipsa postulat, neque propositum hujus operis sinit enumerare omnes causas istiusmodi. Fuerit sat monuisse eas esse numerosissimas, et instare ab omni parte; plerumque, tamen, (fortasse semper, nisi locus observandi plane desit, propter summam celeritatem mortis,) qualiscunque fuerit origo seu remotior causa mali, aliquam vitalium functionum nempe, actionem cerebri que nervorum, aut circuitum sanguinis, aut respirationem impediri aut lædi, aut demum præter solitum affici aliquo modo, prius-quam vita penitus extinguatur. Vero quoniam arctissimus nexus intercedit inter has functiones, ut jam expositum est, unâ ve alterâ earum læsâ, omnes, plerumque, laborant simul.

873. Est quoque pers-

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872. But neither does the subject itself require, nor does the purpose of this work permit to enumerate all the causes of this kind. It will be sufficient to have advised that they are very numerous, and press on every side; generally, however, (perhaps always, unless an opportunity of observing be altogether wanting, on account of the very great quickness of death,) whatever have been the origin or remoter cause of the disease, that some one of the vital functions, for instance, the action of the brain and nerves, or the circulation of the blood, or the respiration is impeded or injured, or indeed unusually affected in some manner, before that life is entirely extinguished. But because a very close connexion exists between those functions, as already has been explained, one or other of them being injured, all, for the most part, suffer at the same time.

873. It is also evident, from the signs of those functions failing, or being

picuum, ex signis illarum functionum deficientium, aut impeditarum, aut habentium se male variis modis, medicum in plerisque morbis posse præscire periculum instans ægrotanti, et vel prædicere mortem, si nulla spes superest, vel si læsio fuerit neque naturâ neque magnitudine prorsus insanabilis, tum, idoneis remediis adhibitis, revocare quasi miserum ex mortuis.

signis illarum functionum deficientium, aut impeditarum, aut variis modis male se habentium, medicum in plerisque morbis periculum ægrotanti instans præscire posse, et vel mortem, si spes nulla superest, prædicere, vel si læsio neque natura neque magnitudine prorsus insanabilis fuerit, tum idoneis adhibitis remediis miserum quasi ex mortuis revocare.

874. Igitur, et decet et oportet medicum novisse signa appropinquantis mortis; quæ quidem, licet varient haud parum in variis morbis, et sæpe sint incerta, non modo accidentia singula, sed plurima juncta simul, tamen, plerumque, observantur in iisdem morbis, et satis constantia, et satis que super certa; præsertim si medicus attenderit animum, non modo ad manifesta signa, sed simul, ad naturam et causam morbi, et conditionem ægri.

874. Medicum igitur et decet et oportet signa appropinquantis mortis novisse: quæ quidem licet in variis morbis haud parum varient, et non modo singula accidentia, sed plurima simul juncta, sæpe incerta sint, tamen plerumque in iisdem morbis et satis constantia observantur, et satis superque certa; præsertim si non modo ad signa manifesta, sed simul ad naturam et causam morbi, et conditionem ægri, medicus animum attenderit.

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impeded, or having themselves badly in various ways, that the physician in most diseases can foreknow the danger impending over the sick, and either predict death, if no hope remains, or if the lesion should be neither in its nature nor extent utterly incurable, then, by suitable remedies being applied, recall as it were the wretched patient from the dead.

874. Therefore, it both becomes and behoves the physician to know the signs of approaching death; which indeed, although they may vary not a little in different diseases, and often are uncertain, not only when happening single, but many joined together, nevertheless, for the most part, they are observed in the same diseases, both sufficiently constant, and sufficiently and over certain; especially if the physician shall apply his mind, not only to the manifest signs, but at the same time to the nature and cause of the disease, and the condition of the patient.

875. Imprimis igitur, ingens debilitas (380), tum subita tum usque augescens, ita ut æger neque se movere, neque sustinere ut solebat in lecto, neque demum loqui, neque cibum sumere aut devorare possit, cadente scilicet maxilla, et vi propria gulæ pereunte; tremores, aut contractiones, aut convulsiones musculorum aut artuum; defectus vel amissio sensus cujusvis, sive externi sive interni, præsertim visus vel tactus; stupor, torpor, delirium grave, in plerisque morbis, acutis pariter atque vetustis, mala signa sunt.

875. Imprimis, igitur, ingens debilitas, tum subita tum usque augescens, ita ut æger possit neque movere neque sustinere se in lecto ut solebat, neque demum loqui, neque sumere cibum, aut devorare, scilicet, maxillâ cadente, et propriâ vi gulæ pereunte; tremores, aut contractiones, aut convulsiones musculorum aut artuum; defectus, vel amissio cujusvis sensûs, sive externi sive interni, præsertim visûs vel tactûs; stupor, torpor, grave delirium, sunt mala signa in plerisque morbis, acutis pariter atque vetustis.

876. Porro, pulsus arteriarum multum vitiati, sive valde celeres sive tardi facti fuerint, sive præter modum validi, sive demum, admodum debiles, et obscuri, et vix sentiendi, aut abnormes et intermittentes, cum vultu pallido et collapso, oculorum splendore extincto, artubus frigentibus, sudore frigido

876. Porro, pulsus arteriarum multum vitiati, sive facti fuerint valde celeres sive tardi, sive præter modum validi, sive demum admodum debiles, et obscuri, et vix sentiendi, aut abnormes et intermittentes, cum pallido et collapso vultu, splendore oculorum extincto, artubus frigentibus, fri-

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875. First of all, therefore, great debility, as well sudden as that constantly increasing, so that the patient can neither move nor support himself in bed as he used, nor even speak, nor take food, or swallow, that is, from the jaw falling, and the proper power of the gullet perishing; tremors, or contractions, or convulsions of the muscles or of the limbs; defect, or loss of any sense, whether external or internal, especially sight or touch; stupor, torpor, severe delirium, are bad signs in most diseases, acute equally and chronic.

876. Moreover, the pulsations of the arteries much vitiated, whether they shall become very quick or slow, or unusually strong, or indeed very weak, and obscure, and scarcely to be perceived, or irregular and intermitting, with a pallid and collapsed countenance, the splendour of the eyes extinguished, the limbs becoming cold, cold and clammy sweat, froth about the

gido et tenace sudore, spumâ circa os, et gravi anxietate, plerumque ostendunt summum periculum, sæpe instantem mortem.

877. Respiratio, quoque, imperfecta, difficilis, laboriosa, et facta strepens, ubi organa respirationis non prius laboraverant, est pessimum.

878. Sæpe, etiam, in longis morbis, vero nonnunquam in acutis, magna macies corporis, cadaverosus aspectus, et illa facies dicta Hippocratica, et in utroque genere morborum, insolitus fætor, et tandem generalis putredo, observantur aliquamdiu ante mortem.

879. Hæc, quidem, et signa hujusmodi, accidunt in variis morbis, que probe declarant magnitudinem atque periculum eorum. Vero plurima alia, et longe diversa, ostendunt se in aliis atque aliis generibus morborum, secundum naturam horum que partes corporis quibus

et tenace, spuma circa os, et gravi anxietate, plerumque summum periculum, sæpe instantem mortem ostendunt.

877. Respiratio quoque imperfecta, difficilis, laboriosa, et strepens facta, ubi prius organa respirationis non laboraverant, pessimum est.

878. Sæpe etiam in longis morbis, nonnunquam vero in acutis, magna corporis macies, aspectus cadaverosus, et facies illa Hippocratica dicta, et in utroque genere morborum, fætor insolitus, et tandem putredo generalis, aliquamdiu ante mortem observantur.

879. Hæc quidem et hujusmodi signa in variis morbis accidunt, eorumque magnitudinem atque periculum probe declarant. Plurima vero alia, et longe diversa, in aliis atque aliis morborum generibus, secundum horum naturam, partesque corporis quibus maxime in-

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mouth, and great anxiety, for the most part indicate the greatest danger, often impending death.

877. The respiration, also, when imperfect, difficult, laborious, and become loud, when the organs of respiration had not previously suffered, is very bad.

878. Often, also, in chronic diseases, but sometimes in acute, great emaciation of the body, a cadaverous aspect, and that face called Hippocratic, and in both kind of diseases, an unusual fetor, and at length general putridity, are observed for some time before death.

879. These, indeed, and signs of this sort, happen in various diseases, and thoroughly declare the extent and danger of them. But a great many others, and far different ones, shew themselves in different kinds of diseases, according to the nature of them and the parts of the body over which they

cumbunt, se ostendunt, eorumque periculum, interdum fortasse insanabilem naturam, ab ipso initio commonstrant.

880. Ipsa autem signa (874) quæ maxime infausta, et plerumque lethalia habentur, periculo sæpe carent, scilicet cum a causis levibus aut fugacibus, vel saltem facile medicabilibus, oriuntur; veluti in hysteria, asthmate, scorbuto, febribus quibusdam intermittentibus, multisque aliis morbis.

881. Causa mortis, saltem plena et proxima ejus causa, debet esse semper eadem, nimirum quæ consistit in amissione illius ignoti status generis nervosi, qui vitam, quatenus corporea est, efficere videtur. Quoniam vero status ille adhuc prorsus ignotus est, plenam et proximam mortis causam, que nihil aliud est quam ejus extinctio, pariter ignotam esse plane oportet.

882. Quin et causæ mortis re-

maxime incumbunt, que commonstrant, ab ipso initio, periculum, interdum, fortasse, insanabilem naturam eorum.

880. Autem signa ipsa quæ habentur maxime infausta, et plerumque lethalia, sæpe carent periculo, scilicet, cum oriuntur a levibus aut fugacibus vel saltem facile medicabilibus causis: veluti in hysteriâ, asthmate, scorbuto, quibusdam intermittentibus febribus, que multis aliis morbis.

881. Causa mortis, saltem plena et proxima causa ejûs, debet semper esse eadem, nimirum quæ consistit in amissione illius ignoti statûs nervosi generis, qui videtur efficere vitam, quatenus est corporea. Vero quoniam ille status est adhuc prorsus ignotus, plane oportet plenam et proximam causam mortis, quæ est nihil aliud quam extinctio ejus, esse pariter ignotam.

882. Quin et remotiores

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most hang, and demonstrate, from the very beginning, the danger, sometimes, perhaps, the incurable nature of them.

880. But the signs themselves which are considered most unfavorable, and for the most part deadly, often are free from danger, namely, when they arise from slight or transient or at least easily remediable causes; as in hysteria, asthma, scurvy, some intermitting fevers, and many other diseases.

881. The cause of death, at least the full and proximate cause of it, ought always to be the same, as being that which consists in the loss of that unknown state of the nervous system, which seems to produce life, so far as it is corporeal. But because that state is still altogether unknown, it evidently behoves that the full and proximate cause of death, which is nothing else than the extinction of that, be alike unknown.

882. Moreover the remoter causes of death, namely, such as bring on that

causæ mortis, nimirum, quales inducunt istum ignotum statum nervosi generis, intelliguntur vix melius in longe plerisque exemplis; neque sane possunt detegi inspectione cadaverum. Enim vis nervosi generis, ut videtur, sæpe deficit, cum fabrica ejus, quatenus facultas explorandi aut scalpello aut nostris sensibus, data sit, manet sana et integra. Exempla hujusmodi observantur quotidie, in corporibus eorum qui fuerint extincti quibusdam febribus, aut multis aliis similibus morbis, aut paralysi, aut convulsionibus, aut gangrænâ, aut variis venenis, receptis vel in ventriculum, vel in pulmones, vel in sanguinem, aut fulmine, aut gravibus affectibus animi, aut subitâ morte, aut interdum, demum, externâ vi illatâ vel capiti vel ventriculo.

883. Haud raro, tamen, insignes læsiones vel cerebri ipsius, vel saltem

motiores, quales nimirum ignotum istum statum generis nervosi inducunt, in longe plerisque exemplis vix melius intelliguntur; neque sane inspectione cadaverum detegi possunt. Sæpe enim, ut videtur, vis generis nervosi deficit, cum fabrica ejus, quatenus aut scalpello aut sensibus nostris explorandi facultas data sit, sana et integra manet. Hujusmodi exempla quotidie observantur, in corporibus eorum qui febribus quibusdam, aut multis similibus morbis, aut paralysi, aut convulsionibus, aut gangræna, aut variis venenis, vel in ventriculum, vel in pulmones, vel in sanguinem receptis, aut fulmine, aut gravibus animi affectibus, aut subita morte, aut demum interdum vi externa vel capiti vel ventriculo illata, extincti fuerint.

883. Haud raro tamen læsiones insignes, vel ipsius cerebri, vel alicujus saltem partis generis nervosi,

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unknown state of the nervous system, are understood scarcely better in far the most examples; nor indeed can they be detected by the inspection of dead bodies. For the power of the nervous system, as it appears, often fails, when the structure of it, so far as the power of examining either by the scalpel or our senses, has been given, remains sound and entire. Examples of this kind are observed daily, in the bodies of those who have been cut off by certain fevers, or many other similar diseases, or paralysis, or convulsions, or gangrene, or various poisons, received either into the stomach, or into the lungs, or into the blood, or by thunder (lightning), or severe affections of the mind, or by sudden death, or sometimes, in a word, by external violence done either to the head or stomach.

883. Not unfrequently, however, remarkable lesions, either of the brain itself, or at least of some parts of the nervous system, are detected in dead

in cadaveribus deteguntur, quæ vulgo, quamvis parum accurate, pro plena et proxima causa mortis habentur; veluti si cervix aut calvaria fractæ fuerint, aut cerebrum compressum, aliterve læsum, sive a depressa aliqua parte calvariæ, sive a tumoribus intra caput, sive a sanguine, aut sero, aut pure, aut aqua in eodem effusis, sive tantum a vasis sanguine plus æquo turgentibus, ut in epilepsia, apoplexia, paralysi, hydrope, febribus quibusdam, nonnunquam accidit.

884. Sæpe quoque impedimenta aliarum functionum vitalium, et interdum etiam insignes læsiones fabricæ partium quæ iis inserviunt, deteguntur, et merito pro causa, quamvis, ut jam expositum est, non proxima causa, mortis habentur; veluti cor vel vas aliquod magnum ruptum, vel erosum, vel obstructum, vel pulmones inflammati, vel

alicujus partis nervosi generis, deteguntur in cadaveribus, quæ vulgo, quamvis parum accurate, habentur pro plena et proxima causa mortis; veluti si cervix aut calvaria fuerint fractæ, aut cerebrum compressum, ve aliter læsum, sive a aliquâ parte calvariæ depressa, sive a sanguine, aut sero, aut pure, aut aquâ effusis in eodem, sive a vasis tantum plus turgentibus æquo sanguine, ut nonnunquam accidit in epilepsiâ, apoplexiâ, paralysi, hydrope, quibusdam febribus.

884. Sæpe quoque, impedimenta aliarum vitalium functionum, et interdum etiam insignes læsiones fabricæ partium quæ inserviunt iis deteguntur, et merito habentur pro causâ, quamvis, ut jam expositum est, non proximâ causâ, mortis; veluti cor, vel aliquod magnum vas ruptum, vel erosum, vel

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bodies, which commonly, although no way accurately, are considered as the full and proximate cause of death; as if the neck or skull should be broken, or the brain compressed, or otherwise injured, whether from some part of the skull being depressed, or from blood, or serum, or pus, or water being effused in the same, or from the vessels only being more turgid than proper with blood, as sometimes occurs in epilepsy, apoplexy, paralysis, dropsy, certain fevers.

884. Often, also, impediments of the other vital functions, and sometimes even remarkable lesions of the structure of the parts which subserve to them, are detected, and justly are considered as the cause, although, as already has been explained, not the proximate cause of death; as the heart, or some great vessel broken, or eroded, or obstructed, or the lungs inflamed, or filled with blood, or serum, or mucus, or pus, or water, or impeded by

obstructum, vel pulmones inflammati, vel impleti sanguine, aut sero, aut muco, aut pure, aut aquâ, vel impediti tumoribus vicinarum partium, aut plurimâ aquâ collectâ in pectore; et similia.

885. Sæpe, tamen, nulla læsio, aut nervosi generis, aut partium quæ inserviunt circuitui sanguinis, aut respirationi, potest detegi, sed tantum aliquod vitium naturalium functionum organorum, vel demum quædam labes, aut generalis suâ naturâ, aut primo inficiens aliquam partem corporis, quamvis paulatim corrumpens totum corpus; unde quædam functiones necessariæ ad vitam impeditæ, valetudo labefacta ab omni parte, infirmitas indies augescens, et tandem inevitabilis mors.

886. Provida Natura curavit, ut hæc ultima linea rerum non careret suâ formidine; neque consilium obscurum cur

sanguine, aut sero, aut muco, aut pure, aut aqua impleti, vel tumoribus vicinarum partium, aut plurima aqua in pectore collecta, impediti; et similia.

885. Sæpe tamen nulla, aut generis nervosi, aut partium quæ sanguinis circuitui aut respirationi inserviunt, detegi potest læsio, sed tantum vitium aliquod organorum functionum naturalium, vel demum, labes quædam, aut sua natura generalis, aut partem aliquam corporis primo inficiens, quamvis paulatim totam corpus corrumpens; unde quædam functiones ad vitam necessariæ (8, 9) impeditæ, valetudo ab omni parte labefacta, infirmitas indies augescens, et tandem mors inevitabilis.

886. Hæc ultima linea rerum provida Natura curavit, ut sua formidine non careret; neque obscurum consilium cur ita mor-

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tumours of the neighbouring parts, or by a great deal of water collected in the chest; and the like.

885. Often, however, no lesion, either of the nervous system, or of the parts which are subservient to the circulation of the blood, or respiration, can be detected, but only some disorder of the natural functions of the organs, or, in fine, some blemish, either general in its nature, or at first infecting some part of the body, although by degrees corrupting the whole system; whence, certain functions necessary to life are impeded, health impaired from every side, infirmity daily increasing, and at length inevitable death.

886. Provident Nature has taken care that this ultimate boundary of things should not want its own terror; nor is the design obscure why she

talia pectora effinxerit, ut repugnanter omnino hanc vitam, utcunque gravem et ærumnosam, cum alia et ignota commutemus. Multum vero erraverunt mortales, et male sibi consuluerunt, qui terrorem mortis intendere, sibimet persuadentes gravissimum illam semper secum angorem ferre, nec sine summo cruciatu cuiquam unquam esse moriendum. Quod profecto eo magis verisimile hominibus visum est, quod immanes dolores aliquando necant et moribundi sæpe agitantur multum, et anhelant, et gemunt, et convelluntur, non secus ac miseri gravibus doloribus cruciati.

887. Nihilominus vero et ratio et observatio satis demonstrarunt, nullum unquam esse moriendi sensum, causasque quæ vitam extinguant tales sæpe esse, quales neque dolorem neque sensum ullum dare possint, corporisque demum con-

ita effinxerit mortalia pectora, ut commutemus omnino repugnanter hanc vitam, utcunque gravem et ærumnosam, cum aliâ et ignotâ. Vero mortales multum erraverunt, et maleconsuluerunt sibi, qui intendêre terrorem mortis, persuadentes sibimet semper ferre secum illum gravissimum angorem, nec cuiquam unquam esse moriendum sine summo cruciatu. Quod profecto visum est magis verisimile hominibus eo quod immanes dolores aliquando necant, et moribundi sæpe agitantur multum et anhelant, et gemunt, et convelluntur, non secus ac miseri cruciati gravibus doloribus.

887. Vero nihilominus, et ratio et observatio satis demonstrarunt nullum sensum moriendi unquam esse, que causas quæ extinguant vitam, sæpe esse tales quales neque possint dare dolorem, neque ullum sensum, que demum, con-

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should so have formed mortal breasts, that we exchange altogether repugnantly this life, however irksome and laborious, for another and unknown. But mortals have greatly erred, and have badly consulted for themselves, who have augmented the terror of death, persuading themselves that it always carries along with it that most severe anguish, nor that any one ever is to die without the greatest torture. Which truly has seemed the more probable to men, because very cruel pains sometimes kill, and dying persons often are agitated a great deal, and pant and groan, and are convulsed, in like manner as wretches tortured by grievous pains.

887. But, nevertheless, both reason and observation have sufficiently demonstrated, that no feeling of dying ever exists, and that the causes which extinguish life, often are such as neither can produce pain nor any feeling, and, in fine, that the condition of the body, generally, for a long time before

ditionem corporis, plerumque diu antequam moribundus exhalaverit animam, esse istiusmodi quæ auferat pariter et dolorem et omnem sensum.

888. Mors est placida, imprimis, illis qui absumuntur senili morte, quæ sola potest dici naturalis: scilicet qui, nullâ vi adhibitâ quæ raperet e vivis, tamen desinunt vivere, ut matura poma sponte cadunt ex arboribus. Quin et, tantus stupor solet adesse in his, ut omnis sensus videatur fuisse sopitus et extinctus, longe prius quam vita. Neque profecto aut videtur ulla causa doloris adesse in iis, aut ulla indicia doloris observantur inter moriendum.

889. Porro, causa lethi eorum quos varii morbi rapiunt ætate magis viridi, est fere eadem. Hi morbi, puta febres que similes, sine dubio donec vires vitæ et sensus supersunt integri, facessunt sat que super doloris et

ditionem, diu plerumque antequam animam exhalaverit moribundis, istiusmodi esse, quæ et dolorem et omnem sensum pariter auferat.

888. Illis imprimis qui morte senili, quæ sola naturalis dici potest, absumuntur, placida mors est; scilicet qui nulla adhibita vi quæ e vivis raperet, tamen vivere desinunt, ut matura poma ex arboribus sponte cadunt. Quin et tantus in his stupor adesse solet, ut longe prius sensus omnis sopitus et extinctus fuisse videatur quam vita. Neque profecto in iis aut causa ulla doloris adesse videtur, aut ulla observantur inter moriendum doloris indicia.

889. Porro, eadem fere ratio est eorum lethi quos magis viridi ætate varii morbi rapiunt. Hi morbi, puta febres, similesque, sine dubio donec vires vitæ et sensus integri supersunt, sat superque doloris et molestiæ facessunt: sed quum jam

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that the dying person has exhaled his life, is of that sort which takes away alike both pain and all feeling.

888. Death is placid, in the first place, to those who are carried off by senile death, which alone can be called natural: as being who, no violence being applied which could hurry them from the living, nevertheless cease to live, as ripe apples spontaneously fall from the trees. Moreover, so great a stupor is accustomed to be present in these, that all feeling seems to have been lulled and extinct long before life. Nor, truly, either does there seem any cause of pain to be present in them, or are any indications of pain observed while dying.

889. Moreover, the cause of the death of those whom various diseases hurry off at an age more green, is almost the same. These diseases, for instance fevers and the like, without doubt, while the powers of life and the senses remain entire, cause sufficient and above, of pain and trouble: but

ad extrema ventum est, fractis viribus, et deleto fere omni sensu, neque causa doloris vehemens esse potest, neque si fuerit, propter corporis conditionem, dolorem ullum excitare.

890. Causa vero mortis sæpe talis est, qualis non modo non creet dolorem, sed sensum omnem plane sopiat adimatque. Sic multi sunt morbi somniculosi in quibus ægri nunquam de dolore, vix quidem de molestia, conqueruntur. Syncope quoque sæpe morti continuata est, neque in alterutra aut dolor, aut sensus ullus, adesse videtur. Moriuntur quoque interdum non rupto somno, qui sani prorsus et vegeti obdormiverant.

891. Quin et in iis exemplis in quibus mors violentissima est, sive intus sive extrinsecus ejus causa fuerit, summa mortis celeritas

molestiæ : sed quum jam est ventum ad extrema, viribus fractis, et omni sensu fere deleto, neque potest esse vehemens causa doloris, neque si fuerit, excitare ullum dolorem, propter conditionem corporis.

890. Vero causa mortis sæpe est talis qualis non modo non creet dolorem, sed plane sopiat que adimat omnem sensum. Sic sunt multi somniculosi morbi, in quibus ægri nunquam conqueruntur de dolore, vix quidem de molestiâ. Syncope, quoque, est sæpe continuata morti, neque videtur adesse in alterutrâ aut dolor aut ullus sensus. Moriuntur quoque, interdum, somno non rupto, qui obdomiverant prorsus sani et vegeti.

891. Quin et, in iis exemplis in quibus mors est violentissima, sive causa ejus fuerit intus vel extrinsecus, summa

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when now it is come to the last, the powers being broken, and all feeling being almost destroyed, neither can there be violent cause of pain, nor if there should be, can it excite any pain, on account of the condition of the body.

890. But the cause of death often is such, as not only does not cause pain, but altogether lulls and takes away all feeling. But there are many drowsy diseases, in which the sick never complain of pain, scarcely even of uneasiness. Syncope, also, is often continued to death, nor does there seem to be in either, either pain or any sensibility. They die also, sometimes, the sleep not being broken, who had slept altogether sound and lively.

891. Moreover, in those examples in which death is most violent, whether the cause of it be from within or without, the extreme rapidity of death altogether takes away all feeling of dying.

celeritas mortis plane aufert omnem sensum moriendi.

892. Est satis perspicuum multos morbos, que alias causas mortis facessere insignem dolorem, et molestiam, et anxietatem: veluti si magna vis fuerit illata sentienti parti, aut inflammatio oborta, vel denique, si aliquæ actiones necessariæ ad vitam impeditæ fuerint, quod sæpe fit a merâ debilitate. Neque profecto est negandum, multos hoc modo scivisse mortem instantem sibimet, et igitur comiter valedixisse amicis et astantibus, in fere articulo ipso mortis. Vero est semper tenendum memoriâ, talem molestum sensum adesse inter vivendum, non inter moriendum, que eundem fere desinere, et extingui, priusquam moribundus efflet animam. Igitur, ad summam ut videtur, morimur non secus ac linquimur animo, aut corripimur convulsionibus, sine

omnem moriendi sensum plane aufert.

892. Satis perspicuum est multos morbos, aliasque mortis causas, insignem dolorem, et molestiam, et anxietatem facessere; veluti si magna vis parti sentienti illata fuerit, aut inflammatio oborta, vel deniquē, si actiones aliquæ ad vitam necessariæ impeditæ fuerint, quod a mera debilitate sæpe fit, Neque profecto est negandum, multos hoc modo mortem sibimet instantem scivisse, et igitur amicis et astantibus in ipso fere mortis articulo comiter valedixisse. Semper vero memoria tenendum est, talem molestum sensum inter vivendum, non inter moriendum, adesse, eundemque fere prius desinere et extingui quam animam moribundus efflet. Ad summam igitur, ut videtur morimur, non secus ac animo linquimur, aut convulsionibus corripimur, sine do-

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892. It is sufficiently evident that many diseases, and other causes of death, cause remarkable pain, and uneasiness, and anxiety: as when great violence has been applied to a sentient part, or inflammation has arisen, or, in fine, when some actions necessary to life have been impeded, which often arises from mere debility. Nor indeed is it to be denied, that many in this way have known death impending upon themselves, and therefore courteously have bidden adieu to their friends and the bystanders, in almost the moment itself of death. But it is always to be kept in mind, that such troublesome feeling was present while living, not during dying, and that the same generally ceases, and is extinguished before that the dying person breathes out his life. Therefore, on the whole, as it seems, we die in like manner as we faint, or are seized with convulsions, without pain, or indeed any feeling,

lore, aut sane sensu ullo quamvis eo sæpe perducant variæ causæ quæ plurimum cruciare possint.

893. Ridiculum forsitan primo aspectu videbitur, ad testimonium tali de re provocare; sed multa extiterunt exempla hominum in vitam reducum postquam tam pene exanimes fuissent, plurimis et admodum diversis mortis generibus, ut neque ulla vitæ indicia exhiberent, neque credibile esset sensum ullum superstitem fuisse. Talibus vero hominibus nulla solet esse memoria gravis doloris aut molestiæ sensus ne quidem cum vehementissimis convulsionibus agitati fuissent. Minime igitur absurda videtur pulchra clari et elegantis auctoris sententia, initii et finis vivendi eandem quod ad sensum rationem esse, neque cum altero voluptatem quantum recordamur, neque cum altero dolorem quantum novimus,

dolore, aut sane ullo sensu, quamvis variæ causæ, quæ possint cruciare plurimum sæpe perducant eo.

893. Forsitan videbitur, primo aspectu, ridiculum provocare ad testimonium de tali re, sed multa exempla extiterunt hominum reducum in vitam, postquam fuissent pene tam exanimes, plurimis et admodum diversis generibus mortis, ut neque exhiberent ulla indicia vitæ, neque esset credibile ullum sensum fuisse superstitem. Vero nulla memoria gravis doloris, aut sensus molestiæ, solet esse talibus hominibus, ne quidem cum fuissent agitati vehementissimis convulsionibus. Igitur, pulchra sententia clari et elegantis auctoris, rationem initii et finis vivendi, quod ad sensum, esse eandem, videtur minine absurda, neque, quantum recordamur, voluptatem necessario conjungi cum altero, neque, quantum

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although various causes, which may torture a great deal, often may conduct us thither.

893. Perhaps it will seem, at first sight, ridiculous to appeal to testimony upon such a subject, but many examples have existed of persons brought back to life, after that they had been almost so lifeless, by many and very different kinds of death, that neither did they exhibit any signs of life, nor was it credible that any feeling had been left. But no recollection of severe pain, or of sense of uneasiness, is accustomed to be in such persons, not even when they had been agitated by the most violent convulsions. Therefore, the beautiful opinion of a celebrated and elegant author, that the manner of the beginning and end of living, as to feeling, is the same, seems by no means absurd, nor, so far as we recollect, that pleasure is necessarily con-

novimus, aut possumus conjicere, dolorem cum altero.

aut conjicere possumus, necessario conjungi.

894. Animâ efflatâ, totum cadaver friget, riget, putrescit, et brevi solvitur in pristina elementa.

894. Efflata anima, cadaver friget totum, riget, putrescit, et brevi in pristina elementa solvitur.

895. Homo, utcunque soleat conqueri de brevitate vitæ, comparatus cum aliis animalibus est habendus longævus. Quamvis plurimum hic pendeat a primâ atque congenitâ fabricâ et constitutione corporis, nondum plene intellectis, mollior compago totius corporis rigescens tardius, crescens diu, et perducta sero ad justam formam, quoque potest conferre multum.

895. Homo, utcunque de brevitate vitæ conqueri soleat, cum aliis animalibus comparatus, longævus habendus est. Quamvis plurimum hic pendet a prima atque congenita corporis fabrica et constitutione, nondum plene intellectis, multum quoque conferre potest mollior totius corporis compago, tardius rigescens, diu crescens, et sero ad justam formam perducta.

896. Est verisimile molliores et laxiores homines, modo fuerint sani, vivere diutius, et senescere tardius quam firmiores et validiores; cujus rei plurima exempla exstitere. Vero adhuc erit opus plurimis aliis, priusquam liceat stabilire

896. Verisimile est, molliores et laxiores homines, modo sani fuerint, quam firmiores et validiores diutius vivere, et tardius sēnescere; cujus rei plurima exempla exstitere. Plurimis vero aliis adhuc opus erit, priusquam hanc sententiam stabilire liceat. Satis autem

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joined with the one, nor, so far as we know, or can conjecture, pain with the other.

894. The life being breathed out, the entire dead body grows cold, stiffens, putrefies, and quickly is resolved into its former elements.

895. Man, however he may be accustomed to complain of the shortness of life, compared with other animals is to be considered long lived. Although a great deal here depends upon the first and congenital structure and constitution of the body, not yet fully understood, a softer texture of the whole system becomes rigid more slowly, growing for a long time, and brought late to the due shape, also may contribute much.

896. It is probable that more soft and more lax persons, provided they be healthy, live longer, and grow old more slowly, than firmer and stronger ones; of which thing a great many examples have existed. But still there

constat, vetulas, si modo ætatem qua menses solent desinere feliciter superaverint, diutius et sanius vivere quam senes, et mentis viribus minus imminutis frui: probabile enim videtur, desipientiæ et mortis senilis eandem fere rationem esse (303).

hanc sententiam. Autem satis constat, vetulas, si modo feliciter superaverint ætatem quâ menses solent desinere, vivere diutius et sanius quam senes, et frui viribus mentis minus imminutis; enim videtur probabile rationem senilis desipientiæ et mortis esse fere eandem.

897. Satis superque etiam constat, durum et perpetuum laborem, quali magna pars hominum sibi suisque victum quærunt, quamvis a multis morbis tueatur, senectutem festinare, et ideo mortem præmaturam inducere. Optimates enim et divites, quamvis luxu et ignavia debilitati, et multis sæpe morbis fracti, tamen tardius senescunt, et igitur diutius vivunt, quam inopes artifices atque agricolæ, quibus res angustæ domi temperantiam et laborem satis persuaserant.

897. Etiam constat, satis que super, durum et perpetuum laborem, quali magna pars hominum quærunt victum sibi que suis, quamvis tueatur a multis morbis, festinare senectutem, et ideo inducere præmaturam mortem. Enim optimates et divites, quamvis debilitati luxu et ignaviâ, et sæpe fracti multis morbis, tamen senescunt tardius, et igitur vivunt diutius quam inopes artifices atque agricolæ, quibus angustæ res domi satis persuaserunt temperantiam et laborem.

898. Vitæ hominis spatium,

898. Spatium vitæ ho-

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will be need of a great many others, before that it may be allowed us to establish this opinion. But it is sufficiently established, that old women, provided, happily, they should get over the age in which the menses are accustomed to cease, live longer and more healthily than old men, and enjoy the powers of the mind less impaired; for it seems probable, that the explanation of senile dotage and death is nearly the same.

897. Also, it is established, sufficiently and above, that hard and constant labour, by such as a great proportion of persons seek food for themselves and their families, although it may protect from many diseases, hastens old age, and consequently brings on premature death. For the nobility and the rich, although debilitated by luxury and idleness, and often broken down by many diseases, notwithstanding, grow old more slowly, and therefore live longer than needy artificers and peasants, to whom their straightened circumstances had sufficiently persuaded temperance and labour.

ninis, post diluvium Noachi, videtur fuisse fere idem ubique orbis terrarum. Exempla hominum qui compleverint centum annos, rarissima; et humana memoria potest vix recordari unum ve alterum exemplum vitæ protractæ ad centum et quinquaginta annos.

899. Nonnulli habent prærogativam diuturnitatis vitæ ab naturâ ipsâ, et primâ et congenitâ fabricatione corporis; scilicet quæ sæpe est hæreditaria, et in quibusdam familiis fere constans. Alii, naturâ debiles et morbosi, vel fracti intemperantiâ, et parum idoneo genere vitæ, sæpe compararunt sibimet novam et meliorem constitutionem corporis, et interdum protraxerunt vitam ultra solitos limites, perpetuâ curâ, solicitudine, et temperantiâ: cujus rei Cornaro exstat eximium exemplum et documentum.

900. Mens quoque læta,

post diluvium Noachi, idem fere videtur fuisse ubique terrarum orbis. Rarissima hominum exempla qui centum annos compleverint; et vix unum alterumve exemplum humana potest memoria recordari vitæ ad centum et quinquaginta annos protractæ.

899. Nonnulli diuturnitatis vitæ prærogativam ab ipsa natura, et prima et congenita corporis fabricatione, habent; scilicet quæ sæpe hæreditaria est, et in quibusdam familiis fere constans. Alii, natura debiles, et morbosi, vel intemperantia, et vitæ genere parum idoneo, fracti, perpetua cura, et solicitudine, et temperantia, sæpe novam et meliorem constitutionem corporis sibimet compararunt, et vitam ultra solitos limites interdum protraxerunt; cujus rei eximium Cornaro exemplum et documentum exstat.

900. Mens quoque læta, et bene

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898. The duration of the life of man, after the deluge of Noah, appears to have been nearly the same every where on the globe of the earth. Instances of persons who have completed a hundred years, are very rare; and human memory can scarcely remember one or another example of life prolonged to a hundred and fifty years.

899. Some have the prerogative of length of life from nature itself, and the original and congenital construction of the body; as being that which often is hereditary, and in certain families almost constant. Others, by nature weak and diseased, or broken down by intemperance, and no way suitable mode of life, often have acquired for themselves a new and better constitution of body, and sometimes have protracted life beyond the usual limits, by incessant care, solicitude, and temperance; of which thing Cornaro remains a remarkable instance and document.

recta, et modicis et gratis affectibus leniter excitata, neque studiis intensioribus, neque gravibus curis, neque miseris tumultibus, lacerata, ad vitæ diuturnitatem haud parum conferre videtur.

901. Quamvis non sit credibile remedium unquam repertum iri quod juventutem præteritam revocaverit, tamen satis verisimile videtur, quædam remedia senectuti moram afferre posse, ejusque mala sublevare, et vitam suaviorem reddere, et nonnihil forsan protrahere; victum scilicet satis nutrientem et concoctu facilem, exercitationem modicam, aliquantum potus generosi, et remedia nonnulla quæ laxant corpus, aëra imprimis calidum, et balneum aliquando. Hujusmodi victus et vitæ genus corpus nutrit, et non onerat, genus nervosum grate excitat alitque, sanguinis motum jam languentem juvat, secretiones promovet, et omnes soli-

et bene recta, et leniter excitata, modicis et gratis affectibus, lacerata neque intensioribus studiis, neque gravibus curis, neque miseris tumultibus, videtur conferre haud parum ad diuturnitatem vitæ.

901. Quamvis sit non credibile remedium unquam repertum iri quod revocaverit juventutem præteritam, tamen videtur satis verisimile, quædam remedia posse afferre moram senectuti, que sublevare mala ejus, et reddere vitam suaviorem, et forsan protrahere nonnihil; scilicet, victum satis nutrientem, et facilem concoctu, modicam exercitationem, aliquantum generosi potus, et nonnulla remedia quæ laxant corpus, imprimis calidum aëra, et aliquando balneum. Victus et genus vitæ hujusmodi, nutrit corpus, et non onerat, grate excitat que alit nervosum genus, juvat motum sanguinis jam languentem, promovet secre-

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900. The mind also cheerful, and well governed, and gently excited, by moderate and agreeable affections, distracted neither by the more intense studies, nor oppressive cares, nor wretched tumults, seems to conduce not a little to length of life.

901. Although it be not credible that a remedy ever will be found out which will recall youth when passed by, notwithstanding it seems very probable that some remedies may bring delay to old age, and relieve the disorders of it, and render life more agreeable, and perhaps prolong it somewhat; that is, food tolerably nutritious, and easy to be digested, moderate exercise, some little of generous drink, and some remedies which relax the body, especially warm air, and sometimes the bath. A diet and mode of life of this sort, nourishes the body, and does not burthen it, gratefully excites and supports the nervous system, assists the motion of the blood

tiones, et reddit omnes solidas partes molliores et mobiliores et magis sentientes.

das partes molliores, et mobiliores, et magis sentientes, reddit.

902. Statura quoque hominum, non secus ac diuturnitas vitæ videtur semper et ubique fuisse fere eadem, nisi in nonnullis frigidissimis regionibus quas aliud et brevius genus hominum habitat. Adhuc parum constat de gigantibus Patagoniæ; vero est non dubium, quosdam tantum excedere solitam magnitudinem hominum, ut appellentur non immerito gigantes; vero hi raro observantur bene formati, et sæpe debiles et hebetes et parum apti ad varias exercitationes corporis et labores. Quin et potest demonstrari ex mathematicis principiis gigantem, qui multum excederet solitam staturam hominum, dummodo esset factus ex eâdem materiâ ac alii homines, fore penitus inhabilem, que tracturum ægre proprium corpus.

902. Statura quoque hominum, non secus ac vitæ diuturnitas, eadem fere videtur semper et ubique fuisse, nisi in regionibus nonnullis frigidissimis, quas aliud et brevius genus hominum habitat. Parum adhuc constat de gigantibus Patagoniæ; non dubium vero est, quosdam solitam hominum magnitudinem tantum excedere, ut non immerito Gigantes appellentur; hi vero raro bene formati observantur, et sæpe debiles, et hebetes et ad varias corporis exercitationes et labores parum apti. Quin et ex principiis mathematicis demonstrari potest, Gigantem, qui solitam hominum staturam multum excederet, dummodo ex eadem factus esset materia ac alii homines, penitus inhabilem fore, propriumque corpus ægre tracturum.

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when languid, promotes the secretions, and renders all the solid parts softer, both more mobile and more sentient.

902. The stature also of men, in like manner as the length of life seems always and every where to have been nearly the same, except in some very cold climates which another and shorter race of men inhabits. As yet it is not determined concerning the giants of Patagonia; but it is not doubtful, that some individuals so far exceed the ordinary size of men, that they may be called not undeservedly giants; but these seldom are observed well formed, and often weak and dull and no way fitted for the various exercises of the body and labours. Moreover it may be demonstrated from mathematical principles that a giant, who greatly exceeded the ordinary stature of men, provided he were made of the same matter as other men, would be wholly unwieldy, and would drag with difficulty his own body.

903. Nani quoque aliquando spectantur, qui vix dimidiam, vel sane tertiam partem, justæ magnitudinis attigerint. Hi autem deformes fere sunt, gibbosi sæpe, aut ingente capite instructi, raro fœcundi, nunquam gentem nanorum daturi. Morbus aliquis plerumque causa fuisse videtur, cur tales nani vel non crescerent more solito, vel forsitan decrescerent, postquam aliquantum crevissent.

904. Variat tamen nonnihil statura apud diversas gentes, et magis adhuc in singulis hominibus; ita ut differentia pedis et amplius inter bene formatos homines observetur: neque sane vis et robur corporis a magnitudine ejus multum pendent. Proceritas in quibusdam familiis fere perpetua observatur; sæpe igitur pendere oportet a prima et hæreditaria corporis fabrica et constitutione. Viri in universum quam fœminæ haud parum proceriores

903. Nani quoque spectantur aliquando, qui attigerint vix dimidiam vel sane tertiam partem justæ magnitudinis. Autem hi fere sunt deformes, sæpe gibbosi, aut instructi ingente capite, raro fœcundi, nunquam daturi gentem nanorum. Aliquis morbus videtur plerumque fuisse causa, cur tales nani vel non crescerent solito more, vel forsitan decrescerent postquam crevissent aliquantum.

904. Tamen statura variat nonnihil apud diversas gentes, et adhuc magis in singulis hominibus; ita ut differentia pedis et amplius observetur inter bene formatos homines; neque sane vis et robur corporis pendent multum a magnitudine ejus. Proceritas observatur fere perpetua in quibusdam familiis; igitur oportet sæpe pendere a primâ et hæreditariâ fabricâ et constitutione corporis. Viri in universum sunt haud parum proceriores quam

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903. Dwarfs also are seen sometimes, who have reached scarcely the half or indeed the third part of the due size. But these mostly are deformed, often humped, or furnished with a large head, rarely fruitful, never likely to produce a nation of dwarfs. Some disease seems for the most part to have been the cause why such dwarfs either did not grow in the usual way, or perhaps decreased after that they had grown a little.

904. However the stature varies somewhat among different nations, and still more in individual men; so that a difference of a foot and more may be observed between well formed men; nor indeed do power and strength of body depend much upon the size of it. Tallness is observed almost constant in certain families; therefore it behoves that it often depends upon the first and hereditary structure and constitution of the body. Men in general are not a little taller than women and have a far different shape. Other animals

fœminæ et habent longe diversam formam. Cætera animalia crescunt vel minuuntur multum paucis generationibus, prout cibus abundaverit vel defecerit. Homo quoque experitur nonnihil hujusmodi, quamvis haud tantum ac belluæ.

905. Opinio fortasse primo aspectu videbitur absurda, istas mutationes, quas corpus subit variis ætatibus, esse causas morborum, præsertim quum fere omnia animalia, et etiam multi homines vivant sani omni tempore, et alia sanitas non secus ac alia facies debeat esse infanti, alia viro, alia seni.

906. Verum enimvero est non eo minus certum plurimos morbos infestare certa tempora vitæ, que eos pendere a statu corporis, tum deflectentis nonnihil a perfectissimâ sanitate, et facti proclivis ad quosdam morbos; ita ut, dum anni labuntur et corpus mutatur aliâ atque aliâ ratione, proclivitate

sunt, et longe diversam formam habent. Cætera animalia paucis generationibus crescunt vel minuuntur multum, prout cibus abundaverit vel defecerit. Homo quoque nonnihil hujusmodi experitur, quamvis haud tantum ac belluæ.

905. Primo fortasse aspectu absurda videbitur opinio, mutationes istas, quas variis ætatibus corpus subit, morborum causas esse, præsertim quum animalia fere omnia, et multi etiam homines, sani omni tempore vivant, et alia sanitas infanti, non secus ac alia facies, alia viro, alia seni, esse debeat.

906. Verum enimvero non eo minus certum est, plurimos morbos certa tantum vitæ tempora infestare (51), eosque a statu corporis, tum nonnihil a perfectissima sanitate deflectentis, et ad quosdam morbos proclivis facti, pendere: ita ut, dum anni labuntur, et corpus alia atque alia ratione mutatur, proclivitate

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increase or are diminished a great deal in a few generations, according as the food shall abound or be deficient. Man also experiences something of this sort, although not so much as brutes.

905. The opinion perhaps at first sight will appear absurd, that those changes, which the body undergoes at different ages, are the causes of diseases, especially as almost all animals, and even many men, live healthy the whole time, and a different health in like manner as a different face ought to be to the infant, different to the man, different to the old man.

906. But truly it is not the less certain that very many diseases infest certain periods of life, and that they depend upon the state of the body, then deviating somewhat from the most perfect health, and become prone to certain diseases; so that, while the years glide on and the body is changed in different ways, the tendency to certain diseases being corrected, or entirely

ad quosdam morbos correcta vel penitus deleta, aut sane vivatur, aut novi accedant, et prioribus contrarii, morbi.

907. Difficillimum foret indicare res omnes quæ variis vitæ temporibus corpus tot diversis morbis opportunum reddant. Sat fuerit memorasse, istas mutationes, morbosque igitur qui ex iis profluunt, ad certa capita non inepte referri: scilicet ad statum universæ compagis (75, 94) partium solidarum, mollioris, aut firmioris justo, ad statum generis nervosi (109, et seqq.) nimis, vel nimis parum sentientis aut mobilis, debilis aut validi (370 et seqq.) ad statum circuitus sanguinis liberi aut impediti, languidi aut vehementis, æquabilis aut abnormis (443 et seqq.) ad statum secretionum et excretionum, copiosarum, vel deficientium et impeditarum (707 et seqq.) et denique ad statum quarundam partium quæ certo

ad quosdam morbos correctâ, vel penitus deletâ, aut vivatur sane aut novi morbi et contrarii prioribus accedant.

907. Foret difficillimum indicare omnes res quæ reddant corpus opportunum tot diversis morbis variis temporibus vitæ. Fuerit sat memorasse istas mutationes, que morbos igitur qui profluunt ex iis referri non inepte ad certa capita; scilicet ad statum universæ compagis solidarum partium mollioris, aut firmioris justo, ad statum nervosi generis nimis, vel nimis parum sentientis, aut mobilis, debilis aut validi, ad statum circuitûs sanguinis liberi aut impediti, languidi, aut vehementis, æquabilis, aut abnormis, ad statum secretionum et excretionum copiosarum, vel deficientium et impeditarum, et denique ad statum quarundam partium quæ evolvuntur certo tempore, et agunt aliquamdiu et tandem de-

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destroyed, either it is lived by them healthily or new diseases and contrary to the former come on.

907. It would be very difficult to point out all the things which render the body liable to so many different diseases at the various periods of life. It will be sufficient to have related that those changes, and diseases therefore which proceed from them are referred not improperly to certain heads; that is, to the condition of the whole frame of the solid parts being softer, or firmer than proper, to the state of the nervous sys em too much, or too little feeling, or mobile, weak or strong, to the state of the circulation of the blood free or impeded, languid or vehement, equable or irregular, to the state of the secretions and excretions more copious, or deficient and impeded and lastly to the state of certain parts which are evolved at a certain time, and act for some time, and at length cease to act. The condition of the

sinunt agere. Conditio humorum quoque videtur conferre nonnihil ad varios morbos singularum ætatum, qui variant multum copiâ, crassitudine, acrimoniâ.

tempore evolvuntur, et agunt aliquamdiu, et tandem desinunt agere (757 et seqq). Nonnihil quoque ad varios singularum ætatum morbos conferre videtur conditio humorum, qui multum variant copia, crassitudine, acrimonia, (512 et seqq).

908. Sic infantes, quibus omnes solidæ partes sunt mollissimæ et debiles, et nervosum genus valde irritabile, et distributio sanguinis liberrima, et secretiones et excretiones copiosissimæ, sæpe fiunt deformes, sæpe plectuntur hernia varii generis, aut prolapsu, et strumis, et rachitide, et sæpe afficiuntur convulsionibus aut febriculis a levissimis causis. Vero iidem raro laborant gravi febre, aut valida inflammatione, aut profluviis sanguinis, aut phthisi, aut paralysi, aut podagrâ, aut rheumatismo, aut hydrope, nisi capitis, qui sæpe pendet vel a strumosâ constitu-

908. Sic infantes, quibus omnes solidæ partes mollissimæ et debiles sunt, et genus nervosum valde irritabile, et liberrima sanguinis distributio, et secretiones et excretiones copiosissimæ, sæpe deformes fiunt, sæpe hernia varii generis, aut prolapsu, et strumis, et rachitide, plectuntur, et sæpe convulsionibus aut febriculis a levissimis causis afficiuntur. Iidem vero, gravi febre, aut valida inflammatione, aut sanguinis profluviis, aut phthisi, aut paralysi, aut podagra, aut rheumatismo, aut hydrope, nisi capitis, qui sæpe vel a strumosa corporis constitutione vel a nimio

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fluids also seems to contribute something to the various diseases of the individual ages, which vary greatly in quantity, thickness, acrimony.

908. Thus infants, to whom all the solid parts are very soft, and weak, and the nervous system very irritable, and the distribution of the blood very free, and the secretions and excretions very copious, often become deformed, often are attacked with hernia of various kinds, or prolapsus, and scrofula, and rickets, and often are affected with convulsions or light fevers from the slightest causes. But the same seldom suffer from severe fever, or strong inflammation, or discharges of blood, or phthisis, or paralysis, or gout, or rheumatism, or dropsy, except of the head, which often depends either upon a strumous constitution of body or upon an excessive flow of blood towards the head.

sanguinis caput versus fluxu pendet, raro laborant.

909. Infantes quoque sanguinis jacturam male ferunt, tenuiorum humorum bene; male etiam inediam tolerant; marcescunt subito dum ægrotant, sed cito convalescunt, et pinguescunt iterum. Medicamentis plerisque, vel levissimis, facile afficiuntur, sopiuntur, excitantur, purgantur. Mirus autem teneris eorum corporibus contra morbos renixus, ita ut sæpe præter omnem spem convalescant, vitæ quam adulti homines multo tenaciores.

910. Adolescentes, aut juvenes, aut viri, firmiores et validiores quam infantes, et minus irritabiles, a morbis infantilibus plerumque immunes facti, aliis sæpe opportuni fiunt. Scilicet quum desinunt crescere, sanguine nimis pleni fiunt, qui fere in arteriis (444, 445), pro rata parte magis quam

tione corporis vel a nimio fluxu sanguinis versus caput.

909. Infantes quoque ferunt jacturam sanguinis male, tenuiorum humorum bene; etiam tolerant inediam male; subito marcescunt dum ægrotant, sed cito convalescunt, et iterum pinguescunt. Facile afficiuntur, sopiuntur, excitantur, purgantur, plerisque, vel levissimis medicamentis. Autem renixus teneris corporibus eorum, contra morbos, mirus, ita ut sæpe convalescant præter omnem spem, multo tenaciores vitæ quam adulti homines.

910. Adolescentes aut juvenes, aut viri firmiores et validiores quam infantes, et minus irritabiles, plerumque facti immunes a infantilibus morbis, sæpe fiunt opportuni aliis. Scilicet quum desinunt crescere, fiunt nimis pleni sanguine qui fere congeritur, pro rata parte magis in arteriis

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909. Infants also bear the loss of blood badly, of the thinner fluids well; also they bear fasting badly; they suddenly grow lean whilst they are sick, but quickly become convalescent, and again grow fat. They easily are affected, are lulled, are excited, are purged, by most, even the slightest medicines. But the resistance by the tender bodies of them, against diseases, is wonderful, so that often they become convalescent beyond all hope, much more tenacious of life than adult persons.

910. Young men or youths, or men firmer and stronger than infants, and less irritable, generally become free from infantile diseases, often become liable to others. Because when they cease to grow, they become too full of blood which generally is congested, in proportion more in the arteries than in the veins, and often spontaneously breaks forth from parts which refuse to be distended farther, and first from the nostrils, afterwards from the

quam in venis, et sæpe sponte erumpit e partibus quæ recusant distendi amplius, et primo e naribus, postea e pulmone, sæpe non sine magno periculo phthiseos. Juvenes quoque, partim ob hanc nimiam abundantiam sanguinis, partim ob auctum vigorem universi corporis, fiunt obnoxii gravissimis febribus et inflammationibus. Præterea puellæ acquirunt singularem mobilitatem constitutionis, prius vix observandam, et fortasse pendentem quodammodo a statu genitalium organorum quâ fiunt proclives ad hysteriam.

911. Optima et firmissima valetudo plerumque contingit virili ætati: nimirum quum omnes partes corporis jam adeptæ sint justam proportionem et formam et vigorem, neque nimia rigiditas vel universæ compaginis vel quarundam præ aliis partibus accesserit, neque nervosa vis deficiat, neque motus humorum langues-

in venis congeritur, et sæpe e partibus quæ amplius distendi recusant (861) sponte erumpit, et primo e naribus, postea e pulmone, non sine magno sæpe phthiseos periculo. Juvenes quoque, partim ob hanc nimiam sanguinis abundantiam, partem ob auctum universi corporis vigorem, gravissimis febribus et inflammationibus obnoxii fiunt. Puellæ præterea, singularem constitutionis mobilitatem, prius vix observandam, et fortasse a statu genitalium organorum quodammodo pendentem, acquirunt, qua ad hysteriam proclives fiunt.

911. Virili ætati optima plerumque et firmissima valetudo contingit; nimirum quum omnes corporis partes justam proportionem, et formam, et vigorem, jam adeptæ sint, neque nimia vel universæ compaginis vel quarundam præ aliis partibus rigiditas accesserit, neque vis nervosa deficiat, neque

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lungs, often not without great danger of phthisis. Youths also, partly because of this excessive abundance of blood, partly because of the increased vigour of the whole body, become subject to very severe fevers and inflammations. Besides, girls acquire a peculiar mobility of constitution, at first scarcely to be observed, and perhaps depending in some degree upon the condition of the genital organs, by which they become disposed to hysteria.

911. The best and firmest health for the most part belongs to virile age: namely, when all the parts of the body now have acquired their due proportion and form and vigour, nor has excessive rigidity either of the whole frame or of some before other parts come on, nor does the nervous power fail, nor the motion of the fluids grow languid; and thus men mostly free from the

motus humorum languescat; et sic viri a morbis infantiæ aut juventutis fere immunes, senii morbis nondum facti sint obnoxii.

912. Status autem corporis humani, strictius sic dictus, nullus profecto existit: quamprimum enim suam perfectionem attigerit, statim, quamvis sæpe lente, dilabitur, et sane per easdem causas, quæ id prius ad suam perfectionem perduxerant (12, 19).

913. Rigescentibus primo partibus quæ maxime comprimuntur, arteriæ brevi nimis duræ et validæ fiunt, et coarctantur paulatim, et vim et firmitatem venarum tandem æquant vel superant (444, 445), quo fit ut plus justo sanguinis in venis congeratur, præsertim in iis partibus in quibus languidius movetur, et quarum venæ valvis carent, et parum auxilii habent a motu musculorum. Sic in abdomine (420) et in capite (421), pro-

cat; et sic viri fere immunes a morbis infantiæ aut juventutis nondum facti sint obnoxii morbis senii.

912. Autem nullus status humani corporis, strictius sic dictus, profecto existit; enim quamprimum attigerit suam perfectionem, statim, quamvis sæpe lente, dilabitur, et sane per easdem causas, quæ prius perduxerant id ad suam perfectionem.

913. Partibus quæ comprimuntur maxime primo rigescentibus, arteriæ brevi fiunt nimis duræ et validæ, et paulatim coarctantur, et tandem æquant vel superant vim et firmitatem venarum quo fit ut plus sanguinis justo congeratur in venis, præsertim in iis partibus in quibus movetur languidius, et venæ quarum carent valvis, et habent parum auxilii a motu musculorum. Sic provecta ætate plurimus sanguis sæpe congeritur in abdo-

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diseases of infancy or of youth have not yet become liable to the diseases of old age.

912. But no status of the human body, more strictly so called, truly exists; for as soon as it has reached its perfection, it immediately, although often slowly, decays, and truly through the same causes, which first had brought it to its perfection.

913. The parts which are compressed most of all first growing rigid, the arteries soon become too hard and strong, and by degrees are constricted, and at length equal or exceed the power and the strength of the veins whence it happens that more blood than proper is congested in the veins, especially in those parts in which it is moved more languidly, and the veins of which want valves, and have little assistance from the motion of the muscles. Thus in advanced age a great deal of blood often is accumulated in the

mine et in capite, unde hæmorrhois, et obstructiones viscerum, et aliquando hydrops, et paralysis, et apoplexia.

914. Mala hujusmodi, pendentia a statu venarum et arteriarum accidunt frequentius eo quod multi senes fiunt plus pleni sanguine justo, scilicet qui sæpe bene valent, et concoquunt bene, et indulgent lautioribus epulis, et exercent corpora parum, et habent parcam exhalationem per cutem; nimirum plurima vasa et foramina cujus fere concluduntur.

915. Vero citra nimiam abundantiam sanguinis ve abnormes congestiones aut distributiones ejus senes fiunt obnoxii paralysi, et hydropi varii generis, et obstructionibus, et carcinomati, nervosa vi deficiente, et motu sanguinis languente: ob easdem causas quoque visus obtunditur, auditus hevecta ætate, plurimus sanguis sæpe congeritur, unde hæmorrhois, et viscerum obstructiones, et hydrops aliquando, et paralysis, et apoplexia.

914. Hujusmodi mala, a statu venarum et arteriarum pendentia, eo frequentius accidunt, quod multi senes sanguine plus justo pleni fiunt, scilicet qui sæpe bene valent, et bene concoquunt, et epulis lautioribus indulgent, et corpora parum exercent, et parcam per cutem exhalationem habent: nimirum cujus plurima vasa et foramina fere concluduntur.

915. Citra vero nimiam sanguinis abundantiam, ejusve congestiones aut distributiones abnormes, deficiente vi nervosa, et languente sanguinis motu, paralysi, et hydropi varii generis, et obstructionibus, et carcinomati (751 et seqq.) senes obnoxii fiunt: ob easdem quoque causas, visus obtunditur,

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abdomen and in the head, whence hæmorrhoids, and obstructions of the viscera, and sometimes dropsy, and paralysis, and apoplexy.

914. Diseases of this sort, depending upon the state of the veins and arteries, happen the more frequently because many old men become more full of blood than proper, that is, who often are in very good health and digest well, and indulge in more luxurious fare, and exercise their bodies little, and have a scanty exhalation by the skin; namely, a great part of the vessels and pores of which are nearly closed up.

915. But besides an excessive abundance of blood or irregular congestions or distributions of it old men become liable to palsy, and dropsy of various kinds, and obstructions, and cancer, from the nervous power failing, and the motion of the blood becoming languid: on account of the same causes also vision is blunted, the hearing grows dull, and finally all the senses wear out.

auditus hebescit, et omnes demum sensus fatiscunt.

916. Porro, innumeris vitiis plerique senes plectuntur organorum quæ urinæ inserviunt (737 et seqq.) diu forsan sine gravi periculo aut incommodo: iidem vero morbi indies ingravescentes, et fere immedicabiles, suo tandem periculo non carebunt.

917. Aliis demum morbis senes magis quam juvenes opportuni sunt, veluti podagræ, calculo, &c. quorum ratio magis obscura est: quippe qui non senibus proprii sint, qui multum pendeant a prima et congenita corporis fabricatione, et qui sæpe jungantur cum aliis morbis, præsertim ventriculi.

918. Denique, satis verisimile est vitium quodvis diu latens, neque fortasse suspectum (49), tum demum se manifeste prodituram, quum, viribus omnibus deficientibus, omnes functiones impedian-

bescit, et demum omnes sensus fatiscunt.

916. Porro plerique senes plectuntur innumeris vitiis organorum quæ inserviunt urinæ diu forsan sine gravi periculo aut incommodo; vero iidem morbi indies ingravescentes, et fere immedicabiles, tandem non carebunt suo periculo.

917. Demum senes sunt magis opportuni aliis morbis quam juvenes, veluti podagræ, calculo, &c. ratio quorum est magis obscura: quippe qui sint non proprii senibus qui pendeant multum a primâ et congenitâ fabricatione corporis, et qui sæpe jungantur cum aliis morbis, præsertim ventriculi.

918. Denique est satis verisimile quodvis vitium latens diu, neque fortasse suspectum, tum demum prodituram se manifeste quum, omnibus viribus deficientibus, omnes functiones impediantur, et

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916. Moreover most old people are affected with innumerable disorders of the organs which are subservient to the urine a long time perhaps without great danger or inconvenience; but the same diseases daily increasing, and almost irremediable, at length will not want their own danger.

917. Again, old people are more liable to other diseases than young persons, as to gout, calculus, &c. the reason of which is more obscure: as being what are not peculiar to old persons which depend much upon the first and congenital conformation of the body, and which often are joined with other diseases, especially of the stomach.

918. Lastly it is sufficiently probable that some fault lying hid a long time, nor perhaps suspected, then at length will betray itself openly when, all the powers failing, all the functions are impeded, and the disorder

malum præcipue incumbat in partes jam debiles et morbosas. Hæc videtur esse ratio cur multi hæreditarii morbi, raro observandæ, primâ vel etiam consistente ætate, demum erumpant senectute.

tur, et malum in partes jam debiles et morbosas præcipue incumbat (363). Hæc videtur esse ratio cur multi morbi hæreditarii, prima ætate, vel etiam consistente, raro observandæ, senectute demum erumpant.

CAP. XXIII.—*De varietatibus constitutionum.*

CAP. XXIII.—*De constitutionum varietatibus.*

919. SANITAS est non prorsus eadem omnibus; enim sua constitutio non secus ac sua facies aut forma corporis constat singulis hominibus. Varietates hujusmodi jure vindicant sibi attentionem medici, quippe quæ sæpe observentur tantæ et tales inter homines ejusdem

919. SANITAS non omnibus prorsus eadem est; sua enim singulis hominibus constitutio constat, non secus ac sua facies, aut forma corporis. Hujusmodi varietates medici attentionem jure sibi vindicant, quippe quæ tantæ et tales sæpe observentur inter homines

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especially presses upon the parts now weak and diseased. This seems to be the reason why many hereditary diseases, seldom to be observed, at the first or even advanced age, at length break out in old age.

CHAP. XXIII.—*Of the varieties of constitutions.*

919. HEALTH is not exactly the same to all; for their own constitution in like manner as their peculiar face or form of body belongs to individual persons. Varieties of this sort properly claim to themselves the attention of the physician, as being what often are observed so great and such between men of the same age and country, using the same food and kind of life, that

ejusdem ætatis, et regionis, eodem cibo et vitæ genere utentes, ut alii aliis plectantur morbis, et quod aliis prosit, aliis valde noceat, neque sane eadem remedia, aut diæta, aut vitæ genus, omnibus conveniant. Res igitur haud levis momenti erit uniuscujusque ægroti constitutionem corporis penitus novisse.

ætatis et regionis, utentes eodem cibo et genere vitæ, ut alii plectantur aliis morbis, et quod prosit aliis, valde noceat aliis, neque sane eadem remedia, aut diæta, aut genus vitæ conveniant omnibus. Igitur erit res haud levis momenti novisse penitus constitutionem corporis uniuscujusque ægroti.

920. Hujusmodi vero notitiam sola experientia docet: quædam vero differentiæ, quales frequentius occurrunt, ab antiquissimis etiam temporibus observatæ sunt, et certis nominibus insignitæ. Hæ varietates temperamenta dicuntur (tanquam a mixtura, et quasi temperatione, variorum quæ in humano corpore insunt elementorum, originem ducerent); eorumque quatuor primaria temperamenta vulgo numerantur; sanguineum, scilicet, melancholicum, cholericum, et phlegmaticum. De ra-

920. Vero experientia sola docet notitiam hujusmodi; quædam differentiæ vero, quales frequentius occurrunt, observatæ sunt etiam ab antiquissimis temporibus, et insignitæ certis nominibus. Hæ varietates dicuntur temperamenta, (tanquam ducerent originem a mixturâ et quasi temperatione variorum elementorum quæ insunt in humano corpore;) que quatuor eorum vulgo numerantur primaria temperamenta; scilicet sanguineum, melancholicum, cholericum, et phlegmaticum. Parum

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some are attacked by other diseases, and what benefits some, greatly hurts others, nor truly do the same remedies, or diet, or kind of life agree with all. Therefore it will be a thing of no small moment to know thoroughly the constitution of the body of each individual patient.

920. But experience alone teaches a knowledge of this sort; certain differences truly, such as more frequently occur, have been observed even from the most ancient periods, and designated by certain names. These varieties are called temperaments, (as if they drew their origin from the mixture and as it were tempering of the various elements which exist in the human body;) and four of them commonly are reckoned primary temperaments; that is, the sanguineous, the melancholic, the choleric, and the phlegmatic. Little is acted upon concerning the reason of the names; nor

constat de ratione nominum; nec multum refert quo vocabulo utamur ad exprimendam quamlibet rem, dummodo id vocabulum definiatur bene; et certe foret nefas mutare nomina quæ sunt omnibus in ore et bene intellecta.

921. Revera medici omni tempore hallucinati sunt plurimum qui conati sunt reddere rationem varietatum temperamentorum; et retulerunt unumquodque ad certum humorem vel elementum abundans plus justo in corpore veluti aquam, sanguinem, bilem, atram bilem, gluten, terram. Neque veteres soli observarunt bene, et descripserunt fideliter, quamvis ratiocinati sint male de iisdem rebus. Erit quoddam saltem novisse istas descriptiones et observationes, quatenus spectent ad medicum usum, utcunque obscura ratio earum videatur.

922. Sanguineum tem-

tione nominum parum constat; nec multum refert quo vocabulo utamur ad rem quamlibet exprimendam, dummodo id vocabulum bene definiatur; et nefas certe foret nomina mutare, quæ omnibus in ore sunt, et bene intellecta.

921. Plurimum revera hallucinati sunt medici omni tempore, qui temperamentorum varietatum conati sunt rationem reddere; et unumquodque retulerunt ad certum humorem vel elementum plus justo in corpore abundans, veluti aquam, sanguinem, bilem, atram bilem, gluten, terram. Neque soli veteres observarunt bene, et descripserunt fideliter, quamvis male de iisdem rebus ratiocinati sint. Erit quoddam saltem, descriptiones et observationes istas novisse, quatenus ad usum medicum spectent, utcunque obscura ratio earum videatur.

922. Temperamentum sangui-

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does it much signify what word we use to express any thing, provided that word be defined well; and certainly it would be wrong to change names which are to all in the mouth and clearly understood.

921. Truly, physicians at every period have mistaken very much, who have endeavoured to render an account of the varieties of temperaments; and referred every one to a certain humour or element abounding more than proper in the body, as water, blood, bile, black bile, gluten, earth. Nor have the ancients alone observed well, and described faithfully, although they have reasoned badly from the same things. It will be something at least to know those descriptions and observations, so far as they look to medical practice, however obscure the reason of them may seem.

922. The sanguineous temperament is distinguished by a fuller constitu-

neum dignoscitur constitutione corporis pleniore, compagine molliore, cute delicata, tenui, molli, calida, venis magnis, conspicuis, cæruleis, eximio vultus colore, capillis sæpe rufis aut flavis, aliquando nonnihil fuscis. Homines tali constitutione prædíti, præter solitum sentientes et irritabiles observantur, et pulsus habent solito frequentiores, et sanguinis motum liberrimum, et secretiones et excretiones fere copiosas, raro obstructas, et animum plerumque lætum et hilarem, aliquando, levem ; nam animi non secus ac corporis varietates a temperamento sæpe pendent.

923. Hoc temperamentum, præ aliis, sanguinis nimiæ abundantiæ et vehementi motui, febribus, morbisque inflammationem habentibus, rheumatismo, anginæ, &c. et morbis nervosi generis, hysteriæ imprimis obnoxium est. Huic igitur

peramentum dignoscitur pleniore constitutione corporis, molliore compagine, delicata, tenui, molli calidâ cute, magnis, conspicuis, cæruleis venis, eximio colore vultus, capillis sæpe rufis aut flavis, aliquando nonnihil fuscis. Homines prædíti tali constitutione, observantur præter solitum sentientes et irritabiles, et habent pulsus frequentiores solito, et motum sanguinis liberrimum, et secretiones et excretiones fere copiosas, raro obstructas, et animum plerumque lætum et hilarem, aliquando levem; varietates animi non secus ac nam corporis sæpe pendent a temperamento.

923. Hoc temperamentum, præ aliis, est obnoxium nimiæ abundantiæ et vehementi motui sanguinis, febribus, que morbis habentibus inflammationem rheumatismo, anginæ, &c. et morbis nervosi generis imprimis hysteriæ. Igitur tempe-

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tion of body, a softer frame, a delicate, thin, soft, warm skin, large, conspicuous, blue veins, an excellent colour of countenance, by the hair being often red or yellow, sometimes somewhat brown. Persons endowed with such a constitution, are observed unusually sentient and irritable, and have the pulse more frequent than ordinary, and the motion of the blood very free, and the secretions and excretions generally copious, seldom obstructed, and the mind for the most part joyful and cheerful, sometimes light; for variations of the mind in like manner as of the body often depend upon the temperament.

923. This temperament, more than the others, is liable to too great abundance and vehement motion of the blood, to fevers, and diseases having inflammation, as rheumatism, angina, &c. and diseases of the nervous system, especially hysteria. Therefore, temperance in food and drink, and

rantia in victu et potu, et crebra exercitatio conveniunt huic, aliquando et exinanitiones quas solet tolerare bene.

924. Melancholicum temperamentum videtur fere contrarium huic notatum compagine firmiore, sæpe macrâ; cute crassâ, fuscâ, hirsuta, venis magnis, crinibus, et superciliis et oculis nigris; colore vultûs atro. Prædíti hoc temperamento fere habent pulsus tardos, et motum sanguinis languidiorem, sanguinem ipsum, ut fertur, crassiorem solito, et secretiones et excretiones parcas, aliquando deficientes, que nervosum genus parum sentiens aut mobile, et animum gravem, sæpe tristem, meditabundum, haud commovendum facilè, quo semel commotus est tenacissimum affectûs, indefessum in negotiis, acutissimum in studiis, ferventissimum, fidelissimum in amore, sæpe ap-

temperantia in victu et potu, et exercitatio crebra conveniunt, et aliquando exinanitiones, quas bene tolerare solet.

924. Temperamentum melancholicum huic fere contrarium videtur, compagine firmiore, sæpe macra; cute crassa, fusca, hirsuta; magnis venis, crinibus, et superciliis, et oculis nigris: atro vultus colore, notatum. Hoc temperamento prædíti pulsus fere habent tardos, et sanguinis motum languidiorem, sanguinem ipsum, ut fertur, crassiorem solito, et secretiones et excretiones parcas, aliquando deficientes, genusque nervosum parum sentiens aut mobile, et animum gravem, sæpe tristem, meditabundum, haud facile commovendum, quo semel commotus est affectus tenacissimum, in negotiis indefessum, in studiis acutissimum, in amore ferventissimum, fidelissimum, ad poesin sæpe aptum, in

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frequent exercise suit it, sometimes also evacuations, which it is accustomed to bear well.

924. The melancholic temperament seems almost the opposite to this, denoted by the frame being firmer, often lean; the skin thick, dark, hairy; the veins large, the hair, and eyebrows, and eyes black; the colour of the countenance black. Those endowed with this temperament, generally have the pulse slow, and the motion of the blood more languid, the blood itself, as it is said, thicker than usual, and the secretions and excretions scanty, sometimes deficient, and the nervous system little sentient or irritable, and the mind serious, often sad, meditative, not to be disturbed easily; when once it has been roused very tenacious of passion, unwearied in business, very acute in studies, very fervent, very faithful in love, often fitted for

melancholiam et insaniam aliquando proclivem (292 et seqq.). Iidem patiuntur multum a vita otiosa et sedentaria, et stimulantibus et calefacientibus remediis: sæpe male concoquunt, et a ventriculo laborant, et hypochondriasi obnoxii sunt, quæ in aliis constitutionibus rarius observatur. Dicuntur præ aliis hominibus obstructionibus viscerum abdominis obnoxii esse.

925. Medium fere hæc inter locum occupat cholericum temperamentum: nimirum, quod denotatur corpore molliore, mobiliore, cute minus fusca et hirsuta, colore vultus magis vivido, pulsu frequentiore et validiore, secretionibus liberioribus et animo irritabiliore, et, ut fertur, ad iram præsertim magis proclivi, quam in melancholico temperamento observantur.

926. Phlegmaticum temperamentum insignitur, laxa et debili

tum ad poësin, aliquando proclivem in melancholiam et insaniam. Iidem patiuntur multum a otiosâ et sedentariâ vitâ, et stimulantibus et calefacientibus remediis: sæpe concoquunt male et laborant a ventriculo, et sunt obnoxii hypochondriasi quæ rarius observatur in aliis constitutionibus. Dicuntur esse præ aliis hominibus obnoxii obstructionibus viscerum abdominis.

925. Cholericum temperamentum occupat fere medium locum inter hæc: nimirum, quod denotatur molliore, mobiliore corpore, cute minus fuscâ et hirsutâ, magis vivido colore vultûs frequentiore et validiore pulsu, secretionibus liberioribus, et animo irritabiliore, et, ut fertur, observantur magis proclivi præsertim ad iram, quam in melancholico temperamento.

926. Phlegmaticum temperamentum insignitur,

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poetry, sometimes prone to melancholy and insanity. The same suffer much from an idle and sedentary life, and by stimulating and heating remedies: often they digest badly and suffer from the stomach, and are liable to hypochondriasis, which more rarely is observed in other constitutions. They are said to be more than other persons liable to obstructions of the viscera of the abdomen.

925. The choleric temperament occupies nearly a middle place between these: namely, which is denoted by a softer, more mobile body, by a skin less brown and hairy, a more vivid colour of countenance, a more frequent and stronger pulse, the secretions more free, and the mind more irritable, and, as it is said, they are observed more prone especially to anger, than in the melancholic temperament.

926. The phlegmatic temperament is characterized by a lax and weak

laxâ et debili compage corporis, sæpe cum obesitate, pallido vultu, levi cute sine pilis, capillis albis, pulsu tardo, debili, vasis vehentibus sanguinem parvis, humoribus, ut fertur, magis aquosis et blandioribus solito, que motu eorum languido, concoctione, secretione, excretione, tardis, interdum impeditis, animo hebete, torpido, aliquando somniculoso, haud commovendo facile, maxime proclivi ad metum et avaritiam. Exercitatio et stimulantia remedia aliquando conveniunt præditis tali constitutione; neque nocet multum interdum caluisse mero.

927. Hæc, primaria et pura temperamenta, sæpe miscentur variis modis et proportionibus: veluti sanguineum cum phlegmatico aut melancholico; conjunctiones cujusmodi spectamus quotidie.

928. Nonnulli, demum, describunt aliud temperamentum, quod vocant

corporis compage, sæpe cum obesitate, vultu pallido, cute levi sine pilis, capillis albis, pulsu tardo, debili, vasis sanguinem vehentibus parvis, humoribus, ut fertur, aquosis magis et blandioribus solito, eorumque motu languido, concoctione, secretione, excretione, tardis interdum impeditis, animo hebete, torpido, aliquando somniculoso, haud facile commovendo, ad metum et avaritiam maxime proclivi. Tali constitutione præditis, exercitatio, et stimulantia remedia aliquando conveniunt; neque multum nocet interdum caluisse mero.

927. Primaria et pura hæc temperamenta variis modis et proportionibus sæpe miscentur: veluti sanguineum cum phlegmatico aut melancholico; cujusmodi conjunctiones quotidie spectamus.

928. Aliud demum temperamentum nonnulli describunt, quod

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frame of body, often with fatness, a pale countenance, a smooth skin without hairs, the hair white, the pulse slow, weak, the vessels carrying the blood, small, the fluids, as it is said, more watery and blander than usual, and the motion of them languid, the concoction, secretion, excretion, slow, sometimes impeded, the mind dull, torpid, sometimes drowsy, not to be roused easily, very much disposed to fear and avarice. Exercise and stimulating remedies sometimes suit those endowed with such a constitution; nor does it hurt much sometimes to have been heated with wine.

927. These, the primary and pure temperaments, often are mixed in various ways and proportions, as the sanguineous with the phlegmatic or melancholic; combinations of which kind we see every day.

928. Some, again, describe another temperament, which they call

nervosum vocant; nec immerito, (secundum hujus vocabuli sensum nunc apud medicos et sane vulgum quoque receptum), quippe cui insignis generis nervosi debilitas et mobilitas contingant. Talis generis nervosi conditio in omnibus temperamentis, facilius vero in sanguineo, vel puro vel cum phlegmatico mixto, effici potest, vitæ genere scilicet otioso et sedentario, nimia sanguinis abundantia, calore, aliisque causis jam (370 et seqq.) recensitis; hinc apud divites, et ignavos, et luxuriosos, frequentissima; veteribus fere ignota, saltem multo rarius inter eos observata, recentibus jam fere per centum annos satis superque cognita.

929. Hoc temperamentum, multis morbis generis nervosi, veluti hysteriæ, dyspepsiæ, &c. opportunum est: exinanitiones fere omnes, præsertim jacturam sanguinis, et medicamenta pleraque fortiora,

nervosum; nec immerito, (secundum sensum hujus vocabuli, nunc receptum apud medicos, et sane vulgum quoque,) quippe cui insignis debilitas et mobilitas nervosi generis contingant. Talis conditio nervosi generis potest effici in omnibus temperamentis, vero facilius in sanguineo, vel puro vel mixto cum phlegmatico, scilicet, otioso, et sedentario genere vitæ, nimiâ abundantiâ sanguinis, calore, que aliis causis jam recensitis: hinc frequentissima apud divites et ignavos et luxuriosos; fere ignota veteribus, saltem multo rarius observata inter eos, jam satis cognita recentibus fere per centum annos que super.

929. Hoc temperamentum est opportunum multis morbis nervosi generis, veluti hysteriæ, dyspepsiæ, &c. male fert fere omnes exinanitiones, præsertim jacturam sanguinis, et pleraque fortiora

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nervous; nor improperly, (according to the signification of this word, as now received among physicians, and indeed the public also,) as being that to which great debility and irritability of the nervous system belong. Such a condition of the nervous system may be produced in all the temperaments, but more easily in the sanguineous, either pure or mixed with the phlegmatic, that is, an idle and sedentary kind of life, excessive abundance of blood, heat, and the other causes already enumerated: hence very common among the rich, and idle, and luxurious; almost unknown by the ancients, at least much more rarely observed amongst them, now sufficiently known to the moderns nearly for a hundred years and more.

929. This temperament is liable to many diseases of the nervous system, as hysteria, dyspepsia, &c. badly bears almost all evacuations, especially loss

medicamenta: et sæpe postulat roborantia remedia.

930. Alia constitutio fere datur viris, alia fœminis. Hæ, nimirum, habent plus sanguinei, vel aliquando phlegmatici temperamenti, scilicet quæ sunt molliores et delicatiores, et debiliores quam viri; et habent animos pariter ac corpora mobiliora, et humores blandiores; et sunt magis opportunæ morbis nervosi generis, vero minus morbis qui habent inflammationem. Igitur, fœminæ pari ratione differunt a viris, quod ad constitutionem corporis, quamvis haud tantum ac infans differt ab adulto.

931. Neque temperamentum constat idem cuiquam, variis ætatibus. Enim omnia mutantur tempore, que aliud interdum transit fere in aliud. Sic, primâ ætate, sanguineum observatur purissimum, vero idem mediâ ætate, appropinquat ad

male fert; et roborantia remedia sæpe postulat.

930. Alia fere viris, alia fœminis, constitutio datur. Hæ nimirum plus habent sanguinei, vel aliquando phlegmatici temperamenti; scilicet quæ molliores, et delicatiores, et debiliores sunt quam viri; et animos pariter ac corpora mobiliora habent, et humores blandiores; et magis opportunæ sunt morbis nervosi generis, minus vero morbis qui inflammationem habent. Pari igitur ratione fœminæ a viris differunt quod ad corporis constitutionem, quamvis haud tantum, ac infans differt ab adulto (908, et seqq.).

931. Neque variis ætatibus idem cuiquam temperamentum constat. Omnia enim mutantur tempore, aliudque interdum fere in aliud transit. Sic prima ætate sanguineum purissimum observatur; idem vero media ætate ad choleri-

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of blood, and most stronger medicines: and often requires strengthening remedies.

930. One constitution generally is given to men, a different to women. The latter, indeed, have more of the sanguineous, or sometimes of the phlegmatic temperament, as being who are softer and more delicate, and weaker than men; and have their minds as well as bodies more irritable, and the fluids more bland; and are more liable to diseases of the nervous system, but less to diseases which have inflammation. Therefore, women in like manner differ from men, as to constitution of body, although not so much as the infant differs from the adult.

931. Nor does the temperament continue the same to each person, at the various ages. For all things are changed by time, and one sometimes passes almost into another. Thus, at the first age, the sanguineous is observed

cum, ultima ad melancholicum, appropinquat; et melancholicum contra, prima ætate sanguineum fere participat.

932. Præterea, a natura cœli sub quo vivimus, victusque et vitæ genere quo utimur, corpus haud parum afficitur, hominesque sic aliis morbis obnoxii fiunt, ab aliis immunes vivunt.

933. Quamvis nulla fortasse regio fuerit generi humano prorsus inhabitabilis, tamen verisimile est quasdam reliquis præstare, hominesque producere animo et corpore perfectissimos. Temperatæ mediæ inter nimium calorem et frigus, hanc videntur excellentiam habere. Plurima autem vetant gentium varietates solis cœli effectibus tribuere; quippe quæ multum afficiantur ab aliis causis, tum naturalibus tum moralibus. Varietates autem gentium haud exiguæ a cœlo manifestissime pendent.

cholericum, in ultimâ ad melancholicum; et melancholicum, contrà, primâ ætate fere participat sanguineum.

932. Præterea, a naturâ cœli sub quo vivimus, que genere victûs et vitæ quo utimur, corpus afficitur haud parum, que homines sic fiunt obnoxii aliis morbis, vivunt immunes ab aliis.

933. Quamvis nullâ regio, fortasse, fuerit prorsus inhabitabilis humano generi, tamen est verisimile, quasdam præstare reliquis, que producere homines perfectissimos animo et corpore. Temperatæ, mediæ inter nimium calorem et frigus, videntur habere hanc excellentiam. Autem plurima vetant tribuere varietates gentium effectibus solis cœli; quippe quæ afficiantur multum ab aliis causis, tum naturalibus tum moralibus. Autem haud exiguæ varietates gentium manifestissime pendent a cœlo.

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most pure, but the same, at the middle age, approaches to the choleric, in the last to the melancholic; and the melancholic, on the other hand, at the first age mostly partakes of the sanguineous.

932. Besides from the nature of the climate under which we live, and the kind of diet and life which we use, the body is affected not a little, and men thus become liable to some diseases, live free from others.

933. Although no country, perhaps, would be wholly uninhabitable to the human race, still it is probable, that some excel the rest, and produce men the most perfect in mind and body. The temperate, intermediate between excessive heat and cold, seem to possess this excellence. But very many things forbid us to attribute the varieties of nations to the effects alone of climate; as being which may be affected much by other causes, as well natural as moral. But no few varieties of nations most evidently depend upon climate.

934. Sic corpus solvitur et debilitatur in calidis regionibus, nervosum genus fit valde mobile, motus sanguinis est liberrimus, et secretiones copiosæ, præsertim exhalatio per cutem, que humores fere tenuiores, et, ut est receptum apud fere omnes medicos, magis proclives in putredinem, quam in temperatis aut frigidis regionibus. Igitur incolæ calidarum regionum plerumque observantur (nam hæc res est minime constans,) ignavi, imbelles, inhabiles ad omnes labores, plerumque dediti voluptatibus, præsertim veneri; proni in omnes affectus animi, vividi sed leves, habentes parum vis animi; maxime utuntur tenui victu, conflato ex frugibus, neque fere abutuntur generosis liquoribus, quippe quibus parum egent.

935. Sunt opportuni morbis nervosi generis, que putridis et biliosis morbis, maxime intermit-

934. Sic in calidis regionibus corpus solvitur et debilitatur, genus nervosum valde mobile fit, motus sanguinis liberrimus est, et secretiones copiosæ, præsertim exhalatio per cutem, humoresque fere tenuiores, et, ut apud omnes fere medicos receptum est, in putredinem magis proclives, quam in regionibus temperatis aut frigidis. Incolæ igitur calidarum regionum plerumque (nam hæc res minime constans est) ignavi, imbelles ad omnes labores inhabiles observantur, voluptatibus plerumque dediti, præsertim Veneri: in omnes animi affectus proni, vividi, sed leves, parum vis animi habentes; victu tenui, ex frugibus conflato maxime utuntur, neque fere abutuntur liquoribus generosis, quippe quibus parum egent.

935. Morbis nervosi generis, morbisque putridis et biliosis, maxime febribus intermittentibus,

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934. Thus the body is relaxed and debilitated in hot countries, the nervous system becomes very irritable, the motion of the blood is very free, and the secretions copious, especially the exhalation by the skin, and the fluid mostly thinner, and, as is admitted by almost all physicians, more prone to putridity than in the temperate or cold regions. Therefore the inhabitants of hot regions generally are observed, (for this thing is by no means constant,) idle, weak, unfit for all labours, for the most part addicted to pleasures, especially to venery; prone to all affections of the mind, vivid but light, possessing little strength of mind; they mostly use a thin diet, prepared from vegetables, nor commonly do they abuse generous liquors, as being what they little want.

935. They are liable to diseases of the nervous system, and putrid and bilious diseases, especially intermitting fevers; they are affected more rarely

opportuni sunt; inflammationibus rarius afficiuntur: ideoque, dum ægrotant, remediis quæ putredinem et bilem corrigant multum egent, et exinanitiones, sanguinis imprimis detractionem, ægre tolerant.

936. Frigidarum contra regionum incolæ corpora habent firmiora et validiora, genus nervosum minus irritabile, humores crassiores, eorumque motum languidiorem, et parcam per cutem exhalationem; et sæpe obesi fiunt: victu multum utuntur validissimo, ex carnibus præsertim constante, et vino, aliisque liquoribus generosis. Robustiores quam calidarum regionum incolæ observantur, et animosiores, et ad omnes labores et militiam magis apti, minore hilaritate, majore autem vi animi præditi; minus etiam mulierosi, sed non eo minus fœcundi.

937. Febribus continuis, et inflammationibus, obnoxii sunt;

tentibus febribus; afficiuntur rarius inflammationibus; que ideo dum ægrotant multum egent remediis quæ corrigant putredinem et bilem, et tolerant ægre exinanitiones, imprimis detractionem sanguinis.

936. Contra, incolæ frigidarum regionum habent corpora firmiora et validiora, nervosum genus minus irritabile, humores crassiores, que motum eorum languidiorem, et exhalationem per cutem parcam; et sæpe fiunt obesi: multum utuntur validissimo victu, præsertim constante ex carnibus, et vino, que aliis generosis liquoribus. Observantur robustiores quam incolæ calidarum regionum, et animosiores, et magis apti ad omnes labores et militiam, prædíti minore hilaritate, autem majore vi animi; etiam minus mulierosi, sed non eo minus fœcundi.

937. Sunt obnoxii continuis febribus et inflam-

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by inflammations; and, therefore, while they are sick they much require remedies which correct putridity and bile, and they bear badly evacuations, especially detraction of blood.

936. On the other hand, the inhabitants of cold regions have their bodies firmer and stronger, the nervous system less irritable, the fluids thicker, and the motion of them more languid, and the exhalation by the skin scanty; and often become fat: they abundantly use very strong diet, especially consisting of meat and wine and other generous liquors. They are observed more robust than the inhabitants of warm countries, and more courageous, and more fit for all labours and warfare, endowed with less hilarity, but with greater strength of mind; also less addicted to women, but not therefore less prolific.

937. They are liable to continued fevers and inflammations; not so much

mationibus: haud tantum morbis nervosi generis, nisi fregerint nativam vim malo genere vitæ, neque putridis neque biliosis morbis. Dum ægrotant, fere egent validioribus medicamentis, et plerumque tolerant jacturam sanguinis bene.

haud tantum morbis nervosi generis, nisi malo vitæ genere vim nativam fregerint, neque putridis neque biliosis morbis. Dum ægrotant, validioribus fere medicamentis egent, et sanguinis jacturam plerumque bene tolerant.

938. Porro, similes varietates, quamvis haud tantæ, observantur diversis tempestatibus anni; quo fit ut alii morbi grassentur aliis temporibus, que fere alia ratio medendi conveniat iisdem morbis vere, alia autumno.

938. Similes porro varietates, quamvis haud tantæ, diversis anni tempestatibus observantur; quo fit ut alii aliis temporibus grassentur morbi, iisdemque fere morbis alia vere, alia autumno, medendi ratio conveniat.

939. A genere victûs non leves varietates oriuntur. Sic, qui utuntur victu ex carnibus pro maximâ parte cibi, et indulgent lautioribus epulis et generosis liquoribus, fere sunt robustiores potoribus aquæ, que iis qui vescuntur frugibus solis; sed sæpe minus sani, procliviores ad nimiam abundantiam sanguinis, et inflammationes, et putredinem.

939. A victus genere, varietates non leves oriuntur. Sic qui victu ex carnibus pro maxima cibi parte utuntur, et epulis lautioribus et liquoribus generosis indulgent, robustiores fere sunt aquæ potoribus, iisque qui frugibus solis vescuntur; sed sæpe minus sani, ad nimiam sanguinis abundantiam, et inflammationes, et putredinem procliviores.

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to diseases of the nervous system, unless they have broken their native vigour by a bad kind of life, nor to putrid nor bilious diseases. Whilst they are sick, they mostly want stronger medicines, and generally bear loss of blood well.

938. Moreover, similar varieties, although not so great, are observed at the different seasons of the year; whence it happens that some diseases prevail at some times, and generally one mode of healing suits the same diseases in spring, another in autumn.

939. From the kind of diet no slight varieties arise. Thus, they who use a diet of meat for the greatest part of their food, and indulge in more sumptuous fare and generous liquors, commonly are more robust than the drinkers of water, and those who feed on vegetables alone; but often less healthy, more disposed to excessive abundance of blood, and inflammation, and putridity.

940. Vitæ genus, præsertim quod ad exercitationem aut ignaviam, multum facit, hominesque ab aliis morbis incolumes præstat, ad alios proclives reddit. Sic exercitatio, modo non nimia fuerit, corpus roborat, concoctioni opitulatur, secretiones et excretiones promovet, sanguinis motum intendit, neque sinit plus justo sanguinis congeri; ideoque multos morbos vel arcet, vel jam inductos atque urgentes depellit.

941. Ignavia vero corpus solvit, debilitat, mobile reddit, motum sanguinis languidum facit, secretiones et excretiones fere minuit, et plenitudinem et obesitatem efficit; et igitur plurimis morbis, hysteriæ, dyspepsiæ, podagræ, sanguinis profluviis, apoplexiæ, paralysi, obstructionibus, hydropi, viam sternit.

942. Exercitatio autem vehemens, quamvis corpus sæpe firmet, et roboret, et excitet, nonnullis

940. Genus vitæ præsertim quod ad exercitationem aut ignaviam, facit multum, que præstat homines incolumes ab aliis morbis, reddit proclives ad alios. Sic exercitatio, modo fuerit non nimia, roborat corpus, opitulatur concoctioni, promovet secretiones et excretiones, intendit motum sanguinis, neque sinit plus sanguinis justo congeri; que ideo vel arcet multos morbos, vel depellit jam inductos atque urgentes.

941. Vero ignavia solvit, debilitat, reddit corpus mobile, facit languidum motum sanguinis, fere minuit secretiones et excretiones, et efficit plenitudinem et obesitatem; et igitur sternit viam plurimis morbis, hysteriæ, dyspepsiæ, podagræ, profluviis sanguinis, apoplexiæ, paralysi, obstructionibus, hydropi.

942. Autem vehemens exercitatio, quamvis sæpe firmet, roboret, et excitet

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940. The kind of life, especially with respect to exercise or idleness, does much, and keeps men safe from some diseases, renders them prone to others. Thus, exercise, provided it be not excessive, strengthens the body, assists concoction, promotes the secretions and excretions, increases the motion of the blood, nor suffers more blood than proper to be accumulated; and therefore either wards off many diseases, or drives away those already induced and urgent.

941. But idleness relaxes, weakens, renders the body irritable, causes a languid motion of the blood, for the most part diminishes the secretions and excretions, and causes fulness and obesity; and therefore strews the way for very many diseases, as hysteria, dyspepsia, gout, fluxes of blood, apoplexy, paralysis, obstructions, dropsy.

942. But violent exercise, although often it may invigorate, strengthen,

corpus, tamen facit opportunius nonnullis morbis; partim, fortasse, ob majorem densitatem aut acrimoniam humorum, vero magis propter insignem vim et robur solidarum partium, que ideo auctum impetum humorum; quo fit ut quædam febres et inflammationes incumbant facilius et vehementius. Vero durus et perpetuus labor, prorsus alia ratione, exhaurit, debilitat, indurat corpus, et ideo inducit præmaturam senectutem.

943. Regimen, quoque, mentis, conducit non minus ad sanitatem, quam ad diuturnitatem vitæ. Vehementes affectus animi, sive excitantes sive deprimentes, et graves curæ, officiunt valetudini variâ ratione: quoque nimis intensa studia, neque intermissa ut decet, nocent et animo et corpori: imprimis nervoso generi, et ventriculo, et capiti. Autem damnum quod vulgo existimatur

tamen morbis opportunius facit; partim fortasse ob majorem densitatem aut acrimoniam humorum, magis vero propter insignem solidarum partium vim et robur, auctumque ideo humorum impetum; quo fit ut febres quædam, et inflammationes, facilius et vehementius incumbant. Durus vero et perpetuus labor, alia prorsus ratione, corpus exhaurit, debilitat, indurat, et ideo senectutem præmaturam (897) inducit.

943. Regimen quoque mentis ad sanitatem non minus quam ad vitæ diuturnitatem (900) conducit. Vehementes animi affectus, sive excitantes sive deprimentes, et graves curæ, varia ratione (345, 346) officiunt valetudini: studia quoque nimis intensa, neque ut decet intermissa, et animo et corpori nocent; generi nervoso imprimis, et ventriculo, et capiti. Damnum autem quod a studiis

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and excite the body, yet renders it more liable to some diseases; partly, perhaps, on account of the greater density or acrimony of the fluids, but more on account of the great power and strength of the solid parts, and consequently the increased impetus of the fluids; whence it happens that certain fevers and inflammations attack more easily and more violently. But severe and constant labour, in altogether a different way, exhausts, debilitates, hardens the body, and therefore brings on premature old age.

943. The regulation, also, of the mind, conduces not less to health than to length of life. Violent affections of the mind, whether exciting or depressing, and weighty cares, injure the health in a varied manner: also too intense study, nor intermitted as it ought, hurt both the mind and body; especially the nervous system, and stomach, and head. But the injury which commonly is thought to arise from studies generally is attributed

vulgo oriri existimatur, melius plerumque tribuitur vitæ generi parum idoneo, quod multi literarum cupidi degere solent, scilicet qui corporis exercitationem fere negligunt: neque sane obscura ratio qua vita sedentaria (941) nocet.

944. Cæterum, quamvis multi in armis, multi in negotiis, multique demum in otio, et luxu, et voluptatibus, consenuerint, sanique omni tempore vixerint, tamen plurimorum philosophorum exempla demonstrant, vitam quietam, temperatam, contemplativam, ad sanitatem, et ideo ad vitæ diuturnitatem, maxime conducere, quippe quæ haud paucis careat periculis et morborum causis, quibus vita actuosa obnoxia est.

945. Postremo, memoria semper tenere oportet, hominem adeo versatilem existere, ut ad omnes cœlos, utcunque diversos, et ad vitæ genera maxime contraria, unus

oriri a studiis, plerumque tribuitur melius generi vitæ, parum idoneo, quod multi cupidi literarum solent degere; scilicet, qui fere negligunt exercitationem corporis, neque sane est ratio obscura quâ sedentaria vita nocet.

944. Cæterum quamvis multi consenuerint in armis, multi in negotiis, que multi, demum, in otio, et luxu, et voluptatibus, que vixerint sani omni tempore, tamen exempla plurimorum philosophorum demonstrant quietam, temperatam, contemplativam vitam, conducere maxime ad sanitatem, et ideo ad diuturnitatem vitæ, quippe quæ careat haud paucis periculis et causis morborum quibus actuosa vita est obnoxia.

945. Postremo, oportet semper tenere in memoria, hominem existere adeo versatilem, ut unus, omnium animalium, accommodet sese ad omnes

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better to the mode of life, no way suitable, which many fond of literature are accustomed to lead; that is, who mostly neglect exercise of the body, nor truly is the manner obscure in which a sedentary life hurts.

944. But although many have grown old in arms, many in business, and many, in fine, in idleness, and luxury, and pleasures, and have lived healthy at every period, yet the examples of the most of philosophers demonstrate that a quiet, temperate, contemplative life, conduces most to health, and consequently to length of life, as being that which is free from the no few dangers and causes of diseases to which an active life is exposed.

945. Lastly, it behoves always to keep in mind, that man exists so versatile, that he alone, of all animals, can accommodate himself to all climates, however different, and to modes of life the most opposite, and truly seems to be born for all. In almost a like way he accommodates

cœlos, utcunque diversos, et ad genera vitæ maxime contraria, et sane videatur esse natus ad omnia. Fere pari ratione accommodat sese ad diversissima genera cibi, et demum ita assuescit gravissimis causis morborum, que rebus quæ non immerito habentur venena, ut non modo capiat parum detrimenti ex iis, sed sæpe, sive sanus, sive ægrotans, sive convalescens, possit carere iisdem ægre, nec sine periculo.

omnium animalium se accommodet, et sane ad omnia videatur esse natus. Pari fere ratione, ad diversissima cibi genera se accommodat, et demum gravissimis morborum causis, rebusque quæ non immerito venena habentur, assuescit, ita ut non modo parum ex iis detrimenti capiat, sed iisdem sæpe, sive sanus, sive ægrotans, sive convalescens, ægre, nec sine periculo, carere possit.

FINIS PRIMÆ PARTIS, COMPLECTENTIS PHYSIOLOGIAM ET PATHOLOGIAM.

FINIS PARTIS PRIMÆ, PHYSIOLOGIAM ET PATHOLOGIAM COMPLECTENTIS.

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himself to the most different kinds of food, and at length so accustoms himself to the most powerful causes of diseases, and to things which not undeservedly are considered poisons, that not only he takes little detriment from them, but often, whether healthy, or sick, or convalescent, can be devoid of the same with difficulty, nor without danger.

END OF THE FIRST PART, COMPRISING PHYSIOLOGY AND PATHOLOGY.

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