Charles M Lea
Washington, D.C.

THE

STUDY OF MEDICINE,

WITH A

PHYSIOLOGICAL SYSTEM

OF

NOSOLOGY.

BY

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MEM. AM. PHIL. SOC. AND F.L.S. OF PHILADELPHIA.

IN FIVE VOLUMES.

VOL. I.

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TO

SIR HENRY HALFORD, BART. M.D. F.R.S. F.A.S.

PRESIDENT

OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON,

PHYSICIAN TO THE KING;

This Work

IS

INSCRIBED AS A TRIBUTE

OF

GRATITUDE

AND

FRIENDSHIP.

AUGUST VI, MDCCCXXII.

Preface.

THE object of the present work is to unite the different branches of medical science, which, when carried to any considerable extent, have hitherto, by most writers, been treated of separately, into a general system, so that the whole may be contemplated under a single view, and pursued under a common study. These branches are the following:

I. PHYSIOLOGY, or the doctrine of the natural action of the living principle.
II. PATHOLOGY, or the doctrine of its morbid action.
III. NOSOLOGY, or the doctrine of the classification of diseases.
IV. THERAPEUTICS, or the doctrine of their treatment and cure.

All these are of high, if not of equal, importance. As it is impossible for a workman to set about restoring a machine to order, with any rational hope of success, without knowing the full extent and nature of the injury it has sustained, so is it equally impossible for him to acquire this knowledge, unless he has also a knowledge of the structure of the machine, and has studied its several parts methodically, and in reference to the bearing which one part has upon another.

It is this advantage of the study of one part in relation to another, that constitutes, or should constitute, in the art of medicine, the basis of a NOSOLOGICAL ARRANGEMENT; for by grouping diseases, not arbitrarily, but in the order of connexion in which

they make their appearance in different functions, and the organs on which those functions depend, it is almost impossible to obtain an insight into the nature of any one disease belonging to such groups, without obtaining some insight into the nature of the rest, or tracing out some of the laws of morbid action which are common to the whole.

If it be convenient to concentrate the diseases of the nervous department into one division, as has been attempted by many nosologists, and ably accomplished by Dr. Cullen, it is to be lamented that the same principle has not been allowed to pervade the whole of the nosological plan; and that the diseases of the other chief departments of the animal frame have not been concentrated in the same way, instead of being scattered, as we too often find them, over different divisions of a classification that is itself perpetually shifting from one ground of arrangement to another: which in one division, as in the Synopsis of Dr. Cullen, by far the best of his day, is derived from the temperature of the body; in a second, from its anatomical structure; in a third, from its chemical depravities; and in a fourth, from its topography: thus offering us in each division a new principle, and one that has no common clue or analogy with the rest.

It was the hope of obtaining a clearer and more connected method than had hitherto been studied in the schools of medicine, that induced the present author to turn his attention to this subject many years ago, and at length enabled him to submit to the public a System of Nosology founded entirely on a physiological basis, in which the diseases of the respective functions of the animal frame are connected in classes derived from those functions, and follow each other in the order in which physiologists have usually treated of them.

It was not, however, from a mere hope of obtaining a more exact and comprehensive synopsis of diseases, that the author was induced to undertake this new arrangement, but with a view of employing it as a text-book for the collateral branches of the Art of Healing already adverted to, as soon as he should find leisure to enter upon them, and to which no other synopsis he was acquainted with seemed equally adapted.

This work was published in the beginning of 1817, under the

title of a "Physiological System of Nosology, with a corrected and simplified Nomenclature;" and the favourable opinion which has been formed of it; its adoption as a text-book in various medical schools of high reputation in our own country, and on the continent; the application which has been made to the author by some of the oldest and most established lecturers of this metropolis to print a syllabus of its classification for the purpose of lecturing from; and above all the approbation which the Royal College of Physicians has bestowed upon it, by permitting it to be dedicated to that learned body, after having been circulated amidst the Fellows of the College, under an express order of the late president, for an examination of its contents by every individual at his own house, are, he trusts, a sufficient apology for his adhering to his original intention, and taking this system, instead of any other, as the ground work of the ensuing arrangement.

It is not necessary in the present place to enter into a minute explanation of the subordinate parts of this system, nor of the occasional changes in medical nomenclature which are to be found in it: and which a close attention to correctness and simplicity seemed to render indispensable. All these are fully illustrated in the Preliminary Dissertation to the volume of Nosology, which the author is desirous of having regarded as a part of the general design. An alteration in the distribution of one or two of the diseases, as originally laid down, may be noticed by an attentive eye in the present volumes. They are changes which have been made out of deference to the opinions of others, or from a maturer consideration of the subject by the author himself: but, upon the whole, they are too few and of too little importance to render it necessary to indicate them in the present place.

A pretty active spirit of PHYSIOLOGY will be found to pervade the entire work; but the author has, beyond this, availed himself of the advantage which his arrangement so readily allows, of prefixing to every class a summary of the most important laws and interesting discoveries of physiology that relate to, or can elucidate the subjects which constitute its scope. And he has occasionally enriched the dissertation by a glance at the more striking

analogies of the animal, and even of the vegetable world at large, wherever they could add to the illustration.

In the Pathological Department, if the reader meet with an occasional development of new principles, a question as to several that have been long before the public, or a further extension of many that are well established, the author trusts that whatever doctrines are advanced will, at least, be found true to themselves, and form a digested system operating in accordance through the entire work, in what way soever they may be affected by future investigations. He trusts, it will also be found that nothing is newly started for the mere sake of novelty, or controverted from a mere love of disputation: and that whenever it has been his misfortune to differ from high authorities which have preceded him, he has done it with the candour which should peculiarly characterise a liberal profession. His main object has been to explain to the student the different subjects that pass before him, and to illustrate them by analogies, instead of confining himself to a dry and wearisome history of morbid symptoms and operations.

In Therapeutics the author has allowed himself a liberal range, and has, occasionally, introduced into his Materia Medica substances that are highly esteemed abroad, though little valued or even known at home, or that seem, without reason, to have fallen into temporary disrepute. There are some practitioners who think that all the articles which are of real use in the cure of diseases lie within a small compass, and may be learnt without burthening the memory. This remark may be allowed to those who are limited to a portable dispensary, as in travelling, or on ship-board; but when uttered under other circumstances, it savours less of wisdom than of indolence. If the pharmacopœias of former times were too voluminous, and were occasionally loaded with medicines of trifling importance, the lopping and topping that must hereupon ensue, would make a destructive inroad upon their boundaries, and take from them much that is good as well as something that can be spared. We may easily, indeed, substitute one medicine for another, but it is very rarely that we can hereby obtain an integral representative; a remedy possessing not only the general, but the particular qualities of that whose place is supplied, so as to be equally adapted to the exact state of

the disease or the express character of the idiosyncrasy. Sir George Baker was engaged as reasonably and scientifically in examining into the virtues of the cardamine pratensis or lady's smock, as Dr. Stoerck in proving, upon his own person, the violent powers of colchicum and stramonium. A common fate has, indeed, attended the whole of these experiments. From attracting and concentrating the attention of the public, the medicines to which they were directed became equally over-valued; were employed upon all occasions; produced frequent disappointment; and gradually fell into disuse. The colchicum has been fortunate enough to ascend once more to its full zenith of popularity; many efforts have been made on behalf of the stramonium; and the cardamine, though at present less successful than either of the others, still holds in abeyance its post in the established pharmacopœias, waiting for some lucky trial to bring it once more into general esteem.

A work erected upon scientific principles should know nothing of these accidental reverses, and still less of the varying, and too often capricious taste of the day. To judge by the sentiments of some writers, the reputation of the bark seems at present on the wane, while the seeds of the croton Tiglium, after a long neglect, are again rising into notice. In the remedial part of the present work the author has endeavoured to allow to every medicine its proper value, as far as he has been able to estimate it, whatever may have been the era of its credit; and as there can be no stronger ground for the study of botany, oryctology, or chemistry than the advantage they afford to the art of healing, and as these are provinces cultivated in our own day by almost every one, he has felt himself called upon by the general voice of the times to range with some latitude over the medicinal stores afforded by art and nature and to discriminate the respective properties of each, rather than to limit himself to a few leading productions, or to refer to the whole under the general divisions of stimulants, sedatives, and cathartics, or whatever other names may serve for a medicinal classification.

It is this, indeed, that after all must chiefly constitute the THERAPIA, or PRACTICE OF MEDICINE, to which every thing else, though of the utmost moment, is but introductory. "The

First Lines" of Dr. Cullen, when read as they were delivered, in connexion with his "Treatise on the Materia Medica," constitute the most important course of instruction that has ever, perhaps, been laid down and completed by the same individual. But for this purpose they must be read together, though they were not published together, nor for the express design of forming a contemporaneous study: for it is a singular fact that the First Lines of the Practice of Physic, though full both of mind and of matter, of elaborate axioms and theoretical principles, contain little of what the title suggests; while the treatise on the Materia Medica, without making any pretensions to the subject, is altogether a practical work, replete with practical principles, and founded upon a practical investigation.

Whatever may be the theory or the practice advanced in the ensuing volumes, the author will generally be found to leave nothing upon trust; but to support or illustrate his assertions by authorities which he has endeavoured to give, with some degree of copiousness, from ancient as well as modern times: so as to render the work in a certain sense a summary of the general history of medicine in most ages and countries.

To the labours of our own countrymen, however, he professes to be chiefly indebted for his supplies: to the illustrious dead and to the illustrious living: to all of whom he has conscientiously endeavoured to do justice, even where he has been under the misfortune of differing from any of them in opinion. With the former he can have no controversy; and, with the latter, he has taken the most gratifying means of avoiding it, and at the same time of adding considerably to the value of his work, by submitting to the most distinguished of them, and especially to those with whom he has the honour of a personal acquaintance, the successive sheets of the work, while passing through the press, that contain a notice of their respective opinions or publications; with a request that they would correct any incidental mis-statement, or communicate any valuable hint that may since have occurred to them on the subject. It would occupy too much space to enumerate all the individuals to whom the author has been indebted for assistance of this kind: but there are several whose names the public ought

to be made acquainted with as adding, in no ordinary degree, to the authority of the work itself.

He has, in the first place, to return his very grateful thanks to the President of the Royal College of Physicians, without whose fostering encouragement, his health and strength, considerably encroached upon by the laborious and unremitting study with which it has been necessary to prosecute the subject, would hardly have held out to its close; and who has not only taken the trouble of examining the sheets that relate to his own valuable labours, but of watching the progress of the work generally, and of perusing many parts of it as they have issued from the press. He has next to offer his acknowledgments to his highly distinguished and venerable friend Dr. Perceval, of Dublin; who has been so kind as to favour him with a valuable manuscript series of notes, in the form of a running commentary, upon the entire volume of Nosology, in illustration of its definitions or opinions; the whole of which will be found embodied into the present work, with a reference to the real author in every instance. To the liberality of Sir James M'Grigor he is indebted for important assistance on several occasions, and particularly for his munificent offer of a free and facilitated access to all the medical documents of the army, addressed to him as Inspector General. To his kind friend Sir John Webb he is also largely indebted for similar assistance from the Ordnance Department, and particularly in respect to the subject of plague, upon which he has proved himself to be so perfectly conversant. The kindness of Dr. Baillie can never be erased from the author's memory, but he has particularly to thank him on the present occasion for reviewing the article on spasmodic stricture of the rectum as well as several others, which, without his previous labours, would not perhaps have been found in the present work, or have been found but very imperfectly. To Dr. Latham he is under obligations on various accounts; but, in the present work, he is especially indebted to him for his friendly revision of the article, paruria *mellita* or diabetes. The volumes will display abundant instances in which he has derived assistance from the comprehensive mind of Sir Gilbert Blane, but the friendliness with which

he has consented to furnish him with a description of his own case, in a very singular and obstinate attack of prurigo, and to revise the statement when printed, demands an especial acknowledgment. To Dr. Bree the author is indebted for perusing the article on asthma, and his very liberal opinion on the same. To Dr. Young for a like attention to that on phthisis, and the valuable hints with which his opinion was accompanied. To Dr. Cooke, whose friendship he has experienced in many important instances, he is under a similar obligation for perusing, and, in a few instances, correcting the account of apoplexy and palsy: and to his excellent and judicious friend Dr. James Johnson, for various hints concerning tropical diseases, and a perusal of some parts of the present volumes in which they are treated of.

The author has entered with a considerable degree of fulness into the different modifications of the diseases, in order to adapt the work to foreign climates and stations as well as to domestic practice: for a system of medicine, to be complete, should be of universal application. To render it such, however, it is seldom necessary to do more than follow up the common diseases of a country into their respective varieties: for the general laws of the morbid action of the living principle are as permanent and universal as those of its natural action, and a really new SPECIES of disease is, perhaps, as much a phænomenon as a really new species of plant or animal. We see all these infinitely diversified by accidental circumstances, and particularly the circumstances of habit and climate; but the specific outlines are still preserved, and we are still capable of reducing them, under every disguise, to their proper relations, and of assigning them their proper posts. From a few nondescript skeletons occasionally found in the bowels of the earth, and particularly from the interesting museum of such established by M. Cuvier at Paris, we have reason to believe that a few species of animals have totally disappeared; as we have also, from the classifications of recent naturalists compared with those of earlier times, that a few species are now in being which had no existence in remote ages. And in like manner, whilst a few species of diseases are now no longer to be found which are described by earlier writers, a few seem to have supplied their

place, which are comparatively of modern origin. Yet, upon the whole, the march of nature is but little interfered with in either case; and hence the prognostics and aphorisms of Hippocrates, the medical histories of Aretæus and Galen, of Rhazes and Avicenna, and the natural histories of Aristotle and Pliny, are transcripts of animal life in our own day, as well as in the times in which they were severally composed; and form important subjects of modern, as it is well known they did of ancient study. The extensive family of fevers and spasmodic affections are, in the main, the same now as they are repesented in the most ancient writings that have descended to us; the plague of Athens, as described by Thucydides, we shall find in the ensuing pages to be the prototype of what still occasionally takes place in Egypt and along the Barbary coast; and even the leprosy of the Levitical law, so minutely described by Moses, will be found, when the passage is closely and accurately rendered, still to retain its hold in the East, and to exhibit even the very same modifications as are noticed by the Hebrew legislator, and have been intermediately assigned to it by Celsus.

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TABLE

OF

CLASSIFICATION.

CLASS I. CŒLIACA.

DISEASES OF THE DIGESTIVE FUNCTION.

ORD. I. ENTERICA.

AFFECTING THE ALIMENTARY CANAL.

GEN. I. ODONTIA.

Misdentition.

SPEC. 1. O. DENTITIONIS. *Teething.*
2. DOLOROSA. *Tooth-ache.*
3. STUPORIS. *Tooth-edge.*
4. DEFORMIS. *Deformity of the Teeth.*
5. ENDENTULA. *Toothlessness.*
6. INCRUSTANS. *Tartar of the Teeth.*
7. EXCRESCENS. *Excrescent Gums.*

GEN. II. PTYALISMUS.

Ptyalism.

SPEC. 1. P. ACUTUS. *Salivation.*
2. CHRONICUS. *Chronic Ptyalism.*
3. INERS. *Drivelling.*

GEN. III. DYSPHAGIA.

Dysphagy.

SPEC. 1. D. CONSTRICTA. *Constrictive Dysphagy.*
2. ATONICA. *Atonic Dysphagy.*
3. GLOBOSA. *Nervous Quinsy.*
4. UVULOSA. *Uvular Dysphagy.*
5. LINGUOSA. *Lingual Dysphagy.*

GEN. IV. DIPSOSIS.

Morbid Thirst.

SPEC. 1. D. AVENS. *Immoderate Thirst.*
2. EXPERS. *Thirstlessness.*

GEN. V. LIMOSIS.

Morbid Appetite.

SPEC. 1. L. AVENS. *Voracity.*
2. EXPERS. *Long Fasting.*
3. PICA. *Depraved Appetite.*

SPEC. 4. L. CARDIALGIA.
Heart-burn. Waterbrash.
5. FLATUS.
Flatulency.
6. EMESIS.
Sickness. Vomiting.
7. DYSPEPSIA.
Indigestion.

GEN. VI. COLICA.

Colic.

SPEC. 1. C. ILEUS.
Ileac Passion.
2. RHACHIALGIA.
Colic of Poitou. Painter's Colic.
3. CIBARIA.
Surfeit.
4. FLATULENTA.
Wind-Colic.
5. CONSTIPATA.
Constipated Colic.
6. CONSTRICTA.
Constrictive Colic.

GEN. VII. COPROSTASIS.

Costiveness.

SPEC. 1. C. CONSTIPATA.
Constipation.
2. OBSTIPATA.
Obstipation.

GEN. VIII. DIARRHŒA.

Looseness.

SPEC. 1. D. FUSA.
Feculent Looseness.
2. BILIOSA.
Bilious Looseness.
3. MUCOSA.
Mucous Looseness.
4. CHYLOSA.
Chylous Looseness.
5. D. LIENTERIA.
Lientery.
6. SEROSA.
Serous Looseness.
7. TUBULARIS.
Tubular Looseness.
8. GYPSATA.
Gypseous Looseness.

GEN. IX. CHOLERA.

Cholera.

SPEC. 1. C. BILIOSA.
Bilious Cholera.
2. FLATULENTA.
Wind Cholera.
3. SPASMODICA.
Spasmodic Cholera.

GEN. X. ENTEROLITHUS.

Intestinal Concretions.

SPEC. 1. E. BEZOARDUS.
Bezoar.
2. CALCULUS.
Intestinal Calculus.
3. SCYBALUM.
Scybalum.

GEN. XI. HELMINTHIA.

Worms.

SPEC. 1. H. ALVI.
Alvine Worms.
2. PODICIS.
Anal Worms.
3. ERRATICA.
Erratic Worms.

GEN. XII. PROCTICA.

Proctica.

SPEC. 1. P. SIMPLEX.
Simple Proctica.

2. P. SPASMODICA.
Spasmodic Stricture of the Rectum.
3. CALLOSA.
Callous Stricture of the Rectum.
4. TENESMUS.
Tenesmus.
5. MARISCA.
Piles.
6. EXANIA.
Prolapse of the Fundament.

ORD. II. SPLANCHNICA.

AFFECTING THE COLLATITIOUS VISCERA.

GEN. I. ICTERUS.

Yellow Jaundice.

SPEC. 1. I. CHOLŒUS.
Biliary Jaundice.
2. CHOLOLITHICUS.
Gall-stone Jaundice.
3. SPASMODICUS.
Spasmodic Jaundice.
4. HEPATICUS.
Hepatic Jaundice.
5. INFANTUM.
Jaundice of Infants.

GEN. II. MELÆNA.

Melena.

SPEC. 1. M. CHOLŒA.
Black, or Green Jaundice.
2. M. CRUENTA.
Black Vomit.

GEN. III. CHOLOLITHUS.

Gall-stone.

SPEC. 1. C. QUIESCENS.
Quiescent Gall-stone.
2. MEANS.
Passing of Gall-stones.

GEN. IV. PARABYSMA.

Visceral Turgescence.

SPEC 1. P. HEPATICUM.
Turgescence of the Liver.
2. SPLENICUM.
Turgescence of the Spleen.
3. PANCREATICUM.
Turgescence of the Pancreas.
4. MESENTERICUM.
Turgescence of the Mesentery.
5. INTESTINALE.
Turgescence of the Intestines.
6. OMENTALE.
Turgescence of the Omentum.
7. COMPLICATUM.
Turgescence compounded of various organs.

CLASS II. PNEUMATICA.

DISEASES OF THE RESPIRATORY FUNCTION.

ORD. I. PHONICA.

AFFECTING THE VOCAL AVENUES.

GEN. I. CORYZA.

Running at the Nose.

SPEC. 1. C. ENTONICA.
Entonic Coryza.
2. ATONICA.
Atonic Coryza.

GEN. II. POLYPUS.

Polypus.

SPEC. 1. P. ELASTICUS.
Compressible Polypus.
2. CORIACEUS.
Cartilaginous Polypus.

GEN. III. RHONCHUS.

Rattling in the Throat.

SPEC. 1. R. STERTOR.
Snoring.
2. R. CERCHNUS.
Wheezing.

GEN. IV. APHONIA.

Dumbness.

SPEC. 1. A. ELINGUIUM.
Elingual Dumbness.
2. ATONICA.
Atonic Dumbness.
3. SURDORUM.
Deaf-Dumbness.

GEN. V. DYSPHONIA.

Dissonant Voice.

SPEC. 1. D. SUSURRANS.
Whispering Voice.
2. PUBERUM.
Voice of Puberty.
3. IMMODULATA.
Immelodious Voice.

GEN. VI. PSELLISMUS.

Dissonant Speech.

SPEC. 1. P. BAMBALIA.
Stammering.
2. BLÆSITAS.
Misenunciation.

ORD. II. PNEUMONICA.

AFFECTING THE LUNGS, THEIR MEMBRANES, OR MOTIVE POWER.

GEN. I. BEX.

Cough.

SPEC. 1. B. HUMIDA.
Common or humid Cough.
2. SICCA.
Dry Cough.
3. CONVULSIVA.
Hooping-Cough.

GEN. II. LARYNGYSMUS.

Laryngic Suffocation.

SPEC. 1. L. STRIDULUS.
Stridulous constriction of the Larynx.

GEN. III. DYSPNŒA.

Anhelation.

SPEC. 1. D. CHRONICA.
Short-breath.

2. D. EXACERBANS.
Exacerbating Anhelation.

GEN. IV. ASTHMA.
Asthma.

SPEC. 1. A. SICCUM.
Dry or Nervous Asthma.
2. HUMIDUM.
Humid or common Asthma.

GEN. V. EPHIALTES.
Incubus.

SPEC. 1. E. VIGILANTIUM.
Day-Mare.
2. NOCTURNUS.
Night-Mare.

GEN. VI. STERNALGIA.
Suffocative Breast-pang.

SPEC. 1. S. AMBULANTIUM.
Acute Breast-pang.
2. CHRONICA.
Chronic Breast-pang.

GEN. VII. PLEURALGIA.
Pain in the Side.

SPEC. 1. P. ACUTA.
Stitch.
2. CHRONICA.
Chronic pain in the Side.

CLASS III. HÆMATICA.

DISEASES OF THE SANGUINEOUS FUNCTION.

ORD. I. PYRECTICA.
FEVERS.

GEN. I. EPHEMERA.
Diary Fever.

SPEC. 1. E. MITIS.
Mild Diary Fever.
2. ACUTA.
Acute Diary Fever.
3. SUDATORIA.
Sweating Fever.

GEN. II. ANETUS.
Intermitting Fever. Ague.

SPEC. 1. A. QUOTIDIANUS.
Quotidian Ague.
2. TERTIANUS.
Tertian Ague.
3. A. QUARTANUS.
Quartan Ague.
4. ERRATICUS.
Irregular Ague.
5. COMPLICATUS.
Complicated Ague.

GEN. III. EPANETUS.
Remittent Fever.

SPEC. 1. E. MITIS.
Mild Remittent.
2. MALIGNUS.
*Malignant Remittent.**
3. HECTICA.
Hectic Fever.

* α Autumnal Remittent. ♂ Yellow Fever. γ Burning Remittent. ♂ Asthenic Remittent.

GEN. IV. ENECIA.

Continued Fever.

SPEC. 1. E. CAUMA.
Inflammatory Fever.
2. TYPHUS.
Typhous Fever.
3. SYNOCHUS.
Synochal Fever.

ORD. II. PHLOGOTICA.

INFLAMMATIONS.

GEN. I. APOSTEME.

Aposteme.

SPEC. 1. A. COMMUNE.
Common Aposteme.
2. PSOATICUM.
Psoas Abscess.
3. HEPATICUM.
Abscess of the Liver.
4. EMPYEMA.
Lodgement of Matter in the Chest.
5. VOMICA.
Vomica.

GEN. II. PHLEGMONE.

Phlegmon.

SPEC. 1. P. COMMUNIS.
Common Phlegmon.
2. PARULIS.
Gum-boil.
3. AURIS.
Imposthume in the Ear.
4. PAROTIDEA.
Parotid Phlegmon.
5. MAMMÆ.
Abscess of the breast.
6. BUBO.
Bubo.
7. P. PHIMOTICA.
Phimotic Phlegmon.

GEN. III. PHYMA.

Tubercle.

SPEC. 1. P. HORDEOLUM.
Sty.
2. FURUNCULUS.
Boil.
3. SYCOSIS.
Ficous Phyma.
4. ANTHRAX.
Carbuncle.

GEN. IV. IONTHUS.

Whelk.

SPEC. 1. I. VARUS.
Stone-pock.
2. CORYMBYFER.
Carbuncled Face. Rosy Drop.

GEN. V. PHLYSIS.

Phlysis.

SPEC 1. P. PARONYCHIA.
Whitlow.

GEN. VI. ERYTHEMA.

Inflammatory Blush.

SPEC. 1. E. ŒDEMATOSUM.
Edematous Inflammation.
2. ERYSIPELATOSUM.
Erysipelatous Inflammation.
3. GANGRÆNOSUM.
Gangrenous Inflammation.
4. VESICULARE.
Vesicular Inflammation.

5. E. PERNIO.
Chilblain.
6. INTERTRIGO.
Fret.

GEN. VII. EMPRESMA.

Visceral Inflammation.

SPEC. 1. E. CEPHALITIS.
*Inflammation of the Brain.**
2. OTITIS.
Ear-ache.
3. PAROTITIS.
Mumps.
4. PARISTHMITIS.
Quinsy
5. LARYNGITIS.
Inflammation of the Larynx.
6. BRONCHITIS.
Croup.
7. PNEUMONITIS.
Peripneumony.
8. PLEURITIS.
Pleurisy.
9. CARDITIS.
Inflammation of the Heart.
10. PERITONITIS.
Inflammation of the Peritoneum.
11. GASTRITIS.
Inflammation of the Stomach.
12. ENTERITIS.
Inflammation of the Bowels.
13. HEPATITIS.
Inflammation of the Liver.
14. SPLENITIS.
Inflammation of the Spleen.
15. E. NEPHRITIS.
Inflammation of the Kidneys.
16. CYSTITIS.
Inflammation of the Bladder.
17. HYSTERITIS.
Inflammation of the Womb.
18. ORCHITIS.
Inflammation of the Testicles.

GEN. VIII. OPHTHALMIA.

Ophthalmy.

SPEC. 1. O. TARAXIS.
Lachrymose Ophthalmy.
2. IRIDIS.
Inflammation of the Iris.
3. PURULENTA.
Purulent Ophthalmy.
4. GLUTINOSA.
Glutinous Ophthalmy.
5. CHRONICA.
Lippitude. Bleareye.

GEN. IX. CATARRHUS.

Catarrh.

SPEC. 1. C. COMMUNIS.
Cold in the Head or Chest.
2. EPIDEMICUS.
Influenza.

GEN. X. DYSENTERIA.

Dysentery.

SPEC. 1. D. SIMPLEX.
Simple Dysentery.
2. PYRECTICA.
Dysenteric Fever.

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* α Brain Fever. ϛ Acute Dropsy of the Head.

GEN. XI. BUCNEMIA.

Tumid Leg.

SPEC. 1. B. SPARGANOSIS.
Puerperal tumid Leg.
2. TROPICA.
Tumid Leg of hot Climates.

GEN. XII. ARTHROSIA.

Articular Inflammation.

SPEC. 1. A. ACUTA.
Acute Rheumatism.
2. CHRONICA.
Chronic Rheumatism.
3. PODAGRA.
Gout.
4. HYDARTHRUS.
White-swelling.

ORD. III. EXANTHEMATICA.

ERUPTIVE FEVERS. EXANTHEMS.

GEN. I. ENANTHESIS.

Rash Exanthem.

SPEC. 1. E. ROSALIA.
Scarlet-Fever.
2. RUBEOLA.
Measles.
3. URTICARIA.
Nettle-rash.

GEN. II. EMPHLYSIS.

Ichorous Exanthem.

SPEC. 1. E. MILIARIA.
Miliary Fever.
2. APHTHA.
Thrush.
3. VACCINIA.
Cow-pox.
4. VARICELLA.
Water-pox.
5. E. PEMPHIGUS.
Vesicular or Bladdery Fever.
6. ERYSIPELAS.
St. Anthony's Fire.

GEN III. EMPYESIS.

Pustulous Exanthem.

SPEC. 1. E. VARIOLA.
Small-pox.

GEN. IV. ANTHRACIA.

Carbuncular Exanthem.

SPEC. 1. A. PESTIS.
Plague.
2. RUBULA.
Yaws.

ORD. IV. DYSTHETICA.

CACHEXIES.

GEN. I. PLETHORA.

Plethora.

SPEC. 1. P. ENTONICA.
Sanguine Plethora.
2. ATONICA.
Serous Plethora.

GEN II. HÆMORRHAGIA.

Hemorrhage.

SPEC. 1. H. ENTONICA.
Entonic Hemorrhage.
2. ATONICA.
Atonic Hemorrhage.

GEN. III. MARASMUS.

Emaciation.

SPEC. 1. M. ATROPHIA.
Atrophy.
2. CLIMACTERICUS.
Decay of Nature.

3. M. TABES.
Decline.
4. PHTHISIS.
Consumption.

GEN. IV. STRUMA.

Scrophula.

SPEC. 1. S. VULGARIS.
King's Evil.

GEN. V. CARCINUS.

Cancer.

SPEC. 1. C. VULGARIS.
Common Cancer.

GEN. VI. LUES.

Venereal Disease.

SPEC. 1. L. SYPHILIS.
Pox.
2. SYPHILODES.
Bastard Pox.

GEN. VII. ELEPHANTIASIS.

Elephant-skin.

SPEC. 1. E. ARABICA.
Arabian Elephantiasis. Black Leprosy.
2. ITALICA.
Italian Elephantiasis.
3. ASTURIENSIS.
Asturian Elephantiasis.

GEN. VIII. CATACAUSIS.

Catacausis.

SPEC. 1. C. EBRIOSA.
Inebriate Catacausis.

GEN. IX. PORPHYRA.

Scurvy.

SPEC. 1. P. SIMPLEX.
Petechial Scurvy.
2. HÆMORRHAGICA.
Land-scurvy.
3. NAUTICA.
Sea-scurvy.

GEN. X. EXANGIA.

Exangia.

SPEC. 1. E. ANEURISMA.
Aneurism.
2. VARIX.
Varix.
3. CYANIA.
Blue-skin.

GEN. XI. GANGRÆNA.

Gangrene.

SPEC. 1. G. SPHACELUS.
Mortification.
2. USTILAGINEA.
Mildew-mortification.
3. NECROSIS.
Dry Gangrene.
4. CARIES.
Caries.

GEN. XII. ULCUS.

Ulcer.

SPEC. 1. U. INCARNANS.
Simple healing Ulcer.
2. VITIOSUM.
Depraved Ulcer.
3. SINUOSUM.
Sinuous Ulcer.
4. TUBERCULOSUM.
Warty, excrescent Ulcer.
5. CARIOSUM.
Carious Ulcer.

CLASS IV. NEUROTICA.

DISEASES OF THE NERVOUS FUNCTION.

ORD. I. PHRENICA.

AFFECTING THE INTELLECT.

GEN. I. ECPHRONIA.

Insanity. Craziness.

SPEC. 1. E. MELANCHOLIA.
Melancholy.
2. MANIA.
Madness.

GEN. II. EMPATHEMA.

Ungovernable Passion.

SPEC. 1. E. ENTONICUM.
Empassioned Excitement.
2. ATONICUM.
Empassioned Depression.
3. INANE.
Hair-brained Passion.

GEN. III. ALUSIA.

Illusion. Hallucination.

SPEC. 1. A. ELATIO.
Sentimentalism.
Mental Extravagance.
2. HYPOCHONDRIAS.
Hypochondrism.
Low Spirits.

GEN. IV. APHELXIA.

Revery.

SPEC. 1. A. SOCORS.
Absence of Mind.
2. INTENTA.
Abstraction of Mind.
3. A. OTIOSA.
Brown-Study.

GEN. V. PARONIRIA.

Sleep-disturbance.

SPEC. 1. P. AMBULANS.
Sleep-walking.
2. LOQUENS.
Sleep-talking.
3. SALAX.
Night Pollution.

GEN. VI. MORIA.

Fatuity.

SPEC. 1. M. IMBECILLIS.
Imbecility.
2. DEMENS.
Irrationality.

ORD. II. ÆSTHETICA.

AFFECTING THE SENSATION.

GEN. I. PAROPSIS.

Morbid-Sight.

SPEC. 1. P. LUCIFUGA.
Night-Sight.
2. NOCTIFUGA.
Day-Sight.
3. LONGINQUA.
Long-Sight.
4. PROPINQUA.
Short-Sight.
5. LATERALIS.
Skue-Sight.
6. ILLUSORIA.
False-Sight.
7. CALIGO.
Opake Cornea.
8. GLAUCOSIS.
Humoral Opacity.

9. P. CATARRACTA. *Cataract.*
10. SYNIZESIS. *Closed Pupil.*
11. AMAUROSIS. *Drop Serene.*
12. STAPHYLOMA. *Protuberant Eye.*
13. STRABISMUS. *Squinting.*

GEN. II. PARACUSIS.

Morbid Hearing.

SPEC. 1. P. ACRIS. *Acute Hearing.*
2. OBTUSA. *Hardness of Hearing.*
3. PERVERSA. *Perverse Hearing.*
4. DUPLICATA. *Double Hearing.*
5. ILLUSORIA. *Imaginary Sounds.*
6. SURDITAS. *Deafness.*

GEN. III. PAROSMIS.

Morbid Smell.

SPEC. 1. P. ACRIS. *Acute Smell.*
2. OBTUSA. *Obtuse Smell.*
3. EXPERS. *Want of Smell.*

GEN. IV. PARAGEUSIS.

Morbid Taste.

SPEC. 1. P. ACUTA. *Acute Taste.*
2. OBTUSA. *Obtuse Taste.*
3. EXPERS. *Want of Taste.*

GEN. V. PARAPSIS.

Morbid Touch.

SPEC. 1. P. ACRIS. *Acute Sense of Touch or general Feeling.*
2. EXPERS. *Insensibility of Touch or general Feeling.*
3. ILLUSORIA. *Illusory Sense of Touch or general Feeling.*

GEN. VI. NEURALGIA.

Nerve-ache.

SPEC. 1. N. FACIEI. *Nerve-ache of the Face.*
2. PEDIS. *Nerve-ache of the Foot.*
3. MAMMÆ. *Nerve-ache of the Breast.*

ORD. III. CINETICA.

AFFECTING THE MUSCLES.

GEN. I. ENTASIA.

Constrictive Spasm.

SPEC. 1. E. PRIAPISMUS. *Priapism.*
2. LOXIA. *Wry Neck.*
3. ATRICULARIS. *Muscular Stiff-joint.*
4. SYSTREMMA. *Cramp.*
5. TRISMUS. *Locked-jaw.*
6. TETANUS. *Tetanus.*

7. E. LYSSA.
Rabies. Canine Madness.
8. ACROTISMUS.
Suppressed Pulse.

GEN. II. CLONUS.

Clonic Spasm.

SPEC. 1. C. SINGULTUS.
Hiccough.
2. STERNUTATIO.
Sneezing.
3. PALPITATIO.
Palpitation.
4. NICTITATIO.
Twinkling of the Eye-lids.
5. SUBSULTUS.
Twitching of the Tendons.
6. PANDICULATIO.
Stretching.

GEN. III. SYNCLONUS.

Synclonic Spasm.

SPEC. 1. S. TREMOR.
Trembling.
2. CHOREA.
St. Vitus's Dance.
3. BALLISMUS.
Shaking Palsy.
4. RAPHANIA.
Raphania
5. BERIBERIA.
Barbiers.

ORD. IV. SYSTATICA.

AFFECTING SEVERAL OR ALL THE SENSORIAL POWERS SIMULTANEOUSLY.

GEN. I. AGRYPNIA.

Sleeplessness.

SPEC. 1. A. EXCITATA.
Irritative Wakefulness.
2. A. PERTÆSA.
Chronic Wakefulness.

GEN. II. DYSPHORIA.

Restlessness.

SPEC. 1. D. SIMPLEX.
Fidgets.
2. ANXIETAS.
Anxiety.

GEN. III. ANTIPATHIA.

Antipathy.

SPEC. 1. A. SENSILIS.
Sensile Antipathy.
2. INSENSILIS.
Insensile Antipathy.

GEN. IV. CEPHALÆA.

Head-Ache.

SPEC. 1. C. GRAVANS.
Stupid Head-ache.
2. INTENSA.
Chronic Head-ache.
3. HEMICRANIA.
Megrim.
4. PULSATILIS.
Throbbing Head-ache.
5. NAUSEOSA.
Sick-head-ache.

GEN. V. DINUS.

Dizziness.

SPEC. 1. D. VERTIGO.
Vertigo.

GEN. VI. SYNCOPE.

Syncope.

SPEC. 1. S. SIMPLEX.
Swooning.
2. RECURRENS.
Fainting-fit.

GEN. VII. SYSPASIA.

Comatose Spasm.

SPEC. 1. S. CONVULSIO.
Convulsion.
2. HYSTERIA.
Hysterics.
3. EPILEPSIA.
Epilepsy.

GEN. VIII. CARUS.

Torpor.

SPEC. 1. C. ASPHYXIA.
Asphyxy. Suspended Animation.
2. ECSTASIS.
Ecstasy.
3. CATALEPSIA.
Catalepsy.
4. LETHARGUS.
Lethargy.
5. APOPLEXIA.
Apoplexy.
6. PARALYSIS.
Palsy.

CLASS V. GENETICA.

DISEASES OF THE SEXUAL FUNCTION.

ORD. I. CENOTICA.

AFFECTING THE FLUIDS.

GEN. I. PARAMENIA.

Mis-menstruation.

SPEC. 1. P. OBSTRUCTIONIS.
Obstructed Menstruation.
2. DIFFICILIS.
Laborious Menstruation.
3. SUPERFLUA.
Excessive Menstruation.
4. ERRORIS.
Vicarious Menstruation.
5. CESSATIONIS.
Irregular cessation of the Menses.

GEN. II. LEUCORRHŒA.

Whites.

SPEC. 1. L. COMMUNIS.
Common Whites.
2. L. NABOTHI.
Labour-show.
3. SENESCENTIUM.
Whites of advanced Life.

GEN. III. BLENORRHŒA.

Gonorrhœa.

SPEC. 1. B. SIMPLEX.
Simple urethral Running.
2. LUODES.
Clap.
5. CHRONICA.
Gleet.

GEN. IV. SPERMORRHŒA.

Seminal Flux.

SPEC. 1. S. ENTONICA.
Entonic Seminal Flux.
2. ATONICA.
Atonic Seminal Flux.

GEN. V. GALACTIA.

Mislactation.

SPEC. 1. G. PRÆMATURA. *Premature Milk-Flow.*
2. DEFECTIVA. *Deficient Milk-Flow.*
3. DEPRAVATA. *Depraved Milk-Flow.*
4. ERRATICA. *Erratic Milk-Flow.*
5. VIRORUM. *Milk-Flow in Males.*

ORD. II. ORGASTICA.

AEFECTING THE ORGASM.

GEN. I. CHLOROSIS.

Green-Sickness.

SPEC. 1. C. ENTONICA. *Entonic Green-Sickness.*
2. ATONICA. *Antonic Green-Sickness.*

GEN. II. PRŒOTIA.

Genital Precocity.

SPEC. 1. P. MASCULINA. *Male Precocity.*
2. FEMININA. *Female Precocity.*

GEN. III. LAGNESIS.

Lust.

SPEC. 1. L. SALACITAS. *Salacity.*
2. FUROR. *Lascivious Madness.*

GEN. IV. AGENESIA.

Male Sterility.

SPEC. 1. A. IMPOTENS. *Male Impotency.*
2. DYSPERMIA. *Seminal Mis-emission*
3. INCONGRUA. *Copulative Incongruity.*

GEN. V. APHORIA.

Female Sterility. Barrenness.

SPEC. 1. A. IMPOTENS. *Barrenness of Impotency.*
2. PARAMENICA. *Barrenness of Mismenstruation.*
3. IMPERCITA. *Barrenness of Irrespondence.*
4. INCONGRUA. *Barrenness of Incongruity.*

GEN. VI. ÆDOPTOSIS.

Genital Prolapse.

SPEC. 1. A. UTERI. *Falling down of the Womb.*
2. VAGINÆ. *Prolapse of the Vagina.*
3. VESICÆ. *Prolapse of the Bladder.*
4. COMPLICATA. *Complicated Genital Prolapse.*
5. POLYPOSA. *Genital Excrescence.*

ORD. III. CARPOTICA.

AFFECTING THE IMPREGNATION.

GEN. I. PARACYESIS.

Morbid Pregnancy.

SPEC. 1. P. IRRITATIVA.
Constitutional derangement of Pregnancy.
2. UTERINA.
Local derangement of Pregnancy.
3. ABORTUS.
Abortion.

GEN. II. PARODYNIA.

Morbid Labour.

SPEC. 1. P. ATONICA.
Atonic Labour.
2. IMPLASTICA.
Unpliant Labour.
3. SYMPATHETICA.
Complicated Labour.
4. PERVERSA.
Preternatural Presentation.
5. P. AMORPHICA.
Impracticable Labour.
6. PLURALIS.
Multiplicate Labour.
7. SECUNDARIA.
Sequential Labour.

GEN. III. ECCYESIS.

Extra-uterine Fetation.

SPEC. 1. E. OVARIA.
Ovarian Exfetation.
2. TUBALIS.
Tubal Exfetation.
3. ABDOMINALIS.
Abdominal Exfetation.

GEN. IV. PSEUDOCYESIS.

Spurious Pregnancy.

SPEC. 1. P. MOLARIS.
Mole.
2. INANIS.
False Conception.

CLASS VI. ECCRITICA.

DISEASES OF THE EXCERNENT FUNCTION.

ORD. I. MESOTICA.

AFFECTING THE PARENCHYMA.

GEN. I. POLYSARCHIA.

Corpulency.

SPEC. 1. P. ADIPOSA.
Obesity

GEN. II. EMPHYMA.

Tumour.

SPEC. 1. E. SARCOMA.
Sarcomatous Tumour.
2. ENCYSTIS.
Encysted Tumour.
3. EXOSTOSIS.
Bony Tumour.

GEN. III. PAROSTIA.

Mis-ossification.

SPEC. 1. P. FRAGILIS.
Fragility of the Bones.
2. FLEXILIS.
Flexility of the Bones.

GEN. IV. CYRTOSIS.

Contortion of the Bones.

SPEC. 1. C. RHACHIA.
Rickets.
2. CRETINISMUS.
Cretinism.

GEN. V. OSTHEXIA.

Osthexy.

SPEC. 1. O. INFARCIENS.
Parenchymatous Osthexy.
2. IMPLEXA.
Vascular Osthexy

ORD. II. CATOTICA.

AFFECTING INTERNAL SURFACES.

GEN. I. HYDROPS.

Dropsy.

SPEC. 1. H. CELLULARIS.
Cellular Dropsy.
2. CAPITIS.
Dropsy of the Head.
3. SPINÆ.
Dropsy of the Spine.
4. THORACIS.
Dropsy of the Chest.
5. ABDOMINIS.
Dropsy of the Belly.
6. OVARII.
Dropsy of the Ovaries.
7. TUBALIS.
Dropsy of the Fallopian Tubes.
8. H. UTERI.
Dropsy of the Womb.
9. SCROTI.
Dropsy of the Scrotum.

GEN. II. EMPHYSEMA.

Inflation. Wind-Dropsy.

SPEC. 1. E. CELLULARE.
Cellular Inflation.
2. ABDOMINIS.
Tympany.

GEN. III. PARURIA.

Mismicturition.

SPEC. 1. P. INOPS.
Destitution of Urine.
2. RETENTIONIS.
Stoppage of Urine.
3. STILLATITIA.
Strangury.
4. MELLITA.
Saccharine Urine. Diabetes.
5. INCONTINENS.
Incontinence of Urine
6. INCOCTA.
Unassimilated Urine.
7. ERRATICA.
Erratic Urine.

GEN. IV. LITHIA.

Urinary Calculus.

SPEC. 1. L. RENALIS.
Renal Calculus.
2. VESICALIS.
Stone in the Bladder.

ORD. III. ACROTICA.

AFFECTING THE EXTERNAL SURFACE.

GEN. I. EPHIDROSIS.

Morbid Sweat.

SPEC. 1. E. PROFUSA.
Profuse Sweat.
2. CRUENTA.
Bloody Sweat.
3. PARTIALIS.
Partial Sweat.
4. DISCOLOR.
Coloured Sweat.
5. OLENS.
Scented Sweat.
6. ARENOSA.
Sandy Sweat.

GEN. II. EXANTHESIS.

Cutaneous Blush.

SPEC. 1. E. ROSEOLA.
Rose-Rash.

GEN. III. EXORMIA.

Papulous Skin.

SPEC. 1. E. STROPHULUS.
Gum-Rash.
2. LICHEN.
Lichenous-Rash.
3. PRURIGO.
Pruriginous-Rash.
4. MILIUM.
Millet-Rash.

GEN. IV. LEPIDOSIS.

Scale-Skin.

SPEC. 1. L. PITYRIASIS.
Dandriff.
2. LEPRIASIS.
Leprosy.
3. PSORIASIS.
Dry-Scall.
4. L. ICTHYIASIS.
Fish-Skin.

GEN. V. ECPHLYSIS.

Blains.

SPEC. 1. E. POMPHOLYX.
Water-blebs.
2. HERPES.*
Tetter.
3. RHYPIA.
Sordid Blain.
4. ECZEMA.
Heat Eruption.

GEN. VI. ECPYESIS.

Humid Scall.

SPEC. 1. E. IMPETIGO.
Running Scall.
2. PORRIGO.†
Scabby Scall.
3. ECTHYMA.
Papulous Scall.
4. SCABIES.
Itch.

GEN. II. MALIS.

Cutaneous Vermination.

SPEC. 1. M. PEDICULI.
Lousiness.
2. PULICIS.
Flea-bites.
3. ACARI.
Tick-Bite.
4. FILARIÆ.
Guinea Worm.
5. ŒSTRI.
Gad-fly Bite.
6. GORDII.
Hair Worm.

GEN. VIII. ECPHYMA.

Cutaneous Excrescence.

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* ♈ Shingles. ♂ Ring-worm.
† ☾ Scalled-head.

SPEC. 1. E. CARUNCULA.
Caruncle.
2. VERRUCA.
Wart.
3. CLAVUS.
Corn.
4. CALLUS.
Callus.

GEN. IX. TRICHOSIS.

Morbid Hair.

SPEC. 1. T. SETOSA.
Bristly Hair.
2. PLICA.
Matted Hair.
3. HIRSUTIES.
Extraneous Hair.
4. DISTRIX.
Forky Hair.
5. POLIOSIS.
Gray Hairs.
6. ATHRIX.
Baldness.
7. T. AREA.
Areated Hair.
8. DECOLOR.
Miscoloured Hair.

GEN X. EPICHROSIS.

Macular-Skin.

SPEC. 1. E. LEUCASMUS.
Veal Skin.
2. SPILUS.
Mole.
3. LENTICULA.
Freckles.
4. EPHELIS.
Sun-burn.
5. AURIGO.
Orange-Skin.
6. PŒCILIA.
Pye-balled-Skin.
7. ALPHOSIS.
Albino-Skin.

CLASS I.

PHYSIOLOGICAL PROEM.

THE first class of diseases that call for our attention, upon the physiological arrangement proposed in the present work, consists of those which primarily affect, or commence in, the digestive organs, and impede the digestive function. I say *primarily* affect or commence in these organs, because the same parts may be affected in a secondary manner, by sympathy or induction, in consequence of diseases that originate elsewhere, and which on this account do not belong to the present class. Of these, numerous examples will occur to us as we proceed.

Now in order to obtain a clear idea of the nature of the diseases before us, it is necessary to have a distinct knowledge of the organs which are the seat of them, and of the function which they embrace. To follow up this inquiry into a very minute detail, is the joint province of anatomy, physiology, and animal chemistry: and a finished practitioner must derive his information from these three sources collectively, pursued through an extent of many volumes. But for the purpose immediately before us, it may be sufficient to concentrate the subject, and to present a general and connected view of those parts of it which directly relate to the organs appropriated to the digestive process, constituting the field of diseases which the present class is designed to comprehend.

There is no animal function that displays a greater diversity of means for its performance than that of digestion; and perhaps the only point in which animals of all classes agree upon this subject, is in the possession of an internal canal or cavity of some kind or other, into which the food is introduced, and prepared for nutrition; an agreement which may be regarded as one of the leading features by which the animal structure is distinguished from the vegetable.

Let us, then, in the first place, trace this cavity as it exists in man and the more perfect animals; and next observe the organs that are supposed to be auxiliary to it, and the powers by which it accomplishes its important trust.

The alimentary cavity in man extends from the mouth through the whole range of the intestinal canal; and hence its different parts are of very different diameters. In the mouth, where it commences, it is comparatively wide; it contracts in the œsophagus; then again widens to form the stomach, and afterwards again contracts into the tube of the intestines. This tube itself is also of different diameters in different parts of its extent; and it is chiefly on this diversity of magnitude that anatomists have established its divisions. Its general length is five or six times that of the man himself; and, in children, not less than ten or twelve times, in consequence of their diminutive stature. In some animals it is imperforate, the dross of the food being rejected by the mouth. It is so occasionally in birds, and fishes; perhaps in the medical leech (hirudo *sanguisuga*, or *medicinalis*); though Cuvier,* in opposition to the assertion of Dumeril† and others, contend that it has a very small open anus. In zoophytes it is almost uniformly imperforate.

In man himself it is sometimes found imperforate on birth, with a preternatural outlet to supply the place of an anus in some neighbouring part or organ, as the bladder, in which case the feces have been discharged by the urethra; the vagina; the navel; or the groin. The most extraordinary instance of accommodation of this kind which I have ever met with in the collections of medical curiosities, is that of a girl who, from birth, was imperforate both in the anus, and meatus urinarius; in fact in the whole division of the vulva: and who to the age of fourteen, when the account was written, had regularly discharged her urine by the breasts after the manner of milk, and her feces by a natural vomiting or rejection from the stomach.‡

Generally speaking, the extent of the digestive cavity bears a relation to the nature of the aliments by which the individual is designed to be nourished. The less analogous these aliments are to the substance of the animal they are to recruit, the longer they must remain in the body to undergo the changes that are to assimilate them. Hence the intestinal tube of herbivorous animals is for the most part (for we still meet with exceptions) very long, or in particular portions very capacious; in various kinds very complicated, and often double or triple. Thus in the horse the large intestines are of an enormous size, and dilated into sacculi, while the cœcum is as capacious as the stomach. In the ruminant animals the stomach is not only peculiarly complicated, but often, as in the ram, twenty-seven times the length of the body. Carnivorous animals, on the contrary, have a short and straight canal; the food on which they feed, being already of their own nature, and containing a larger quantity of nourishment in a less bulk; and hence demanding a smaller proportion of time and space to become fit for use.

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* Leçons d' Anat. Comp. Sim. iv. p. 141.

† Zoologie Anatomique, p. 298.

‡ Samml. Med. Wahrnehmung. Band. viii. p. 29.

In this respect man maintains a medium between the two. His digestive canal is less capacious or complex than that of most mammals that feed on grass alone, yet more so than that of most mammals that feed on a diet of their own nature. Man is hence omnivorous; and is capable of subsisting on an aliment of either sort; and from the nature of his digestive, as well as of various other organs, is better qualified for every diversity of aliment and climate than any other animal. Thus many nations in a savage state live almost, perhaps altogether, on fruits and roots; as those of the yam, beet, and potatoe, the bread-fruit-tree, bread nut, (brosimum *alicastrum*,) sweet-chesnut, banana, cabbage-tree palm, (areca *oleracea*,) and meal-bark, (cycas *circinalis*.) Others live on raw animal flesh, or flesh of the coarsest kind, as that of one species at least of the walrus, (trichechus *Dudong*,) the sea-bear, and sea-calf. The Greenlander feeds voraciously on the skin and fins of the nord-capon, and on the flesh of whales. Many African tribes are said to live on dead lions, and hippopotami. Dogs are eaten in the South Sea Islands, horses in Tartary, and cats in many parts as a substitute for rabbits. Among numerous tribes of savages, indeed, the flesh of man himself is still dressed for food: the custom may have been more extensive formerly than in the present day, but it still prevails in several of the Australasian isles, and was not long since exhibited even in New Zealand; where the inhabitants are nevertheless peculiarly intelligent, and disposed to adopt the manners of Europeans. The Hindus subsist chiefly on rice and maize, and will not touch flesh of any kind; many tribes of wandering or nomadic Moors on gums, principally gum seneca; the Kamschadales, and the wretched inhabitants of the neighbouring shores, on fishes, or coarse fish-oil mixed into a paste with saw-dust, or the rasped fibres of indigenous plants. While the more polished and luxurious nations of Europe live on solid and liquid foods of every description. Yet it should not be forgotten, that even in this metropolis, and still more largely in Ireland, the only aliment subsisted upon in extensive and populous communities, whose poverty prevents them from obtaining any other, is the tubors of a species of night-shade, of only recent cultivation in this part of the world, but now known to every one under the name of potatoe.

Man, therefore, is omnivorous. But he is not the only omnivorous animal in the world; for the great Author of Nature is perpetually showing us that though he operates by general principles, he is in every instance the lord and not the slave of his own laws. And hence among quadrupeds the swine, and among insects the ant, (and more examples might be adduced if necessary,) possess as omnivorous a power as man himself, and feed equally on the fleshy parts of animals, and on grain, and the sweet juices of plants.

No animal, however, seems capable of deriving nutriment from any material that does not contain some portion of azote, which is an essential element of the animal body, and exists in it far more largely than in plants. It has often been made a question, whether

this abundance of azote is derived partly from the atmosphere by the process of respiration or absorption, or both; whether produced by the action of life itself; or whether obtained entirely from the different articles of food.

The experiments of M. Magendie, seem nearly to have determined this question; for on feeding animals of various kinds on substances that contain no sensible portion of azote, as sugar, gum, olive-oil, and butter, together with distilled water, and confining them to this kind of diet, they gradually became atrophous and died. The secretions assumed the character of those of herbivorous animals; the food was digested, but the muscles were reduced to one sixth of their proper volume. It is singular that all the animals before death exhibited an ulcer in the cornea; which sometimes spread through the membrane, so that the humours of the eye were emptied.

Upon the whole, we may observe, that the general length of the alimentary canal is greater in mammals than in the subordinate classes. It diminishes successively in birds, amphibials, and fishes, being in some fishes even shorter than the body itself, which is never the case in the first three classes: and in insects and worms is so diversified, as almost to bid defiance to any kind of scientific arrangement; being in many instances short and narrow, as in the leech; and in others, as proper hydatids and infusory worms, constituting the globular membrane in which the entire structure of the animal consists.

Attached to the cheeks, in some quadrupeds, as the monkey and marmot tribes, is a pouch or pocket, which conveniently holds their spare food, or enables them to convey it to their winter hoards.

The mouth, as is well known, communicates with the stomach by the strong, narrow and fleshy canal, denominated the œsophagus or gullet. This in quadrupeds, but not in man, is strongly muscular, and in many animals so dilatable as to enable them to swallow animals much larger than themselves. We have not time to follow up these playful diversities of nature; and must confine ourselves to a brief glance at the general structure of the human stomach to which the œsophagus conducts. This is situated on the left side of the diaphragm or midriff; in its figure it resembles the pouch of a bag-pipe; its left end is most capacious; its upper side is concave, and its lower convex; the two orifices for receiving and discharging the food are situated in the upper part. In its substance it consists of three principal coats or layers, the external and internal of which are membranous, and the middle muscular. The internal coat, moreover, is lined with a villous or downy apparatus, and is extremely convoluted or wrinkled; the wrinkles increasing in size as the diameter of the stomach contracts. In its adult state it will commonly contain three pints or rather more. In the more perfect classes of animals, the line of the larger intestines is distinctly bounded from that of the smaller by a muscular valve, formed jointly of the coats of the colon and the ileum by a short natural

intro-susception of the terminating portion of the latter into the commencing portion of the former; the important use of which is to moderate the flow of the contents of the smaller intestines into the latter, and to prohibit a regurgitation of feces into the former. And hence we never meet with fecal matter in the stomach, except in cases in which this valve or sphincter has lost the whole or a considerable portion of its muscular power. In the hedge-hog, and several other quadrupeds, the valve of the colon does not exist: and in a few others, as the sloth and armadillo, the cœcum is wanting. In birds the rectum, at the termination of its canal, forms an oval or elongated pouch, called *bursa Fabricii*, from the name of its discoverer; and then expands into a cavity, which has been named cloaca, from its receiving the extremities of the ureters and genital organs and their secretions; so that the fluids from all these are discharged from one common emunctory. The same mechanism is extended to a few quadrupeds, as the ornithorhynchus *paradoxus*, and the hystrix: the penis of the male, and the horns of the uterus in the female being equally lodged in its interior.*

Contributory to the function of digestion which is performed in the stomach, and the parts of the alimentary canal which immediately adjoin it, are several organs which surround it, and are connected with it in a peculiar manner. Of these the chief are the pancreas, the liver, the spleen, and the omentum. The two last are less constantly found in the animal kingdom than the liver, to which they are by many physiologists supposed to be subservient. They generally become more obscure or diminish in size from quadrupeds to fishes: a remark that will equally apply to the pancreas, which upon the whole disappears sooner than the spleen. It is found in the shark and the skate: but in other fishes its place seems to be occupied and supplied by the cœcal appendices or pyloric cœca, which afford a copious secretion analogous to the pancreatic liquor.

The largest and most important of all these organs is the liver, which is consequently the seat of a great variety of diseases, and appears to produce a very powerful effect on the blood itself, by a removal of several of its principles, independently of its office as a digestive organ. It descends, under some modification or other, from man to the class of worms; and in the snail and several other gasteropodous moluscæ is comparatively very large: but in various kinds is destitute of a gall-bladder, as well among quadrupeds, as birds, fishes and worms: though this appendage seems to be common to all the amphibials, many of whom, as the salamander, have livers of great magnitude.

All these organs appear to co-operate in some way or other in the general process of digestion, though the peculiar effect produced by several of them is a subject of inquiry at the present moment.

The solid materials of the food are first masticated and moistened

* Phil. Trans. Sir E. Home, 1802, part I. and II

in the mouth and fauces, except when they are swallowed whole; and, in this state, are introduced into the stomach, by whose action they are converted into a homogeneous pulp or paste, which is called chyme; they are then in this pultaceous form introduced into the duodenum, and by an additional operation, transmuted into a fluid, for the most part of a milky appearance, denominated chyle; in which state they are absorbed or drank up voraciously by thousands and tens of thousands of little mouths of very minute vessels, which are sparingly, if at all found in the stomach, but which line the whole of the interior coating of the small intestines into which the stomach empties itself, and where they are excited by the flow of the fluid to the act of absorption. These vessels constitute a distinct part of the lymphatic system. From the milky appearance of their contents they are known by the name of lacteals: they anastomose or unite together gradually, and at length terminate in one common trunk, denominated the thoracic duct, which conveys the different streams thus collected from the alimentary canal, as well as from other parts of the body, to the sanguiferous system to be still further operated upon by the action of the heart and lungs.

The means by which the food is broken down into a pulp, after being received into the stomach, are various. In the first place, the muscular tunic of the stomach acts upon it by a slight contraction of its fibres; and, in connexion with a certain degree of pressure derived from the surrounding organs, produces, so far as this cause operates, a mechanical resolution. Secondly, the high temperature maintained in the stomach by the quantity of blood contained in the neighbouring viscera and sanguiferous vessels, gives it the benefit of accumulated heat, and so far produces a concoctive resolution. And thirdly, the stomach itself secretes and pours forth from the mouth of its minute arteries a very powerful solvent, which is by far the chief agent in the process, and thus effects a chemical resolution. In this manner the moistened and manducated food becomes converted into chyme. It then passes into the duodenum, and becomes mixed with the secretions poured into this organ from the pancreas, the liver, and the substance of the duodenum itself, and subject to their action; and hence its conversion into chyle.

Chyle, therefore, is obviously a very complicated fluid, and consists of the dissolved materials of the food and the juices poured forth from the salivary glands, the stomach, pancreas, duodenum, and liver. The several proportions of these juices have been variously estimated, though there can be no doubt that the general aggregate amounts to considerably more than the bulk of the aliment which they hold in solution.

The whole process of digestion, therefore, as it occurs in the human fabric, to which the description now given chiefly applies, consists of three acts, manducation, or chewing, chymifaction, and chylifaction. The entire course is generally run through in about three hours; and under certain states of the system, to which I shall

advert presently, almost as quickly as the food is swallowed. The most important of these three acts is that of chymifaction, or the part contributed by the stomach itself; and while this is taking place, both orifices of the organ are closed, and a degree of chilliness is often felt over the body, and particularly in persons of a weakly habit, in consequence of the demand which the stomach makes upon it for an auxiliary supply of heat to assist in the process which is taking place.

M. Magendie's experiments induce him to calculate, that a dog, upon an average, forms about six ounces of chyle every hour; to which no colouring matter in the intestines imparts a hue.*

"The drink," says Mr. Cruickshank, "taken into the stomach of a man, may be two pounds in twenty-four hours: the saliva swallowed may be one pound in the same period; the gastric juice, another; the pancreatic juice, another. The bile poured into the intestines, Haller supposes, about twenty-ounces, besides the fluid secreted through the whole length of the internal surfaces of the intestines."†

The intestinal secretion here alluded to, was estimated by baron Haller at eight pounds in the twenty-four hours: but M. Blumenbach regards this estimate as extravagant.‡

There are many substances which are so hard and intractable as to sustain the action of the digestive organs without any other change than that of being softened or otherwise partially affected, instead of being entirely subacted, and reduced to chyme or chyle. Such especially are the seeds of plants: and it is well worth observing, though it has not yet been noticed by physiologists, that while birds or other animals derive from this kind of food a very valuable nutriment, notwithstanding its passing through them without being completely digested, the seeds themselves that are thus acted upon, derive also a reciprocal benefit in many instances; and are hereby rendered more easily capable of expanding in the soil into which they are afterwards thrown as by accident, and have their productive power very greatly increased. The olive-tree has, till of late years, only been raised in the south of France by cuttings, or wild plants obtained from the woods. It was remarked by an attentive inhabitant of Marseilles, that when produced naturally, it is by means of kernels carried into the woods, and sown there by birds which had swallowed the olives. By the act of digestion, he further observed, these olives are deprived of their natural oil, and the kernels hence become permeable to the moisture of the earth; the dung of the bird at the same time serving for manure, and perhaps the soda which the dung contains, by combining with a portion of the oil that has escaped digestion, still further favouring germination. Following up this fact, a number of turkies were made by the

* Précis de Physiologie, vol. ii. 155.
† Cruickshank, Anat. of Absorb. Vessels, p. 106.
‡ Institut. Physiol. Sect. xxvii. p. 410.

experimenter to swallow ripe olives, the dung was collected containing the swallowed kernels, the whole was placed in a stratum of earth, and frequently watered. The kernels thus treated vegetated easily, and a number of young plants were procured. And in order to produce upon olives an effect similar to that experienced from the digestive power of the stomach, a quantity of them were afterwards macerated in an alkaline lixivium; they were then sown and proved highly productive.

Most of the plants found on coral islands, and in various other places, are propagated by the same means of passing through the digestive canal; and it is probable that the seeds of many of them are equally assisted by the same process. And even when they are completely disorganized and digested, the material to which their refuse is converted, and which, combined with the animal secretions that accompany it, is called dung, very powerfully contributes, as every one knows, to render the soil productive. So that, in the wisdom of Providence, animal digestion and vegetable fructification are equally dependent on each other, and are alternately causes and effects.

Considering the comparatively slender texture of the chief digesting organ, and the toughness and solidity of the substances it overcomes, it cannot appear surprising, that mankind should, at different times, have run into a variety of mistaken theories in accounting for its mode of action. Empedocles and Hippocrates supposed the food to become softened by a kind of putrefaction. Galen, whose doctrine descended to recent times, and was zealously supported by Grew and Santarelli, ascribed the effect to concoction produced, like the ripening and softening of fruits beneath a summer sun, by the high temperature of the stomach from causes I have just pointed out. Pringle and Macbride advocated the doctrine of fermentation, thus uniting the two causes of heat and putrefaction assigned by the Greek writers: while Borelli, Keil, and Pitcairn resolved the entire process into mechanical action, or trituration; thus making the muscular coating of the stomach an enormous mill-stone, which Dr. Pitcairn was extravagant enough to conceive ground down the food with a pressure equal to a weight of not less than a hundred and seventeen thousand pounds, assisted at the same time, in its gigantic labour, by an equal pressure derived from the surrounding muscles.

Each of these hypotheses, however, was encumbered with insuperable objections; and it is difficult to say which of them was most incompetent to explain the fact for which they were invented. Boerhaave endeavoured to give them force by interunion, and hence united the mechanical theory of pressure with the chemical theory of concoction; while Haller contended for the process of maceration; but still a something else was found wanting, and continued to be so, till Cheselden, in lucky hour, threw out the hint, for at first it was nothing more than a hint, of a menstruum secreted in some part of the digestive system: a hint, which was soon eagerly laid

hold of, and successfully followed up by Haller, Reaumur, Spallanzani, and other celebrated physiologists: and though Cheselden was mistaken in the peculiar fluid to which he ascribed the solvent energy, namely the saliva, still he led forward to the important fact; and the gastric juice was soon afterwards clearly detected, and its power incontrovertibly established.

This wonderful menstruum, the most active we are acquainted with in nature, is secreted, as I have already observed, by the capillary arteries that infinitesimally intersect the cellular texture of the stomach, and decussate each other in their ramifications. Mr. Cruickshank supposes the quantity of the fluid thus secreted to be about a pound in every twenty-four hours. Yet the quantity seems to vary very considerably according to the demand of the system, or the state of the stomach itself. In carnivorous birds, whose stomachs are membranous alone, and consequently whose food is chymified by the sole action of the gastric juice without any collateral assistance, or previous mastication, this fluid is secreted in a much larger abundance: as it is also in those who labour under that morbid state of the stomach which is called canine appetite, and will be distinguished in the present classification by the name of limosis *avens*; as likewise when, on recovery from a fever, or after long abstinence, the system is reduced to a state of great exhaustion, and a keen sense of hunger induces a desire to devour food voraciously, and almost perpetually.

When pure and in a healthy state, the gastric juice is a thin, transparent, and uninflammable fluid, of a weak saline taste, and destitute of smell. Generally speaking, it has a near resemblance in its external properties to the saliva, and is neither acid nor alkaline; though in these qualities it seems to vary more or less, not only in animals whose digestive organs are of a different structure from those of man, but even in the same animal under different circumstances. It may, however, be laid down as a common rule that, in *carnivorous* and *graminivorous* animals, possessing only a *single stomach*, this fluid is slightly acid, and colours blue vegetable juices red: in *omnivorous* animals, as man, whose food is composed of vegetable and animal materials indifferently, it is neutral; and in *graminivorous ruminating* animals, *with four stomachs*, and particularly in the adults of these kinds, it is slightly alkaline, and colours blue vegetable juices green.

This singular secretion has the peculiar property of coagulating milk, as well as all albuminous substances, which it also as completely dissolves; and hence the milk thrown up from the stomach of an infant shortly after sucking is always found in a curdled state. But the two grand and characteristic properties of the gastric juice, are its astonishing power of counteracting and correcting putrefaction, and of dissolving the toughest and most rigid substances in nature.

Of its antiseptic power abundant proofs may be adduced from every class of animals. Among mankind, and especially in civilized life, the food is usually eaten in a state of sweetness and fresh-

ness: but fashion and the luxurious desire of having it subacted and mellowed to our hands, tempt us to keep several kinds, as game and venison for example, as long as we can endure the smell. The wandering hordes of gypsies, however, and the inhabitants of various savage countries, and especially those about the mouth of the Orange River in Africa, carry this sort of luxury to a much higher pitch; for they seem to regard a fetor as a perfume, and value their food in proportion as it approaches putrefaction.

Now all these foods, whatever be the degree of their putridity, are equally restored to a state of sweetness by the action of the gastric juice, a short time after they have been introduced into the stomach. Dr. Fordyce made a variety of experiments in reference to this subject upon the dog; and found, in every instance, that the most putrid meat he could be made to swallow, was in a very short period deprived of its putrescency. We cannot therefore be surprized that crows, vultures, and hyenas, who find a pleasure in tainted flesh, should fatten upon so impure a diet; nor that the dunghill should have its courtiers, among insects, as well as the flower-garden.

The gastric juice has hence been employed as an antiseptic in a variety of cases out of the body. Spallanzani has ascertained that the gastric juice of the crow and the dog will preserve veal and mutton perfectly sweet, and without loss of weight, thirty-seven days in winter; whilst the same meats, immersed in water, emit a fetid smell as early as the seventh day, and by the thirtieth are resolved into a state of most offensive putridity.

Physicians and surgeons have, in like manner, availed themselves of this corrective quality; and have occasionally employed the gastric juice of various animals; internally, in cases of indigestion from a debilitated stomach; and, externally, as a check to gangrenes, and a stimulus to impotent and indolent ulcers. I do not know that this practice has hitherto taken place very largely in our own country, but it has been often resorted to on the Continent, especially in Italy and Switzerland, and in many cases with great success.

Yet the gastric juice is as remarkable for its solvent, as for its anti-putrescent property. Of this any industrious observer may satisfy himself by attending to the economy of digestion in many of our most common animals; but it has been most strikingly exemplified in the experiments of Reaumur, Spallanzani, and Stevens.* Pieces of the toughest meats, and of the hardest bones, inclosed in small perforated tin cases, to guard against all muscular action, were repeatedly, by the two former of these physiologists, thrust into the stomach of a buzzard. The meats were uniformly found diminished to three fourths of their bulk in the space of twenty-four hours, and reduced to slender threads; and the bones were wholly

* For Dr. Stevens's experiments, which were numerous and well conducted, see his Dissertatio Physiologica Inauguralis; or an analysis of it in Edin. Med. Comment. vol. v. p. 146.

digested either upon the first trial, or a few repetitions of it. The gastric juice of a dog dissolves ivory and the enamel of the teeth; that of a hen has been found to dissolve an onyx, and diminish a louis-d'or. And it is not many years ago that the handles of several clasp-knives were found half digested, and the blades blunted, in the stomach and intestines of a man who had some time before swallowed these substances out of hardihood, and at last died in one of the hospitals of this metropolis.

It is in consequence of this wonderful power, that the stomach is sometimes found in the extraordinary action of digesting its own self; and of exhibiting, when examined in dissection, various erosions in different parts of it, and especially about the upper half, into which the gastric juice is supposed to flow most freely. It was the opinion of Mr. John Hunter,* however, that such a fact can never take place except in cases of sudden death, when the stomach is in full health, and the gastric secretion, now just poured forth, is surrounded by a dead organ. For he argues plausibly, that the moment the stomach begins to be diseased, it ceases to secrete this fluid, at least in a state of perfect activity: and that so long as it is itself alive, it is capable, by its living principle, of counteracting the effect of this solvent power. It is true the stomach has been found thus eroded, in one or two cases, where death has followed after long general illness: but in such instances it is probable that the stomach itself had been free from the general disease, or not essentially affected by it.

It is only perhaps upon the principle here laid down by Mr. Hunter, that when the stomach is in a state of disease it ceases to secrete a gastric juice of full vigour and activity, that we can account for the existence of exotic worms and the larves of insects and other animals for a considerable period of time without destruction. Thus Collini gives an example of a lacerta *aquatica* found alive in the stomach two days after it had been swallowed.† Frogs and serpents have for a longer period of time been equally able to resist the action of the stomach; leeches swallowed unintentionally, in a draught of muddy water, have thriven and grown to an enormous size; the eggs and larves of various insects, and especially of the musca *cibaria*, and even of the spider, have been hatched or perfected in the stomach or intestines, and the kernels of plumb and cherry stones have germinated there; all which we shall have occasion to notice more at length when treating of invermination, and the diseases of the stomach.

Muscular action, however, to a certain extent, seems still requisite as an auxiliary in man, and even considerably more so in many animals, especially in graminivorous and granivorous birds.‡ I have

* Phil. Trans. 1772, vol. 62, p. 447.

† Journ. de Med. tom. li. p. 460.

‡ See Sir E. Home's articles, Phil. Trans. vol. xcvi. p. 357, xcvii. pp. 93, 139, c. p. 184, cxiii. p. 77.

already stated this as one cause of digestion: but M. Magendie has endeavoured to restore it to a much higher importance than fair and unequivocal experiments justify: for he asserts that what he calls *artificial digestion*, or that of alimentary substances mixed with the gastric juice, and exposed to the temperature of the stomach, does not succeed in reducing the food to a state of chyme. But this, admitting the fact, would only show us the use of a living principle, and its influence upon every organ, and the operation or function of every organ; and which cannot be imitated out of the body. The assertion, however, is only advanced upon the single authority of M. Montègre, whom we cannot allow to overthrow the experiments of Spallanzani, Reaumur, and later physiologists upon this subject.

There are some experiments of M. Magendie's own that seem to have been well-conducted, are extremely curious in their results, and offer a better ground for reliance. That in proof of the passive power of the stomach in the act of vomiting, has, indeed, been called in question, and controverted by one or two of his countrymen since; but it is nevertheless probably correct. It was in truth the opinion of Baron Haller, and more lately of Mr. J. Hunter. Fluids disappear from the stomach rapidly in whatever quantity they are introduced; a ligature in the pylorus does not in the least retard their vanishing: solids alone pass into the duodenum in a digested state. Alcohol augments the mucous secretion, produces contraction of the stomach, coagulates the albumen of which the stomach always contains a considerable portion, and is afterwards absorbed with great rapidity. If it contain foreign matters in solution, as in the form of wine, these are respectively separated from it in the stomach, and undergo, without disappearing suddenly, the same process as the solid aliment. Salts, however, are not separated from the menstruum in which they are dissolved, but with the fluid are absorbed or vanish rapidly. So that the stomach seems to have absorbents of great activity, which, however, can only imbibe fluids.*

So far, therefore, as the organ of the stomach is concerned in the digestive function, we have some insight into the process. But beyond this we have little or no knowledge whatever. We are totally unacquainted with the immediate part performed by the salivary glands, the pancreas, the liver, the spleen and the omentum. We have sufficient proof, indeed, that the secretions of the two former are possessed of a highly resolvent power, though considerably less than that of the gastric juice; and it is obvious that their joint amount must contribute to hold the food in solution: but we are altogether ignorant of the particular task assigned to either of these secretions, or the qualities in which they differ from each other. We have not much more information concerning the use of the bile, large as is the organ which secerns it in most animals, and common as this fluid is under some modification or other in all the classes.

* Precis Elementaire de Physiologie, 2 tom. 8vo, 1816, 1817, tom. ii. p. 90-130.

It is supposed to promote by its stimulus the peristaltic action of the intestines, and to separate the feculent matter of the food from the genuine chyle, and to complete its animalization: and it unquestionably gives to the feces their yellow colour. In a morbid state it changes its natural properties, and becomes black, green, albuminous or watery, insipid, acrid, or even acid and effervescing. In the sepia *officinalis*, or common cuttle-fish, it is said by Monro to be black; for he regards as bile the natural ink which this animal is well known to excrete when pursued by an enemy; and by which curious contrivance it renders the surrounding water turbid, and thus conceals itself and effects its escape. Cuvier, however, does not allow that the ink of the cuttle-fish is its bile, but regards it as a secretion peculiar to itself.

Yet cases have occurred in which the peristaltic action has been duly continued, and regular stools have been produced without any intermixture of bile, and even when there has been no gall-bladder, nor any duct leading from the liver into the duodenum. Sir Everard Home has given an example of this in a child,* who, however, did not appear to live long, but who seems rather to have died of a marasmus than of any intestinal affection. And from this fact, as well as from various others which we shall have occasion to notice hereafter,† this indefatigable physiologist conceives one of the offices of the bile to be that of converting mucus or the refuse matter of the chyle as it passes into the colon, into fat, which is absorbed and diffused over the system to promote its growth.

Of the action of the omentum and spleen we know nothing whatever. The first may possibly serve the purpose of lubricating the viscera to which it is attached; and the second appears to be an auxiliary to the liver. Various hypothesis, indeed, have been offered concerning their respective uses and by writers of great talents and authority. But they are to this day hypotheses and nothing more, and it is not worth while to detail them. The spleen, indeed, secretes no peculiar fluid except its own blood, which is of a dark livid colour, and coagulates with difficulty. It is even destitute of an excreting duct: and is said to have been, in some instances, extirpated without injury to the general health. It is not found in any tribes below the class of fishes. The ancients, who fancifully regarded the liver as the organ of sanguification from a mixture of the four principal humours of the body, supposed the spleen to be a reservoir for its redundancy of black bile, as they supposed the gall-bladder to be for its redundancy of yellow bile: and ascribed still more disorders to an exuberance of the former than of the latter.

The subject is highly interesting; but to pursue it further, and especially into that diversity of structure which the digestive organs present in almost all the different classes and orders, adapted, as it is

* Phil. Trans. year 1813, art. xxi.

† See Genus Enterolithus, Genus Polyscarcia, and Phys. Proem, to Class vi.

in each of them, with the most skilful attention, to the general economy of their nature, and the mode of life they are destined to lead, would occupy more space than we can spare, and carry us into the regions of general physiology. Enough has perhaps been said, and this is all that has been aimed at, to give a compendious view of the organs which form the seat of that class of idiopathic diseases with which the nosological system about to be unfolded commences, and consequently to enable the reader to follow up those diseases, with greater clearness and comprehension in their distinctive characters and descriptions.

I have limited the above remark to *idiopathic* diseases: and it is necessary the limitation should be attended to. For, from the intimate connexion which the organs of digestion maintain with other organs and sets of organs, there are few general complaints in which the first do not evince some *sympathetic* affection. This is particularly the case with the stomach, which in the opinion of Mr. John Hunter, is the seat and centre of universal sympathy, a doctrine which seems to be more generally acknowledged every day; and which appears to have been taught in France by M. de Bourdeu,* though with less caution, and from fewer premises, at the very time Mr. Hunter was teaching it in London.

Such sympathetic affections cannot fall within the range of the present class; but must necessarily appertain to those diseases, and divisions of diseases, under which they rank as peculiar symptoms, and which can only be removed by removing the idiopathic malady.

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* See his Thesis "An Omnes Corporis Partes digestioni opitulantur?" Paris, 1754.

CLASS I.

CLASS I.

CŒLIACA.

DISEASES OF THE DIGESTIVE FUNCTION.

ORDER I.

ENTERICA.

DISEASES AFFECTING THE ALIMENTARY CANAL.

II.

SPLANCHNICA.

DISEASES AFFECTING THE COLLATITIOUS VISCERA.

CLASS I.

CŒLIACA.

ORDER I.

ENTERICA.

Diseases affecting the Alimentary Canal.

DISQUIET OR DISEASED ACTION IN SOME PART OF THE PASSAGE FOR THE RECEPTION AND DETRITION OF FOOD.

THE diseases of the DIGESTIVE FUNCTION form the first class in the Nosological System about to be unfolded; and to these, from the Greek term ΚΟΙΛΙ'Α, "alvus," "venter," or "the lower belly," I have applied the classic name of CŒLIACA.

By an easy and natural arrangement, this class is divisible into two orders, the first embracing those disorders which affect the alimentary canal; and the second, those which affect the collatitious or auxiliary viscera. The former I have distinguished by the term ENTERICA, and the latter by the term SPLANCHNICA, both of which are Greek adjectives; the one being a derivation from ἔντερον, "intestinum," "alvus;" and the other from σπλαγχνον, "viscus," "a bowel, or entrail."

GENUS I.

ODONTIA.

PAIN, OR DERANGEMENT OF THE TEEEH OR THEIR INVOLUCRES.

THIS genus has by some writers been called odontalgia, and odaxismus. But as both these terms have been limited by other writers to a single species of the genus, that of odontia *dolorosa*, or tooth-

ache, in order to prevent confusion, I have ventured to give it the name under which it now appears ; derived from ὀδους, "a tooth," which, in fact, is the common root of all the terms, and is here preserved in its simplest form.

The involucres of the teeth are their gums, membranes, and sockets, or alveoli. The last, though an immediate apophysis of the jaw-bones, are rather to be regarded as an appurtenance of the teeth than of the bones from which they issue. They are altogether limited to the duration of the teeth, sprouting forth at their commencement, and carried away by absorption, on their decay or removal. They are also in every instance modelled by the shape of the teeth ; and, like the gums, participate in almost all their diseases.

The character of the present genus is purposely therefore made sufficiently general to embrace the disorders of these adjuncts of the teeth ; as well as of the teeth themselves : all which, as distinct species, may be conveniently arranged in the following order :

1.	ODONTIA DENTITIONIS	TEETHING.
2.	——— DOLOROSA.	TOOTH-ACHE.
3.	——— STUPORIS.	TOOTH-EDGE.
4.	——— DEFORMIS.	DEFORMITY OF THE TEETH.
5.	——— EDENTULA.	TOOTHLESSNESS.
6.	——— INCRUSTANS.	TARTAR OF THE TEETH.
7.	——— EXCRESCENS.	EXCRESCENT GUMS.

SPECIES I.

ODONTIA DENTITIONIS.

Teething.

IRRITATION FROM CUTTING THE TEETH.

Dr. Cullen did not allow dentition to enter into the list of diseases : but this is to suppose the process of teething to take place at all times, instead of only occasionally, with perfect ease, and without irritation of any kind. Wherever it occurs in this manner there is undoubtedly no disease ; and so far Dr. Cullen is correct. But in a very large number of cases, perhaps, in refined and intenerated society, in the larger number, there is not only disease, but, in many instances, disease of an alarming and fatal character—strik-

ingly severe in its progress and complicated in its symptoms. The organism of the *teeth*, indeed, is peculiarly distinguished by the following feature: that there is no other part of the human structure so brief in its duration; and none, with the exception of the uterus, so signalized by pain and inconvenience during its progress. Yet their mechanism, notwithstanding these evils, as I shall have occasion to observe presently, is most admirable. No effort of human wit has ever been able to improve upon it even in imagination, and no organ is more strikingly impressed with marks of supernal goodness and intelligence.

There are three periods of life in which dentition, or the breeding and cutting of teeth, uniformly takes place; in infancy, in boyhood, and adult age. Besides which, we meet with instances occasionally of a reproduction of teeth in advanced life. Each of these formations is accompanied with circumstances peculiar to itself; and, when attended with pain or morbid action of any kind, affords a distinct modification of the present species of disease, and consequently lays a foundation for the four following varieties:

α Lactentium. Milk teething.	Cutting the milk or shedding teeth.
β Puerilis. Permanent teething.	Cutting the second set or permanent teeth.
γ Adultorum. Adult teething.	Cutting the adult or wise teeth.
δ Senilium. Climacteric teething.	Cutting teeth in advanced life or old age.

Before we enter upon the symptoms of these varieties, it is necessary to give some explanation of the causes which produce them; or, in other words, to take a brief glance at the order and economy of dentition: in doing which the author must beg leave to copy, with some additions, from a passage to this effect already given in a note to his volume of Nosology.

As the jaw-bones of youth are both wider and longer than those of infancy, it is obvious that the teeth which are cut in the first year must be incapable of filling up the bony arch of the fourteenth. They might indeed have been so contrived as to grow in proportion to the increased range of the jaw-bones; but from their being extraneous bodies, this must have been a very complex process, while the very circumstance of their growth, and the internal change which must be continually taking place, would expose them to many more diseases than they are subject to at present.

A much simpler plan has been devised; and the teeth of man, as indeed of most animals, are composed of two distinct sets, differing both in number and structure: the first or smaller set consisting of ten for each jaw, which are cut between the ninth and twenty-fourth month after birth, shed between the seventh and fourteenth year, and from the period of their protrusion called milk-teeth;

and the second or larger set, consisting of fourteen, fifteen, or sixteen for each jaw, for they occasionally vary in number, which are cut progressively, upon the shedding of the first set, between the seventh or eighth, and the seventeenth or eighteenth year; and which from their continuing till old age, except in cases of accident or disease, are denominated permanent teeth. The farthest grinder on each side, however, is seldom cut so early as the eighteenth year—generally after the twentieth, and sometimes not till the thirtieth: on which account these teeth are denominated dentes *sapientiæ*, or teeth of wisdom.

The rudiments of all the first set, and of four belonging to each jaw of the second set, are produced in the fetus; and may be distinctly seen when it is about four months old. These rudiments consist of minute pulpy substances secreted in the body of the gums, progressively elongating to form their respective necks and fangs. They are severally surrounded by a peculiar membrane, and a bony process, which is denominated its alveolus or socket, that shoots up from the jaw-bone as the tooth advances. It accompanies its growth, and at first entirely surrounds it, in consequence of its being secreted and indurated with more rapidity than the dental pulp; by which admirable contrivance a firm support is given to the gums from the time of birth, and the infant is enabled to make a sufficient pressure for the purpose of sucking, without interfering with the form which the teeth, yet soft and amorphous, are destined gradually to assume. In due time, however, the alveolus yields in its upper surface, as the tooth, in consequence of the gradual elongation of its fang or fangs, is forced through, and cuts not only the socket but the gum: and when the first set, having answered its temporary purpose, has its fangs absorbed, and the body of each tooth is shed or cast out by the gums, the attendant sockets are equally absorbed and disappear at the same time.

This wonderful change begins to take place, as I have already observed, about the seventh year; at which time we possess far more teeth, including both the grown and the growing, than at any other period whatever: for we have in each jaw ten temporary teeth complete, ten incomplete to succeed them, and the two permanent grinders whose stamina were formed during fetal life, making not less than forty-four in the whole. The permanent teeth have separate sockets of their own; and in consequence of the prolongation of the jaw-bones, do not lie immediately under the corresponding shedding teeth, nor directly contribute to the process of shedding, which chiefly takes place in consequence of the absorption of the fangs and sockets of the temporary set, though their ascent contributes in some degree to the general process.

I have observed that the alveoli or sockets, though fixed upon the jaw-bones, and indeed issuing from them, are rather to be regarded as appendages of the teeth than of the bones from which they spring: that they participate in most of the diseases of the teeth, and are strictly coeval with them; sprouting forth on their origin,

modelled by their shape, and disappearing on their decay or removal. It is this disappearance, which is the work of absorption, that principally produces that change in the character of the face which peculiarly distinguishes the period of old age. It follows closely upon the loss of all the teeth; and when these have uniformly given way, and their respective sockets are no longer in existence, as not being wanted, the upper jaw becomes considerably diminished in its range, the under jaw reduced to a thin bone merely covered by the gums, and the roof of the mouth instead of being arched, is rendered almost flat. And from this loss of substance, which is nearly equal to an inch and a half in depth, the face becomes shortened, the cheeks wrinkled, and the chin projecting.

It is curious to observe how differently the teeth are situated in different animals. In the more perfect, they are placed in sockets in the jaw-bones, some of which are in many kinds rendered moveable, as the two fore-teeth of the lower jaw of the mus *maritimus*, or African rat, the largest species of the genus hitherto discovered. The same teeth are equally moveable in the kangaroo; and the hollow tusks or poisoning fangs of the rattle-snake, and other venomous serpents, are capable of depression or elevation at the option of the animal. In the lamprey and myxine, the teeth which are almost innumerable, are placed on the surface of the tongue; in the cancer genus in the stomach, where we likewise find them in the common ear-wig. In the cuttle-fish they are also placed in the middle or lower part of the body, two in number, and horny, and in their figure resemble the bill of a parrot. In the echinus, or sea hedge-hog, they are five in number, arranged around the opening of the under part of the shell, and being moveable by different muscles they form a very complete organ of mastication. In the aphrodita *aculeata*, or sea-mouse, they are fixed upon the proboscis, four in number, and are consequently extended or retracted with this organ at pleasure. The leech has three pointed cartilaginous teeth, which it is able to employ in the same way, and by means of which it draws blood freely.*

Whatever be the time in which teeth are generated and protruded, the process is often so gradual that little or no pain or other inconvenience is experienced, and consequently, under such circumstances, there is no disease. But I have already observed that there is often not only pain and irritation, and therefore disease, but in various instances, disease of a severe, complicated and alarming character. And it is to *dentition* under these circumstances that I am now about to direct the reader's attention.

It will readily be supposed, that the most violent symptoms of dentition are those produced under the first stage referred to in the preceding history, or during the growth and protrusion of the MILK or SHEDDING TEETH; for the system is then in its tenderest state of infancy, and prone to disorder from very slight causes of irritation.

* See for other peculiarities, Phil. Trans. Vol. LXXXIX. p. 237. XCI. p. 319.

The immediate cause of irritation in the present instance is the pressure of the teeth in the gum; and the degree of irritation depends upon the peculiar temperament of the child. As the teeth push forward, the superincumbent gum wastes in consequence of absorption, and is at last cut through, and the tooth makes its appearance. This pressure is not however uniformly exerted through the whole course of teething, but is divided into distinct periods or stages; as though the vital or instinctive principle, which is what we mean by nature, becomes exhausted by a certain extent of action, and then requires rest and a state of intermission. The first active stage of teething is usually about the third or fourth month of infancy, and constitutes what is called breeding the teeth, or the conversion of the pulpy rudiment, buried in the gum, and formed during fetal life, into a solid material, which at the same time shoots downwards, and gives to every tooth a neck or fang. The first and most usual symptom of this change is the looseness with which the infant grasps the nipple, and the frequency with which it lets go its hold, accompanied with fretfulness and crying, and succeeded by a copious discharge of saliva, the salivary glands partaking of the irritation of the gums. Next, the uneasiness of the gums is found to be relieved by the pressure of any hard substance upon them which benumbs their excited sensibility—and hence the child is pleased with having its gums rubbed with the fingers or a coral, or with a gold ring.

This last is perhaps the oldest method, and it may be the best: for the experiments of Dr. Chretien, of Montpellier, who has of late endeavoured to revive the old preparations of gold as a part of the materia medica, show sufficiently that this metal, in very slight quantities of some of its simplest forms, is peculiarly active, and a powerful exciter of those secretions which have a tendency to diminish irritation and subdue inflammatory action. He has proved before a committee of the Royal Academy of Sciences, at Paris, that friction of the tongue and gums with not more than four grains of powder of gold produces sometimes a copious ptyalism, sometimes abundant alvine evacuations, and sometimes profuse perspiration. Mr. Auzebi, however, dissuades from the use of friction by the finger or any other means, from an idea that the gum will hereby become more callous, and consequently more difficult to be cut through.* But, so far as I have observed, this idea is not supported by facts.

If the irritation become very considerable, the gums swell, the child grows still more fretful, and starts in its sleep; or, on awaking suddenly, there is heat, thirst, and other concomitants of pyrexy, with perhaps dullness or drowsiness; the bowels are affected, which is a useful symptom, and a rash appears on the skin, usually the *red-gum*, and if the irritation extend to the muscles of the chest,

* Traité d' Otontalgia, ou l'on présente un système nouveau sur l' origine et la formation des dents &c.—*Lyons.*

there is a dry and troublesome cough. It is the opinion of Dr. Withers, as given in his treatise on Asthma, that a cough, during dentition, never takes place, but from primary affection of the respiratory organs: yet I have often seen this effect produced as evidently from mere sympathy, as increased flow of saliva, or looseness of the bowels. In about ten days or a fortnight these symptoms subside; and though the infant may occasionally be teased with slight paroxysms of uneasiness, it generally passes on without much inconvenience till the arrival of the second stage, or period of cutting the teeth, which we may expect to take place between the seventh and the close of the ninth month, though sometimes this does not occur till a few months later.

This is the usual progress, but here, as in many other organs of the system, we sometimes meet with a singular precocity of action, and at other times with as extraordinary a hebetude; and hence while it is no uncommon thing for an infant to be born with several of its milk teeth already cut—a fact which has in various instances occurred to myself, and is specially noticed by Helwig* and other writers—on other occasions the milk teeth are found to be extremely tardy in their appearance, and in one instance are said not to have been protruded before the child was ten years old.†

It is an observation of Mr. Fox, that these premature teeth, which are usually the central incisors of the under jaw, are nothing more than the upper parts or crowns of teeth without the apparatus of fangs; that they have consequently a weak attachment to the gums, soon get loose, and produce a considerable inflammation in the mouth of the child, as well as great inconvenience to the mother:‡ and he recommends, accordingly, that they be immediately extracted. Speaking generally, this account is correct; but as there are instances in which teeth of this premature growth are possessed of fangs and are perfect, it is better to wait before we extract them, till some inconvenience arises which may call for their removal.

It is somewhat singular that the natural growth of the first set of teeth does not seem to be varied, at least according to any general rule, by the degree of strength of the infant; for weakly children often cut their teeth even more rapidly than those in robust health: though the reverse is perhaps more generally the case, and hence the stimulus of irritation in the process of dentition very nearly keeps pace with that of healthy vigour.

At this time the gum is often extremely sensible, and instead of being eased by the pressure of a hard substance, cannot endure the slightest touch. At the base it is florid and distended, but paler and whiter at the edge or upper part, and when the tooth is on the

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* Obs. 28.

† Eph. Nat. Cur. Dec. II. Ann. IV. Obs. 28.

‡ Hist. of the Teeth, p. 6.

point of protrusion, seems covered with a flat and whitish blister. The other symptoms are a repetition of those just described, with a scabby eruption about the lips or head, erythematic inflammation behind the ears, and occasionally spasmodic movements of the mouth and jaws, convulsions, or epilepsy.

The grand point is here to moderate the local irritation. A diarrhœa or full discharge of saliva does this naturally, and hence these are favourable symptoms. And if the former be too violent, or accompanied with griping, it should be merely corrected by magnesia or prepared chalk. If the bowels be confined, we must employ cooling laxatives; and the discharge of a small quantity of blood from the gums in the first stage, by lancing them, will often afford effectual relief. If the symptoms of oppression or spasmodic action be severe or incumbent, as drowsiness, difficulty of breathing, stertor, or irregular motion of the jaws, antimonial emetics and leeches should be had recourse to, and occasionally repeated; after which, blistering will be found useful behind the ears or on the back. And when the bowels have been thoroughly emptied, the use of anodynes may be allowed, and will generally prove highly serviceable; though they should be employed with great judgment, and never entrusted to nurses.

In the second stage, or when the teeth are on the point of protrusion, the lancet will often afford immediate relief, not by a discharge of blood, for the upper part of the gum is now become so thin and wasted that little or none will follow, but by giving a direct opening to the tooth, which will frequently make its appearance in the course of a few hours. In this stage, however, if we cannot at once cut down directly upon the tooth, the lancet had better be withheld, for we shall be certain of giving pain, though very uncertain of affording relief.

It is singular that the use of the lancet should be objected to so generally. The tooth is imprisoned by a membrane that surrounds it on a full stretch, and is hence in a state of inflammation. Lancing the gum, or rather the inflamed membrane below the gum, takes off the tension, and sets the tooth free. The pain is slight and transient, and by no means to be compared with the permanent uneasiness which the operation undertakes to relieve. It has been conceived that a tough indurated cicatrix will be formed if the divided edges of the gum should unite after the lancet has been applied. Yet in the spongy texture of this organ no such effect is found to follow; but, on the contrary, the recently united edges of the gum, as in all other parts, far more easily give way to the process of absorption than they would otherwise have done; by which means the passage of the tooth is facilitated.

As the erythematic inflammation, which occasionally takes place behind the ears, proves often useful as a revellent, it has also been found sometimes serviceable to imitate it by a friction with savin ointment, or other rubefacients. But I cannot advise that this or any other eruption, when produced naturally, should be suffered to

run its course without restraint: for I have often known them, to say nothing of the offensive appearance, become a worse evil than the original disorder. In this case they should unquestionably be exchanged for some other and more convenient discharge.

In cutting the SECOND OR PERMANENT SET OF TEETH, it is not often that much uneasiness is encountered: for, firstly, their progress is much slower than that of the shedding-teeth; and next, the constitution, with the acquisition of a greater degree of strength, is at this time become much less irritable. In a few cases, however, they push forward too rapidly, and urge the shedding teeth against the superincumbent gums so forcibly, as to excite considerable pain; and here a free application of the lancet affords the speediest and most efficacious relief. And not unfrequently the permanent teeth ascend with great irregularity, and press against the crown or fangs of those above them in erroneous directions; whence another source of considerable pain. In this case the best and indeed the only radical cure is to extract the upper or cutting tooth, and thus allow freedom to the under tooth to right itself.

In the formation, and especially in the cutting, of the third set or WISE TEETH, we ordinarily meet with a far more considerable degree of pain and inconvenience; and this too for many weeks, and the pain spreads by sympathy to the ear, which is often more affected than the tooth itself. Such is especially the case where the formation takes place late, and after the jaw-bones have ceased to grow, and the gum has become thick and callous; for we have here a want of sufficient room, and little power of enlarging it by absorption. In the upper jaw, moreover, the tooth on each side is frequently obliged to incline backward, by which means it presses on the anterior edge of the coronoid process in shutting the mouth, which causes an additional degree of uneasiness; while, in the lower jaw, some part of the tooth continues to lie hid under the coronoid process, and the portion of the gum that covers it, is perpetually liable to be squeezed by the tooth below, and the corresponding tooth in the jaw above. In this case nothing but a very free crucial opening will suffice; and often nothing but an excision of a very considerable piece of the callous gum: while there are other instances in which the evil can only be cured by removing the tooth itself.

We sometimes, though rarely, meet with playful attempts on the part of nature to reproduce TEETH AT A VERY LATE PERIOD OF LIFE, and after the permanent teeth have been lost by accident or natural decay.

This most commonly takes place between the sixty-third and the eighty-first year, or the interval which fills up the two grand climacteric years of the Greek physiologists; at which period the constitution appears occasionally to make an effort to repair other defects than lost teeth, on which we shall have occasion to

treat more at large, when describing that variety of atrophy, which in the present system is denominated climacteric.*

For the most part, the teeth, in this case, shoot forth irregularly, few in number, and without proper fangs; and even, where fangs are produced, without a renewal of sockets wherein to fasten. In consequence of which they are often loose, rarely of much service, and frequently more injurious than useful, by interfering with the uniform line of the indurated and callous gums, which, for many years perhaps, had been employed as a substitute for the teeth. There is a case of this kind related by Dr. Bisset, of Knayton, in which the patient, a female in her ninety-eighth year, cut twelve molar teeth mostly in the lower jaw, four of which were thrown out soon afterwards, while the rest at the time of examination were found more or less loose.†

In one instance, though never more than in one, Mr. John Hunter informs us,‡ that he was a witness to the reproduction of a complete set in both jaws, apparently with a renewal of their sockets. "From which circumstance," says he, "and another that sometimes happens to women at this age, it should appear that there is some effort in nature to renew the body at that time."

He alludes to a restoration of the catamenia, and to the climacteric change, which, as already hinted, we shall have occasion to notice hereafter. The author of this work once attended a lady in the country, who cut several straggling teeth at the age of seventy-four; and at the same time recovered such an acuteness of vision as to throw away her spectacles, which she had made use of for twenty years, and to be able to read with ease the smallest print of the newspapers. In another case that occurred to him, a lady of seventy-six, mother of the late Henry Hughes, Esq. printer of the Journals of the House of Commons, cut two molares, and at the same time completely recovered her hearing, after having for some years been so deaf as to be obliged to feel the clapper of a small hand-bell, which was always kept by her, in order to determine whether it was rung or not.

The German Ephemerides contain numerous examples of the same kind; in some of which, teeth are related to have been produced at the advanced age of ninety, a hundred, and even a hundred and twenty. I have observed, in the volume of Nosology, that one of the most singular instances on record is that given by Dr. Slade in the Philosophical Transactions,§ as it occurred to his father; who, at the age of seventy-five, reproduced an incisor lost twenty-five years before; and at seventy-seven reproduced another to supply a similar vacancy, so that at eighty he had hereby a

* See Class II. Ord. IV. Gen. III. Spec. I.
† Edin. Med. Comment. Vol. VIII. p. 373.
‡ Nat. Hist. of the Teeth.
§ Vol. XXVII. year 1713.

perfect row of teeth in both jaws. At eighty-two they all dropped out successively; two years afterwards they were all successively renewed, so that at eighty-five he had once more an entire set. His hair at the same time changed from a white to a dark hue; and his constitution seemed in some degree more healthy and vigorous. He died suddenly at the age of ninety-nine or a hundred.

Sometimes these teeth are reproduced with wonderful rapidity; but, in such cases, with very great pain, from the callosity of the gums through which they have to force themselves. The Edinburgh Medical Commentaries* supply us with an instance of this kind. The individual was in his sixty-first year and altogether toothless. At this period his gums and jaw-bones became painful, and the pain was at length excruciating. But within the space of twenty-one days from its commencement both jaws were furnished with a new set of teeth, complete in number.

The jugglers on the continent, a century or two ago, were in the habit of taking advantage of this occasional playfulness of nature, and offering as natural phenomena in the formation of teeth, singularities which nature never dreamed of. Thus a boy was at times started, and hawked about the country with a golden tooth, much to the astonishment of both the learned and the unlearned; for though the tooth was in reality a natural one, and only covered over with an inlay of gold, yet the gilding was in one or two instances so exquisitely effected, as to deceive almost every spectator, when the trick was first brought forward, and to lay a foundation for no small number of learned descriptions and profound explanations upon the subject, which have still an existence in the Journal de Sçavans, and the pages of many other distinguished works of the day.†

SPECIES II.

ODONTIA DOLOROSA.

Tooth-Ache.

ACUTE PAIN IN THE TEETH OR THEIR INVOLUCRES.

THERE is often a considerable degree of pain of a particular kind that accompanies the irritation of the last species: but it is rarely,

* Vol. III. p. 105.

† Horstius, De Aureo Dente Lips. 1695, 8vo. Ingolstetter, De Aureo Dente Silesiaci Pueri, Lips. 1695, 8vo. Tylkobsky, Disquisitio duorum Puerorum, unus cum Dente Aureo, alter cum capite giganteo in Lituania visus. Olivæ, 12mo

if ever, of an acute character; and is rather a sense of soreness about the tooth, than an ache within it: and hence the definitions now offered are sufficiently distinct.

Pain of this kind may be produced by various causes, as a catarrh, or cold; an exostosis or deposit of ossific matter on the sides of a tooth or its socket; a caries or decay; a peculiar affection of the nerves of the sockets or jaw-bone, acting upon a tooth by contiguous sympathy, and hence not relieved by extracting the tooth that is suspected. It may be produced also by some remote influence, as that of pregnancy, or sordes in the stomach; by a peculiar diathesis, as that of rheumatism or scurvy; or whatever else tends to render the state of the fluids acrimonious, as a long use of mercury; or by a transfer of action, as in some cases of gout, in which the pain is often most vehement and agonizing; in various instances has produced convulsions,* and in others delirium;† or, in the language of the sufferers themselves, has actually driven them mad. In several of these cases, it is obvious, that it occurs as a mere symptom of some other disease; and can only be cured by a removal of the disease that gives rise to it. The following varieties, however, seem well worth attending to, and will generally be found to result from a primary affection:

α Catarrhalis. Catarrhal tooth-ache.	From cold.
β Cariosa. Carious tooth-ache.	From decay or caries.
γ Exostosa. Nodose tooth-ache.	From ossific deposit.
δ Nervorum. Nervous tooth-ache.	From irritability of the dental or adjoining nerves.

Every tooth has an internal cavity which commences at the point of its fang, and enlarges as it ascends into its body. This cavity is not cellular or rugged, but smooth on its surface: it contains no marrow, but appears to be filled with blood-vessels, accompanied with nerves, which must necessarily be derived from the second and third branches of the fifth pair, though they have never been distinctly traced. In the interior of this cavity the teeth appear to be peculiarly sensible; and hence direct or indirect EXPOSURE TO THE EXTERNAL AIR; or, in other words, a carious opening, or a current of sharp air without such opening, (for the air seems in many instances to act through the substance of a sound tooth,) will produce acute pain, and is, in fact, the common cause of tooth-ache. The pain thus produced will sometimes cease very suddenly, and especially upon the application of an opiate, or some acrid essential oil. But the irritation is often communicated to the periosteum of

* Velschius, Episagm. 16.
† Hoachstetter, Dec. ix. Obs. 3.

the tooth, and thence to the membrane that lines the socket which is only a duplicature of it. And hence, the pain will often become permanent from inflammation excited in these tunics, now thickened and tense, and at the same time incapable of relieving themselves by stretching. While, if a rheumatic or gouty diathesis prevail, the pain may become intermittent or periodical.

In all these cases, wherever we can trace in the tooth a hole opening externally, the readiest and most effectual modes of cure will consist in stopping up the hole, with a metallic or some other substance, so as to defend the tooth from the access of cold; or in destroying the affected nerve by caustics, or cauteries introduced through the hole itself. The pain may also be occasionally diminished by the application of opium or the more acrid aromatic oils, especially that of cajeput, which is a distillation of the leaves of melaleuca *Leucadendron*, either directly to the nerve in the tooth or to the extremity of those nerves in the skin, which are branches of the same pair. These medicines act by exhausting the sensibility of the nerve: and it is hence that relief is procured by volatile alkalies, and rubefacients; or by a blister behind the ear of the affected side; by burning the edge of the helix of the ear; rubbing the cheeks with the cerambyx *moschatus*, which possesses a vesicatory power nearly equal to that of the lytta; holding brandy or hot water in the mouth; or applying the sedative juices of the lady-bird or coccinella *septem-punctata*, as well as that of several other insects, to the tooth or gums, after bruising them for this purpose between the thumb and fingers. The root of the peteveria *alliacea*, a very acrid and even caustic plant, is employed for the same purpose by the inhabitants of Jamaica, who put a small plug of it into the diseased cavity. It is vulgarly called guinea-hen-weed, from the fondness this animal manifests for it in the West Indies.*

So the mastication of various other aromatic or stimulating plants will often produce a similar effect, and especially those that at the same time rouse the ducts of the salival glands to increased action, as the bulbs of the alliaceous plants, the root of several of the seselis, particularly the seseli *vulgare*, the common hartwort, or laserpitium *siler*, Linn. which has long been celebrated both as a sialagogue, and a remedy for the tooth-ache.

Such masticatories, however, are chiefly of use in the tooth-ache produced by rheumatism, or where congestion has taken place in the neighbouring parts from inflammation of any other kind. The sensibility of the nerves may hereby, indeed, be in some degree exhausted, but it is the evacuation that principally affords relief. And it is hence that relief is, also, not unfrequently obtained by smoking or chewing tobacco; and as Dr. Cullen conceives, by the use of camphor;† though it appears probable that both the camphor

* Trans. Stockh. Acad. 1644. p. 287.
† Mat. Med. Vol. II. p. 304.

and tobacco may partly operate by the sedative power they possess. And as errhines promote the same secretion as sialagogues, these have also been frequently employed with considerable success, as well in tooth-aches, as ophthalmias; in both which cases, however, preparations of asarum for some reason or other, have generally been found to produce more alleviation than those of tobacco, which is the basis of our common snuffs.

Electricity has also been tried, and occasionally with success. Magnetism, however, on the continent has been a more favourite remedy; and has, at least, more writers in its recommendation,* whatever be the actual benefit it may have produced, of which I cannot speak from personal knowledge. Animal magnetism seems at one time, indeed, to have been very extensively employed for this as well as for other severe pains; and if we may credit the writers of a century or a century and a half ago, with instant and specific effect.† The grand magnetiser of the day was the then celebrated Valentine Greatrake, who operated by stroking his hands over the part affected, much in the same manner as Mr. Perkins of America not many years ago employed his metallic tractors.‡ And, as strong emotions of the mind are well known to every one to produce a more immediate influence on the tooth-ache than on any other disease whatever, we may readily account for the cures hereby produced in some cases. Confident hope is as strong a stimulant as terror; and the latter is well known to operate so generally that it is a rare fact for a person to be actually suffering pain just before the operation of extraction.

The stopping of a carious opening in a tooth should only be attempted when there is no pain, for otherwise the pain will be increased by the introduction of a foreign body. The substances chiefly employed for this purpose are gum-lac, bees-wax, sealing-wax, tin, lead, and gold. The metals, and especially tin-foil, are amongst the most useful, as they afford the best guard, and far less frequently require to be renewed. Yet none of them can be easily retained in cases where the opening is wider at the top than the bottom; and although attempts have been made to keep them in the proper situation by drilling a small hole through the sides of the teeth, and riveting a proper pin into the metallic substance, they soon become loose, and admit air, food, and other acrimonious materials.

Mr. Fox makes mention of a compound metallic substance that had been recommended to him, as far better calculated to answer

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* De la Condamine, Journ. de Med. tom. xxvii. p. 265. Glaubrecht, Diss. Analecta de Odontalgia, ejusque remediis variis, præcipue Magneta. Argent. 1766. Teske, Neuer Versucht in Curirung, des Zanschmerzens vermittelst eines Magnatischen Stahls. Köingsb. 1765-6.

† Schelhammer. Diss. de Odontalgia tactû sedanda Jen. 1701.

‡ Stubbes—An account of several marvellous cures performed by the stroking of the hands of Valentine Greatrake. Lond. 1666. 4to.

the purpose of a permanent plug than any of the preceding. It is, he tells us, obtained by mixing several metals together, which, by the process made use of, become fluid at the temperature of boiling water; on which account it has been called fusible metal. It is supposed that this may in consequence be employed in a liquid state, and thus have an opportunity of striking, before it becomes cool, into all the ramifications of the carious part, so as to fill up the cavity completely, and form a fixture not easily to be detached. Whether the substance thus recommended to Mr. Fox were ever tried, he does not inform us, nor does he seem to have been acquainted with the proportions or even the kinds of the metals out of which the compound was elaborated.

It has often occurred to me, though I have never seen it tried, that some of the drying earths employed as cements by our stone-masons, that harden into on indissoluble plate or mass under water, might be used with more success for this purpose than any other substance; especially tufa or tuffwacke, as Schmeisser calls it, and tarras, which are compounds of iron, alumine, silex, and carbonate of lime. Introduced into the cavity of a carious tooth in the form of soft paste or mortar, they will easily dry and harden and adhere: and no moisture of the mouth will dissolve them.

If these methods should not succeed, we may attempt a cure by endeavouring to stupify the nerve of the tooth by a frequent use of hot essential oils intermixed with camphor and opium, or we may destroy it directly by a hot iron. And if these methods fail, the only alternative is extraction, which, however, should never be had recourse to till the above plans have been skilfully tried: for first, the pain may proceed from an affection of the socket, and in this case the pain of tooth-drawing will have been incurred for no purpose: and next, a carious tooth whose nerve has been destroyed or rendered torpid, may be of very essential service, as well as ornament for many years, perhaps through the whole of life. Yet if the caries be accompanied with inflammation in the surrounding parts, the tooth should be removed without loss of time; as the mischief may spread and the adjoining teeth may be wounded.

In extracting a tooth a very troublesome hemorrhage will occasionally follow: sometimes profuse and of long continuance. Plater, Schenck and others have, indeed, given cases in which it has proved fatal.* The best ordinary styptic is pressure with an elastic substance, as a piece of sponge covered with wax, touch-wood, spunk, or some other spongy boletus, or dossil of lint dipped in a strong solution of alum, or sulphuric acid. I was not long ago requested to see a young man, who had been profusely bleeding from the gums and socket of an extracted tooth for five days without cessation, and without sleep, till his wan cheeks and faint emaciated frame seemed to indicate that he had scarcely any blood left in his

* Plater, Obs. Libr. iii. p. 773. Schenck. Lib. 1. Obs. 403, 405, p. 99.

vessels. He was so weak as to be incapable of rising from his bed or taking food; and his stools, from the quantity of blood he was perpetually swallowing, had all the appearances of a melæna. On opening his mouth I found it crammed full of lint-wadding, one piece having every hour been added to another, without a removal of the preceding, less the hemorrhage should be increased; whilst the blood in which the wadding was soaked, and which had remained in the socket and over the gums for so long a period, was become grumous, putrid, and intolerably offensive.

I first removed the whole of this nauseating load from the patient's mouth, and gave him some warm brandy and water to wash it with. I next directed him to take a goblet of negus with a little biscuit sopped in it, a part of which he soon contrived to swallow. The bleeding still continued: but as I had no doubt that this proceeded entirely from a total want of power in the lacerated arteries to contract, I applied no pressure of any kind, but prescribed a gargle of equal parts of tincture of catechu and warm water: and I had the satisfaction to find that the hemorrhage diminished almost immediately, and entirely ceased in about half an hour, the mouths of the vessels having recovered their proper tone.

It is not easy to explain by what means teeth become carious. Out of the body they are indestructible except by very powerful chemical agents; and yet in the opinion of many physiologists, they are nearly in the same state in the body as out of it; extraneous substances formed complete at first, without vascularity, growth, or interstitial action, and even destitute of absorbents.

In caries of the bones, observes M. Auzebi, the carious part, in consequence of the oscillations of the vesssels in the sound part below, is thrown off, and gives place to a new growth. While, in the teeth, if the enamel be broken, and a caries commences, the carious part is never thrown off as in the bones, but continues its progress through the parts adjoining; nor can any remedy we know of produce a separation between the part that is sound and that which is unsound. And we have hence, says he, a proof that there are neither fibres nor vessels of any kind in the substance of the teeth, and that they have a distinct conformation from other bones.* Not widely different was the opinion of Mr. J. Hunter when composing his "Natural History of the Human Teeth," an opinion drawn from the impossibility of injecting them—the perfection in which they are produced at first, and their retaining their natural colour after so long a use of madder as a food, that all the other bones of the body have become thoroughly tinged with it. "But they have most certainly," says he, "a living principle, by which means they make part of the body; and are capable of uniting with any part of a living body; and it is to be observed, that affections of the whole body have less influence upon

* Traité d' Odontalgie, ou l'on presente un Systême nouveau sur l'origine et la formation des Dents, &c. *Lyons.*

the teeth than upon any other part of the body. Thus in children affected with the rickets, the teeth grow equally well as in health, though all the other bones are much affected; and hence their teeth being of a larger size in proportion to the other parts, their mouths are protuberant."

Admitting the soundness of these experiments, and the accuracy of this reasoning, it seems impossible that the teeth, when once perfectly produced in the gums, should ever decay: for no action of the living principle can occasion a secretion of those chemical agents, which would alone, in such case, be capable of destroying them. It is probable, therefore, that this reasoning is erroneous; that the teeth are vascular, though the art of injection is incapable of tracing the vascular structure, and that the colouring particles of madder root are not sufficiently attenuate to enter their vessels. Mr. Hunter himself, indeed, appears to speak with some degree of hesitation in the treatise before us; and in his subsequent treatise "On the Diseases of Teeth," offers observations that seem to show he had at that time embraced a different opinion. In the first essay, indeed, he allows, that "the fangs of teeth are liable to swellings, seemingly of the spina ventosa kind, like other bones;" but he immediately adds, that "there may be a deception here, for the swelling may be an original formation." Yet in the second essay, he treats of this swelling as one of the diseases to which the teeth are perpetually liable; he regards the teeth as subject to the common inflammation of other bones, and like other bones, evincing, at times, great sensibility through the entire substance of the organ, as well as in the central cavity itself. Nor is it quite certain that the body of a tooth does not occasionally enlarge as well as its fangs; for nothing is more common than for the space produced by extracting one of the grinders of a healthy adult, to be filled up by an approximation of the two adjoining teeth. Mr. Hunter, indeed, endeavours to account for this, by supposing that each of these teeth has been pressed into the vacancy by the teeth adjoining, in consequence of their want of a proper support in this direction; but in such case there must be some vacuity discoverable between themselves and the teeth which have thus urged them forward. In various cases, the present author has never been able to trace any such vacuity whatever; and has a decisive example to the contrary in the state of his own teeth: for having, when a boy of twelve years old, had the second of the bicuspidati extracted, the vacancy hereby produced has been so completely filled up by the enlargement of the adjoining teeth, that these teeth closely touch, and he is only able to introduce a fine probe between them at the neck, or lowest and narrowest part; while he can introduce nothing between any of the other teeth, which have in no respect given way or separated from each other.

There is probably, therefore, some internal action continually taking place, though we are not able to trace it very evidently. And it is probable, also, that a caries of the teeth is occasionally

produced by some internal cause operating upon and vitiating this action, though there can be no doubt that the chief causes are external. We have already noticed exposure to currents of cold air, and the medical practitioners of Germany and the north appeal to the opposite extreme, of the habitual use of hot aliments as a still more general and mischievous source of the same evil. In the Swedish *Amœntiates Academicæ*,* we have an elaborate examination of this subject by M. Ribe, who tells us, among other things, that "man is the only animal accustomed to hot foods, and almost the only animal affected with carious teeth." Whence the author takes occasion to condemn, in an especial manner, the custom of drinking hot tea and coffee. And, in accordance with this remark and recommendation, M. Tillæus, another celebrated writer in the same interesting journal, tells us from Kalm, in his paper entitled *Potus Theæ*, that the Indians of North America knew nothing of the inconvenience of carious teeth or debilitated stomachs, till tea was introduced among them. There can be no question that the two extremes of heat and cold must be greatly, perhaps equally, injurious to the health; and as little, that the inhabitants of high northern latitudes must suffer more than others from the use of hot aliments, in consequence of the greater coldness of their atmospherical temperature.

To the abuse of hot beverages as a cause of caries M. de la Salle adds, the abuse or excessive employment of sugar; and seems to imagine that these are the two principal means by which teeth are rendered black in their enamel, and carious in their substance.†

Now if sugar act at all, it must be by means of the principle of acidity which is contained in it; and consequently in proportion to the degree of affinity which this principle bears to the earthy matter, or calcareous basis of the teeth and their enamel, beyond that of the acids which enter into their natural composition. And the same may be observed in respect to any other exotic acid whatever.

If, then, we examine the composition of teeth chemically, we shall find that in their structure they consist almost entirely of carbonate of lime with a small proportion of animal matter, and a much smaller of phosphoric acid; and in their enamel, which is altogether of the nature of ivory, that they consist almost entirely of phosphate of lime with a small proportion of animal matter, and scarcely any, if any, carbonic acid whatever. And admitting that the same decompositions take place in an organized living structure, or a simply organized structure in a living frame, as when the principle of life has no concern; we have next to inquire whether there be any acids that have a stronger affinity for lime than the phosphoric, for it is scarcely necessary to extend our research to the carbonic, since this can never be attacked till the enamel into which the phosphoric so largely enters be decomposed, and withdraws its protection.

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* Vol. vii. Art. 136.

† Journ. de Med. tom. xxxviii. appx. p. 399.

Now, by examining the tables of elective attractions we shall find that there are four, and only four, acids that precede the phosphoric in their affinity for lime; the oxalic, sulphuric, tartaric, and succinic. And hence, although it is very probable that a tooth sound in itself, and soundly fixed in the gums, is not decomposed by the application of any given substance, as it is out of the body, yet we have daily proofs that that law of affinity in respect to several of these acids actually holds, and that the teeth, while in their living sockets, are greatly injured by their frequent or habitual use. I have at this moment a lady under my care, who till of late possessed as sound and fine a set of teeth as can any where be boasted of. From a peculiar delicacy of constitution, however, it has been judged requisite that she should, among other medicines, use a very large quantity of sulphuric acid. This prescription has been continued for many months, and her general health is considerably established: but owing to her not having taken all the precaution that is requisite to guard the teeth while swallowing the acid, the pearly enamel is becoming yellow, and its coating very considerably diminished in thickness, so that at the apex of the incisors, it is almost as thin as a razor, and is frequently chipping off. Whether, as she has now no longer an occasion to continue the sulphuric acid, and as the general substance of the teeth is sound, firm, and free from pain, the enamel, at her time of life, may be able to recover its healthy thickness and lustre, remains to be seen. If the principle of life really extend to the teeth and their enamel, and no injurious dentrifice be in the mean time made use of, nor any mischief derived from sudden exposure to great heat or cold, from the remarks already made on the occasional spreading of the substance of a tooth, it is probable that such an effect may take place.

If we apply these observations to the condiment of sugar, we can only infer that this material can have very little effect in destroying the enamel of a tooth. Sugar in itself, though it contain a principle of acidity, cannot with propriety be regarded as an acid. It may give forth this principle by fermentation, in which case it will form acetous acid; or it may give forth the same principle by distillation with nitric acid, when it will form genuine oxalic acid (for that which exists already formed in the oxalis *acetosella*, or wood-sorrell, is precisely of the same kind); and, in this combination, will evince a stronger attraction for lime than any other acid whatever. But of itself, and without this combination, we have no reason to suppose that its action, if there be action at all, can be otherwise than extremely weak. If, in truth, it were a solvent of calcareous matter of any kind, it would first show itself in dissolving, and, consequently, preventing a lodgment of the carbonate, or phosphate of lime which the salivary glands are so continually secreting, and which is perpetually incrusting on the neck of the teeth in mankind, and separating them from the surrounding gums; and hence sugar would be one of the best preservatives against such an encroachment. But as we do not find that those who use a large quantity of sugar are

freer from this excrementitious matter than those who abstain from it altogether, we have again no reason to suppose that it is a solvent of the enamel of the teeth in any degree worth attending to.

It will be well to bear these remarks in memory in the composition of dentrifices containing acids of any kind. For the reasons already assigned, the oxalic, sulphuric, and tartaric acids, ought at all times to be sedulously avoided: and hence cream of tartar, which enters so generally into their composition, should in like manner be rigidly proscribed: while those which have the least chance of doing mischief from their very slight affinity for lime, are the citric, benzoic, acetous, and boracic. Yet even these have a stronger attraction than the carbonic acid; and hence, whenever teeth are deprived of their enamel, or the naked fangs become exposed by a decay of the surrounding gums, these also must in like manner be abstained from.

By whatever means a decay or caries of the teeth may be produced, it appears to operate in three different ways; sometimes commencing in the internal cavity, and working its course outwards; sometimes commencing outwards, and working its course within; and sometimes by a wasting of the enamel, and consequent denudation of the bony part. The first is the least common affection, and is discoverable by an appearance of blackness within the whiter surface of the tooth; the third is often to be met with; but the second is the most frequent of the whole; evincing, at its commencement, the appearance of an opake white spot through the enamel, which gradually crumbles away about the spot, and thus discloses that part of the body of the tooth which forms the original seat of affection. The disease, by its continuance, converts the spot into a hole, and at length destroys the tooth altogether, or at least down to its neck, unless the pain produced by the morbid progress compel the patient to have it extracted before the disease advances thus far.

Caries of the teeth does not appear to be a disease of any particular age, or temperament, or state of health. It exists in infancy, and in the firmest manhood, as well as in old age. In the last, indeed, the teeth that drop out from absorption of their alveoli, are often as sound as when they were first formed: while in childhood it has spread from tooth to tooth so extensively, and at the same time produced so much torture, that it has been necessary to extract almost every tooth before the sixth or seventh year. Mr. John Hunter hence conceived that the decay of the teeth was rather a disease of early than of advanced life; and that the teeth did not become carious after fifty years of age. Mr. Fox, however, observes, that he has met with several persons, who had not only passed fifty years without having had a caries in this organ, but who had been obliged after having arrived at sixty to have several teeth extracted in consequence of tooth-ache produced by a caries. In some general diseases of the constitution the teeth seem to possess a singular degree of health and even luxuriance. Thus in phthisis it is almost

a proverbial remark, that white and pearly gloss of the enamel, which is peculiarly characteristic of soundness, is more than ordinarily clear and bright; while in rickets, in which the whole frame of the bones is shaken, and many of them become soft and spongy, the teeth ascend as firmly and as regularly as if the system were in a state of the most vigorous health.

From the structure of the teeth as just explained, there is no great difficulty in conceiving that, like other bones, they may be subject to EXOSTOSES, or a deposit of ossific matter on their surface, and particularly on the surface of their roots or fangs, from the secretion or conveyance of a larger portion of calcareous fluid than is needful. For however it may be doubted whether the crown or body of the teeth be possessed of secernents in a mature state, there can be no doubt of their possessing absorbents, since we behold their fangs, in very numerous instances, diminished, shortened, and truncated, and sometimes entirely carried away by the activity of absorbents, which it is difficult to conceive can belong to any adjoining organ. And we may lay it down as a general rule, that there is no organ in possession of absorbent vessels, which does not at the same time possess secernents so as to maintain a balance of action. All this we might pronounce proleptically: and what we might thus justly anticipate, we find to occur not unfrequently in fact. We find on extracting a tooth that has long been a cause of considerable pain, that the fangs at least are considerably encrusted with a deposit of ossific matter, so as to give it an appearance of that disease which was formerly but most incorrectly denominated a spina ventosa. And on examining the state of the alveoli after death, we find also that similar morbid apophyses have pullulated occasionally from the face of the alveoli.

Wherever such effects occur, whether in the alveoli or the teeth, a considerable degree of pain, and generally an increasing degree must be the result, from the pressure of the bony projections against the periosteum or alveolar membrane. At first this pain is not quite so acute as in carious or nervous tooth-ache, for the imprisoned tunic is not at this time in a state of irritation. But by a continuance of the pressure it is soon reduced to this state, when the pain will be as severe as on any other occasion, and far less mitigable.

Wherever we can satisfactorily decide upon the cause, and the complaint is recent, we may often put a check to it by a free application of leeches, and the local use of mercurial ointment, or a mercurial plaster. But in cases of long standing, the only cure is an extraction of the tooth; for even if the disease be seated in the socket, it will be instantly arrested by this process, as the substance of the socket, no longer of any use, will from this time be in a state of absorption, and be at length entirely removed.

There is sometimes, however, a PECULIAR IRRITABILITY IN THE NERVES OF THE TEETH themselves, or of those parts by which they are immediately surrounded, and with which they participate in action, that excites the sensation of severe and even agonizing tooth-

ache, without caries or any other concomitant. In this variety the exact seat of pain is less easily defined than in the preceding; and there being no black spot or other external mark to direct us to it, the tooth is often mistaken in the continuous sympathy excited, and a sound tooth is extracted in its stead; so that the torture remains unabated. And there are instances in which the plan of extraction has been followed up from tooth to tooth without any alleviation whatever, till the jaw has been entirely divested of its teeth on the disordered side.

There is often an idiopathic affection dependent upon a peculiar irritability, from a cause we cannot easily trace, of the nerves subservient to the aching tooth or the tunics by which it is covered, or the periosteum, or the fine membrane that lines the interior of the alveoli. But it is more frequently a disease of sympathy, produced by pregnancy, or chronic rheumatism, or acrimony in the stomach in persons of an irritable habit. For this remote or indirect influence it is not difficult to account, when we reflect that the great intercostal nerve, emphatically called the sympathetic, and connected by ramifications with every viscus of the chest and lower belly, is connected also, by its union with a branch of the fifth pair, with the nerves that immediately supply the teeth, and which hence become its indirect extremities.

It is still less to be wondered at that the nerves of the teeth should often associate in the maddening pain of neuralgia *faciei*, or tic douloureux, as the French writers have quaintly denominated it; for here the connexion is both direct and immediate. In consequence of this the patient, in most instances, regards the teeth themselves as the salient point of pain, (and they may unquestionably be so in some cases,) and rests his only hope of relief upon extraction, although, when he has applied to the operator, he is at a loss to fix upon any one tooth in particular. Mr. Fox gives a striking example of this in a person from whom he extirpated a stump which afforded little or no relief: in consequence of which his patient applied to him only two days afterwards, and requested the removal of several adjoining teeth which were perfectly sound. This he objected to, and suspecting the real nature of the disease, he immediately took him to Mr. Astley Cooper, who, by dividing the affected nerve, produced a radical cure in a few days.

Where the pain, therefore, proceeds from sympathy, it is of the utmost importance to trace it home to the organ idiopathically affected, for to this the attention should be chiefly directed. Where it exists as a primary disease, it is often of long duration, and difficult removal. Sometimes narcotics, and sometimes stimulants have been found most successful: blisters have occasionally relieved, and the burning of a little cone of moxa behind the ear, more frequently and more effectually. Where the pain is remittent or periodical, a free use of the bark with change of air has proved most salutary.

SPECIES III.

ODONTIA STUPORIS.

Tooth-edge.

TINGLING UNEASINESS OF THE TEETH FROM GRATING SOUNDS OR FRICTIONS.

THERE is sometimes a peculiar sensibility in the teeth or their sheaths that induce a kind of vibratory pain, in which they are colloquially said to be SET ON EDGE; and that in two ways, as follows:—

α A stridore. From jarring noises.
β Ab acritudine. From vellicative, or acrid substances.

In many cases the teeth sympathize with the ear, on an exposure to harsh, dissonant, or stridulous sounds, as the grating of a file, the creaking of a door on its hinges, or of a swinging-sign in the street. The same effect is produced whenever the teeth are vellicated by smooth substances, as a piece of silk or velvet, or exasperated by acid or other acrid materials.

To explain these effects it is necessary to observe, in the first place, that a close reciprocity of feeling is at all times maintained between the teeth and the tympanum of the ear, by an union of their respective nerves; as one of the branches of the seventh pair, destined to supply the tympanum, anastomoses with the lingual branch of the fifth, which sends offsets to the teeth: by which means the latter become indirectly an organ of sounds as well as of mastication. It is for this reason, among others, that deaf persons open their mouths to catch up speech they cannot otherwise hear; and that, as already observed, in cutting the wise, or adult teeth, the tympanum not unfrequently endures more pain than the gum or membrane by which the tooth is covered; and hence, too, the tuner of a musical instrument is often in the habit of applying his tuning pipe to his teeth as soon as he has put it into a state of vibration, to determine the more accurately upon its pitch.

Now as the last action is a source of pleasure to the teeth, from the vibrating tone proving agreeable to the ear, we can readily see why tones or sounds of any kind that are hateful to the ear should be hateful also to the teeth.

This is the general principle: and it is sufficient to explain why all persons are in a certain degree subject to the tooth-edge upon an exposure to the more common causes that produce it. But in constitutions of a peculiar kind, or where the ordinary association between the two organs has been specially and habitually cultivated, or some early and very powerful impression has been even acci-

dentally communicated from the one to the other, it is obvious that the sensation of tooth-edge will be produced far more frequently, and more acutely than in other cases. And it is equally obvious that when in such persons the teeth are in a state of preternatural sensibility from any kind of diseased action, or from irritating substances applied to them, as acerb or acid juices, the sensation may become so acute as to be intolerable. Bartholine has recorded a case in which the sharpening of a knife so highly excited, not the teeth only, but the surrounding gum, that, along with a very sensible jarring of the teeth, the last were thrown into a profuse hemorrhage,* being perhaps at this time in an inflamed or irritable state.

In many instances the power of the imagination alone, from a long habit of association, is sufficient to call up a very considerable degree of this painful feeling;† as when we see a knife drawn across a china-plate, though so gently as to produce no sound whatever: and there are instances of persons in a high degree of excitement, who, by this action alone, have been suddenly thrown into convulsions.

Where this affection is permanent or very frequent and troublesome, and proceeds from a morbid state of the teeth or their involucres, our attention must be particularly directed to the nature of the cause with a view to its removal: if the gums be inflamed, spongy, or otherwise irritable, scarification will often be found serviceable: and if the disease be seated in the body of the teeth, several of the remedies recommended under the preceding species may have an equally good effect in the present case. If it be a symptom of some other complaint, it can only be removed by a removal of the original disorder. Forestus,‡ Baricelli,§ and other writers assert, that relief may often be obtained by chewing purslane leaves: but it is a remedy I have never tried. When it is the mere result of an association of ideas, or of great strength of sympathy, with an ear delicately alive to harmony of sounds, it is best cured by an habitual exposure to the cause of affection which gradually blunts the feeling. The grating sound produced by filing a saw was probably at one time harsh and abhorrent to the ears of the sawyer; but by being inured to it, he at length hears it with indifference.

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* Epist. IV. p. 523.

† Darwin, Zoonom. sect. xvi. 10. and class iv. 1, 2, 3.

‡ Lib. xiv. Obs. 9.

§ Hortus Genialis, p. 337.

SPECIES IV.

ODONTIA DEFORMIS.

Deformity of the Teeth.

TEETH IRREGULAR IN SHAPE, POSITION, OR NUMBER.

Deformities of the teeth are for the most part produced naturally and in early life. Either set may be too large or too small, or some of them much larger or smaller than the rest, or they may be irregular in their line of ascent. They may be misplaced by incurvation, or procurvation, or obliquity. They may be crowded and confused, or, as has sometimes occurred, be multiplied in crops of double or triple rows.* In all which cases they cannot too soon become a subject of artificial arrangement, which in young persons may accomplish much, and often by skilful management, not only correct the error of shape or number, but give a proper inclination, not merely to the teeth, as they start from their natural line, but even to the mis-shapen sockets.

Many of these irregularities proceed from a natural excess or deficiency of the calcareous matter which enters into the structure of the teeth. This has been sometimes so defective as to leave the teeth cartilaginous, or possessed of their animal part alone: and in a few cases, as I have already observed, to retard the appearance of even the first or shedding set till ten or twelve years of age. But the opposite extreme is by far the most frequent; and where this exists in a considerable degree, we not only find occasionally all the irregularities already noticed as resulting from plurality, but sometimes a direct sympathis,† or inseparable union between the teeth and their sockets, so that it is impossible to extract them in the case of tooth-ache or any other malady without fracturing the socket: sometimes a perfect continuity or coalition between all the teeth,‡ insomuch, that in one instance the whole was found to constitute a single bone or curb of ivory.§ Then again, we sometimes meet with a production of teeth in other parts of the mouth than the gums, and particularly in the palate, of which examples are to be found in Schneck,‖ and Borelli,¶ as well as in several of the continental journals.

* Bloch, Medicinische Bemerkungen, p. 19. For others, see Nosolog. in loc.

† Cortois, Dentiste Observateur.

‡ Bartholin. Hist. Anat. Sent. i. Hist. 35. Henkel, Sammlung. Med. und Chir. Anmerkungen. vii. N. 16.

§ Schneck. libr. i. Obs. 412.

‖ Id. Obs. 411. ¶ Cent. ii Obs. 81.

Another cause of irregularity in the ascent of the permanent teeth, is an inaccordance of time or manner in the absorption of the fangs of the first set of teeth, and the protrusion of those of the second set. As the former fangs are thrown forth, the latter in all cases of regularity, are carried away: and hence the permanent teeth, pressed forward by the gradual prolongation of their fangs, bear before them the mere crowns of the shedding-teeth, and find little resistance to their ascent. And here I may again observe, that we have a proof of the existence as well of secernents as of absorbents in both sets of teeth. There can be no doubt that the fangs in both sets pullulate from the body of the teeth, but they can only pullulate by a process of secretion: and if the body of the teeth possess vessels of secretion, they must necessarily possess vessels of absorption. And, consequently, there ought to be as little doubt that the removal of the fangs is produced by the latter as that their germination is the work of the former. Now if the fangs of the upper set be not sufficiently carried off, or in other words, the crown of the teeth be not sufficiently detached and set at liberty, as the under set, or any particular teeth in the under set press forward, the latter must necessarily be thrown out of their proper line, and rise within, or without, or wherever they can force their way.

The second set of teeth are also wider than the first; and hence, with the exception of the biscuspidati, which from this very circumstance rise under the shedding molares, every single tooth in its ascent must be opposed to more than a single tooth above it; whence another source of difficulty and often of irregularity. In consequence of all which, it is rather to be wondered at that we do not meet with more frequent instances of deranged or mis-shapen teeth than actually occur to us. And nothing can be clearer than the necessity of a close and skilful watch over them during the shedding season, so as to remove any of the first set when they form an undue degree of resistance to the permanent, and have a tendency to throw them out of their proper line; and any of the second set that may exceed their proper number, and, by their surplus, crowd and misplace the rest.

SPECIES V.

ODONTIA EDENTULA.

Toothlessness.

LOSS, OR WANT OF TEETH.

This is also a very common affection, and offers the following varieties:

α Peculiaris.	From constitutional defect.
β A vi extrinseca.	From external violence.
γ A carie.	From decay.
δ Senilium.	From old age.

As the teeth are often produced supernumerously, so are they often naturally deficient in number. This is sometimes the case with the biscuspidati, as it is not uncommon to meet with a person in whom one, two, or more of these have never made their appearance. But it occurs more frequently in the incisors, particularly of the lower jaw: and Mr. Fox refers to an instance in which this defect appertained to several individuals of the same family, none of whom had ever cut the incisors of the lower jaw.

But the other varieties of cause are more obvious and common: being

Violence, by which they are suddenly misplaced, or knocked out:

Caries, or inflammation of the surrounding sheaths, by which they become loosened in their sockets: and

The natural absorption of their sockets in advanced life.

In many instances, therefore, the separated teeth are in a sound state; and, in a few instances, where the alveolus is also perfect, and the tooth has only been out of it for an hour or two, so that its living principle has not altogether ceased, it may be replaced, and will take a fresh hold, and become serviceable for many years; though it rarely, perhaps never, forms so firm and permanent an attachment as before the accident which threw it out.

Mr. John Hunter extended this mode of supply to a transplantation of teeth from other persons: and at one time this method also was carried to a considerable extent of practice. Too much caution, however, cannot be employed in ascertaining the health of the individual by whom the scion-tooth is to be furnished: for it is well known that syphilis, and it seems probable that some other diseases, may be transplanted at the same time. As an instructive case upon this subject I may refer to the following, drawn up by

Dr. Watson, and inserted in the Medical Transactions.* An incisor tooth of the upper jaw, from an unknown cause, becoming carious in a young unmarried lady about twenty-one years of age, it was extracted, and its place very dexterously supplied by a like tooth from another young woman, who upon examination for the purpose, appeared to be in good health. The scion-tooth very rapidly took a firm hold, and soon bid fair to be of great service and ornament. In about a month, however, the mouth became painful, the gums inflamed, discoloured, and ulcerated. The ulceration spread very fast, the gums of the upper jaw were corroded, and the alveoli left bare. Before the end of another month the ulceration stretched outwardly under the upper lip and nose, and inwardly to the cheeks and throat, which were corroded by large, deep, and fetid sores. The alveoli soon became carious, several of the teeth gradually dropped out, and at length the transplanted tooth which had hitherto remained firm in its place.

About this time blotches appeared in the face, neck, and various parts of the body, several of which became painful and extensive ulcers; a considerable degree of fever, apparently hectic, was excited; a copious and fetid discharge flowed from the mouth and throat which impeded sleep, and the soreness of the fauces prevented a sufficiency of nourishment from being swallowed.

The wisest plan would probably have been to have commenced from the first with a mercurial process before the system was so far debilitated, and the general health so deeply encroached upon, as to render any plan of very little use. An antiseptic course, however, of bark and other tonics was first tried and persevered in till found to be of no service whatever; and calomel pills in an alterative proportion were then had recourse to in their stead. This plan was found to soften every symptom, and totally to eradicate many: but the bowels were soon affected with severe pain and purging; and the calomel was exchanged for strong mercurial ointment; which, from the present debility of the patient soon produced a like effect, and an effect that could not be corrected by opium. The venomous taint or putrescent tendency, though occasionally driven back, as often rallied, and at length prevailed; and the patient fell a victim to it in the greatest distress and misery. The person from whom the tooth had been taken, had in the mean time continued in perfect health ; and upon a minute inspection, as well of the sexual organs as of the mouth, evinced not the slightest syphilitic affection.

The case is mysterious, and leaves much ground for the imagination to work upon. If it be difficult to conceive it to have been syphilitic, it is more difficult to conceive it to have been any thing else. But the grand lesson to be learnt from it on the present occasion is, that of the wariest caution, and a caution amounting al-

* Vol. iii. Art. xx.

most to a prohibition, in remedying a deficiency of teeth by transplantation.

Other cases might be advanced, but it is unnecessary. Mr. John Hunter, partial to his own invention, endeavoured to account for most of these, upon the principle of local irritation exciting remote evils, or universal sympathy. Yet the cases of mischief have been so severe and numerous that the practice has long fallen into great disrepute, and is now seldom ventured upon.

A transfer, however, of the mere crowns or bodies of sound teeth, with the fangs filed off, does not seem to have been productive of the same evil effects; and hence these may be conveniently made use of, when the body of one or more teeth has been destroyed by caries, while the fangs have remained sound: for by screwing a piece of gold wire into the crown of the scion-tooth, and boring a hole into the fang of the lost tooth, the former may be made to take a firm hold without any attachment to the adjoining teeth; and, if due care be taken in the selection, it will make the best match and produce the most perfect supply that human art can bestow.

When natural teeth are not employed, the dentist has recourse to artificial teeth commonly obtained from the tusk of the hippopotamus; though in order to obtain a greater durability, they have of late years been ingeniously formed of a composition of porcelain earth properly modelled and burnt.

SPECIES VI.

ODONTIA INCRUSTANS.

Tartar of the Teeth.

THE TEETH INCRUSTED WITH EXTRANEOUS MATTER.

The teeth are always subject to be covered over with layers of an earthy material secreted as a constituent part of the saliva, and denominated tartar.

Simple as this substance seems to be, no very clear explanation either of its origin or character has hitherto been given. According to Professor Berzelius, tartar, when it first settles on the teeth, is mere hardened mucus: "but during the destruction of the mucus," says he, "we insensibly trace phosphate of lime on the enamel of the tooth, which is sometimes increased to a crust of the thickness of from a fourth to the half of a line: and in this state it

contains, besides the phosphate, about a fifth part of its weight of mucus, which has been exsiccated in the earthy mass."*

Tartar of the teeth, therefore, as far as it has been analyzed, consists of concrete or dried saliva, hardened by its own earthy materials. As it flows from the salivary ducts, it is always found most accumulated around those teeth which are situated nearest to their openings. In some persons, however, the saliva is much more loaded with earthy materials than in others; for while some have very little trouble in keeping their teeth free from this deposit, in others it forms so copiously that nothing but an unremitted attention will preserve their teeth from being covered with it.

While this material continues soft, it has a yellowish appearance; but as it hardens, it changes to a dark brown or black; and often, in children, to a dark green. By degrees the teeth lose all their beauty to the eye, the gums are detached from their respective necks, are irritated, and inflamed; the alveolar processes of the teeth are exposed, absorption takes place, and the teeth become loosened: while the breath is loaded with a disagreeable fetor, from the decomposition of such a mass of animal matter. In some cases the accumulation has been so enormous as to cover the whole range of teeth, and unite them in a solid heap.†

It is almost superfluous to point out the necessity of attention to prevent so foul a disfigurement. The daily use of a tooth-brush with any of the ordinary tooth-powders will, however, in most cases be sufficient for this purpose. The basis of these powders is of little importance, provided they contain nothing that may injure the enamel of the teeth. Pulverized fish-shells, cuttle-fish-bone, boles, bark, myrrh, mastic, soot, and charcoal, may be used with equal advantage according to the fancy; and when an odour is wished for, it may be obtained from ambergris or orris-root. It is only necessary to observe, that the powder be innocent in its quality, and impalpable in its reduction.

If the tartar yield not to these, we may without mischief add a small quantity of some of the milder acids in order to render it more efficacious. All dentists oppose the use of acids of every kind; but this is from an inacquaintance with the gradation of chemical affinities. I have already observed that there are but four known acids for which the lime of the teeth has a stronger attraction than for the phosphoric with which it is combined; and these four are, the oxalic, sulphuric, tartaric, and succinic. From these, therefore, we ought sedulously to abstain; but most of the rest may be used very harmlessly, and will often be found, by the friction of a tooth-brush, to dissolve the tartar of the teeth without making the least impression upon their substance.

But if the deposit still bid defiance to our exertions, it must be

* Animal Chemistry, p. 62.

† Eustachius, Tract. de Dentibus, cap. xxix. Stoeller Beobachtungen, &c. N. 3.

removed by the operation of scaling; and the gums afterwards be washed with some pleasant astringent lotion.

SPECIES VII.

ODONTIA EXCRESCENS.

Excrescent Gums.

THE SUBSTANCE OF THE SURROUNDING GUMS EXCRESCENT.

Not only by the concrete deposit called tartar are the teeth occasionally incrusted and buried, but sometimes by a prurient growth of the substance of their own gums, which from different circumstances appears under the two following forms:—

α Spongiosa. Scurvy of the gums.	Fungous or spongy gums.
β Extuberans. Extuberant gums.	With distinct extuberances on the surface.

The gums sometimes assume a soft, fungous, or spongy appearance: and this too, as Mr. John Hunter has observed, in persons who are in all other respects perfectly well:* and this case, though vulgarly called a scurvy of the gums, is distinctly an idiopathic affection. It may however be symptomatic of dyspepsy or some other disorder of the stomach, or some equally remote organ; or the result of a morbid state of the alveoli, or teeth themselves; and unquestionably it may appear as a symptom of porphyra, or real scurvy, affecting the system generally.

If the craggy stump of a tooth be the source of irritation, it will be in vain to attempt a cure till the relic of the tooth be removed: and if the socket be in fault, it will be necessary to expose and examine it. But in all cases in which the disease originates in the gums, and depends upon a lax and debilitated state of their texture, scarification, freely and repeatedly made use of, will be the best, and, in many instances, the only remedy. It disgorges the overloaded vessels, and constringes and invigorates their fibres; and leads not more to immediate ease than to a radical cure. I have frequently found it necessary to follow up the scarification into the roof of the mouth, which often partakes of the irritation, and is puckered into wrinkles of exquisite tenderness, that cannot endure

* Diseases of the Teeth, ch. iii.

the slightest touch. After scarification, the gums and mouth should be washed with some warm and resinous tincture, as that of bark and myrrh; and be gradually accustomed to the friction of a tooth-brush, and some astringent tooth-powder, in the choice of which the patient may be allowed to please his own fancy; though perhaps the best are those prepared from several of the more astringent funguses, and especially the cynomorion *coccineum* of Linnéus, better known by the name of fungus *Mellitensis*. And if this plan be not sufficiently stimulant, it will be necessary to wash the mouth and gums with a very dilute solution of nitrate of silver; or to apply it with a pencil-brush to the gums alone in a much stronger state.

Where this variety is neglected, it will often spread deeply and widely, and be productive of severe and even fatal mischief: a striking example of which is given by Mr. Hill, in the Edinburgh Medical and Surgical Journal.* It succeeded to the extraction of a tooth in an athletic man, aged 52, who had some degree of uneasiness in the socket and adjoining parts for several weeks after the operation, but which gradually disappeared. At the distance of about two months, a puffiness was discovered in the cavity formed by the loss of the tooth, preceded by a sense of soreness in the roof of the mouth. The excrescence soon assumed the character of a bleeding fungus, spread very extensively towards the roof, and so much affected the patient's speech that it was difficult to understand him: at the same time the sublingual glands began to sympathize in the morbid action, to inflame and tumefy. At this period, "the mouth presented a spongy, bleeding fungous swelling, protruding the upper lip, and extending backwards to the centre of the ossa palati. The teeth on each side of the tumour were loose and divergent, appearing as though stuck in a thick jelly. The slightest handling of these parts produced a discharge of venous blood. I removed the loosened teeth, each of which brought away with it a large piece of fungus with the scalpel. I also removed the whole of this substance as clear as I could." This, however, was not sufficient. Though the bones did not at this time, on examination, appear diseased, both the maxilla and os palati became so soon afterwards, and portions of them were separated by Mr. Hey's circular saw. Still the disease held its ground: it was scotched, but not killed. Fresh and more extensive excrescences were protruded, and bid equal defiance to the knife and to various caustics. It does not appear, however, that the actual cautery was tried. "Feeling at length too feeble to labour, he suddenly adopted the resolution of retiring to his native place, as he said, to die." And truly enough he said. He retired into the country, and about three months afterwards, being less than a twelve-month from the attack, fell a sacrifice to pain, debility, and distress: at which time the tumour extended from the angle of the jaw to the top of the shoul-

* Edin. Med. and Surg. Journ. No. lxi.

der, surrounded by various others, one on each side of the nose, all moveable and elastic; the fungus on the gum filling the cavity of the mouth, rendering the speech inarticulate, and the poor sufferer's swallowing extremely difficult.

The extuberant excrescence which forms our second variety, is sometimes firm and unyielding, rising into distinct and hardened knobs instead of assuming the appearance of soft and spongy germinations. In these cases the general texture and consistence is that of the gums themselves: and the only radical cure consists in extirpating them by the knife, a ligature, or a caustic. Even after extirpation, however, they are very liable to grow again, and with great obstinacy and perseverance. Mr. J. Hunter mentions a case in which they were produced six times in succession; and here he suspected a cancerous disposition. They are also, in general, very largely supplied with blood-vessels of considerable magnitude, which often produce a troublesome hemorrhage after the operation. And on both these accounts a ligature or a caustic has usually been found a more convenient mode of excision than that of the scalpel.

GENUS II.

PTYALISMUS.

Ptyalism.

INVOLUNTARY FLOW OF SALIVA FROM THE MOUTH.

The saliva issues from three distinct sets of glands distributed over different parts of the mouth, as the parotid, the submaxillary, and the sublingual; and is a spumous and highly resolvent fluid, consisting of a large portion of water united with some albumen, and holding in solution, as we have already seen in the last species, a small quantity of phosphate of lime, the source of the tartar of the teeth, and occasionally of calculi found in the glands that secrete it. Its quantity has been very differently calculated. Nuck estimates it at a pound in twelve hours; Mr. Cruickshank, with more appearance of truth, at a pound in twenty-four hours. Its office is two-fold: that of moistening the mouth in combination with a small portion of mucus secreted by the labial and buccal glands, and, as observed already, that of contributing to the digestion of the food in the stomach and duodenum.

Under the influence of the irritating passions, and especially of violent rage, it assumes a frothy appearance, and in many animals becomes poisonous. It is said, indeed, to become so sometimes in

man himself;* as we shall have occasion to observe farther when treating on lyssa *canina*, or canine madness.

When the saliva is secreted in a healthy proportion, and the various muscles of the mouth perform their proper office, it is never discharged from the mouth, unless voluntarily, but passes readily from the fauces into the œsophagus. But it may be secreted immoderately, and this both in an active and passive state; or the muscles of deglutition may not properly perform their functions: and in either case the saliva will flow from the mouth involuntarily, accompanied with a specific difference of symptoms. And hence ptyalism, as a genius, offers the three following species of disease:

1. PTYALISMUS ACUTUS,	SALIVATION.
2. ——— CHRONICUS,	CHRONIC PTYALISM.
3. ——— INERS,	DRIVELLING.

SPECIES I.

PTYALISMUS ACUTUS.

Salivation.

INCREASED SECRETION OF SALIVA FROM AN INCREASED ACTION OF THE SALIVARY GLANDS.

An increased action of the salivary glands, productive of salivation, occurs not unfrequently as a symptom of some other disorder; and a symptom that in many cases proves highly salutary and even critical: as, in fevers of various kinds, exanthems, of which Dr. Percival of Dublin, writes me word he has had instances in miliaria with transparent vesicles, in jaundice, and dropsy; instances of which are given in the author's Nosology. It often takes place also in suppressed discharges of various kinds, as those of menstruation, perspiration, and urine, and is occasionally found a useful substitute. But as in all these cases it is a mere concomitant or dependent affection, we must defer our consideration of it in these relations, till we come to the diseases themselves of which it is a symptom or sequel.

The salivary glands are directly excited to an increased action by stimulants, or sialagogues as they are called, of various kinds. There are numerous plants endowed with this power, which in their roots, bark, or leaves, contain a warm, acrid juice: as, tobac-

* Hoffman, Diss. de Salivâ ejusque Morbis, p. 24.

co; mezereon; pyrethrum, or pellitory of Spain; pimpinella *saxifraga*, or smaller burnet saxifrage; imperatoria, or masterwort. Simple mechanical pressure, produced by the manducation of any hard substance, as when we eat a dry biscuit, is also a stimulant of the same kind: far less active indeed, but highly useful in its effect, as tending to resolve the substance to which the pressure is applied. Even the mechanical irritation of another organ with which the salivary glands are closely connected by continuity or sympathy, will often produce a like effect. Mr. Powell has given an interesting instance of this in the Medical Transactions of the College. A piece of wool, accustomed to be worn in the ear, had imperceptibly slid into the meatus auditorius, and for upwards of two years stimulated the organ without being suspected; during the whole of which period the patient discharged from a pint to a pint and half of saliva daily. The ear itself at this period became painful, and was examined; the piece of wool was detected, and extracted in a very offensive state; and the salivation in a short time entirely subsided.*

Generally speaking, however, an increased flow of saliva from any of these causes is of such short duration, and so easily removed when troublesome, that it is rarely the subject of medical attention; and the only varieties to which it gives rise that are particularly worthy of notice are the following:

α Hydrargyratus. Mercurial salivation.	Produced by the use of mercury or its preparations.
β Sensitivus. Mouth-watering.	Produced by the sight, smell, or thought of agreeable food.
γ Mellitus. Sweet spittle.	Accompanied by a sweet or mucilaginous taste.

Quicksilver, in whatever mode introduced into the system, whether by the skin, the stomach, or the lungs, uniformly stimulates the salivary glands, and produces an increased flow of saliva: and is almost, if not altogether, the only substance we know of, which, introduced internally, universally acts in this manner. Nitric acid has been suspected to produce a like operation; but we have no proofs upon the subject, and there is little ground for any such belief.

Antimony has also been thought by a few practitioners to have some such influence upon the salivary glands. "Dr. James lately informed me," says Sir George Baker,† "that for sixteen years past his fever-powder has contained no mercury; and yet that within that space of time he has known at least six instances of a salivation raised by his medicine. He added, that the patients who were thus salivated had neither their teeth loosened nor their breath made offensive, as happens in a mercurial ptyalism." Fusch tells us that

* Vol. II. p. 34, Letter to Sir George Baker.

† Medical Transactions of the College, vol. i. p. 378.

he has occasionally observed a like effect;* as does Willich, when tartarized antimony has been employed.† No other writer or practitioner that I am acquainted with has noticed any thing of the kind; and it is hence probable that the antimonial, in such cases, must meet with some contingent auxiliary in the idiosyncrasy of the patient, or the preparation of the medicine made use of in the anomalous cases.

From the general tendency of mercury to produce this specific effect, those who are engaged in working quicksilver mines, as those of Idria or New Spain, are almost continually in a state of salivation; and when, which is often the case, condemned as criminals to such labour for life, drag on a miserable existence in extreme debility and emaciation, with stiff incurvated limbs, total loss of teeth, and equal loss of appetite, till death in a few years, with a friendly stroke, puts a period to their sufferings.

From the facility with which quicksilver evaporates, and combines, not only with other metals, but with almost all other substances, and especially with many of the elastic gases, a considerable degree of injury is often sustained by workmen in manufactories in which quicksilver is occasionally employed, without their being for a long time aware of the cause. An instance of a similar kind occurred not long ago on board the Triumph man-of-war, which had received on board thirty tons of quicksilver contained in leathern bags of 50 pounds each, that had been picked up on the shore at Cadiz from the wreck of two Spanish line-of-battle-ships, that had been lost in a storm on March 1810. The bags were stowed in the hold, and other low parts of the ship, but being saturated with sea water they soon decayed, and bursted. The quicksilver thus let loose was collected as well as it could be, and committed to proper casks: but much of it escaped into the recesses of the ship; and not a little was secreted by the sailors, who amused themselves with it in various ways. The quicksilver that had escaped unnoticed sank into the bilge-water, became partially decomposed, and ascending soon after, amidst an intolerable stench, with the vapour of the water, coated every metallic substance in the ship with a black hue: and at the same time a general affection of the mouth took place among the men and officers to such an extent that not less than two hundred became severely salivated, and did not recover till the ship, being carried into Gibraltar, was docked and cleaned to its lowest planks.

Mercury, however, produces very different degrees of effect upon different constitutions or states of the body. In a few rare instances it has exerted no sensible influence whatever upon the excretories of the fauces: in others, a very small quantity of almost any of its preparations has stimulated them at once to a copious discharge.

In persons of a highly nervous or irritable temperament, I have

* Dissert. de Antochiria, Jan. 1681.

† Baldinger N. Magazin. Band. VIII. p. 252.

known salivation produced by a single dose of calomel; and Hildanus asserts it to have been followed from merely sprinkling a wound with a little red percipitate. In scorbutic, scrophulous, and other debilitated habits, it will sometimes act in the same manner; and hence a considerable degree of caution is requisite in all cases of this kind. Even the wearing of a leathern girdle, or the occasional application of mercurial ointment to the head to destroy vermin, has, at times, been followed with a like effect.

When mercurial salivation is produced, it is accompanied with a high degree of irritation, not only of the mouth and fauces, but of the system generally. The common course of symptoms is as follows: the mouth feels unusually hot, and is sensible of a coppery or metallic taste: the lingual and sublingual glands swell; aphthous vesicles appear, and terminate in minute and offensive exulcerations: the tongue tumefies; the throat becomes sore; pyrexy and sleeplessness supervene, and are, indeed, often present from an early period of the disease: while in idiosyncrasies, or habits of great irritability, we frequently find the surface of the body wholly, or in particular parts, reddened with a peculiar erythematic inflammation, continuous or in patches, to which the name of hydrargyria has been given by some writers, and that of erythema *mercuriale* by others.

It is difficult to determine by what means mercury produces this singular effect on the salivary glands. It was at one time supposed to act by the gravity of its particles, which were conceived to force themselves between, and divide those of the blood, and thus reduce it to a more attenuate state. But this will by no means account for its peculiar or specific irritation of the excretories of the fauces. Nor is it by any means true that the blood is dissolved in this mechanical manner, however it may be dissolved by the chemical qualities of the mercury. Dr. Cullen, indeed denies that the blood is ever attenuated in any way by the use of mercury, and regards all the appearances that have been adverted to in support of such an opinion as fallacious. And he denies, with still greater pertinacity, that it acts as a specific antidote in lues: a subject which we shall have occasion to examine hereafter. He regards it as nothing more than a general irritant operating equally upon all the sensible and moving fibres of the body, and hence powerfully operating upon all the excretories of the system, without having a special affinity to any one set more than to another. "It proves often," says he, "diuretic; and I have particular proofs of its reaching and acting upon the organs of perspiration."*

The whole of Dr. Cullen's views upon this subject are among the weakest of his speculations. But he had laid down a general principle upon the doctrine of the INCIDENTIA, and ATTENUANTIA, and the present views were necessary for its support. It is impossible, however, to deny that mercury, whether it possess a specific affinity or

* Mat. Med. Vol. II. p. 443.

not for the excretories of the saliva, acts, from some cause or other, more readily and powerfully upon them, than upon any other excretories whatever: and hence this ingenious physiologist endeavoured to account for the notorious fact in the following manner:—He first supposes, that mercury has a particular disposition to unite with ammoniacal salts; and that it is by its union with the ammoniacal salt contained in the serum of the blood, that it becomes so much disposed, and more universally than any other substance we know of, to pass off by the excretories generally. And he next supposes, that the ammoniacal salts are thrown off by the salivary glands more copiously than by any other excretion. "And hence," says he, "we shall find a reason why mercury, associated with such ammoniacal salt, will readily pass to the salivary glands; and being thus applied to their excretories, will produce the salivation that so readily happens."* From what experiments Dr. Cullen deduced this highly ammoniacal quality of the saliva he has not informed us. It is a deduction at variance with all the chemical analyses of the present day: but his hypothesis required such a result.

In attempting a cure of salivation from mercury, our attention is to be directed to the local state of the fauces and the general state of the system.

If the throat be not much inflamed, acidulous gargles and acerb fruits, as the sloe, may be employed with great advantage and should be used freely; but if there be considerable irritation, we must at first content ourselves with emollient gargles of barley-water or quince-seeds: and in either case employ, at the same time, purgatives of Epsom or other neutral salts. When the system is much affected, sulphur and opium have been strongly recommended, and seem in many cases to have been successful. The former is trusted to, chiefly, from its being well known to diminish the activity of mercury out of the body:—a doubtful reason, however, for our employing it internally. The latter is certainly of considerable use in allaying the general restlessness and irritation of the system. Pure air and a milk diet are highly serviceable; but perhaps, there is no disease in which such warm and tonic diluents as the Lisbon diet-drink, or compound decoction of sarsaparilla, may be used with better effect. Taken in the quantity of a quart a day, they equally attenuate and carry off the poison, and support and strengthen the system.

Like most other poisons, mercury, when properly directed and under proper subjugation, may be rendered a most valuable medicine; and is, at this moment, in its multifarious forms, one of the most common, as well as one of the most efficacious in the Materia Medica. In this place, however, we can only contemplate it as a source of disease.

A certain degree of active ptyalism or salivation is also well known to be produced by any high degree of mental or sensorial

* Loc. citat. p. 446.

excitement: in which case the discharge most commonly assumes a frothy appearance. This is particularly the case with violent rage, which stimulates the salivary glands almost as much as grief does the lachrymal. And as the same muscles of the mouth and throat are strongly roused in epilepsy and lyssa, we have here also a like increase of saliva, worked into the same sort of foam, and accompanied with a similar biting of the lips and gnashing of the teeth. But the most striking proof of this effect is produced by an eager longing for agreeable food of any kind, whether seen, smelt, or only thought of: and which is vulgarly denominated MOUTH-WATERING.

Among mankind this increase of secretion is seldom so considerable as to occasion an involuntary flow from the mouth; but among dogs it flows freely and continuously; for here the salivary glands are peculiarly irritable, so that the animal is almost constantly slavering; the discharge appearing to answer the purpose of insensible perspiration in other quadrupeds, and which dogs do not seem to possess: a fact which may serve to explain some of the most singular complaints to which this animal is subject, though it has not hitherto been laid hold of by pathologists for this purpose.

We meet also occasionally with an increased secretion of saliva from a cause less obvious, distinguished by a sweet or mawkish taste;* to which some writers have given the name of SWEET-SPITTLE.† It may possibly exist, at times, as an idiopathic complaint, but is more usually connected with a morbid state of the stomach, and accompanied with a sense of nausea. It is relieved by magnesia, and other absorbents; but is most effectually cured by an emetic, followed by warm stomachics. A lady of delicate habit, now under my care, has been subject to this variety for some years. It returns irregularly, for the most part once in about a month or six weeks, and generally yields to a course of rhubarb, taken, sometimes, in conjunction with two or three grains of calomel. Bloch mentions a case in which it returned at periods, still more regular.‡ This variety of ptyalism is also occasionally the result of a scorbutic diathesis.

Acute ptyalism frequently occurs during dentition; and is by no means an uncommon sequel or crisis of other diseases.

In all these, as I have already hinted at, it proves salutary, and terminates the disorder that excites it. Fevers afford, perhaps, the most numerous examples of this; and the following case is worth relating:—A lady, aged twenty-four, of a delicate constitution, was attacked with a typhus, in the spring of 1788, which ran on for Three weeks. She appeared to be in great danger; but on the twentieth day a sudden and copious salivation took place, that un-

* Art. Nat. Cur. vol. iv. Obs. 59. 89. vol. v. Obs. 71. Degaye, Diss. de Naturâ et Usû Salivæ. Monspel, 1783.

† Paullini, Cent. i. Obs. 81.

‡ Bemerkungen, p. 203.

accountably afforded her great relief. It continued for upwards of a week, the daily flow from the mouth being never less than a pint and a quarter. She nevertheless increased in strength, recovered her appetite, and got well.

We have numerous instances in which this discharge has proved equally serviceable about the acme of small-pox ;* though in one or two cases death has succeeded :† and the fluid of dropsies is said to have been carried off at times by the same channel.

In the Medical Observations and Inquiries,‡ there is a singular case of an obstinate vomiting of five months standing being relieved upon a return of salivation, which for this period had ceased. But perhaps one of the most extraordinary instances to be met with is related by Dr. Huxham, in the Philosophical Transactions.§ The patient was a man aged forty, of a spare, bilious habit, who had an attack of jaundice, followed by a paroxysm of cholic, this last being produced by drinking too freely of cider. Among other medicines was given a bolus, containing a scruple of jalap, eight grains of calomel, and a grain of opium. Copious dejections followed; and a few hours afterwards the patient complained of pain and swelling in the fauces, spat up a little thick, brown saliva, which was soon considerably increased in quantity, of a deep colour, resembling greenish bile, though somewhat thinner. This flux of green and bilious saliva continued for about forty hours; during which time the quantity discharged amounted to two sextorii, or four pints. The colour of the saliva then changed to yellow, like a solution of gamboge, with an increase rather than a diminution of the quantity. It continued of this colour for the space of forty hours more, after which it gradually became pellucid, and the salivation ceased as suddenly as it came on. During the flow of the saliva, the teeth and fauces were as green as if they had been stained with verdigris, and the teeth retained the same colour for a fortnight after the ptyalism had ceased. The patient had a few years before been suddenly attacked by a spontaneous salivation, so excessive as to endanger his life. In the present instance, therefore, it is probable that the dose of calomel co-operated with the peculiarity of the constitution, in exciting the discharge. But whatever was its cause, it proved critical both of the jaundice and the colic; for from the moment it took place, the pain of the bowels ceased, and the greenish colour of the skin began to subside, the urine being at the same time secreted more abundantly, and of a blackish hue.

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* Act. Nat. Cur. vol. VII. Obs. 109. Fich, Diss. de Salivatione spontanea, præcipue Variolarum. Jen. 1713.

† Riedlin, Lin. Med. 1695, p. 384. Weber, Obs. Med. Fascic. I.

‡ Vol. III. p. 241. § Vol. XXXIII. 1724.

SPECIES II.

PTYALISMUS CHRONICUS.

Chronic Ptyalism.

INCREASED SECRETION OF SALIVA FROM DEBILITATED HABIT, AND RELAXATION OF THE SALIVARY GLANDS.

THERE is another kind of ptyalism which is worthy of our attention, and consists in an increased secretion of saliva, but not, strictly speaking, produced by increased action of the salivary glands, but an habitual relaxation and debility. To this species I have, therefore, given the name of *chronic ptyalism*. The stimulus, in this case, depends upon morbid habit alone;* and is an example of what Mr. John Hunter intends by the phrase *stimulus of relaxation*. It is often very distinctly produced by a long and continued use of tobacco† whether chewed or smoked; and is said by Quarin to follow equally upon an habitual use of squills.‡ Warm astringent tonics, as cinchona and port-wine, will frequently be found serviceable, as local applications, or in the form of gargles: or a few drops of some pleasant essential oil, particularly that of the cajeput tree (Melaleuca *Leucodendron*,) may be taken four or five times a-day on a lump of sugar.

SPECIES III.

PTYALISMUS INERS.

Drivelling or Slavering.

INVOLUNTARY FLOW OF SALIVA FROM A SLUGGISHNESS OF DEGLUTITION WITHOUT INCREASED SECRETION.

THERE is a third species which belongs to this genus, in the present system, distinguished by the name of *inert ptyalism*, or ptyalism of inertion; and which depends upon a want of command or power over the muscles of deglutition, rather than on any increased action of the salivary excretories. In vulgar language it is denominated

* Souquet, Journ. de Med. tom. XXII. p. 40.
† Harder, Apiarium. Obs. 43.
‡ Animadversiones, &c.

DRIVELLING OR SLAVERING. It occurs under the three following modifications :—

α Infantilis.	Of infancy.
β Senilis.	Of old age.
γ Moriæ.	Of dotards or idiots.

It is found therefore, in three states of life : among infants, before the will has acquired a power over the muscles of deglutition, and is altogether distinct from the salivary flux of deglutition ; in advanced life, in which the will has lost its power : and in idiots, who possess the power, but seldom or never exercise it. In the first case, time is the best physician ; in the two last, no physician can be of any avail.

GENUS III.

DYSPHAGIA.

Dysphagy.

PAIN, OR OBSTRUCTION IN SWALLOWING; WITHOUT INFLAMMATION; AND, MOSTLY, WITHOUT IMPEDED RESPIRATION.

It is necessary to limit the character of this genus, as in the above definition, since inflammatory affections, in whatever part of the system they occur, constitute one natural order; and dyspnetic affections, or those essentially impeding the respiration, another order; and should, therefore, be arranged and considered in their respective associations : the former under the diseases of the sanguineous function, and the latter under those of the respiratory.

The organs chiefly concerned in the act of swallowing, are the tongue, the parts composing the fauces, and the œsophagus : all of which, when diseased, may produce impeded deglutition ; and consequently lay a foundation for various species under this genus. In Sauvages, and most of the Nosologists, these species are extremely numerous. It is possible to reduce them to the five following :—

1. DYSPHAGIA CONSTRICTA,	CONSTRICTIVE DYSPHAGY.
2. ——— ATONICA.	ATONIC DYSPHAGY.
3. ——— GLOBOSA,	NERVOUS QUINSEY.
4. ——— UVULOSA,	UVULAR DYSPHAGY.
5. ——— LINGUOSA,	LINGUAL DYSPHAGY.

SPECIES I.

DYSPHAGIA CONSTRICTA.

Constrictive Dysphagy.

DIFFICULTY OF SWALLOWING FROM A PERMANENT CONTRACTION OF THE ŒSOPHAGUS.

Sometimes the diameter of the canal is diminished in particular parts by fleshy excrescences, or scirrhous tumours; sometimes a scirrhous thickening of its coats extends through its entire length; and sometimes it becomes contracted by ossification: independently of the casual and symptomatic obstructions which do not fall under our present survey, produced by hysteria, and other spasmodic affections; enthesis, or the lodgment of foreign bodies in the interior of the canal; or external tumours, as in bronchocele, or aneurism of the aorta, pressing against its sides.

The different repositories of medical cases are full of examples of all these: the scirrhous contraction of the coats of the œsophagus is, perhaps, the most frequent: which, in some instances, is limited to a quarter of an inch in length, and in others extends through the greater part, or even the whole of the tube.

In one case, in which the stricture was confined to the upper part of the passage, the author knew a lady supported for twenty years by food passed through a silver canula, somewhat larger than a female catheter, into the stomach. But this is an example of rare occurrence: for the canal usually grows more and more contracted, till at length, if the life be preserved so long by the occasional aid of nutritive clysters, the passage will only admit a common probe. At times the constriction is accompanied with internal ulceration, and a perpetual formation of matter. Mr. Warner's Cases contain a striking example of this painful and distressing complication of symptoms in a young woman of twenty-five; and another has lately occurred in the author's own practice. The patient was here also a female, of a delicate habit, about thirty-five years of age. Rapid was the progress, and she was carried off in about twelve months from the first sensation of a difficulty of swallowing. For the last six months the passage would only admit a bougie of the largest size employed in obstructions of the urethra. The bougie would at times pass with ease; but at other times gave great pain from the extent of the ulceration, and the lodgment of mucus, scabby crusts, and bloody matter, which were occasionally thrown forth in abundance. During this painful state the lady went through a period of pregnancy, and lived to bring forth a feeble and emaciated child that died a few months after birth, and a few weeks after the mother.

From the urgent desire of swallowing, and the food being permitted to descend as low as it can, the latter often accumulates upon the mouth of the stricture, and the œsophagus is in this part considerably widened in consequence of the pressure which takes place.

Dr. Odier relates a fortunate case of a young nobleman at Geneva, in which the œsophagus which seems to have assumed a scirrhous character, had become dilated in this manner into two large bags, one on each side of the neck, and appeared strikingly prominent. The food he took commonly remained in these sacks for an hour or two, and was then thrown up, but whether in any degree digested we are not informed. After having tried the skill of almost every physician and surgeon in the city without success, the patient was at length recommended to swallow hemlock pills, and compress the protuberance by a bandage round the throat. As soon as the pills were rejected, which, like the food, they were sure to be in an hour or two, their place was supplied by others, so as to have the hemlock constantly acting on the seat of the disease. The patient soon became relieved, and was gradually cured; the pouches disappeared, the aliments descended into the stomach, and the œsophagus recovered its former calibre.*

Where osthexia or an ossific diathesis is present, the stricture sometimes assumes a bony hardness; and Metzger gives a pitiable case of this kind, in which the passage was so narrow that the unhappy patient perished altogether of hunger.† At times indeed the œsophagus has become entirely imperforate either from the increasing contraction, or the enlargement of internal or surrounding tubercles: of the former, Rhodius relates a singular case.‡ Examples of the latter have occasionally followed upon small-pox,§ or strumous indurations.‖

In a few instances half the length of the œsophagus has been completely gorged by a single fleshy or glandiform excresence; an instance of which is given in the Edinburgh Medical Essays; the patient died of marasmus in the seventh month from the commencement of the disease, and in the prime of his life. The tumour reached from the middle of the canal to the cardia, and so thoroughly blocked it up, that a probe was with difficulty passed into the stomach on examining the part after death.¶

It is a singular fact that where ulcerations occur, they are more commonly found at a short distance above or below the contraction than in its immediate range; a remark for which I am indebted to

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* Edin. Med. Com. III. p. 193, Letter from Dr. Odier to Dr. Duncan.
† Advers. Med. Vol. I. p. 175.
‡ Cent. II. Obs. 46.
§ Act. Hafn. Vol. I. Obs. 109. Eph. Nat. Cur. Dec. II. Ann. IX. Obs. 45.
‖ Mauchart, Diss. De Strumâ Œsophagi, hujusque Coalitu, &c. Tubing. 1742.
¶ Vol. II. Art. XXIV.

Dr. Baillie, who has illustrated it in his Morbid Anatomy by two distinct plates.*

Of this distressing disease it is often difficult to trace the remote cause. And hence it commences without being sufficiently attended to, and makes an alarming progress before professional advice is sought for. Sometimes it has been evidently superinduced by a neglected catarrh; occasionally by small-pox or syphilis; and at other times by a highly nervous or spasmodic diathesis. It is said to have been brought on by the smoke of tobacco;† by the use of the datura *stramonium*;‡ by mercurial preparations improperly introduced into the system; by a habit of drinking too largely of coffee, or any other fluid immoderately hot or cold.§ A temporary contraction of the œsophagus has also been produced by worms in the stomach and intestines; and in one or two instances, apparently by worms lodged in the hepatic and common duct.‖

Its cure is of difficult accomplishment. In an early period of the disease some benefit has been derived from hemlock and ammoniated copper. And sometimes mercury, carried to the point of salivation,¶ has been found highly serviceable.

Where the disorder depends upon spasmodic action, cold freezing water as a beverage, and applied externally, has diminished and even taken off the morbid effect;** and the action of emetics, as recommended by M. Ferrein,†† may prove a valuable auxiliary, not only in spasmodic, but in various other cases, by relaxing and expanding the affected tube.

But unless either of these medicines be had recourse to in an incipient state of the disease, little benefit is to be expected from their use. Dr. Munkley, however, relates one case of great severity and some years standing, in which mercury, carried to the effect of pytalism, proved perfectly successful. The patient was a female of about forty years old, and, at the time of admission into Guy's Hospital, was incapable of swallowing any thing but the thinnest liquids, and even these in only a very small quantity. She was greatly emaciated; her voice was hoarse; and her breathing very considerably disturbed. She was salivated as soon as possible, and continued under the influence of this process for nearly six weeks; and as the time advanced all her symptoms gradually disappeared;

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* Fascic. III. Pl. III. IV.

† Eph. Nat. Cur. Dec. III. Ann. I. Obs. 79.

‡ Eph. Nat. Cur. Des. III. Ann. II. Obs. 68.

§ Blenland, De sanâ et morbosâ Œsophagi Structurâ.

‖ Eschenbach, Vermischter Bemerkungen, I.

¶ Rush. Inquiries and Observations. Brisbane, Select Cases. Dobson, Medical Observations and Inquiries, VI.

** Montat. Memoires de Paris. Tode, Diss. Adversaria Med. Pract. Hafn. 1729.

†† Memoires de Paris.

and at the end of this period she went out of the hospital perfectly cured.*

Neither hemlock nor mercury, however, will answer in the greater number of confirmed cases. And even from the first, while these are employed as auxiliaries, our chief dependence must be, as in strictures of most other dilatable and highly sensible canals, upon the bougie; which, from an early state of the disease, should be introduced twice a-day, of as large a volume as the patient can bear without muchuneasiness, and increased in its diameter as often as an increase can be borne.

SPECIES II.

DYSPHAGIA ATONICA.

Atonic Dysphagy.

DIFFICULTY OF SWALLOWING FROM DEBILITY OF THE MUSCLES OF DEGLUTITION.

The external tunic of the œsophagus is muscular, and the muscular fibres are both transverse and longitudinal. The protrusion of the food from the fauces into the stomach commences in the action of the circular fibres of the pharynx, which contract in succession, and in a downward direction; and as this direction is continued to the muscular fibres of the œsophagus, the swallowed morsel is carried forward into the stomach by a progressive or peristaltic propulsion.

Now in all cases of debility in the muscles of deglutition, the contractile action of their fibres, and consequently their propulsive power, is lost or enfeebled, and a difficulty of swallowing must be the necessary consequence. Persons of a nervous or irritable temperament are most subject to this species. Like the last, it is often brought on by long continued and neglected catarrhs; and occasionally by a habit of drinking very hot fluids, as tea or coffee.

The cure may be attempted by repeated blisters to the throat and chest, which stimulate from without; and by tonic and astringent gargles, as of alum, catechu, port-wine, and decoction of cinchona, which stimulate from within.

For the same reason the warm and stimulating sialagogues may be employed with advantage, as the root of the pyrethrum, the leaves of the imperatoria, or master-wort; and the bark of the mezereon: or where a slighter irritation is required, the root of the arum *maculatum* or wake-robin. In paralytic affections of the

* Medical Transact. of the College, Vol. I. Art. XI.

tongue and fauces, Boerhaave recommends the use of gum mastick, (the resinous exudation of the pistachia *Lentiscus. Linn.*) but of itself it is too inert, though it makes a good dentifrice, and is still very largely employed for this purpose. In the hands of Boerhaave, indeed, it was commonly united with ginger, or some other warm aromatic. A few drops of some of the more grateful essential oils, as juniper, carraway, lavender, and particularly cajeput, as already recommended in chronic pytalism, will often be found a simple and pleasant remedy, if taken on a lump of sugar three or four times a-day.

A draught of cold water drunk frequently during the day-time, and especially at night and morning, has also as a tonic been frequently found useful. And if the habit be relaxed or irritable, the same tonic plan should be rendered general as well as local; and be especially combined with exercise, sea-air, and sea-bathing: hard study must be relinquished, and if possible, anxiety of mind.

SPECIES III.

DYSPHAGIA GLOBOSA.

Nervous Quinsey.

DIFFICULTY OF SWALLOWING FROM WIND IN THE STOMACH, SPASMODICALLY COMPRESSED INTO THE FEELING OF A BALL ASCENDING INTO THE ŒSOPHAGUS, AND PRODUCING A SENSE OF STRANGULATION.

From this feeling of a hard ball in the throat, the species is in the present system distinguished by the specific name of *globosa*. It is peculiarly common to persons of a nervous or spasmodic temperament: and is hence called by Dr. Darwin and many other writers *globus hystericus*, and by Dr. Heberden *nervous quinsey*. It is the *chute de la luette* of the French.

Most frequently it occurs as a mere symptom of the hysteric or hypochondrical affection; and on this account is regarded as such alone by many Nosologists. It is, however, often to be traced in sudden gusts of passion, as fear, grief, and anger, especially in young subjects whose passions have never been disciplined; and at times exhibits so much violence as to threaten suffocation. In nervous habits I have frequently met with it as a pure idiopathic affection; and, in a few instances, in persons who were not thus constitutionally predisposed to it.

Two clergymen of this metropolis, who bear an equally high character for pulpit eloquence, and have a very sufficient self-possession, have been occasionally under my care for some years in consequence of this complaint. One of them has most commonly

been attacked during dinner; the regular action of the muscles, in swallowing, being converted, from debility of the organ, into the irregular action of spasm. The other received the first paroxysm while reading the service in his own parish-church, and was incapable of proceeding with it. In this case the regular action of the muscles of the glottis in speaking, excited irregular action in those of the œsophagus from contiguous sympathy. And the effect was so considerable, that when the clergyman came to the same passage of the Liturgy on the ensuing Sunday, he was obliged to stop again, for he found he could not get through it. But he preached with as much fluency as ever; and this too with nothing more than a syllabus of his discourse before him. It was many weeks before he could summon courage to make another attempt in the desk: and his first effort was even then made in another church and before another congregation. In this he was fortunate enough to succeed: and he has now entirely overcome the morbid habit.

In both these cases I have found the most effectual remedy at the moment to be a tumbler of cold water swallowed gradually, and the application of a handkerchief dipped in cold water to the throat. The spasm thus counteracted soon ceases; and, in the cases before us, has returned not only less frequently, but with far less violence. Yet, during the intervals, general tonics, a light diet at regular hours, and as much as possible horse exercise, have been had recourse to, and contributed their respective services.

The usual antispasmodics, as volatile alkali, ether, camphor, assafœtida, and even laudanum, had been formerly tried, but, I was told, with little success.

SPECIES IV.

DYSPHAGIA UVULOSA.

Uvular Dysphagy.

SWALLOWING OBSTRUCTED OR TROUBLESOME FROM RELAXATION AND ENLARGEMENT OR DESTITUTION OF THE UVULA.

The uvula is sometimes enlarged from inflammation; but in such case the disease, for reasons already stated, belongs to another class. In the inflammatory state the uvula is hot, acutely painful, of a red or livid colour, and deviates, as it enlarges, from its proper form. In the species before us, its natural form and colour are scarcely interfered with, excepting that, as it grows larger and longer, it also grows paler. It is soft, relaxed, and edematous.

The complaint, therefore, in this variety requires to be treated

with spirituous and astringent stimulants. Gargles of alum or port-wine form, perhaps, the best local applications: and should be combined with cathartics and general tonics. If the disease do not yield to this plan, the elongated and pendulous part must be extirpated.

In a few rare instances the uvula and even the tonsils become hard and cartilaginous;* and in such cases the morbid portion must be removed by the knife instead of by a ligature, as ordinarily recommended.†

The uvula in its natural state appears to assist in swallowing, and to direct the food to its proper channel. And hence, when from ulceration or any other cause it becomes lost or deficient, the act of deglutition is rendered troublesome and even difficult,‡ though not so much so as in the enlargement and illapse of this organ. In this case the healing art can administer nothing, and habit becomes the only physician. There are examples, however, in the medical repositories of so total a loss of the uvula from gangrene, or the barbarous cruelty of cutting out the tongue, that the sad sufferer has been compelled to force the food in every meal into the œsophagus with his fore-finger.

SPECIES V.

DYSPHAGIA LINGUOSA.

Lingual Dysphagy.

SWALLOWING OBSTRUCTED, OR TROUBLESOME FROM PROTRUSION OR MAGNITUDE OF THE TONGUE.

This species exhibits itself under the two following forms or varieties:

α Exsertoria. Lolling tongue.	Tongue extended from the mouth, often with enlargement of its substance.
β Ranula. Frog tongue.	Intumescence of the salivary glands or ducts.

It is necessary, as in the last species, to distinguish both these affections from inflammatory enlargements. The variety before us

* Jaegen, Chirurgische Cautelen, Band. II.

† Sharp, Critical Enquiry, &c. Ch. VI. Siebold, Chirurgisches, Tagebach. N. 78, 88.

‡ Act. Erudit. Lips. 1717. p. 408. Salmuth, Observationes Medicæ. Cent. III. Obs. 6.

is often produced by an improper use of mercury or other metallic poisons, and may be treated as the enlarged uvula.

M. Magendie, in the Bulletin of the Philomathic Society of Paris, for September 1817, quotes the case of a Jew, who was able to double his tongue backwards, and plunge it with the greatest ease into the pharynx: and tells us of a child who acquired the same power by imitating the Jew. The first efforts of the child were unsuccessful: but at length he ruptured the frænulum, and a hemorrhage ensued, which nevertheless did not alarm the boy, for he found from that moment, that he could pursue the imitation more perfectly; till, by continued repetition, he too acquired the singular faculty of swallowing, in the same manner, his own tongue, without the least inconvenience to his respiration.

This variety sometimes occurs as the result of lesion or injury to the tongue. M. Manoury has a case of this sort, in which the tongue suffered so much mischief and was become so enlarged, that not the smallest particle of food could pass by the mouth: and the patient was entirely supported by means of a flexible tube thrust through the nostrils into the œsophagus, by means of which nutritive fluids were conveyed into the stomach.*

The Ranula, or *frog-tongue* as it is commonly called, is said to be an enlargement of Wharton's duct; and often possess a scrophulous character.† Mr. Justamond has removed it by a strong solution of alum: but it will sometimes advance, though slowly, to an imperfect suppuration. From the danger of wounding the salival ducts, it is best to leave the abscess to open spontaneously; but if it be opened by the lancet, the incision should run in a transverse direction, and the tongue be carefully held up during the operation.

In the valuable manuscript-commentary upon the author's volume of Nosology by his distinguished friend Dr. Perceval, of Dublin, adverted to in the introduction, is the following notice of a severe case of ranula produced by cold upon mercury: "A horrid case of dysphagia *linguosa* has lately occurred in a young girl, who took a large drink of cold water whilst her mouth was sore from mercury. The protruded tongue lolled out on the chin, and was half cut through by the pressure of the lower teeth. The ulcer was exceedingly foul: but its appearance soon changed for the better by the use of mel rosæ and carbonas ferri."

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* Journ. de Med. Tom. LXXXVI.

† Alix, Observationes Chirurg. Fascic. I.

GENUS IV.

DIPSOSIS.

Morbid Thirst.

THE DESIRE FOR DRINKING EXCESSIVE OR IMPAIRED.

Between the present and the ensuing genus, entitled Limosis, or morbid appetite, there is a close natural connection, though their position is in different and even distinct organs.

The sense of hunger is well known to be seated in the stomach; and that of thirst in the throat or fauces. Yet though we can trace the organs in which these faculties reside, we are to this moment totally unacquainted with the causes of their difference. And though we give them the name of sensations, they have none of the characteristics which the term sensation imports, as applied to any other part of the system, or as derived from any particular set of nerves with which we are acquainted. In the local senses, as those of sight, smell, taste, and hearing, we can trace the respective nerves from which these respective feelings proceed. In the seats of hunger and thirst, on the contrary, we can trace no other nerves than those which are common to the sensation of touch; and we know of no modification of these nerves that is capable of producing a new sensorial power: for hunger and thirst are not touch, any more than they are sight, or smell, or taste or hearing. Within a certain degree of intensity they are both pleasurable sensations: but, like all other pleasurable sensations, they become acutely painful when raised to an extreme.

In this obscurity of the subject, it is not to be wondered at that various hypotheses should have been devised to account for these sensations: thus, the feeling of hunger has been ascribed by Dr. Willis to acid vapours generated in the stomach; by Dr. Cullen to an uneasy contraction of this viscus when no longer distended; and, by others, to the stimulus of the gastric juice. In like manner thirst has been attributed to a diminished or exhausted power of secretion in the salivary or buccal glands; to the stimulus of salt, or other acrid matters taken by the mouth, and lodged in the follicles or duct of the same glands; and to acrimonious materials in the stomach sympathetically affecting the fauces. In all these conjectures there is ingenuity, but no satisfactory elucidation. Many of them are evidently erroneous; and none of them entitled to adoption. In thirst, there is, perhaps, always a sense of dryness in the fauces; and yet dryness of this organ does not appear to be the cause of thirst; at least, the intensity of the feeling does not appear to depend on the intensity of the dryness: for there is sometimes but little thirst,

where the tongue, to its very roots, is covered with a thick and dry crust, as in the achme of continued fevers; while it is often vehement under the influence of violent passions, and intolerable on a surcharged stomach, when the tongue and fauces have no dryness whatever.

The common modes of quenching these agonising sensations are well known to be eating and drinking: yet when these cannot be indulged in, there are other modes that may answer as a substitute. Thus violent pressure against the coats of the stomach, whether externally or internally, is well known to take off the gnawing sensation of hunger; and stimulating the fauces, to take off the burning faintness of thirst. It is on this last account that chewing a mouthful of hay, alone, or merely moistened with water, proves so refreshing to a tired horse, and is found so serviceable when we dare not allow him, in the midst of a long stage, to slake his thirst in the natural way. Savages and savage beasts are equally sensible of the benefit of pressure in the case of hunger, and resort to it upon all occasions where they have no opportunity of taking off the pain in the usual way. The manis or pangolin, that swallows its food whole, will swallow stones, or coals, or any other substance, if it cannot obtain nutriment; not that its instinct deceives it, but for the purpose of acquiring such a pressure as may blunt the sense of hunger which it finds intolerable. Almost all carnivorous beasts pursue the same method; and a mixed mass of pieces of coal, stone, slate, and earth, or other hard materials, is often met with in the stomach of ostriches, cassowaries, and even toads. The Kamschadale obtains the same end by swallowing saw-dust; and some of the northern Asiatic tribes, by a board placed on the region of the stomach, and rudely laced behind with cords, drawn tighter and tighter according to the urgency of the uneasiness. In our own country we often have recourse to a similar expedient, and only exchange the tightened stomach board for a tightened handkerchief.

It is possible, therefore, temporarily to overcome these natural sensations without the natural means: and the passions of the mind have as strong an influence on both as any of the substitutes just adverted to. Thus both are completely lost beneath the sudden communication of news that overwhelms us with grief or disappointment. So, Van Helmont tells us, that, happening to dislocate his ancle while walking with a good appetite to dine with a friend, his appetite immediately forsook him; but returned as soon as the joint was replaced, though the pain continued for some time with little alteration. There are some passions, however, as those of rage and eager desire, which, while they repel the sense of hunger, increase that of thirst. But they prove equally the close connection of both feelings with the state of the nervous system generally; and the strong and extensive influence which is sympathetically exercised over them.

Morbid thirst, as a genus, is new to the science of Nosology; and hence the two species which belong to it have hitherto, in al-

most every instance, being separated from each other and thrown loosely into remote parts of the classification. Dr Young however, offers an exception to this remark: for, with his accustomed accuracy, he has united them under a common head. The genus being new, it has hence been necessary to create a new name for it: and that of Dipsosis, from δίψαω, "to thirst," has appeared not only most pertinent, but most consonant with the nomenclature in common use, which has naturalized various terms derived from the same root; as adipsia, polydipsia, phobodipsia; this last being a synonym for hydrophobia.

The two species of the genus are the following:—

1. DIPSOSIS AVFNS, IMMODERATE THIRST.
2. ——— EXPERS. THIRSTLESSNESS.

SPECIES I.

DIPSOSIS AVENS.

Immoderate Thirst.

CONSTANT DESIRE OF DRINKING: WITH A SENSE OF DRYNESS IN THE MOUTH AND THROAT.

SIMPLE thirst is a natural;—immoderate, or inextinguishable thirst, a morbid feeling. Yet even the latter is less frequently an idiopathic disease than an individual symptom of some other complaint, or some peculiar state of body, the removal of which will alone effect its cure. Occasionally, however, we meet with it under the first of these two forms; and it is hence necessary to assign it a distinct place in a System of Nosology.

I have at this time under my care a young lady of about thirteen years of age, in other respects in good health, who is tormented with a thirst so perpetual that no kind or quantity of beverage seems to quench it for more than a few minutes. Emetics and purgatives have been tried in vain. Squills and other nauseating expectorants seem to promise more success. It has now lasted for several weeks.

The most grateful palliatives are the vegetable acids, and especially acescent fruits, and a decoction of sorrel-leaves (rumex *acetosa* Lin.) slightly inspissated with gum Arabic or some other mucilage, and sweetened to meet the palate. Liquorice, which among the Greeks had so high a reputation for quenching thirst as to be honoured with the name of ἀδίψιν, "the thirst-extinguisher," has little or no effect. And it is most probably true, as seggested by Dr. Cullen, that it only acts in this manner when the root is well chew-

ed, by which means the salivary excretories become stimulated to an increased secretion of fluid.

In a foreign medical miscellany we have reported to us a case of the same kind, brought on by drinking a cold beverage during the paroxysm of a fever, that continued for more than a twelvemonth.* And in another foreign journal we have an account of this disease as epidemic among children.†

The quantity actually drunk is sometimes enormous. Four hundred pints of wine-and-water have, in some cases, been swallowed daily.

As a symptom, excessive thirst is chiefly found in the hot fit of fevers, in dropsy, dysentery, diabetes, diarrhœa, and other discharges. It is also frequently excited in wet-nurses as soon as the child takes hold of the nipple; but perhaps is felt most intolerably under the torture inflicted to compel a confession of guilt; in which case it is said to form the worst part of the suffering.‡

SPECIES II.

DIPSOSIS EXPERS.

Thirstlessness.

CONSTANT WANT OF THIRST.

Considering that thirst is a natural feeling, and contemplating the vehemence of this feeling when extreme, it is not a little extraordinary that instances of its total absence should ever occur. Yet there are many animals, and warm-blooded animals too, that never require drink, and consequently never thirst: as mice, quails, parrots. Here, however, the want of thirst or desire to drink, is a natural condition in the economy of these animals. In man, and animals constituted like man, with a constitutional proneness to thirst, and an instinctive urgency to quench it by drink, this want of desire can never take place without disease. Nor are the cases in which it occurs by any means frequent. Sauvages, however, mentions two instances that occurred to himself. In the one, the patient, a learned and excellent member of the Academy of Toulouse, never thirsted, and passed months at a time without drinking even in the hottest part of the summer: in the other, the patient, who was a female of a warm and irascible temperament, abstained from

* Heuermann, Bemerkungen, I. p. 28.
† Gazette de Santé, 1777, p. 93.
‡ Pecklin, lib. III. Obs. 39.

drinking for forty days, not having the smallest degree of thirst through the whole of this period,* and Neergaard, as quoted by Blumenbach, has furnished us with other examples.†

GENUS V.

LIMOSIS.

Morbid Appetite.

THE APPETITE FOR FOOD IMPAIRED, EXCESSIVE, OR DEPRAVED.

THE sensation of hunger, as observed already, is seated in the stomach; and, like that of thirst, is a natural or instinctive desire. It may, however, become diseased, and loose its natural character; and this in various ways, and accompanied with various sets of symptoms; each of which lays a foundation for a distinct species. Like the species of the last genus, however, they have hitherto in most Nosologies been omitted, or loosely scattered over different parts of the classification, though they evidently belong to a common family, and should be contemplated in a concentrated view. It is for this purpose they are now united under the banners of a single genus, to which I have ventured to give the name of LIMOSIS from λιμος, "hunger," being the root of various terms current in the medical vocabulary; as bulimia, alimia, alimon, alimonia, alimentum; though the three last have been commonly mis-derived by the lexicographers from *alo*, "to nourish:" unless *alo* itself be from the same source.

The species that properly appertain to it are the foollowing:—

1.	LIMOSIS AVENS,	VORACITY.
2.	——— EXPERS,	LONG FASTING.
3.	——— PICA,	DEPRAVED APPETITE.
4.	——— CARDIALGIA,	HEART-BURN, WATER-BRASH.
5.	——— FLATUS,	FLATULENCY.
6.	——— EMESIS,	SICKNESS, VOMITING.
7.	——— DYSPEPSIA,	INDIGESTION.

* Nosol. Method. vol. I. p. 170, 4to edit.

† Blumenb. Physiol. sect. xxi. 322.—J. W. Neergaard Vergleichende Anatomie und Physiologie des Verdenungswerkzenge, &c.

SPECIES I.

LIMOSIS AVENS.

Voracity.

INSATIABLE CRAVING FOR FOOD.

This affection may be produced by a sense of faintness and inanition, without any known cause of exhaustion; probably in consequence of some organic error in the stomach; by gluttony, or an habitual indulgence in large and frequent meals; or by exhaustion from hard exercise, long fasting, fevers, or excessive discharges: thus offering the three following varieties of this species:—

α Organica. Canine appetite.	From a feeling of faintness and inanition.
β Helluonum. Gluttony.	From the habitual indulgence in large and frequent meals.
γ Exhaustorum. Hunger of exhaustion.	From exhaustion as the consequence of hard exercise, fevers, or excessive discharges.

There are many persons who from birth, or a particular period of life, without any habit of indulgence, are capable of taking into the stomach an enormous quantity of food, and cannot be satisfied without it, from a constant sense of faintness and inanition; and who by no means increase in bulk in proportion to the quantity swallowed; being often, on the contrary, slender and emaciated.

It is difficult to account for this effect in every case; but there is great reason to believe that in general it depends upon some error in the structure or position of the stomach, by which means the food passes out of this organ as soon as it is introduced into it. Thus, Ruysch gives a case, in which the diameter of the pylorus was considerably enlarged from relaxation: and there are others in which it has been changed from its natural to a lower or dependent position, in consequence of the left side of the stomach being elevated by a dropsy of the ovarium, or an enlargement of the liver. The existence of a double stomach, or of an immediate insertion of the ductus communis choledochus into the stomach, though noticed as causes by Blasius and Bonet, are more doubtful. In the hunger of general exhaustion, forming our third variety, we know it to be produced by the secretion of an extraordinary quantity of gastric juice, by which the food is digested almost as soon as it reaches the digestive organ. And it may sometimes, as supposed by Galen, be produced by some acrimony in the stomach, exciting that mimic feeling which is commonly known by the name of *false appetite*.

Whatever be the cause, the quantity of food devoured by persons labouring under this affection is enormous, and in some instances almost incredible. Dr. Mortimer* relates the case of a boy of only twelve years old, who from a feeling of inanition had so strong a craving that he would gnaw his own flesh when not supplied with food; when awake he was constantly eating; the food given him consisted of bread, meat, beer, milk, water, butter, cheese, sugar, treacle, puddings, pies, fruits, broths, potatoes; and of these he swallowed, in six successive days, three hundred and eighty-four pounds eight ounces avoirdupois; being sixty-four pounds a-day on the average. The disease continued for a year; and in this case we have a clear proof that the feeling of hunger did not depend upon any extraordinary secretion of gastric juice producing a rapid digestion; for the food was usually rejected soon after it was swallowed, but whether without passing, or after having passed into the duodenum, it is impossible to say. And there are other cases related by Lommius of a similar kind.

In various instances, however, the food thus voraciously swallowed does appear to be digested, and that almost as soon as taken. The case of Tarare, as related to the National Institute, by M. Percy, a surgeon in chief to the French Army, is a striking illustration of this. Before his enlistment, he was in the habit of devouring enormous quantities of the coarsest flesh, fruits, and roots; and subsequently, he was found, after swallowing his own rations, to feed on the refuse of his comrades' messes, or offensive meat thrown on the dunghills; and to devour cats, dogs, and serpents. He was strongly suspected of cannibalism; and was often restrained with difficulty from the ward appropriated to the dead. He at length fled from the army before a rumour of having devoured a child of sixteen months old, which had suddenly disappeared. The alvine evacuations of this man were not immoderate: but after gorging his stomach, he slept and sweated in torrents of perspiration, a symptom common to the disease. He fell at length into a hectic, and died of marasmus.

Voracity is often a symptom of some other affection: it will sometimes occur, in the most capricious manner, during pregnancy, often in the middle of the night, or at some other unexpected period; when the patient, with a sudden sense of faintness and inanition, will perhaps devour an inordinate quantity of almost any food that can be obtained at the moment, though in many cases there is a fanciful longing for a particular kind, as for herrings, of which Talpius gives an instance of a lady, who in this state devoured fourteen hundred at a meal.† In these instances it is probable that the urgent desire becomes a stimulus to the secernents of the stomach, and that a greater quantity of gastric juice is in consequence poured forth.

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* Phil. Trans. Vol. XLIII. p. 366.
† Lib. II.

In like manner voracity and the sense of hunger occur also as a symptom in many cases of helminthia, or worms in the stomach or duodenum. But from the emaciation which usually accompanies such persons, it is most probable that the inanition or emptiness of the stomach is here produced not by a rapid or elaborate digestion, but by an irritable state of the muscles of the stomach, which contract too readily, and force the food into the intestines before chymifaction has taken place. Dr. Burroughs relates the case of a patient in the Philosophical Transactions, who, from this cause alone, was rendered capable of devouring an ordinary leg of mutton at a meal for several days together, and fed greedily at the same time, on sow-thistles and other coarse vegetables.

Among the Greeks, idiopathic voracity appears to have been a frequent disease; they paid much attention to it, and distinguished it by a variety of names, but do not seem to have been very successful in determining on the nature of its cause, or the best means of treating it. The last, indeed, must be as variable as the efficients that produce it. When we have reason to ascribe it to a morbid state of the stomach, in respect to tone or secretion, purgatives, and especially those that are warm and bitter, as aloes, may be found successful. Stimulating stomachics have been found equally so; whence Galen very judiciously recommends frequent and small doses of brandy; and Riverius, of ambergris. If these do not succeed, the stomach should be kept for some days in a state of constant nausea: and with this view, as well as with that of destroying the morbid irritation on which the voracity depends, opium will often be found a highly salutary medicine. If the disease be produced by worms, or any other remote irritation, it is obvious that it can only be conquered by conquering the primary affection. And if it depend on a preternatural enlargement of the right orifice of the stomach, so that the food slips away as soon as it is introduced into this organ, a perfect cure is beyond the reach of art; though some benefit may be derived from a strong external pressure so as to detain the food in its proper place.

The second variety resulting from a gluttonous habit is far more common, and very readily produced; insomuch, that there is not perhaps a corporate town in the kingdom that does not offer abundant examples of it. It is in fact one of the numerous evils to which idleness is perpetually giving birth: for let a man have nothing to do, and he will be almost sure, whenever he has an opportunity, to fill up his time by filling up his stomach: and hence the lazy train of servants that vegetate from day to day, almost without locomotion, in the vestibule, hall, and other avenues of a great man's house, eat three or four times as many meals as their masters, who may possibly be employed, from morning till evening, in the courts of law, the committee-rooms of parliament, or in a fatiguing maze of commercial transactions.

In tracing the cause of this voluntary disease, we have no difficulty whatever. When the stomach becomes accustomed to disten-

tion it is never easy without it; and at length requires to be constantly full to be free from disquiet. It is also well known that every sense grows more acute the more it is employed: and hence the taste and longing of the glutton becomes more alive to what is relishing and savoury: he enjoys such indulgencies more than other men, and turns with disgust from foods that are plain and simple: on this account the difference between the craving of a pampered appetite and that of real hunger is extreme. The former, whatever be its longing, can only satiate itself on delicious and high seasoned dishes; the latter is content with a fare of any kind, and enjoys the plainest more than the richest.

It is not often that we are asked to attempt a cure of this complaint: it generally proceeds till the tone of the stomach is exhausted by its hard labour, and the cure is effected by the introduction of dropsy, or some other disorder worse than itself, which effectually extinguishes all appetite whatever. The man, nevertheless, who would honestly undertake to reclaim himself from this mischievous habit, and to acquire a better, should proceed in his career gradually; for organs that have long been under the influence of perpetual excitement, would lapse into atony upon the sudden adoption of a severe counterplan. The food should gradually be plainer, less in quantity, and repeated at a greater distance of time; while the intervals should be filled up with some pleasant and active pursuit that may wholly engross the attention; for the surest way for such a man to produce faintness, flatulency, and uneasiness in his stomach, is to think about it. The bowels will at first perhaps be costive; but this may easily be remedied by occasional doses of the warmer and bitter purgatives, as aloes, colocynth, and rhubarb; which will operate as usefully by their tonic, as by their aperient qualities.

The voracity produced by an exhausted state of the system is rarely of difficult removal; for, in general, it requires good plain food, and abundance of it. It is most usually consequent upon rapid growth of the body in the period of youth, fevers, excessive discharges, especially from the bowels or blood-vessels, long-fasting, severe and uninterrupted exercise, and particularly the union of the last two, as often occurs in shipwreck, or the retreat of an enemy: it happens not unfrequently that in such cases the stomach occasionally overloads itself, and throws back some part of what has been swallowed. But this is of little importance, and often proves serviceable, by more effectually inculcating moderation than can be accomplished by medical precepts.

SPECIES II.

LIMOSIS EXPERS.

Long Fasting.

LOSS OR WANT OF APPETITE WITHOUT ANY APPARENT AFFECTION OF THE STOMACH.

The causes that lay a foundation for this species are numerous, and some of them are accompanied with a slight diversity of symptoms. The following are the chief varieties it offers to us :—

α Defessorum. Want of appetite from exhaustion.	From too great fatigue or protracted fasting.
β Pathematica. Want of appetite from mental emotion.	From violent passion or other absorption of the mind.
γ Protracta. Chronic fasting.	From habit or other cause enabling the system to sustain almost total abstinence for a long and indefinite time without faintness.

Muscular exertion and long fasting, in a vigorous constitution, prove often, as I have just observed, the most powerful incentives to hunger. But, if even in the robustest frame, these are carried beyond a certain limit, the appetite palls, and is recovered with great difficulty; while in the feeble and delicate, a very little exercise, and a slight protraction of a meal beyond the accustomed hour, and especially where the attention is directed to it and hangs upon the delay, is productive of the same effect. In all these cases, the stomach is best re-excited to its proper feeling by half a wine glass of sherry or madeira, with a crust of bread or piece of biscuit; or, if there be very great languor, by a few drops of laudanum in a tea-spoonful or two of aromatic spirit of ammonia; while the interval should be filled up by what is most likely to attract the attention; for one of the surest revellents in uneasiness of the stomach is a strong excitement of the mind.

I have just said, that a strong excitement of the mind is one of the surest remedies for general uneasiness of the stomach: and every day shows us how powerfully this acts in repressing or taking away the painful sensations of hunger. No man, perhaps, ever had an appetite for food under a full influence of the depressing passions, as fear or grief: he may eat from persuasion, or a sense of duty; but

he eats without desire, or any craving sense of hunger. Hence those who are suddenly deprived of their senses by an overwhelming and unexpected evil, pass days and nights without food of any kind, exclaiming perhaps in the language of King Lear—

> When the mind's free
> The body's delicate; the tempest in my mind
> Doth from my senses take all feeling else
> Save what beats there.

Even where the mind is simply but entirely abstracted, and lost in itself while pursuing an abstruse problem or proposition, or adjusting a long train of intricate accounts in a banking house, the individual has no sensation of hunger; and, if left alone, may perhaps persevere without knowing how the time proceeds, till warned by the darkness of the evening. And hence, La Bruyere, if I mistake not, in one of his pictures of an absent man, describes him, without any deviation from nature, as totally mistaken upon the subject of his dinner. Being summoned by his servant to the dinner table, he answers that he will come immediately, but still continues in the same place, and indulges in the same reverie for an hour; when, being summoned a second time, he shews himself angry at the interruption, and still more so at the servant's stoutly insisting upon it that he had not dined, and that the dishes were still upon the table untouched, while the master contended, on the contrary, that he had actually made his dinner, and that too in the dining room.

In simple cases of this kind, medicine is not wanted; and in the severer, it is of no use; for it is not in the healing art, under such circumstances, to "minister to a mind diseased." This must be left to time, the palliatives of friendship, and a change of scene.

The modifications, however, thus far contemplated, may be regarded as mere paroxysms, or acute cases of fasting. The most singular variety of the species consists in what may be called the chronic form of affection, exhibited in those who are able to endure an unbroken abstinence from food for a long and indefinite period of time without faintness or inconvenience of any kind.

The medical journals and ephemerides of different nations, and the transactions of learned societies, abound with examples of this last and most extraordinary modification: many of them extending to a term of time so apparently extravagant as almost to repulse belief, notwithstanding the respectability of the authorities appealed to. It is necessary therefore, before any such histories are noticed, that I should lay down a few general principles, too well established to allow of controversy, which by their conjoint force may lead us more readily to an admission of such as are founded upon trust-worthy evidence.

1. As the stomach is capable of acquiring a habit of gluttony, or of craving too much; so, it may acquire a habit of fasting, or of craving too little: or, in other words, we are as capable of triumphing over the appetite of hunger, as we are over any other appetite

whatever. The Chippeways, and native savages of Canada, according to Mr. Long, give striking proofs of the power of the stomach in both extremes—that of hard eating, and that of hard fasting—and as nearly as may be at the same time: for, when one of these is on the point of commencing a journey, he devours as much as he would otherwise take in a whole week: and having gorged the stomach, he starts upon his expedition, and commences a long season of severe abstinence.

2. Most of the cases of long fasting, that are credibly recorded, have been introduced by a habit of this kind. A few, indeed, have been brought on suddenly; as the result of an accidental shock, inducing an instantaneous and unconquerable antipathy to food: but by far the greater number are of the former kind; and have had their origin in severe abstraction of the mind, by intense study, rigid mortification of the natural feelings in a course of religious discipline; or some growing obstruction, or other affection in the passage from the mouth to the stomach, or in the stomach itself, producing great uneasiness in deglutition, or digestion.

3. When a habit of this kind is once established, and a life of indolence or perfect quiet is associated with it, the quantity of food capable of supporting the animal frame may be reduced to a trifle, and may perhaps consist of water alone for weeks, or even months. We see examples of this in other animals than man. It forms a well-established fact in the history of fishes of various kinds. Even the pike, the most voracious, perhaps, of all fishes, when he has no longer opportunity of indulging his gluttonous propensity, will both live and thrive upon water alone in a marble basin. The mere air of the atmosphere appears to afford nourishment enough for many forms of animal life. Snails and chameleons have been often known to live upon nothing else for years. Garman asserts it to be a sufficient food for the greedy spider; and tells us, that though the spider will ravenously devour flies and other prey, whenever he can seize it, he will not starve upon the spare regimen of air alone. Latreille confirms this assertion by an experiment of his own. He stuck a spider to a piece of cork, and cut him off from all food whatever for four months; at the end of which period he appeared to be as lively as at first. Mr. Baker in like manner confined a beetle under a glass for not less than three years; allowing him nothing but air for his diet; at the expiration of this period, he was not only alive, but fortunate enough to effect his escape, and go in pursuit of a more substantial repast. And we are hence prepared to receive with less hesitation than we should otherwise do, the wonderful tales of frogs, toads, lizards, and other reptiles, found imbedded in trunks of trees, or blocks of marble, so deeply seated, that, though exhibiting life and activity on exposure to the atmosphere, they must have been blocked up in their respective cavities for fifty, and, in some instances, for a hundred years; cut off from every kind of food except the moisture by which they have been surrounded, and from all direct communication with the atmosphere itself.

4. It may possibly be observed, that these examples are drawn, for the most part, from cold-blooded, or exsanguineous animals, and that in such cases there is no waste of living matter by the skin, the great vehicle of discharge in animals of a higher rank. But they are drawn from animals, that, in their common customs and habits, have the same instinctive craving for food, and the same faculty of converting it into their own substance, by a process of digestion, as animals of any superior class. While a like power of enduring long periods of fasting in a state of inactivity, without any injury to the general health, is quite as conspicuous and incontrovertible in many kinds of warm-blooded animals, and especially those that sleep through the winter season. In the hedge-hog, indeed, and the Alpine marmot, we trace a slight loss of substance on their reviving in the spring; as they are then found somewhat thinner and less weighty than when three or four months before they first became torpid; but in dormice and squirrels, as in by far the greater number of hybernating plants, we perceive no waste or dimunition whatever. In the Transactions of the Linnéan Society, there is an account of a pig that lived without food for a hundred and sixty days; which it is difficult to resolve into any other principle than that which thus operates in winter-sleeping quadrupeds.*

5. We have reason therefore, as well from analogy as from recorded facts, to believe it possible for man himself, under certain circumstances, not indeed to pass life altogether without food, but to lose all relish for it, and to habituate himself to fastings of very considerable length, and only interrupted by slender portions of the sparest and most diluted aliment. The cases are innumerable in which fasting has been endured, ten, twelve, or fifteen days; and, where there has been access to water, twenty or thirty days;† Raulin mentions one of fifty-two days, water alone being drunk during the time.‡ But there are other cases related at full length, and upon authority altogether unimpeachable, of fasting continued for twenty-five months :§ three,‖ ten, fifteen, and eighteen years; and, with a very spare and only occasional taste of solid food, through the entire life. In the running commentary to the volume on Nosology, I have given several of these histories at some length, and the reader may amuse himself with them at his leisure.

In most cases, and probably in all, if they had been critically investigated, water, tea, or some other fluid seems to have been indispensably necessary: and such was found to be the fact in the noted instance of Ann Moore of Tutbury, that has occurred within our own day. That she was an impostor, in pretending to be able to live without any food whatever, is unquestionable. But so very

* Vol. XI. Extracts from the Minute Book. Communicated by T. Marshall, Esq.

† Phil. Trans. Vol. XIV. p. 577. Memoires de Toulouse, ann. 1788.

‡ Observations de Medicine, p. 270.

§ Bresl. Samml. Band. II. passim.

‖ Phil. Trans. 1742. 1777.

spare was the quantity she had accustomed herself to, from very great difficulty and pain in diglutition, that there is reason for believing, that for many years before she submitted to the test proposed, she had swallowed very little food of any kind except tea and spring water. And such is in truth, the recorded opinion of the active and very intelligent committee who undertook the trouble to watch her night and day for a whole month in rotation. Absolutely cut off from all fluids as well as solids, this woman was on the point of expiring when she reached the tenth day, and had scarcely strength enough left to confess the fraud she had been induced to practice. Yet the committee thus close their report of her history:—"On the whole, though this woman is a base impostor with respect to her pretence of *total* abstinence from all food whatever, liquid or solid; yet she can perhaps endure the privation of solid food longer than any other person. It is thought by those best acquainted with her, that she existed on a mere trifle, and that from hence came the temptation to say that she did not take any thing. If, therefore, any of her friends could have conveyed a bottle of water to her, unseen by the watch, and she could have occasionally drunk out of it, little doubt is entertained that she would have gone through the month's trial with credit. The daughter says, that her mother's principal food is tea, and there is reason to believe this to be true.*

SPECIES III.

LIMOSIS PICA.

Depraved Appetite.

APPETITE FOR IMPROPER AND INDIGESTIBLE SUBSTANCES.

In this species there is no want of appetite, often indeed an inordinate craving; but, instead of its directing the patient, as in the first species, to palatable and substantial food, whenever such can be obtained, it urges him in preference to the most whimsical and innutritive materials. This character forms the specific definition. The specific name here given is *pica*. Not that the term has any particular or very obvious merit, for its origin and primary meaning are doubtful; but that out of many terms with which nosology has been encumbered to express this disease, pica appears to be the most general, and there is no sufficient reason for changing it.

Now an appetite for improper and indigestible substances may be of two descriptions. It may proceed from a want of taste or dis-

* Full exposure of Ann Moore, the pretended fasting woman of Tutbury.

crimination, as in infants or idiots: or from a corrupt taste, or corrupt indulgence, often founded on empyrical or other dangerous advice, as the eating of chalk or acids to produce a fair skin; and we have hence the two following varieties:

α Insulsa. Unwitting pica.	From want of correct taste or discrimination.
β Perversa. Perverse pica.	From a corrupt taste or indulgence.

The depraved appetite which is sometimes manifest in infants can only proceed from want of proper management and direction: for nothing is more tractable than the organ of taste in early life. And hence, indeed, it is that the different nations of the world are brought by habit, and habit almost coeval with their birth, to prefer such kinds of food as their respective climates produce in greatest abundance, or as they obtain by an easy barter of indigenous substances. Thus, the Hindoos live entirely on fruits and grain; the Tonguses, on berries, the refuse lichen found undigested in the stomach of the rein-deer, dried fishes, and beasts of prey; the Californians, on snakes, rats, lizards, rabbits, intermixed with the wild herbs of the soil. But perhaps there is no stronger proof of the force of habit in forming an acquired taste to be met with in any part of the world than in our own country;—in our exchanging the natural and instinctive desire of a bland and sweet fluid, as milk, for the bitter beverage of tea for breakfast, and beer for dinner.

On this account it is not to be wondered at that children without a guidance, or with an improper one, should often acquire depraved or vicious tastes, and be longing for substances that are innutritive, or even hurtful to the general health. Where this propensity has obtained a footing, it may be successfully opposed by discipline, and overpowered by a counter-habit. Among idiots it is incorrigible.

A longing for improper and indigestible substances, however, is often produced by other means, and occurs in persons who are possessed of a sound judgment. It is frequently to be traced as a symptom of some other disease, as pregnancy, chlorosis, and perhaps some species of mental emotion: in all which cases it is only to be cured by curing the primary disorder. But it sometimes exists as a primary malady; and is then most commonly brought on by a vain desire of improving the beauty of the person, of giving a graceful slenderness to the form, or a languishing fairness to the skin, through the medium of chalk, acids, or other empyrical materials. In consequence of which, the Greek physicians, in whose day the practice seems to have been more common than even in our own, and this too, among young men as well as young women, gave to this variety of the disease the name of μαλακια, *softness*, or *effeminacy*.

Whatever be the cause, when this morbid propensity has once obtained a triumph over the natural taste, the substances for which it excites a desire, are often not only of the most indigestible, but

disgusting quality. We have had examples of an inclination for devouring dirt, cinders, ordure, fire, spiders, lice, toads, serpents, leeches, bits of wood, squills, hair, candles; and more literature, in the form of paper, and printed books, than is devoured by the first scholars in Christendom.

Borelli gives us numerous examples of most of these; and some of them of a very extravagant kind:* and those who are desirous of gratifying themselves still further, may have full indulgence by consulting the Ephemerides of Natural Curiosities. Mr. John Hunter describes a longing for dirt, in the form of clay or loam, to have been an endemic disease among the blacks in Jamaica.† But he is surpassed by Dr. Darwin, who tells us, that he once saw a young lady, about ten years of age, that had filled her stomach with earth out of a flower-pot, and then vomited it up with small stones, bits of wood, and wings of insects amongst it.‡

There are other persons who have had a taste for harder substances, and have glutted themselves with stones,§ glass,‖ and even leaden bullets.¶ Others, again, have feasted on pieces of money, which have sometimes formed a very expensive repast; for Borelli gives us an instance of a pantophagist who swallowed a hundred louis-d'ors at a meal.** Yet perhaps, after all, the most marvellous, though certainly one of the most common exhibitions of depraved taste, is an appetite for knives. There is not a country in Europe but has furnished examples of this in both sexes: and hence the medical journals and miscellanies are numerous in their descriptions of London knife-eaters;†† Prussian knife-eaters;‡‡ Bohemian knife-eaters;§§ and even out of Europe, Brazilian knife-eaters.‖‖ The wretched patients have sometimes perished shortly after the extraordinary feat; and sometimes dragged on a miserable existence for a few years before they fell victims to their madness or malady. In a few instances they have recovered.

This morbid action is best opposed by giving a counter-action to the organ in which it exists. And hence emetics and purgatives are highly useful. Rhubarb is perhaps the best medicine for the last purpose; and in moderate doses it should be continued daily; and in combination with it, bark, steel, and other tonics. An acid has often been suspected as the cause of the disease, and the ab-

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* Cent. I. Obs. 24, 52. II. 37. IV. 95.
† Observations on the Diseases of the Army in Jamaica.
‡ Zoonom. Cl. III. i. 2. 19.
§ Act. Hafn. vol. v. ‖ Camerarius Memorab. Cent. v.
¶ Bonet. Medic. Septentrion. lib. I. p. 510. Binninger, Obs. Cent. II.
** Cent. iv. Obs. 95.
†† Act. Hafn. v. 107.
‡‡ Dolœus. Encycl. Chir. p. 679.
§§ Crollius, Basilic. Chym. præf. p. 110.
‖‖ Binninger, Cent. v. Obs. 7.

sorbent earths, as chalk, magnesia, and Armenian bole, have been tried in large quantities: but the relief they afford is seldom more than temporary. In the mal d'estomac, or cachexia *Africana*, as it has been called, which is the disease of dirt-eating among the wretched negroes referred to by Mr. John Hunter, an acrimony of some kind or other, perhaps an acidity, may exist; and may instinctively call for the drier earths, as absorbents. But the longing for such materials is, in this disease, a mere symptom; and rarely shews itself till the frame is completely exhausted by atrophy, dropsy, and hectic fever, brought on by a longing of a far more serious kind—a longing to return home; a pining for the relations, the scenes, the kindnesses, the domestic joys of which the miserable sufferers have been robbed by barbarians less humanized than themselves; and which they have been forced or trepanned to resign for the less desirable banquet of whips, and threats, and harness, and hunger.

SPECIES IV.

CARDIALGIA.

Heart-burn.

IMPAIRED APPETITE, WITH A GNAWING OR BURNING PAIN IN THE STOMACH OR EPIGASTRIUM, AND A TENDENCY TO FAINT.

The symptoms laid down in this definition are sufficiently marked to separate cardialgia from dyspepsy, in which it is merged by Dr. Cullen and various other writers; for in the last there is not necessarily a gnawing or burning pain; and the appetite is rather fastidious than essentially or at all times impaired. Cardialgia is certainly sometimes found as a symptom in dyspepsia, as it is also in a multitude of other complaints; as flatulency, scirrhus, or inflammation of the stomach, worms, retrocedent gout, suppressed menstruation, and various diseases of the heart, liver, pancreas, kidneys, and intestines; in hypochondrias, and in sudden and violent emotions of the mind: but it is likewise found in many instances, as an idiopathic affection; and should therefore be described as such.

Cardialgia admits of the three following varieties:

α Mordens. Heart-burn.	Gnawing or burning uneasiness, felt chiefly at the cardia, the tendency to faint being slight.
β Syncoptica. Sinking heart-burn.	The pain or uneasiness extending to the pit of the stomach; with anxiety, nausea, coldness of the extremities, failure of strength, and great tendency to faint.

γ Sputatoria. Black-water. Water-brash.	Burning pain extending over the epigastrium; and accompanied with an eructation of watery fluid, usually insipid, sometimes acrid.

The first variety is perhaps the most common form of the disease. And as the gnawing or burning pain in this case is felt chiefly at the cardia or upper orifice of the stomach, the specific name of cardialgia is derived from this symptom. The cardia is indeed generally supposed to be the immediate seat of affection: but this is an erroneous view. It is from the greater sensibility of the upper orifice of the stomach than any other part of it, that we are most sensible of uneasiness in that region: but irritability of the whole, or of any other part of the organ, and perhaps of the adjoining organs, as the pancreas, spleen, and liver, will often produce the same local pain; and in some instances it has been ascertained after death to have been occasioned by a scirrhous, or some other obstruction of the pylorus.

In the second variety, we find the pain or uneasiness somewhat less intense, but far more general; reaching, indeed, over the whole range of the stomach and epigastrium, accompanied with nausea and anxiety; and by sympathetically affecting the general system, attended with coldness of the extremities, failure of strength, shortness of breath, and great tendency to faint, which continues till the system re-acquires warmth and perspiration.

From the wider circumference of the affection, Hippocrates denominated it periodynia stomachi. It is distinguished in popular language by the name of *sinking heart-burn.*

The third variety is distinguished by a morbid increase in the quantity of the fluids secerned; and hence the peculiar symptom of an eructation, frequently in considerable abundance, of a thin watery liquor; chiefly in the morning after food has been abstained from for many hours, and the stomach has nothing in its cavity but its own fluids. Dr. Cullen has admirably described the disease: though he has singularly separated it to a great distance from dyspeptic affections, transferred it to another order, and erected it, apparently contrary to his own mode of reasoning, into a distinct genus. "It appears most commonly," says he, "in persons under middle age, but seldom in any persons before the age of puberty. When it has once taken place, it is ready to recur occasionally for a long time after; but it seldom appears in persons considerably advanced in life. It affects both sexes, but more frequently the female.—The fits of this disease usually come on in the morning and forenoon when the stomach is empty. The first symptom is a pain at the pit of the stomach, with a sense of constriction, as if the stomach were drawn towards the back: the pain is increased by raising the body into an erect posture, and therefore the body is bended forward. This pain is often severe; and, after continuing for some time, brings on an eructation of a thin watery fluid in considerable

quantity. This fluid has sometimes an acid taste, but is very often absolutely insipid. The eructation is for some time frequently repeated; and does not immediately give relief to the pain which preceded it, but does so at length, and puts an end to the fit."* To this description it may be added, that when the watery discharge is altogether insipid, there is merely an increased secretion of the fluids poured into the stomach, apparently in a thinner or more dilute condition; and that when this discharge is of an acrid taste, the gastric, or other juices, which exist simply and without food, or other intermixture, in the stomach at the time, possess an acidity in themselves, a fact which closely connects pyrosis with cardialgia as a species, and readily reduces it to the rank of a variety under its banner. In the colloquial tongue of England it is called *black-water*, in that of Scotland *water-brash*, and *water-qualm*. It is the pyrosis of Sauvages and many other writers.

Most of these varieties have sometimes returned periodically,† especially in the spring:‡ and as their general causes and mode of treatment do not essentially differ, it is more convenient to consider them jointly than under detached heads. Dr. Perceval, of Dublin, in the manuscript comment with which he has obliged me on the Nosology, ingeniously inquires, "Does it ever arise from an affection of the pancreas?" I think it likely that it does, from contemplating the structure and office of this organ; and we have various cases, in which, after death, the pancreas has been found considerably enlarged.

The remote causes then of the present species, under whatever variety it shews itself, which is chiefly regulated by the habit or idiosyncrasy of the individual, are indigestible food or other ingesta; an habitual and copious use of very cold or very hot beverages, but especially the latter; indulgence in spirituous potations; worms, hydatids, and insects or their larves; drastic purges; obstructed perspiration; repelled cutaneous eruptions; and bile depraved, or excessive in its secretion. Of the indigestible foods, the most common are animal fat, oil, butter, or cheese eaten in excess; which last has produced a cardialgia that continued for three years.‖ The stones or kernels of fruits have often laid a foundation for the complaint, especially where they have remained, as they have occasionally been found to do, and particularly cherry-stones, for two, or even for three years, with little or no change whatever.§ It occurs also, as already observed, not unfrequently as a sequel, or symptom of some other affection.

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* First Lines, vol. IV. p. 13.

† Bartholin. Hist. Anat. Cent. III. Hist. 50. Zacchius, Concil. N. 54. 98.

‡ Eph. Nat. Cur. passim.

‖ Paulini, De Nuce Mochata, sect. iii. p. 3. Eph. Nat. Cur. Dec. II. Ann. V. app. 71.

§ Bresl. Samml. 1725. i. p. 77. Gronen. Commerc. Liter. Nov. 1733, p. 189.

All these causes have a direct tendency to produce imbecility of the stomach, especially a loss of tone, or weaker action of its muscular fibres; and consequently a morbid condition of the fluids, secreted by, or poured into the stomach; which hence become changed in their quantity or their quality, and are given forth too freely or too scantily; with an acid or other acrimonious character, or tendency; or with several of these in conjunction, according to the idiosyncrasy or peculiarity of the constitution. And hence, through the whole of this species, we meet with a peculiar proximate cause, as well as a remote one.

The existence of an acrimony from acidity seems to be common to all its varieties; and this to such a degree that, as Dr. Darwin observes, the contents of the stomach when regurgitated on a marble hearth, have often been seen to produce an effervescence on it.

The acid, according to the experiments of M. Perperes, is chiefly the acetous, and he has found that not less than two ounces and six drachms of it have been produced by eight ounces of roasted chesnuts, an aliment that ferments in the stomach for an hour and a half; and even then digested with great difficulty. In some cases the formation of acetous acid seems to be favoured by the nature of the gastric fluid itself, which appears to be secreted in too dilute or weakly a condition for the purposes of digestion; on which account, the food, instead of being converted into chyme, runs readily into a state of fermentation, so that some persons cannot take either honey or sugar without producing this effect: while, in others, the gastric juice is possibly itself acid at the time of secretion; since we occasionslly find that the disease is not increased by vegetable foods, or even acescent fruits; and that water alone, or small wine-and-water suit the stomach better than undiluted wines or spirits.

It is not improbable that the third variety, cardialgia *sputotaria*, may, in some instances, be produced by a peculiar paresis or inactivity of the proper absorbents of the stomach. The experiments of M. Magendie show, that, in a state of health, all fluids disappear from the stomach with great rapidity, in consequence of the urgency of this absorption, insomuch that a ligature on the pylorus does not in the least retard their vanishing. And hence the quantity of fluid that is often regurgitated may result from a want of this action. This, however, is a cause that pathologists have not attended to, so far as I know.

In applying to this disease the resources of the art of healing, it is obvious that our intention should be two-fold: to palliate the present distress, and to prevent a recurrence of the paroxysms. The first may be obtained by small doses of opium, and sometimes by other antispasmodics, as the ethers and volatile alkali; and where acidity is unquestionable, by calcareous and saponaceous earths. Lime-water, or acidulous alkaline waters, or the different alkalies of the alkalescent earths, magnesia and lime, have been

almost the only ones that have hitherto been employed, or at least the others have not been submitted to a sufficient trial and under a sufficient variety of modifications to enable us to speak of them with accuracy. It is a common belief that chalk, with an acid in the stomach, produces an astringent, and magnesia a laxative neutral. This idea is doubted by Dr. Cullen; but it seems to have a foundation, and should regulate our practice. Chalk, however, when used in large quantities, and long persevered in, has an indisputable evil, which does not equally belong to magnesia, and that is, its aptitude to form balls or calculi in some part of the intestinal canal; and thus produce a very troublesome obstruction, and occasionally colic. I have known various instances of this; and, in some cases, attended with alarming symptoms before the balls were dejected; many of which I have also known to be evacuated in masses of more than an ounce weight each. There is no evidence that an acid is found below the duodenum, and hence it is chiefly in the upper part of the alimentary canal that these calculous concretions are impacted and agglutinated. Dr. Parr and some others assert, that an acid formed in the stomach certainly never enters the circulating fluid. It is, indeed, true, that we have no sensible trace of it in the course of circulation: but the benefit which has lately been discovered, and which we shall have occasion to advert to more fully hereafter, of introducing magnesia into the stomach, in habits possessing a tendency to form calculi in the kidneys and bladder from a superabundant secretion of lithic acid, seems to show that an acid principle, or base, still passes from the stomach into the circulation in certain cases, though too minutely divided to be detected by chemical tests; and that the introduction of magnesia into the stomach destroys or neutralizes it at the fountain-head. (See Enterolithus and Lithia.) M. Perperes, in taking off acidity from the stomach, unites the calcareous earths with a warm bitter; and recommends, as the medicine he has found most successful, columbo root with magnesia, in doses of ten grains of the former to twelve of the latter.

Oleaginous preparations have also been had recourse to, and in some habits apparently with success. In such cases it is most probable that they act in a double way; first by converting a part of the acid into soap: and next by proving aperient, and thus accelerating the passage of the acid material into the intestinal canal. They may also, perhaps, in other acrimonies than acidity, obtund their irritating power: for in many cases of heart-burn, speedy and effectual relief is obtained by the simple and pleasant remedy of eating six or eight almonds.

Yet when we have full proof of acidity as the existing cause, there are few medicines we can more fully depend upon than soap: probably because in its decomposition it lets loose the oleaginous principle, which may in some degree obtund the pain, and at the same time unites its alkali with the acid of the stomach; thus neutralizing its acrimony, and forming a valuable aperient. "It is

often, " says Dr. Cullen, " a more convenient remedy than common absorbents or simple alkalies."* If the pain be very severe, we shall much improve the beneficial operation of the soap, by combining it with opium. This I have already mentioned as a very valuable medicine in all the varieties of the disease: but it is peculiarly so in water-brash, or the third variety. The distinguished writer I have just quoted asserts, indeed, that he has found nothing but opium that will give it real relief: but this, he afterwards adds, relieves only the present fit, and contributes nothing to the prevention of future attacks.

It is hence necessary, in every case, to direct our view to the second intention I have pointed out; I mean, that of preventing a recurrence of the paroxysm.

Now this can only be done effectually by restoring the stomach to its proper tone: and hence the entire process we shall have to notice under Dyspepsia, forming the seventh species of the present genus, will here be found equally advantageous. The warmer bitters, the metallic oxyds, and especially the oxyds of zinc and bismuth, first mentioned by odier, bid fairest for success. Of the bitters, one of the most elegant as well as most effectual, is the extract of chamomile. Yet the matricaria *chamomilla*, or dog's-chamomile, seems to rival its powers; and has often been found a very active and useful stomachic in most debilities of the stomach. The nux vomica, long since extolled by Linnéus, remains yet to be fairly experimented with in this country. It has the peculiar property of diminishing the sensibility, while it increases the irritability of the animal frame—a property of which I shall speak more at large when discussing the subject of Paralysis. It is said to have been given in doses of ten grains three times a-day. But this I very much question, where the drug has been sound and genuine. In palsy, I have never been able to raise it above seven grains, without making the head stupid and vertiginous.

Among the aromatics, many of the terebinthinate balsams will be found highly useful. The balsam of Gilead, and that of Mecca, amyris *Gileadensis*, and a. *opobalsamum*, were once highly extolled, and perhaps deservedly; but are too dear for common use. The Turks take eight or ten drops as a dose; but the quantity may be considerably increased. In some of the pharmacopœias, cubebs, as much cheaper, have been ordered instead of the balsams.

It is almost superfluous to add, that the diet should consist of articles least disposed to ferment; as animal food generally, shell-fishes, biscuits; and for drink, small brandy-and-water, toast-and-water, lime-water, or most of the mineral waters.

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* Mat. Med. Vol. II. p. 400.
† Opera citato, Vol. II.

SPECIES V.

FLATUS.

Flatulency.

IMPAIRED APPETITE, WITH AN ACCUMULATION OF WIND IN THE STOMACH OR INTESTINAL CANAL; AND FREQUENT REGURGITATION.

It is supposed by Mr. John Hunter, and there is reason for the supposition, that air is occasionally secreted from the mouths of the secernents into certain cavities in which it is found: but, in the present instance, there can be little or no doubt that it is merely separated from the materials introduced into the stomach in the form of food, and tending towards fermentation. When the fluids which are poured naturally into the stomach are secreted in a state of health, they concur, and perhaps equally so, in checking fermentation. But when from imbecility of this organ, or its consociate viscera, they are secreted in a dilute or rather imperfect state, they lose their corrective power, fermentation rapidly commences, and the stomach is overloaded, distended, and sometimes ready to burst with the air, for the most part carbonic acid gas, that is hereby let loose; relief being only obtained by frequent *eructation* or rejection upwards, *crepitation*, or rejection downwards, which the Greeks denominated Βόμβος, as the Latins did *crepitus*; or its combining loosely with such fluids as may exist in the large intestines, where it often rolls about in an ascending or descending direction, according to the action of the diaphragm and abdominal muscles; sometimes with a rumbling sound where the intestinal fluid is but small in quantity, and sometimes, when it is considerable, with a gurgling noise like air rushing into a bottle as the water contained in it is poured out: and hence by the Greeks denominated *borborygmus*. We have, in consequence, the three following varieties, under which this species presents itself unto us:

α Borborygmus. Rumbling of the bowels.	With frequent rumbling of the bowels.
β Eructatio. Eructation.	With frequent rejection upwards.
γ Crepitus. Dejection of wind.	With frequent rejection downwards.

The quantity of air separated in the manner just described, is sometimes prodigious, and may amount to an eructation of many hogsheads in an hour. Nor need we be surprised at this; for, by the experiments of Dr. Hales, it appears that a single apple, during fermentation, will give up above six hundred times its bulk of air:

while many of the vegetable materials introduced into the stomach possess far more ventosity than apples.

Flatulency, under one or other of the forms now enumerated, is often found as a symptom of other diseases; especially in dyspepsy, cholera, colic, hysteria, and hypochondrias. But there is no doubt that it occasionally exists by itself, and is strictly idiopathic, occurring after the deglutition, and even enjoyment of a full meal without any other symptom of indigestion, and ceasing as soon as the process of digestion is completed.

A very common and a very active cause is drinking a large quantity of some cold fluid while the system is labouring under great heat. Van Swieten mentions a singular instance of this kind of inflation from indulging in a draught of cold whey,* and Riedlin another, from a like indulgence in cold beer,† during an extreme heat of the body.

Infants are peculiarly subject to this affection from the natural delicacy of the stomach, and particularly when brought up without their natural sustenance, and upon food which requires more labour of the stomach to digest. In many cases it must necessarily be combined with acidity; for this, as already observed, is a general effect of impaired action in the chylific viscera; and when both these causes concur, the infant will also be tormented with severe gripings, and great irregularity in the bowels; a distressing and watry diarrhœa; or an obstinate costiveness; and sometimes with both in succession. Essential oils, absorbent powders, and aperients may palliate the symptoms, but the best cure will always be found in a healthy breast of milk.

Hypochondriacs, and others of weak digestive power, are very apt to acquire a morbid habit of eructing; and are perpetually striving to throw up wind from the stomach in an expectation of relieving themselves from the elastic vapour with which they seem to be bursting. The habit is vain and mischievous: for the vacuity hereby produced is instantly re-occupied by a fresh separation of gass from the fermenting materials, often thrown forth in still larger abundance, and still more distending and weakening the coats of the stomach; and hence there is not only no relief, excepting for a few moments, but an evident increase of the disease. So, opening vessels that contain new wine, accelerates the fermentation, while stopping them puts a check to it. If cardialgia attend, the air is sometimes erected with a sense of burning so violent, as to make the patient imagine he is actually like a volcano, belching forth flames and fire from his entrails.

There are some cases on record in which persons appear to have a power of distending the stomach and abdomen to an enormous size at pleasure; and advantage has been taken of this by one or two female impostors, who, for particular purposes, have hereby

* Constit. Epid. L. B. p. 88.
† Cent. II. Obs. 43.

pretended to be pregnant, and have succeeded by such an imposition. But a distention of this kind does not belong to the disease before us.

The cure in this species, as in the last, depends upon giving tone to the muscular fibres of the stomach and intestinal canal; and hence the plan laid down already, and the course to be described under dyspepsia, will have the greatest chance of success.

Emetics have occasionally been recommended with a view of giving a change to the action of the stomach, but they are of doubtful efficacy. They have been of great service, however, incidentally, by discharging some lurking body which has itself been a chief cause of the disease. In this manner worms have at times been thrown up; and at times also morsels of indigested fruit or other materials, as plum-stones or fragments of a pear or apple.*

The disease may be palliated by an innumerable host of carminatives, which vary in their several effects according to the variety of the idiosyncracy, or the actual state of the stomach. The verticillate order affords an abundant stock from which we may select at pleasure; as marjoram, thyme, rosemary, lavender, spear-mint, pepper-mint, and penny-royal; the aroma of all which resides chiefly in the leaves or calices. The coniferous order offers, perhaps, nearly as many, including the terebinthinate and juniper tribes, but of less activity than the preceding, except in the instance of the essential oil of juniper, the pleasantest of all the turpentine family. The medicinal virtue of both these orders is that of camphor, which they all contain very largely, especially the pepper-mint, as shewn by the experiments of Gaubius.† The pungency of this plant, however, is so acrid, as to exhaust the sensibility of the nerves of the tongue and palate for a moment, and hence to give a feeling of coldness in succession to that of heat. Its best form is what is called its essence, which, as conjectured by Dr. Cullen, appears to be nothing more than its rectified essential oil dissolved in spirit of wine. On account of the acritude of this plant, it is less valuable, as well as less palatable than spear-mint: which last acts better, and is more pleasant to the taste when fresh in infusion, than when distilled.

The umbellate order affords also a rich variety of carminatives, whose virtue, with a few exceptions, resides almost entirely in their seeds. The aroma of several of these is very pleasant, as the coriander, anise, and dill; while in a few, as in the fennel, it approaches the nauseous smell and taste of the fetid gums. This, however, is an advantage in flatulencies occurring in hysteric or other nervous habits.

To these may be added many of the aromata imported from hot climates in very different forms; as barks, roots, berries, pods, and seeds, particularly ginger, cloves, cardamoms, cinnamon, pimento,

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* Riedlin, Lin. Med. Ann. IV. V.

† Adversar. passim.

pepper, and capsicum. Like those already noticed, they all owe their virtue to an essential oil, in whatever part of the plant such virtue may reside: but several of them have likewise some other property which may render them more or less elegible in different cases. Generally speaking, the stimulants we are now contemplating are more strictly entitled to the name of cordials than the umbellate or verticillate plants; for, by exciting the nervous energy in a greater degree, they increase the action of the heart, and quicken the pulse. And hence, when the circulation is weak and languid, they have an advantage over the preceding; but when the pulse is already too frequent, they should be abstained from.

To this general remark, however, there may be one or two exceptions. Newmann and Gaubius, reasoning from the general use of pepper among the Hindus and Javanese, without any particular marks of excitement, have contended that it produces less effect on the sanguiferous system than many other carminatives: but this may be resolved into habit. Dr. Lewis, from some less obvious train of argument, came to a like conclusion in respect to ginger; which to many is as heating as any of the spices whatever. But it seems generally conceded, that nutmeg is entitled to the character of a sedative and even of an hypnotic; and hence, where flatulency is accompanied with great irritability, it becomes peculiarly valuable. Bontius speaks of this influence as a matter of frequent occurrence in the East-Indies, and one which had often fallen under his own observation: and in the German Ephemerides,* we have an account of some extraordinary effects on the nervous system occasioned by swallowing a large quantity of this spice. To which I may add the following confirmatory evidence of Dr. Cullen derived from his own practice. "A person by mistake," says he, "took two drachms or a little more of powdered nutmeg. He felt it warm in his stomach, without any uneasiness: but, in about an hour after he had taken it, he was seized with drowsiness, which gradually increased to a complete stupor and insensibility: and not long after he was found fallen from his chair lying on the floor of his chamber in the state mentioned. Being laid a-bed, he fell asleep: but waking a little from time to time he was quite delirious: and he thus continued alternately sleeping and delirious for several hours. By degrees, however, both these symptoms gradually diminished; so that in about six hours from the time of taking the nutmeg, he was pretty well recovered from both: although he still complained of headache and some drowsiness, he slept naturally and quietly through the following night, and next day was quite in his ordinary health."

There is no doubt that this effect was entirely produced by the nutmeg; and it is probable that several other aromatics, taken in large doses, and much larger than we are in the habit of giving them, might produce a like result. And hence, Dr. Cullen pro-

* Dec. II. Ann. II. Obs, 120.

ceeds to caution us against using them very copiously in apoplectic or paralytic cases. Yet in the affection before us, it is a quality that may often be turned to a very good account.

There was a time when zedoary was also regarded as an excellent medicine in flatulencies of the stomach and bowels, and stood almost at the head of the carminative list. Cartheuser was most extravagant in its praise: and from its general character it maintained for a long time a place in the Materia Medica of the London College, and was supposed to be one of the most important articles in what is now called aromatic confection. It has the boast of uniting a bitter to an aromatic principle; but its virtues are very feeble; and it is deservedly rejected from the London Pharmacopœia of the present day. It was introduced into practice as a substitute for gentian, which, at that period, had gotten into disfavour from being frequently adulterated with another article supposed to be poisonous: but better substitutes might have been found with a trifling research.

Electricity and even magnetism have been tried and highly extolled; but by very doubtful authorities.*

Before quitting this subject, I will just notice two other remedies for flatulency, because they not only afford benefit at the time, but by their tonic virtue have some tendency to correct the disorder radically.

The first of these is the tincture of aspalathus *canariensis*, the rose-wood or Rhodium lignum of the old writers. This shrub readily yields its fragrant essential oil to rectified spirit; and the tincture is commonly made by macerating four ounces of the wood in a pint of the spirit. It proves a warm, balsamic, and pleasant cordial in doses of from twenty or thirty drops to a drachm.

The second remedy I have alluded to is the etherial oil as it is now called, or the oleum vini as it was called formerly, which is found in the residuum of sulphuric ether, and is easily made to float on the surface by the addition of water. It has a strong, penetrant, and aromatic odour, and readily dissolves in alkohol and ether. It is powerfully sedative as well as cordial, and is sufficiently known to be the basis of Hoffman's celebrated anodyne liquor. In the current Pharmacopœia of the London College, this anodyne is imitated in the preparation called compound spirit of ether, the only form in which the etherial oil is employed as an ingredient. For the purpose I am now speaking of, however, it should be dissolved, and in double the quantity contained in the preceding preparation, in the aromatic spirit of ether, the sweet elixir of vitriol of the old dispensatories; in which case it combines its powers with the fragrant and valuable species of this preparation, and becomes a very grateful carminative and exhilarant.

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* Hall, Nachrichten von Magnateuren.

SPECIES VI.

EMESIS.

Sickness of the Stomach.

REJECTION OF THE CONTENTS OF THE STOMACH, OR TENDENCY TO REJECT.

A DISPOSITION to regurgitate, or even the act of regurgitation itself, is not necessarily a morbid affection; and to render it such it must be combined with the symptoms forming the generic character, which, though not actually repeated, are always supposed to constitute a primary part of its description; and which in the present genus is an "impaired, excessive, and depraved appetite." Thus a regurgitation of food is natural to all grazing quadrupeds, possessing complicated or numerous stomachs, as the sheep and ox; and it constitutes what is called rumination or chewing the cud; the inverted action taking place at the will of the animal, and the food being thrown back from the first stomach, or paunch, into the mouth, for the purpose of further mastication. There are instances of rumination, or a little voluntary regurgitation of the food into the mouth, among mankind. The German writers upon this subject are numerous, and their collections of cases abundant. But one of the best examples on record, is that given by Dr. Slare, in the Philosophical Transactions, as noticed in the volume of Nosology.* The subject was an adult man, in good general health: the rumination regularly took place about a quarter of an hour after eating, at which time the food felt heavy in the lower end of the œsophagus, or rather perhaps the upper orifice of the stomach. If he did not ruminate at the proper time, he soon became languid and sick.

It is a question which has excited much controversy in the present day, which are the parts chiefly concerned in exciting the stomach to vomit? It was the opinion of Mr. John Hunter, that this action is performed, alone, by the muscles surrounding the stomach. And that the stomach itself is at the time as passive as the lungs in expiration.

M. Magendie, of Paris, has lately been instituting a series of highly curious experiments, to determine this point. And from these it would appear, that in nausea the action is confined to the organ of the stomach alone, or perhaps in conjunction with the œsophagus; that retching is produced by the contraction of the abdominal muscles, and rejection by the contraction of the diaphragm alone, or in conjunction with that of the abdominal muscles; and consequently that an emetic does not cause vomiting by irritating the

* Vol. XVII, 1690—S.

fibres, or nerves of the stomach, but, as suspected by Mr. J. Hunter, by means of absorption and irritation on the nerves of the muscle that surround the stomach. In one experiment M. Magendie entirely removed the stomach, and substituted a bladder, which he attached permanently to the base of the œsophagus; after sewing up the abdomen, he injected an emetic into the animal's veins: it had nausea, made inspirations, and discharged a coloured fluid which had been previously put into the bladder, quite as well as it could have done with its natural stomach.*

These experiments of M. Magendie, however, have since been called in question by M. Portal, as not conducted with sufficient strictness, and leading to conclusions too generally and too hastily drawn. M. Portal is led to maintain that vomiting commences by a particular action of the stomach, and is then aided and continued by the action of the abdominial muscles, and of the diaphragm: but that, in many cases, this auxiliary assistance is by no means necessary; since, according to his experiments, vomiting may be produced in the stomach when the abdominal parietes have been removed.† And consistently herewith, Dr. Parr informs us, that the diaphragm "has been wounded, torn, and its apertures enlarged, so as, either by laceration or dilatation, to admit of the passage of the stomach, or a part of the colon into the thorax, without any uncommon symptoms."‡

It is not difficult to reconcile these apparently conflicting facts: for such is the close connexion and sympathy that exists between the stomach and its surrounding muscles, that, let the irritation commence in which lower organ it may, it will be instantly propagated to the other. We have the same proofs of sympathy in the stomach, the ileus, the œsophagus, and the fauces. And we can evidently trace the retrogressive action, commencing in different diseases and under different circumstances, sometimes in one of these organs and sometimes in the other. And we can sometimes moreover see this action limited to a particular part; sometimes running through a certain length of the chain, and sometimes through the whole. The idea of swallowing a nauseous dose of medicine, or an irritation of the fauces by a hair, will often excite a retrograde action in the œsophagus alone: a discharge of wind in cardialgia, or of a small portion of acid, or oil, or any other substance floating on the surface of whatever may be contained in the stomach, seems to excite the fibres of the cardia alone, and they are expelled by its simple and unassisted effort producing a single act of eructation or belching. The sulphates of zinc and copper, and perhaps all the metallic emetics, act unquestionably upon the fibres of the stomach generally and primarily; and probably all the ipecacuans,

* Rapport á l'Institut. Nat.

† Mem. de l'Institut. Royal de France. Mai 19, 1817.

‡ Dict. Append. p. 101.

whether of the psycochia, the calicocca, or the viola genus, are first absorbents, as asserted by M. Magendie, and then produce vomitting by irritating the fibres of the surrounding muscles. Sea-sickness, and various affections of the head, apparently act in the same manner; and the contractile and inverted action only takes place after a paroxysm of intolerable sinking and languor. In ileus, the retrogressive movement commencing in the bowel which gives rise to the name of this disease, runs with great violence through the whole chain of the alimentary canal; insomuch that medicines introduced into the rectum are rejected by the mouth.

Sickness of the stomach occurs under different forms; the three following are the chief varieties:

α Nausea. Loathing.	Tendency to reject, but without regurgitation.
β Vomituritio. Retching.	Ineffectual effort to vomit.
γ Vomitus. Vomiting.	Act of vomiting, or rejecting from the stomach.

Sauvages and Linnéus regard the first and third of these varieties as distinct genera of disease, and even arrange them as such. This appears highly incorrect: for, if minutely examined, they will be found in every case to be little more than different degrees or modifications of the same affection, produced by a greater or less inversion of the peristaltic motion of the stomach and œsophagus, whatever be the cause of such inversion, and allayed and overcome by the very same means. Where the stimulus, and consequently the degree of inversion, is slight, the effect is confined to nausea; if beyond this, the nausea becomes retching; and then the retching becomes vomiting. They may, indeed, exist separately; for the cause may be of a kind or strength sufficient to throw the stomach at once into a state of violent inversion, and consequently to produce vomiting without the common intermediate changes; as in the case of various metalline emetics, sympathetic irritation from pregnancy, or the swallowing putrid vapour. While, on the contrary, minute doses of squills, or ipecacuan, or any other cause that produces but a slight degree of action, will excite nothing more than nausea or the first stage alone of the inverted action upon which the general affection depends.

It is, nevertheless, curious and of great importance, to observe the different and opposite effects produced on the animal frame by these two stages of one and the same disease. Nausea lowers the pulse, contracts the small vessels, occasions cold perspiration, severe rigors, and trembling, and diminishes, as long as it lasts, the action and even the general powers of life. The act of vomiting, on the contrary, rouses rather than depresses; puts to flight all the preceding symptoms, and restores the system to itself. There are few persons so debilitated as not to bear vomiting, but many who

would sink under nausea. It is obvious, therefore, that these two different states of the stomach may be employed as powerful instruments in attacking a variety of general, and even of remote local diseases; this organ being justly considered as the common centre of sympathy, and producing opposite results according as it is excited to different modes or degrees of action. As nausea diminishes the action of the system generally, and particularly that of the small vessels, it has been often had recourse to with success in inflammation of various organs, particularly of the eyes and lungs; as it has also, on the approach of the first fit of intermitting fevers, or the accession of those of a continued type, and that threaten a considerable degree of violence. Full vomiting, by augmenting the general action, and consequently giving great additional energy to the absorbent system, has also been very advantageously employed to remove inflammation, though in a different manner; and particularly inflammation of the suppurative kind. Orchitis and purulent opthalmy have often yielded to it as a charm; and we have various instances, in which the fluid of extensive abscesses have been hereby carried off in a few hours. From the pressive violence of the action, it has also been highly beneficial in many cases of obstruction, or chronic torpitude: and hence its occasional utility in amaurosis and caligo; and still more so in congestions of the liver, and other abdominal viscera.

As different emetics, however, produce not only a different action on the stomach, but also on the system at large, or different parts of it, they are by no means to be used indiscriminately, but in reference to the particular object we have in view. This difference of effect depends upon the peculiarity of their *emetine*, as the French writers denominate it, or emetic principle, of which we know but little at present; though the experiments of MM. Magendie and Pelletier have given us some information concerning this principle, as it exists in the brown ipecacuan (psychotria *emetica*,) the grey (calicocca *ipecacuanha*,) and the white (viola *emetica*.)

The ipecacuans, however, though possessing some diversities of power, concur in operating very generally upon the skin, at the same time that they excite the stomach; increasing in a slight degree, a discharge of mucus from the lungs, and adding a little to the peristaltic motions of the bowels. The antimonial emetics, in a full dose, act more violently upon the stomach, bowels, and skin, but less upon the mucous secrements. While in small doses, the nausea they produce is accompanied with the most deadly languor, and with an atony, that, in numerous cases, has been succeeded with more mischief than any degree of benefit that could have been proposed by their use: "Many in this manner," says Dr. Perceval, of Dublin, in his manuscript remarks on the volume of Nosology, "have sunk under the nauseating doses of emetic tartar, employed upon the hypothesis of Dr. Cullen, in low fevers. The heart of a frog is so torpefied by this antimonial, as not to be excited by galvanism, which is not the case with opium. The fraction of a grain

of tartar-emetic, in a gouty habit, subject to melœna and palpitation, produced an alarming deliquium. In the same subject, a similar effect attended the use of other antimonials."

The squill and seneka root act very generally; proving not only emetics, but cathartics and expectorants. The asarum, which was once extensively employed for vomiting, both in its root and leaves, at the same time that it inverts the stomach, acts powerfully on the olfactory nerves, and becomes a pungent emetic. It is hence by far the best emetic we can select in affections of the eyes, and several of the species of cephalea. Hot water operates only as a simple stimulant to the stomach, and hence, unless there be other irritants in its cavity, rarely takes effect till the stomach becomes distended, and the nervous fibres of the pylorus inordinately excited by the quantity swallowed. If, however, we infuse in the hot water, a certain portion of horse-radish, mustard seed, the root of mezereon, or a handful of chamomile flowers, we increase its stimulant power, and a much smaller quantity is sufficient. And it is probable, that all these substances act in like manner as simple stimulants alone; for in small doses they tend rather to take off than to excite sickness. There is little doubt that air acts in the same manner: for some persons, as Mr. Goss, of Geneva, by swallowing and distending his stomach with air, was at any time able to discharge its contents. The sulphates of zinc and copper, and the more powerful preparations of antimony, as the vitrum and crocus metallorum are probably simple stimulants also, but of a high degree of activity. They act on the stomach almost as soon as they are introduced: and hence are peculiarly eligible for a rapid expulsion of poisons that have been taken inadvertantly. If taken, however, in too large a dose, they become quite as mischievous as any poison they are intended to remove; for they prove violently corrosive to the coats of the stomach, and excite hæmatemesis, or vomiting of blood. There are some of the alkaline salts that act in the same manner when taken in excess, and throw not only the stomach, but other parts of the system into violent spasmodic motions. Two ounces of nitre were taken by mistake, for one ounce of Epsom salts. An almost incessant vomiting for two days was the result, accompanied with a copious discharge of grumous blood from the excoriated mucous membrane of the stomach; notwithstanding that very large quantities of warm water were repeatedly drank, and alternated with equal quantities of gruel and mucilage of gum arabic, to defend the surface of the stomach by an artificial mucilage. Mr. Buller, who relates this case, informs us, that the patient recovered, but was long afterwards subject to the chronic spasms, resembling chorea.*

It is now very well known that ipecacuans, and indeed most of the preceding emetics, excite vomiting as effectually by being

* Edin. Med. and Surg. Journ. No. LIII. p. 34.

introduced into the blood-vessels, as by being conveyed into the stomach. But there are some articles of the Materia Medica, that will produce this effect on being applied to the surface of the epigastric region, or the hypochondria alone; as tobacco, and, what we should far less expect to possess such activity, the leaves of groundsel beat up into a cataplasm. Mr. Stedman, of Kincross, who, I believe, first published an account of this power in both plants, availed himself of it as a remedy for agues, and parabysmic humours of the liver.*

As the stomach is the common centre of sympathy, it is not to be wondered at, that nausea or sickness should be a symptom common to a variety of diseases seated in organs more or less remote from itself. And hence we find it occurring in colic, colera, stone, the accessions of fevers, repelled gout, and carious affections of the head.

The last is, indeed, a very frequent, perhaps the most frequent, of all the sympathetic causes whatever: for nothing can disturb the regularity of the sensorial function without disturbing the stomach; and hence sickness is sure to follow upon oppression of the brain, whether produced internally, by hanging, drowning, or apoplexy; or externally, by a fracture of the cranium accompanied with depression. A severe jar of the brain, in the case of concussion, even without extravasation, is certain of exciting the same effect. Nay, any slighter motion to which the head has not been accustomed, as that of moving it rapidly from shoulder to shoulder in a half rotatory direction, accomplishes the same purpose. And hence we see the reason of the vomiting induced by running, or riding a horse round a small circle; by the action of swinging, of riding backward in a coach; and all the languor and deep regurgitation of sea-sickness. The living frame, however, has a most wonderful instinctive power of accommodating itself to circumstances: and hence, by habit, we are enabled to undergo the new motion without any inconvenience to the sensorium, and consequently without any sickness of the stomach. And this power of accommodation is so considerable that we have numerous instances of extensive depressions, and even of bullets and other foreign substances lodged in the brain, which, though at first productive not only of incessant sickness, but of the most dangerous symptoms of compression, have by habit been borne without any evil to this organ; and hence also without any disquiet to the stomach: while in a few rare instances, the very act of vomiting is said to have raised the depressed bone and restored it to its proper level.†

In an affection resulting from such an infinite variety of causes, no one remedy or even plan of treatment can apply generally. Sympathetic sickness can only be radically removed by removing

* Edin. Med. Essay, Vol. II. Art. V. 295.
† Pelargus, Medicinische Jahrgänge, III. p. 258.

the idiopathic disease upon which it is dependent, though it may often be mitigated when very distressing, and the primary disorder is likely to be of long standing. The best palliatives in most cases of this kind will be found in carbonic acid air; the saline draught, as it is called, in a state of effervescence, whether made with lemon juice, or, as first proposed by Riverius, with sulphuric acid; the more grateful carminatives; and small doses of opium. When the stomach is overloaded, or irritated by bile or any other material that sits uneasily, the offending matter must be first discharged, and then the stomach restored to its proper tone and action by some aromatic cordial, or if necessary by narcotics. Food should at first be given in the smallest quantity and of the lightest kind. A little toast-and-water alone, taken in small sippings, or a small spoonful of brandy-and-water with a single morsel of sopped biscuit, will often sit easy, when nothing else will remain; and gradually solicit the stomach to a healthful reaction. Stimulant cataplasms applied to the epigastrium are also frequently serviceable.

When the sickness proceeds from a chronic debility of this organ, the lighter and warmer bitters, as the infusion of orange-peel, cascarilla, or columbo; or, where a more active stimulant is necessary, that of leopard's bane (arnica *montana*,) may be found useful. The cinchona rarely agrees with the stomach, and is of doubtful efficacy where it is not rejected. The metallic oxyds are less precarious, and especially those of zinc and bismuth. Sea-sickness is only to be cured by habit: yet it has often been relieved and rendered less distressing by small quantities of brandy, the aromatic spirit of ammonia, or laudanum.

SPECIES VII.

DYSPEPSIA.

Indigestion.

THE APPETITE FASTIDIOUS; THE FOOD DIGESTED WITH DIFFICULTY; HABITUAL COSTIVENESS.

This is by far the most complicated of all the disorders belonging to the present genus. The last three species may often be traced by themselves, or in a state of separate existence. Dyspepsy may be regarded as consisting in a combination of their respective symptoms irregularly intermixed; sometimes one set of symptoms taking the lead, and sometimes another; with a peculiar tendency to costive bowels, and especially that species of costiveness which we shall hereafter have occasion to denominate *coprostasis obstipata*, dependent on a weakly temperament or a sedentary habit, and in

which the discharged feces, instead of being congestive and voluminous, are hard, slendar, and often scybalous.

Dyspepsy, therefore, in the language of Dr. Cullen, may be described as "a want of appetite, a squeamishness, sometimes a vomiting, sudden and transient distensions of the stomach, eructations of various kinds, heart-burn, pains in the region of the stomach, and a bound belly." Yet none of these are uniformly present, and all of them seldom. So that, as already observed, the symptoms of cardialgia, flatus, and emesis, with a few others, enter in irregular modifications into dyspepsia, as those of dyspepsia enter into hypochondrias. All these species lead to it, as they have a natural tendency to lead to one another; dyspepsy is, in many instances, a direct sequel of the whole, a chronic concentration of their respective symptoms.

There is also another complaint which frequently enters into the multiform combination of maladies of which dyspepsy is the general expression, and which has rarely been noticed by writers, although it is often a very troublesome symptom, and that is gravel. In treating of gravel or lithia, as an idiopathic affection, we shall have to notice that one of its chief and most common causes is excess of acidity in the primæ viæ; and, as such excess is almost constantly to be found in dyspepsy, gravel must frequently attend or follow, and is even a necessary effect where there exists what has been called a calculous diathesis.

The grand proximate cause of the three preceding species is debility of the stomach, whence, among other evils, a morbid secretion of gastric fluid. In the present instance, the debility is not often confined to the stomach, but extends to the intestinal canal, and the collatitious viscera, especially the liver, in which, indeed, it frequently commences; though this fact has not been often, if at all, noticed by pathologists; and hence another cause of the greater complexity of this disease than of those we have just examined.

The debility, and indeed torpitude of the intestinal canal is evident from the habitual costiveness which so peculiarly characterizes this affection. Whether this be direct or indirect, intrinsic or sympathetic, as harmonizing with the weakness of the stomach, it is not easy to determine: but nothing can be a stronger proof of the great inactivity of the intestinal tube, from whatever cause produced, than the feebleness of its peristaltic motion, notwithstanding the pungency of the acid and other acrimonious matters that are so frequently formed in the stomach, and hence so frequently diffusing their asperity over its inner surface.

The imbecility of the liver is equally obvious in most cases, from the small quantity of bile that seems to be secreted, or its altered and morbid hue, as evinced by the colour of the feces; which, in some instances, are of an unduly dark, and in others of an unduly light tint; and possibly from the inactivity of the intestines themselves, whose peristaltic motion is conceived by Dr. Saunders and other pathologists to be, in a great measure, kept up by its stimulus.

It is highly probable that the pancreas and spleen are both also affected in many cases of dyspepsia. Of the actual part taken by either in the process of digestion, we have already had occasion to observe that we know but little: but we do know that the pancreas pours forth a considerable portion of the fluid which holds the solid part of our aliment in solution: while in most of the cases of dyspepsy, brought on by a habit of drinking spirituous liquors, the spleen is evidently affected as well as the liver. Sir Everard Home has endeavoured to show that the spleen is a direct organ of communication between the stomach and the liver: and though he has not been able to detect any set of vessels that immediately connect the stomach with the spleen, he seems to have sufficiently established it, that fluids pass by some channel or other into the latter from the cardiac portion of the former.* But this is a subject we shall soon have an opportunity of examining more at large.

It has also been well observed by Dr. Wilson Philip, that the lungs are, in many instances, apt to associate in the morbid action of the digestive organs, when it has become chronic, and to produce, as a result, a peculiar variety (with him, *species*) of consumption, to which he has given the name of dyspeptic phthisis. The dyspeptic character of the disease, however, and especially the hepatic symptoms, together with those of lowness of spirits, flatulency, and other hypochondriacal affections, always accompany it even when complicated with phthisis, and point out its real source; and the cure must be chiefly directed to the primary malady. We shall have to take some further notice of this combination when treating of phthisis.

Under whatever form, and from whatever cause the disease occurs, there is a considerable degree of general languor and debility. Exercise or exertion of any kind soon fatigues; the pulse is weak; the sleep disturbed; the extremities are cold, or rendered so on slight occasions; and the tongue for the most part is furred or covered with a creamy mucus in the morning. Yet this last symptom is not always to be depended upon; for it is sometimes wanting in the disease, and sometimes common to those who have no such disease whatever, and are in the enjoyment of habitual health.

That dyspepsy should be connected with a morbid condition of any of the adjoining organs, is by no means difficult to conceive, when we reflect that they are all concerned, directly or indirectly, in contemplating the great object of the digestive process, which is that of furnishing a constant supply of nutrition for the system at large. Digestion is commonly supposed to take place in the stomach alone; but this is an erroneous view, though the stomach may be regarded as the chief link in the great associate chain. In the stomach, as we have already seen in the proëm to the present class, the food is only broken down into the pultaceous mass called chyme, and thus converted into the mixt principles of oil, gelatine,

* Phil. Trans. 1808, p. 45, 133, 135, 144.

and sugar, and little else; for though we have some traces of animalization, they are rudiments and nothing more. Yet this, which is the first, is the most important stage of digestion; and its perfection depends upon the quantity, perhaps the elaboration of the vital power which is furnished from the sensory, and pervades the system generally. Where this power is small and enfeebled, the process of chymifaction is necessarily impaired or interrupted: the wonderful machinery of the stomach, which finds no parallel, not only without the body, but in any other part of it, is disturbed or impeded in its operation; and its fluids are poured forth too sparingly or too inconditely.

The next stage of the digestive process takes place in the duodenum, which easily admits of distension, and receives the food in the form of chyme from the stomach. Here the bile, the most highly animalized of all the secretions, and abundance of the pancreatic juice meet it, and a new play of affinities commences, the bile, as supposed by Fourcroy, becoming separated into two parts, its saline principles and its resin. The latter is discharged with, and gives a colouring matter to the excrements; the former become decomposed, attenuate the chyme, communicate their azote, and thus complete its animalization; while the juice of the pancreas dilutes and holds the material in solution, and probably contributes to some other effect, but which has not yet been detected. In this liquid state it is called chyle. The recrementary part, which descends into the larger intestines, is attacked, as it proceeds, by the mouths of a considerable number of lacteals that drink up whatever small quantity of the chyle may be accidentally intermixed with it; while the great body of this fluid is absorbed in the duodenum itself, by an innumerable host of the same vessels which concentrate their mouths on its inner surface.

We thus see how largely the digestive process ranges, and from what a wide spread of organs, closely sympathising with each other, the disease of dispepsy may proceed. But the finishing touch still remains to be added; the absorbed chyle before it becomes completely assimilated, has to be exposed to the action of the atmosphere, and for this purpose has to travel to the lungs. What change it sustains in consequence of this exposure will be the subject of a subsequent inquiry. At present it is sufficient to show the connexion which subsists between the stomach and the lungs in the common function of providing for the sustenance of the animal machine; and to inculcate the means by which a morbid action of the former may be communicated to, or lay a foundation for impaired action in the latter; since, to say nothing of that sympathetic influence which is always found to take place between the extreme links of a chain that runs through any part of the animal machine, it must be obvious that if the chyle, which originates in the stomach, and when in a state of health, communicates a peculiar stimulus to the lungs, as it enters their substance in combination with the recurrent and exhausted blood, should be conveyed to them in an unhealthy

condition, this peculiar stimulus may be changed in its mode or degree of action, and the lungs in consequence become a sufferer; more especially where they are predisposed to any kind of morbid action. And hence a frequent origin of dispeptic phthisis, which like every other modification of the disease, may depend, therefore, upon imbecility of one or more of the digestive organs.

The common causes of this imbecillty, whether confined to the stomach, or co-extensive with the associate viscera, may be contemplated under two heads, *local* and *general;* under both which they are still further resolvable into the two opposite extremes of deficient and excessive stimulation; and consequently into a divergency of any kind from that medium of excitement and activity upon which health is made to depend.

The local remote causes are, a too large indulgence in sedative and diluting substances; as tea, coffee, and warm water, or similar liquids taken as a beverage; or an equal indulgence in stimulant and acrid materials, as ardent spirits, spices, acids, tobacco whether smoked or chewed, snuffs, a daily habit of distending the stomach by hard eating or drinking; or a rigid abstemiousness, and very protracted periods of fasting.

The general remote causes are, an indolent or sedentary life, in which no exercise is afforded to the muscular fibres or mental faculties. Or, on the other hand, the habitual exhaustion from intense study, not properly alternated with cheerful conversation; becoming a prey to the violent passions, and especially those of the depressing kind, as fear, grief, deep anxiety, immoderate libidinous indulgence; and a life of too great muscular exertion. Perhaps the most common of this latter class of causes are late hours and the use of spirituous liquors.

Dispepsia is hence presented to us under several varieties, of which the two following are chief:

α Organica. Organic indigestion.	Originating in the digestive organs and principally confined to them.
β Enervis. Enervate indigestion.	Originating in a relaxed state of the constitution from causes acting generally.

For both these, the general principles that should govern us in attempting a cure are the same, though the means of carrying such principles into effect, will admit of diversity.

Under what shape soever the disease may present itself, the first thing to be enjoined is a relinquishment of whatever cause has laid a foundation for it; we must next palliate the symptoms that aggravate and continue the disease; and, lastly, we must restore the debilitated organs to their proper tone; or, in other words, we must correct or remove what is called, though not very precisely, the proximate cause of the malady.

The patient must, in the first place, be convinced of the necessi-

ty of putting himself under a new rule of conduct, and be deeply impressed with the idea, that though he may have continued his late plan of life for a considerable period of time without having sensibly suffered for it, yet, now that he is suffering, nothing but his conforming to another plan will remove his present complaint.

Severe and long continued study, protracted, as I have often known it, through ten hours a-day for many months, without any relaxation or interchange of pursuit, must give way to the exercise of walking or riding, and this not occasionally, but daily; and to the still better cordial of cheerful conversation. The last is of very great importance; and without it even exercise itself will be of little avail: for the mind, accustomed to a certain track of intellectual labour, will otherwise relapse, even while riding or walking, into the same habitual course, be dead to the most fascinating prospects around it, and become exhausted by its own abstraction. And it is to characters of this kind, perhaps more than to any other, that the amusements of a watering place promise ample success; where the general bustle and hilarity, and the voluntary forgetfulness of care, the novelty of new scenes, and new faces, and new family anecdotes, and the perpetual routine of engagements that fill up the time with what would otherwise be trifles and frivolities, reverse the mischievous order and monotony of the past, break the sturdy chain of habit and association, and give leisure to the worn-out sensory to refresh itself.

Where the same effect has proceeded from a town-life of fashionable follies and dissipation, nothing is more common than to recommend a like change of residence. But in this case, though it may be a change of residence, it is not a change of life; and hence it is too often made without any benefit whatever. A total retreat from the world, the unbroken seclusion of a remote hamlet, the sober society of a few intimate friends, simple meals and early hours; instead of close and heated rooms, crowded and motley routs, costly feasts, and midnight madrigals, are what are especially called for in this instance, but are not always to be met with in the resort of a watering-place. In such as are still distinguished for their quiet and unfrequented shores, where all is rude and simple, and spruce squares and long-drawn parades have not yet put to flight the scattered and irregular cottages of former times, the advantages may still be obtained But it is rarely that patients who are suffering from a life of dissipation will consent to relinquish the higher attractions of our gayer and more public retreats, for what they are apt to esteem the dulness of an unfrequented coast, till it is of little importance whether they go any where, or remain at their own homes.

In like manner the habitual use of hard eating and drinking must give way to a wholesome plainness of diet; though I am afraid that not a little mischief has often ensued by rigidly compelling the man who is suffering from a long habit of the former to abandon this habit at once, and run to an extreme of abstemiousness. Nothing can be more injurious. Even in full health the animal frame,

though it may be brought to any extreme by degrees, very ill brooks abrupt changes; and I have often seen where such changes have been attempted in an enfeebled constitution, that they have introduced worse complaints than they have been intended to remove. The use of tobacco is not, in our own day, employed very often to such excess, whether in smoking or chewing, as to become a very alarming cause of dyspepsy: but I have known instances where the former has been suspected, though perhaps unjustly, of having been the cause of this complaint, and where an abrupt prohibition of its entire use has introduced a dangerous atrophy.

It is certain, however, that a free use of tobacco under either or any form has produced very severe dyspeptic affections, and consequently, in such cases, it ought to be relinquished by degrees. Nor is it difficult to conceive by what means tobacco thus acts: for, like opium, it is a stimulant readily producing a narcotic effect, or, in other words, rapidly exhausting the sensorial power. In chewing, a considerable portion of tobacco is conveyed to the stomach along with the saliva; in smoking, a somewhat smaller quantity is conveyed in the same manner; and in both the salivary glands are excited to a great waste of secretion, which cannot take place without impairing the chymifactive process indirectly, as the introduction of the tobacco into the stomach impairs it more immediately. The areca or Malabar nut, though a good bitter, when chewed for a long time, is well known to impair it in the same manner. Even in the form of snuff, tobacco has not unfrequently been found to produce the same result; partly perhaps from the paresis of the olfactory nerves in which the stomach participates by sympathy, and partly from the portion of tobacco that is constantly passing into it from the nostrils. "I have found," says Dr. Cullen, "all the symptoms of dyspepsia produced by snuffing, and particularly pains of the stomach occurring every day. The dependence of these upon the use of snuff became very evident from hence, that upon an accidental interruption of snuffing for some days these pains did not occur; but upon a return to snuffing the pains also recurred; and this alternation of pains of the stomach and of snuffing having occurred again, the snuff was entirely laid aside; and the pains did not occur for many months afterwards, nor, so far as I know, for the rest of life."*

Dr. Cullen tells us in another place, in proof of the same fact, but in proof also that the habit is sometimes variable in its influence, that he knew a lady, who had been for more than twenty years accustomed to take snuff, and that at every time of day; but who came at length to observe, that snuffing a good deal before dinner took away her appetite; and that even a single pinch taken at any time in the morning, destroyed almost entirely her relish for that meal. When however she abstained entirely from snuff before dinner, her appetite continued as usual; and after dinner for the rest of the day, she took snuff pretty freely without any inconvenience.†

* Mat. Med. Vol. II. p. 275. † Op. citat. p. 274.

This singularity may partly have depended, as Dr. Cullen supposes, on the inequality of the power of habit in exerting its effects: but it most probably depended also upon some peculiar change in the stomach at the time; apparently on an increased irritability which made it more susceptible, in an empty state, to the nauseating quality which tobacco possesses in common with many other narcotics.

We are perpetually witnessing a like change in other cases. At the time of writing, I have a patient who has just consulted me on an obstinate dyspeptic affection; but who is otherwise in very good general health, and was a few years ago able very readily to digest all the articles of food that enter into our ordinary meals, as butter, cheese, sugar, tea, malt-beverage, and wine. Such however is the state of his stomach at this moment, and has been for some years past, that he cannot take the smallest quantity of any of these articles without serious inconvenience. He becomes oppressed, flatulent, and distressed with acidity and sickness. I am unable to learn what was the cause of this morbid change; for he has ever been a man of the greatest temperance and most regular habits. It is a change however that seems entirely confined to the stomach; for though other organs suffer slightly and occasionally, it is clear that in these the evil is only secondary and dependent. Thus he is subject to severe costiveness, and never has a motion without some aperient. His motions however, are well tinged with bile, though constantly loose from the means made use of. His appetite is good, and his sleep undisturbed; but his vascular system is languid, his extremities often cold, and, without a free use of horse-exercise, his appetite and sleep fail equally. I do not state the plan I have put him upon, as he has only just commenced it, and it must be long before its real effect can be discerned.

There can be no doubt, however, that in the present condition of this gentleman's stomach, he has done wisely to change his former diet for a new one. And the remark is applicable to every one who is labouring under the present disease; for not in manner of life alone, but in manner of food, should we rigidly proscribe whatever we find to be a cause of indigestion. And hence dyspeptic patients should pay a particular attention to themselves, so as to discriminate between the viands that sit easy on the stomach, and those that render them uncomfortable: for nothing in a morbid state is more capricious than this organ, and twenty different cases may perhaps demand as many varieties of regimen. Thus tea of all kinds, and especially green tea, is generally accounted a narcotic; Dr. Smith and Dr. Lettsom endeavoured to trace up its narcotic principle by experiments; and it is to this principle that Dr. Cullen ascribes the deleterious effects it produces upon some stomachs. Yet while it acts as a narcotic upon many persons, upon others, and myself among the rest, it proves powerfully agrypnic; and if taken on going to bed, keeps up wakefulness through a great part of the night.

We must first then prohibit, in our endeavours to effect a cure, whatever we know to be a local or general cause of the disease. Our next intention should be to palliate the symptoms that aggravate and continue it.

As the stomach is often overloaded with crudities and acidity, Dr. Cullen recommends an emetic at the outset. I have rarely found this of use; it often adds to the debility of the stomach; and at most is only of service for a few hours. For so long as the cause continues by which an accumulation of undue materials is produced, this effect will be perpetually taking place, and an emetic might be necessary every day. The most rational mode of prevention is, to limit the stomach to such food as it will most easily digest; to allow it in small quantities; to quicken its removal by gentle aperients, that may increase the peristaltic action, and warm tonics that may invigorate the digestive organs.

For the correction of flatulency, most of the carminatives noticed under the fifth species of this genus may be conveniently had recourse to; and for that of acidity, lime-water, the acidulous alkaline waters, the alkaline salts, and absorbent earths. Magnesia is a remedy of peculiar value for this last intention. In some cases of great obstinacy, but evidently dependent upon a chronic tendency to an acetous fermentation, magnesia, given in the proportion of an ounce a-day, has effected an entire cure:* and in all cases it resists the costiveness as well as the acidity, and is far less disposed to coacervate in the alimentary canal than the calcareous earths. It is also, as I have already observed, a powerful antidote against that class of calculous concretions in the kidneys and bladder that depend upon an acid principle.

The eructations that occur in dyspepsy, however, are not always acid. They are often of a compound and very offensive taste, and give to the breath the smell of carburetted hydrogen gas, or rotten eggs; as though the gastric juice were incapable of performing its proper office, and the food were retarded in the stomach till the process of putrefaction had commenced. In this case, instead of avoiding acids, we should recommend a free use of them, from whatever quarter they may be obtained; as they not only tend to correct the fetor, but to strengthen the stomach. The mineral are the most powerful; and of these the sulphuric is by far the pleasantest; but, in common with the rest, it labours under this disadvantage, that only a small quantity of it can be taken at a time, because of its corrosive quality.† It may advantageously be employed as a medicine; but for acidulated diet-drinks, it must yield to the vegetable acids. These are of three kinds, native, distilled and such as are obtained by fermentation. The first are commonly the most grateful, and especially when they exist in the form of fruits: but as in most of these they are combined with a fermenting

* See Dr. Watson's Communication, Medic. Observ. Vol. III.
† Horst. Opp. III. p. 62.

leaven, they are apt in weak stomachs to set free a very large quantity of air, and consequently to produce a very troublesome flatulency, and even to promote the acescent disposition of the organ. The citric and the oxalic may be exceptions; and there may be also a few others, but they are not numerous: and where these cannot be procured, we must have recourse to the acids elaborated by distillation, or a fermenting process. The last are called vinegars, whether obtained from malt, weak wines, or sugar; and being of themselves, when properly refined, very pure and dilute, they are capable with a little care of being rendered highly grateful.

The distilled acids of vegetables have not yet been sufficiently tried to determine whether any of them possess any specific virtue. They were at one time very generally made use of under the guise of tar-water; the whole of whose benefits Dr. Cullen ascribes to the acid of the fir with which the tar was impregnated; but I cannot avoid conceiving, that some and not a small part of its good effects resulted from the camphorate or terebinthinate principle which was communicated at the same time. Glauber and Boerhaave seem to have been of the same sentiment; and as the Norway tar is richer in this principle than the American, we are at no loss to determine why Dr. Berkeley preferred the former to the latter. This medicine has experienced the fate of every human discovery whose praise is carried to extravagance: and from being esteemed good for every thing, it is now esteemed by many practitioners good for nothing, and has sunk into total disuse. But this is to sink it very considerably below its level. There are many complaints for which it has very fair pretensions; but I must limit myself on the present occasion to a recommendation of it for the purpose before us. Where the taste is not disliked, it will often be found a useful remedy in indigestions attended with offensive and putrid eructations.

I will just mention another remedy which deserves a much more extensive trial than it has hitherto received for the symptoms before us: and that is the powder of charcoal. From the experiments of Lowitz and others, this is now well known to be the most powerful corrector, next perhaps to the gastric juice, of putrid substances out of the stomach; and we can hence account for the success with which it has been occasionally employed as an internal medicine on the continent: the dose may be from half a scruple to a scruple, repeated three or four times a day.

Before I quite drop the subject of the crudities in the stomach, I must observe that our object should not be to destroy all acescency whatever; for a certain proportion is natural to the organ from the early period of lactation, and appears necessary to the digestive process, and hence we are only called upon to moderate this quality when in excess: upon which ground absorbent powders and even magnesia itself, when not actually necessary, may add to the mischief instead of removing it.

Costiveness is a symptom of dyspepsy still more common than

acidity, and one that requires a very vigilant attention. In our attempts to remove it, we should always bear in mind that it is a chronic and not a temporary concomitant; and consequently, that violent purgatives are of all things to be avoided; and that such aperients should be preferred which act gently, and rather by soliciting the peristaltic motion of the bowels to the regularity of health, than by irritating them to a laborious excitement.

Rhubarb is, for this purpose, one of the best articles in the Materia Medica; for while by its aperient power it relieves the present distress, we cannot have a much better tonic than its bitter. Where the bowels are merely sluggish, it will prove sufficient without any other cathartic; though it is better to combine it with soap and such aromatics as agree with the patient. It is often however incompetent of itself; and in such cases derives, in the form of an extract, a valuable assistance from half the quantity of the extract of aloes, or the compound extract of colocynth.

Since the publication of M. Daubenton's little tract in an English dress, very small doses of ipecacuan, not exceeding a grain or a grain and a half, have been extensively tried upon the recommendation of this celebrated physiologist. The intention appears to be that of exciting a change of action in the secernents of the stomach; but notwithstanding the advantage which is said to have been derived from this medicine, by the writer himself, it does not seem to have succeeded in this country; and indeed the dose is so small that little effect of any kind seems capable of being produced by its use. By some writers it is supposed, that in such minute proportions it will slip over the pylorus, and prove aperient by acting on the intestines. I have rarely, however, found it to do this alone, though it is a useful auxiliary with aperients of a more decided character. And where there has been great irritability of the stomach, I have known it even in the form of a single grain excite so much nausea as to prohibit its further use.

The quicksilver or blue pill will generally answer better for both purposes; but is chiefly to be employed where we have reason to apprehend that the one or both the portals of the stomach, and especially the pylorus, is in a scirrhous state; or that the dyspepsy is connected with a morbid condition of the liver, or some other allied viscus. In this case much benefit has also been derived from the white oxyde, or magistery as it was formerly called, of bismuth, now more generally known as a cosmetic under the name of *pearl-white*. For scirrhous affections of the stomach it has been tried successfully by Carminati, of Pavia; and apparently with equal advantage in France.* Independently of its discutient power, it has the virtue of allaying irritation in general; and on this last account Dr. Odier, of Paris, has employed it satisfactorily in most of the acute diseases of the alimentary canal, especially in pains of the stomach, di-

* Beaumé Journ. de Med. Tom. LXXIV. Hufeland, Neue. Annalen, Band. I. p. 351.

arrhœa, and colic, as he has also in hysteria, and even in tooth-ache.* The best form of giving it is that of pills, in doses of from four to ten or twelve grains, four or five times a-day.

In the meanwhile, we must never forget that our primary object is to restore the stomach, or the system at large where the stomach is only secondarily affected, to its proper tone and strength.

The general plan, as I have already hinted, must be the same: for as the virtues of medicines can only be communicated to the system at large through the medium of the stomach; and as the state of the latter has at all times a powerful influence upon the former; there can be little doubt that, by improving the digestive function, the vigour of the system will be improved generally at the same time, and consequently that the energy of the whole of the moving fibres will be increased. While the collateral means of cure that are applied externally, as those of air, exercise, and sea-bathing, and which are chiefly designed to operate on the system at large, will convey an equal advantage to the stomach.

The principle evils we have to encounter in dyspepsy are deficient action, and a relaxed state of the fibres. For these there are three classes of remedies to which we may have recourse; stimulants to increase the action, and bitters and astringents to augment the tone. The first, however, are of very doubtful advantage; for a lax state of fibres will bear very little increase of action without having an equal increase of debility; and hence stimulants can never be recommended alone, except in cases of emergency, as to remove a severe fit of pain or other inconvenience, and then only for a short period of time; but they may be combined very advantageously with either astringents or bitters, and particularly with those medicines that possess these qualities jointly. The mode by which astringents act on living animal fibres is obvious and without any mystery, for we see them acting the same part when employed out of the body; they contract their length, and strengthen by condensation; and hence the fibres become less mobile, and more firm and rigid; the force of cohesion is considerably augmented; and atony gives way to a restoration of healthful tone or elasticity.

We have reason to think that bitters act in the same manner, though their mode of operating is not so conspicuous; for we see them, in a multitude of instances, giving tone to remote parts of the system, and we can readily account for an increase of tone, by an increase of contractile power. It is probable, however, that bitters, and perhaps astringents, independently of this chemical mode of action, excite the sensorial fluid, or increase its secretion, and in this way add considerably to the tone of the particular part, or the entire frame. And hence, as indigestion and loss of appetite are in many cases very clearly dependent upon a loss of tone, we have reason to conclude that bitters, which are among the most ef-

* Journ. de Med. Tom. LXVIII.

fectual means of counteracting these evils, operate by restoring tone where it is wanted. They have, however, another and more immediate advantage in the disease before us: for they directly attack that tendency to fermentation in the stomach which is one of the most prominent features of dyspepsy, and which is, indeed, the chief cause of the flatulence and acidity that so generally accompany it. Of this we have no doubt; for the experience of every day brings its testimony: and we employ bitters, as hops and quassia, for this very purpose in our fermentable beverages.

How far it may be true, as conjectured by Dr. Cullen, that bitters, like stimulants, possess also some deleterious property; and that a too free and long-continued use of them destroys that very tone of the stomach* which a shorter and more moderate employment, has established, it is not at present worth while to inquire, as we shall have occasion to return to the subject when treating of the nature and cure of gout. That some of them contain a mischievous and even a sedative power in union with a bitter principle, is unquestionable, for we see it distinctly in the hop, the ignatia *amara* or nux vomica, and more especially in opium: but to ascribe this sedative or narcotic quality to the bitter principle itself, as Dr. Cullen does in his explanation of the nature of gout, is only to start one hypothesis in support of another. And as the good is unquestionable and immediate, and the evil doubtful and remote, and in every view may be easily avoided by a careful attention to time or a careful rejection of such bitters as may be suspected, it is to tonics of this kind we ought to have recourse without hesitation, and to look up with a confidence of success.

Stimulants, astringents, and bitters, are then the three classes of medicine with which we are to make inroad against the entrenchment of dyspepsy. They may often be conveniently united, and have their forces hereby increased in a more than double proportion. The stimulants, indeed, ought rarely to be employed by themselves, except in spasmodic pains, or some other temporary extremity. Many of these may be found in the list of carminatives already described under the species CARDIALGIA.

One of the most valuable medicines of the kind now under contemplation is myrrh. In doses of six or eight grains it will often excite an agreeable warmth in the stomach without increasing the pulse; and when it does not sit easy in the powder, it should be given in an extract made by water, in which form it is peculiarly mild. Its most stimulating preparation is its tincture, which, Dr. Stahl asserts rightly, will go as far as twice the quantity in substance; and, as a stimulant of too high power, should be sedulously avoided. Some practitioners have recommended that the myrrh be slowly chewed in the mouth, and only that part of it be swallowed which is intimately dissolved in the saliva. I have not tried it in this form; but I think it liable to the objection I have already

* Mat. Med. Vol. II. p. 64

advanced against chewing tobacco, that in dyspepsia it will too much excite the salivary glands, which in many cases partake of the imbecility of the stomach.

There is an old medicine, whose virtues approach to those of myrrh, now no longer in use, which also peculiarly deserves a trial in this disease; and that is, the cassamuniar or casmunar, a tuberous Indian root, bearing from its joints or circles some resemblance to galangal. It was first introduced into notice by Dr. Pechy, then approved by Dr. Marloe and Dr. Meade, and hence soon acquired a height of reputation so much beyond its real merits as to prove its ruin. By uniting an aromatic pungency with an agreeable bitter, it forms an excellent stomachic; and seems to have been of peculiar service when dyspepsy has been combined with nervous affections of the head, as vertigo and hemicrania. It has the smell of ginger, with a mixt taste of zedoary and camphor.

I have observed that dyspepsy is often grafted upon an hysterical or hypochondriacal diathesis; and in these cases we may indulge in stimulants of a much warmer character, as camphor itself, assa-fetida, the alliacea, the spicy aromatics, and even capsicum. Of the last, it may be remarked, that, though the hottest of all the peppers, it has a less tendency to produce complaints of the head than any of the rest. It is one of the best carminatives possible in the case of flatulency from vegetable food; and admirably calculated to remove that stony coldness which distresses a weakened stomach when attacked by a transfer of gout. I have never tried the essential oil of the agallochum or lign-aloes, probably the excœcaria *Agallochum* of Linnéus, though there is some uncertainty upon this point; and cannot therefore determine whether it be entitled to all the commendation bestowed upon it by Hoffman, who regarded it, when dissolved in spirit of wine, as one of the best cordials and invigorants that pharmacy has ever possessed, and especially in debilitated stomachs, accompanied with general depression.* As its taste and odour are equally pleasant, it deserves to be further investigated.

A few years ago I had a considerable specimen sent to me of the yellow gum of New Holland, the product of the acoroides *resinifera*, which is there used very largely in dyspeptic and other weaknesses of the stomach and bowels. It is slightly bitter and astringent with a little pleasant pungency: but I have not found it essentially serviceable.

In selecting from among the simple bitters, we need not be particularly nice, for their principle is the same; the quassia perhaps possesses it in the highest degree, though some have doubted of this: then the gentians; and next to these, columbo. Of the gentians, the most powerful seems to be the g. purpurea, first imported into this country, by Dr. Home, from Norway, and then known by the name of cursuta, from its Norwegian name skarsote. As a

* Observ. Physico-chym. Lib. I. Obs. 4.

simple bitter it is best to unite it with some aromatic. The tincture of gentian of the London College, which is an improvement upon Stoughton's or the stomachic elixir by exchanging the cochineal for the smaller cardamum seeds, is an excellent form for occasional use; but as alcohol should be habitually abstained from in the disease before us, it cannot be employed alone in such quantity as to promise any real benefit, though it may be allowed to enter as an ingredient into more compound remedies.

The bitter of the columbo is combined with a slight and not disagreeable pungency, and has an aromatic smell. It is hence peculiarly calculated for dyspeptic affections in all its forms, and in most cases will sit easy on the stomach, in that of powder in doses of fifteen or twenty grains; and will often give a check to sickness, where bile is not present, more than any other medicine we can employ. It is singular that to the present hour we are unacquainted with the plant that furnishes this excellent drug. Commerson believed it to be a species of menispermum; but it still remains to be ascertained. It is an Indian plant, chiefly exported from Ceylon, from the capital of which it derives its name. It seems to have been first noticed by Redi in 1685.*

There are several other plants that possess a bitter principle in a more intense degree than any of these, as the nux vomica, and wormwood: but they are not simple bitters. The first is a stimulant narcotic; it takes off the sensibility, but renders the head confused; and at the same time excites the irritable fibres to irregularity of action. It has no pretensions to be employed in the disorder before us. Whether wormwood possess any thing of the same principle I cannot satisfactorily determine. Linnæus conceived it does not; but Bergius, Lindenstolpe, and most of the physiologists on the continent, adopt a contrary opinion. It is probable, notwithstanding Dr. Cullen's hypothesis respecting bitters generally, that whatever degree of this quality it possesses, it derives from its essential oil, for the odour or aroma, not only of this but of southern-wood, is apt to produce a like confusion of head in many persons who are shut up in the same room with these plants. It is clear, however, from this very diversity of opinion, that this narcotic power, if it be present at all, exists only in a very small proportion; and that the plant as a stomachic is greatly improved by the possession of a stimulant essential oil. It continues hence to be in high repute on the continent in dyspepsy and indeed in all debilities of the chylopoetic viscera;† and has very unjustly been banished from the dispensatories of our own country. It is perhaps less grateful than the hop, though at one time, very generally employed in the composition of purl; but so far as I have been able to judge, it has all the medicinal properties of the hop in a much higher degree.

* Experimenta circa Res Naturales, p. 142.
† Swalive, Querulæ Ventriculi, p. 286.

As a plant uniting the two principles of an essential oil, warm without being unduly stimulant, and a powerful bitter, the chamomile is, for the purpose before us, one of the best remedies that we can select. It may be taken in a watry infusion, or an extract: but if in the former, the menstruum should be closely covered, that as little as possible of its volatile aroma may fly off. And it should be farther observed, that the infusion should not be continued for longer than an hour; and perhaps a shorter period may suffice. For it may be remarked in respect to bitters in general, that the matter extracted the first hour is not only more charged with the bitter principle, but far lighter and pleasanter to the taste than what is extracted afterwards. There are some bitters that do not so readily give out this principle as others, and for which a single hour's infusion in boiling water may be scarcely, perhaps, time enough; but as a general notice, the remark will hold good; since the infusion should, in every instance be poured off as soon as the water becomes impregnated with the bitter principle of the plant in its first stage of purity.

As we have medicines that unite the two qualities of bitterness, and a stimulant or aromatic warmth, so we have those also that unite the two qualities of a bitter and an astringent; of which the cinchona furnishes us with a striking example: and hence this medicine has been long, and deservedly, one of the most popular of any for debilities of all kinds, whether of the digestive organs alone, or of the system generally. The cascarilla bark has pretensions of a like kind, but far inferior in degree, notwithstanding the high encomiums that have been paid to it by the Stahlian School, which endeavoured to hold it up as a rival to the cinchona. There are many stomachs, however, which will not bear the latter, even in decoction or infusion, and in such cases the cascarilla may form a convenient substitute.

The acids, both mineral and vegetable, are valuable astringents in particular states of the stomach resulting from dyspepsia: for it is obvious that from the tendency of this organ to co-operate in so many cases in the production of a superabundant acetous fermentation, acids cannot at all times be had recourse to. I have occasionally, indeed, employed the mineral acids, and particularly the acqua regia of the old dispensatories, or a mixture of the nitric and muriatic acids, in the proportion of one part of the former to two of the latter, for the purpose of checking this tendency to acidity, in several instances with success; but the plan has not answered generally; and it will hence be better to limit this class of medicines to the intention I have already pointed out, or to delay them till we have by other means overcome the disposition of the stomach to this morbid action. In which case they may be had recourse to with very great advantage under the regulations laid down in the preceding pages

The other mineral astringents which have been employed besides acids are not numerous; and may be limited to the preparations of

iron and zinc. As general tonics, these, under different forms, have proved very extensively successful: but they are less adapted to dyspepsy proceeding from primary imbecility of the stomach or its adjuvant organs; or I should rather, perhaps, say, that they are apt to disagree with these organs till they have been restored to some increased degree of tone beyond what they usually possess when medical aid is sought for.

The preparations of these metals, and particularly of iron, have been very unnecessarily multiplied in many pharmacopœias. In order to render metals active on the human body, it is requisite that they be reduced by acids or some other solvent to a fine impalpable powder. It is very true that the acid, according to the kind or quantity employed, or the nature of its chemical union, may also communicate a new quality: and it is hence that mercury, which, in some of its forms, is a mere stimulant, in others becomes a corrosive poison. For the disease before us, however, all we need is the metal itself in its simplest and most attenuate state: and hence it is most common to take it, as reduced to this state by sulphuric acid, under the popular name of vitriol. This is the ordinary, and in many cases the only advantageous form in which we can employ either iron or zinc in the disease before us: and under this form both are peculiarly astringent, so much so indeed, as to be occasionally used, and especially the zinc, as external applications in the preparation of collyriums or injections.

Other acids have occasionally been employed, but they do not seem to have any superior claim. Hoffman was much attached to the formic acid, or that of ants, conceiving that it was one of the best solvents of iron for medicinal purposes. It has characters of its own, but approaches nearer to the acids obtained from vegetables by fermentation than to any others. It held formerly a place in the Materia Medica of many foreign pharmacopœias, and was esteemed a principal ingredient in the once famous aqua magnanimitatis.

I have observed, that there is always some degree of acid existing in the stomach in a healthy state, and we have seen that one of the most troublesome symptoms of dyspepsia is a morbid increase of this principle. And hence upon an idea that the acid, if thus formed in the stomach, may of itself be sufficient to answer the purpose of the sulphuric, and reduce the particles of the metal to a due degree of tenacity, both the zinc and the iron are also frequently employed in the simple form of filings, rust, oxyds, or calces; and often with the happiest success. And that an acid adequate to this end does in most cases exist in the stomach, is sufficiently proved where the rust of iron is employed, by the black colour of the stools, which may be regarded as a test of the proper solution of the iron; as it may be also of the existence of bile in a state of healthy bitterness: for it is by a combination of the iron with the bitter principle of the bile that this blackness, which is a natural ink, and obtained by the same means as artificial ink, is produced.

There are some animals that have a power of forming this sort of natural ink at option, as the sepia or cuttle fish, but whether by a solution of iron I cannot undertake to say. This, however, is very probable, if it be used, as it is generally understood to be, by the Chinese, as an ingredient in the manufacture of Indian ink. The cuttle-fish, when exposed to danger from the attack of an enemy, throws it forth very freely, employing it, indeed, as a means of defence; and effecting his escape by thus converting the water around him into a black muddiness that sufficiently conceals him from view.

It is on this principle that the flowers or oxyde of zinc, have by many physicians of great reputation been preferred to the sulphate: and it is certain that in the form of an oxyde we can introduce a much larger quantity either of zinc or iron, than in that of a salt: but it does not follow from this fact that the metal may be more efficacious; for from the doubtful measure and strength of the acid existing in a free state in the stomach, there may not be enough to dissolve or form a salt, with the whole of the dose, and consequently a considerable portion of it may be lost or remain inert. And on this account I think it better to have recourse at once to the sulphate of both these metals, whenever it be judged expedient to employ them, than to trust to the chemical changes that may take place with so much precariousness in the stomach.

We may avail ourselves of this remark, before we quit the subject, to reconcile the conflicting statements of different practitioners respecting the efficacy of these metals, in their oxydized form, and the dose in which they should be given. The flowers of zinc have been a medicine of considerable reputation in epilepsy, and other spasmodic affections, ever since the time of Gaubius: but while some physicians have found them successful in doses of five grains, repeated three times a day,* others have carried the dose to three times the quantity† without any success whatever. In like manner, while the ordinary dose of the oxyde or rust of iron is five or six grains, repeated twice or three times in the twenty-four hours, we are told of persons who have been able to swallow six drachms a day without sickness, or other inconvenience. It is possible, from the preceding observations, to reconcile these discrepancies; for it is obvious that much of the difference must depend upon the different states of the stomach in regard to its power of generating an acid at the time.

In employing the metallic salts, and, indeed, tonics of every kind, in disabilities of the stomach, it is a good rule to begin with small quantities, and advance to a full dose by degrees; thus reversing the method that it may often be found advantageous to follow in acute diseases, when the life of a patient may depend upon a bold practice adopted instantaneously, and gradually remitted, as

* Hart. Diss. de Zinco, Lugd. Nat. 1772. Fouquet, Gardane Gazette, p. 14.
† Bell, Med. Comm. Edin. Vol. I.

soon as the object has been obtained. The chronic character of dyspepsy on the contrary allows us time; and as no two stomachs will perhaps bear the same precise dose of a remedy, with the same precise effect, on account of the caprice of this organ in a deranged state, it is better to feel our way before us, and to reach the proper point by degrees; for if we overdose the patient at first, we add to the disease instead of opposing it, and require many days, perhaps weeks, to bring him back to the actual state in which we found him.

In conjunction with this internal treatment it is probable, also, that an external application of the voltaic power to the stomach may increase its energy. In the hands of Dr. Wilson Philip it appears to have been of decided advantage. But as I shall have occasion to notice this active remedy more at large when discussing the nature and cure of dyspnœa *exacerbans*, I shall postpone a further account of its effects and the mode of its application till then.

While, however, a proper course of medicine is pursuing, a proper course of diet and regimen must accompany it, or with the utmost professional skill we shall make no progress. And hence to the remarks already made at the outset, that where the disease has been brought on by a life of indolence, sedentary occupation, or too free indulgence of any kind, the general habit must be changed, and regularity of meals, sleep, and exercise be rigidly insisted upon, it it necessary to add a few other observations to the same purport.

One substantial meal of solid animal food daily is sufficient for a man in full health engaged in a life of ordinary labour. Yet there are many who, without any labour, are from a long habit obliged to take two or even three. But the habit is bad, and cannot too soon be broken through. It follows therefore, of necessity, that, where the stomach is weak, the toil of digesting one full meal of animal food is the most that should be put upon it. This should take place as nearly as may be to the hour of noon, certainly not later than one or two o'clock, so as to occupy the middle of the wakeful period. The animal food should consist of one dish only; and be confined to such as is lightest of digestion, or as the peculiar state of the stomach may call for: for in both these respects there is a considerable difference. Thus shell-fishes do not always agree with weak stomachs, and will sometimes excite great uneasiness, with pyrectic heat, and even throw out a nettle-rash, or some other cutaneous eruption. Yet where they sit easy and are relished, several of them, as the crab and lobster, are found to neutralize acidity in the stomach more readily and effectually than any other kind of animal food: an effect we should little predict, considering that they give out, on a chemical analysis, a smaller portion of ammonia than the flesh of quadrupeds, birds, or even amphibials. The food of young animals is less nutritive than that of old, but it is, in general, digested with less irritation. Many writers have arranged the different animals that furnish food in tables, founded upon their supposed degree of nutriment. But they have drawn them

up with considerable variations, in some instances apparently according to their own fancy. I have not space to enter into a comparison of these, nor is it necessary. Those who have leisure for such a study may turn to Dr. Darwin's, which is perhaps one of the best, and which they will find in his Zoonomia. Generally speaking, the tenderest food is that of the gallinaceous birds: then that of the ungulated quadrupeds; among which the stag, or cervus kind, claims the pre-eminence; and to this succeed the ox, sheep, and hare, in the order in which they are here placed. Yet it should be observed, that the last, though less nutritive than the preceding, is more easily digested than several of them; as it should also, that the flesh of animals in their wild or native state, though less coveted by a pampered palate, offers a more wholesome and digestible aliment, and is more perfectly animalised, than that of animals cooped up and fattened for the table. Below the hare, we may place the web-footed birds that are ordinarily brought to market; and below these, the oyster and lobster tribes, and lastly the numerous genera of fishes.

The vegetable nutriment should be such as is least disposed to ferment in the stomach, and hence all kinds of new bread, sweet preserves, confectionary, and pastry, must be sedulously avoided; and the crust of bread, toasted bread, and unleavened biscuits take their place. The farinacea, whether seeds or roots, as rice, wheat flour, in the form of light and simple pudding, and potatoes, may be allowed in moderation. Water too is the best beverage; but where there is a great flatulency, a small portion of brandy may occasionally be added. The only condiments that can be conceded are salt and spices: pickles might be admitted where acids constitute a part of the medical treatment; but they are disposed to provoke a false appetite, and hence to weaken the stomach by overloading it.

From fixing the principal meal so near the hour of noon, it is clear that we suppose the day to commence at a very different period from the ordinary regulations of fashionable life; in which the bed is rarely quitted before nine or perhaps ten o'clock, after a night of imperfect and feverish sleep, when the languid idler immediately procceds to a breakfast of tongue, ham, and eggs, in addition to the ordinary materials of this meal, as though he had been already labouring in the field for two hours; and by means of their combined stimulus fills his stomach with a load, which might indeed do good to the husbandman, but to himself proves nothing more than a mischievous oppression. Yet to this morning toil of the stomach succeeds, at about two o'clock, the ordinary luncheon in a still more solid shape; followed in the evening by a dinner of numerous courses, with high seasoned condiments and a stimulating change of wines; the real business of this vain and frivolous life perhaps not commencing till the better disciplined peasant has begun his quiet sleep: when, roused by a flow of factitious spirits, and primed for gaiety and gallantry, the votary of pleasure, as it is called, sallies forth to join his comrades at the allotted place of rendezvous, and

to pass the midnight in hot and crowded ball-rooms, or in orgies of a still more exhausting nature. Of the whole of this career, the only rational part of it is the luncheon a little after mid-day; this may be copied by the invalid before us, as his dinner, but from all the rest we must carefully shut him out. He should quit his bed by six or seven o'clock in the morning in the summer, and by seven or eight in the winter; and after having risen for an hour he may partake of a light breakfast of milk, cocoa, sassafras, or any other aromatic or warm-flavoured tea, with toasted bread, the crust of bread, or sea-biscuits, as observed already. The morning may be devoted to such exercises or recreations as may be most agreeable without producing fatigue. To this will succeed the chief meal of the day, upon the plan already laid down; and a light refreshment of the same nature as the breakfast should conclude the daily diet, a few hours before retiring to rest, which should never be later than eleven o'clock. Sea-bathing or the shower-bath before breakfast will considerably add to the means of improvement wherever these advantages can be enjoyed, and particularly when the warmth of the season may give them the character of luxuries.

Proper temperance and clothing are also subjects of some importance; but as we shall have occasion to enlarge upon these, more particularly when treating of Phthisis, I shall only observe at present, that the feet and chest should be kept especially warm, and that all extremes of heat and cold should be sedulously avoided: a general glow on the surface, when produced by exercise, will be advantageous, but it should not be carried to the extent of much sensible perspiration, as this might terminate in a debilitating chill.

GENUS VI.

COLICA.

Colic. Belly-Ache.

GRIPING PAIN IN THE BOWELS, CHIEFLY ABOVE THE NAVEL, WITH VOMITING AND COSTIVENESS.

There are various diseases to which this definition will apply; but which, nevertheless, differ from each other in several particulars. M. de Sauvages thought these particulars of so much importance as to justify him in advancing each of these complaints to the rank of a distinct genus, under the names of gastrodynia, colica, rhachialgia, and ileus. Dr. Cullen, however, judged differently and more correctly. He regarded their distinctions as of subordinate moment, and in their prominent symptoms traced so close a resemblance as to in-

dicate their being a sort of natural tribe or family. And he has consequently simplified them into one genus under the name here adopted, of COLICA. In the ramifications of his species, however, he seems a little too diffuse, and he has unnecessarily, and somewhat capriciously, varied a few of the ordinary specific names, as those of ILEUS and RACHIALGIA, which for reasons assigned in the volume of Nosology are here restored. In other respects, the present arrangement does not materially differ from Dr. Cullen's classification. The species that seem fairly entitled to attention are the following:

1. COLICA ILEUS.	ILEAC PASSION.
2. ——— RHACHIALGIA.	COLIC OF POITOU, OR PAINTER'S COLIC.
3. ——— CIBARIA.	SURFEIT.
4. ——— FLATULENTA.	WIND-COLIC.
5. ——— CONSTIPATA.	CONSTIPATED COLIC.
6. ——— CONSTRICTA.	CONSTRICTIVE COLIC.

SPECIES I.

COLICA ILEUS.

Ileac Passion.

GRIPING PAIN, VOMITING, AND COSTIVENESS, ACCOMPANIED WITH RETRACTION OF THE NAVEL AND SPASMS OF THE MUSCLES OF THE BELLY.

THE name of Ileus (ιλεος or ειλεος, for it was written both ways) is entitled to veneration, as it has descended to us from the earliest Greek writers, who thus denominated it, either from that introsusception or convolution of the intestinal tube, which so often accompanies the disease, and which is the direct meaning of the term; or from the ileum or small intestine in which the disease is principally or most usually seated. Sauvages, and nearly all the continental writers, continue the term. Dr. Cullen has exchanged it for spasmodica, as an adjunct to colica; but by perusing the comment to the Nosological Synopsis just referred to, it will be seen that he has gained nothing hereby, either in regard to precision or elegance.

The griping pain or belly-ache in this species is very acute, and the vomiting is accompanied with a discharge, not only of bile from the duodenum, but of stercoraceous matter from the large intestines, or of injections introduced into the rectum; forcing their way through the strong muscular valve of the colon, which we have already noticed as being formed by a natural prolapse of the ileum, for the purpose of preventing a regurgitation of the feces

into this last intestine; and evidently proving a powerful inversion of peristaltic action through the whole or nearly the whole length of the intestinal canal. While the obstinate costiveness which attends at the same time, pretty clearly indicates a spasmodic constriction, though rarely producing a total occlusion, of that part of the canal where the pain is most violent, often indeed extending to other parts, and even to the bile-ducts. And in this last case, even when the feces are discharged by the mouth, they are untinged with bile, while all the symptoms of jaundice supervene.* The morbid action is, indeed, not unfrequently so violent as to excite inflammation over a considerable part of the intestine chiefly affected; and consequently to aggravate all the other symptoms.

And hence the disease is presented to us under the two following varieties:

α Fæcosa. Stercoraceous colic.	The vomiting accompanied with feces or substances injected by the anus.
β Inflammatoria. Inflammatory colic.	Accompanied with symptoms of inflammation.

The dissection of persons who have died of either of these varieties has shown us, in some cases at least, that one portion of the affected intestine, constringed and lessened in its diameter, has fallen into another portion below it, and thus produced what is called an INTROSUSCEPTION, or involution of its coats; but we dare not say that such an involution is common to every case of the disease, and we have reason to believe that in the slighter attacks it is not so. The fact is not difficult to be accounted for; and it will readily explain the cause of the great torture which is often suffered under the influence of this grievous malady. In every case in which the intestinal tube is weakened, there is a very copious extrication of air, producing in many instances a palpable distention of the parietes of the abdomen. In ileus, however, there is also as we have already observed, in conjunction with this, a strong inversion of the peristaltic action operating from the rectum to the stomach, and forcing back whatever recrement or other materials are co-acervated in any part of the intestines. These, by intermixing with the elastic vapour of the intestinal tube, become very voluminous, and distend it to its utmost range wherever distension can be accomplished. In one or more parts, however, of its entire length we have also seen that there is a violent spasmodic constriction, through which the distensive force cannot prevail, excepting perhaps by snatches, or during a remission of the spasm. The two powers are hence brought into immediate contact; and while the gut is in consequence rigidly contracted above, it is widened almost to bursting below; and, during the struggle which ensues, a part of the imprisoned

* Bartholin. Hist. Anat. Cent. v. 62. Ephem. Nat. Cur. Doc. 1. Ann. IV. V.

contents of the expanded intestine is forced upwards, and the collapsed portion of the superior intestine at the same time slides downward at the point of the stricture.

In the midst of this spasmodic commotion, there is also another extraordinary change, which has been sometimes found to take place in the relative positions of the different parts of the intestinal tube. For from the urgency of the moving power that works upwards, the natural effect of the gravitating power that works downwards, and the looseness of the convoluted canal itself in many parts, and its tightness from adhesions in others, it has sometimes become twisted into nooses and knots; in which the portion forming an encircling cord or bridle has been drawn so tight as to produce strangulation, and render gangrene inevitable.* In one instance, indeed, the spasmodic action was so extreme, that the bridle not only produced strangulation and gangrene, but cut through all the coats of the intestine on the opposite side to the mesentery, and made an opening of about an inch in length.†

Generally speaking, however, there is more danger in the second variety than in the first; the symptoms, if not early opposed, are more rapid in their progress, and gangrene is produced in a shorter period of time. Yet when an active and well discriminated course of treatment is pursued, the inflammation is very frequently subdued, and the patient escapes without further injury.

It is a singular fact that though ileus is no uncommon result both of introsusception and inflammation, it sometimes takes place without either of them, or at least without intestinal pain or other manifest symptoms of inflammation or spasm; for which we have the authority of Stoll,‡ Haller,§ and Morgagni.‖ Even where inflammation exists, it is not difficult to distinguish the disease from enteritis, by the spasmodic contraction of the abdominal muscles that accompanies it, the diminution of pain which ensues upon pressing the abdomen, and the small degree of fever which is present, compared with that by which enteritis is usually characterised.

Both varieties of ileus are apt to run into each other, and the disease assumes the first or the second form from the patient's idiosyncrasy, the peculiar condition of the organs affected at the time of the onset, the temperament of the season, or some other adventitious circumstance. The causes therefore, for the most part, are alike, and very numerous. The common are acrid, cold, or indigestible esculents: cold beverages on a heated stomach; catching cold in the feet or abdomen; unalimentary substances swallowed through bravado or by mistake, as knives, metallic money, or pieces

* Mem. de l'Acad. Royale, XXIII. par M. de la Peyrouse.

† Med. Observ. Vol. IV.

‡ Ratio Medendi, VIII. 129.

§ Comment. Nova, Gotting. VIII. 1.

‖ De Sedibus, &c. XXXV. 19, 21, 23.

of glass, plum, cherry, or other fruit-stones; an excessive flow of bile, especially in a state of acrimony; worms; drastic purgatives in an over-dose, as scammony, black hellebore, and colocynth; which last has produced a troublesome colic of thirty years standing;* calculous or other balls congested in the intestines, and obstructing their passage, as scybala, bezoards, and indurated feces; violent passions or other emotions of the mind, as extreme rage or terror; a diminished capacity of the intestinal canal from scirrhous or cancerous tumours, or from an ossification, callosity, or coalescence of its internal tunic. It is also at times a consequence of transferred gout, or rheumatism.

In the treatment of ileac passion, whenever there is inflammation, or a decided tendency towards it, evidenced by shivering or a full pulse, blood should be taken freely and even repeatedly from the arm, whether the patient be of a strong, robust, or of a delicate and weakly constitution. It is a practice, indeed, recommended generally by many writers in the commencement of the disease, even where no inflammatory action exists, with a view of relaxing the spasmodic constriction; but in these cases it is not absolutely called for, and, where the habit is weakly, is likely to produce more harm than good.

The two next points to be aimed at are, a removal of the griping or spasmodic pain; and a restoration of the intestines, from a state of inverted action, to their proper peristaltic motion; and hereby a resolution of the costiveness.

For the first, humid heat in the form of a warm bath, warm fomentation, and warm and copious clysters, afford a rational chance of success. The last should be rendered emollient by a solution of oils, and moderately loaded with purgatives, so that both intentions of cure may be carried forward at the same time. In combination with these opium may also be tried, and various other narcotics—and especially the extract of hyoscyamus, which, in many instances evinces an aperient, as well as a narcotic power. If the opium be employed in the form of a tincture, the dose should be from a hundred to a hundred and twenty drops in an injection of four ounces of warm olive oil. If hyoscyamus be had recourse to, we may safely use either the seeds or the extract: about four or five grains of the former and ten of the latter may be added to each injection. Clysters of a strong decoction of poppy heads have also frequently been found highly beneficial. And to these should succeed the application of stimulants to the belly, as volatile alkali, or blisters. Sir John Pringle speaks highly of the latter, and not without reason; for if made sufficiently large to be active, they often succeed not only in quieting the spasm, but in obtaining evacuations, after injections, purgatives by the mouth, fomentations, and opiates have been tried without effect.

Purgatives for the second intention, and combined with antispas-

* Fordyce, Chirurg. and Med. Fragm.

modics, should in like manner, be attempted by the mouth; though the vomiting is sometimes so incessant that we can get little or nothing to stay on the stomach. But the attempt must be made, and steadily persevered in. Calomel in free doses of about four grains to a dose, will usually be found the best aperient medicine. It occupies the smallest space, and, in the form of a pill, has the fairest chance of being retained. If repeatedly rejected, it must be combined with opium, which nevertheless has a tendency to retard its action, but as the opium may mitigate the spasm and diminish the pain, it will commonly be found an useful adjunct, and a grain or two of it may be given every six hours. Calomel, however, though sure, is slow in its operation; and should hence, where the stomach will bear it, be united with some other and brisker aperient. Of these, the neutral salts seem to answer best: but if they cannot be retained, we must exchange them for crystals of tartar, which are less likely to be thrown back. It is seldom that the drastic purgatives can be recommended; because if they do not succeed, they are apt by their stimulus to excite inflammation where it does not exist, and to increase it where it does.

The relief derived from the symptom of vomiting is apt to lead a practitioner to prescribe emetics; and the large quantity of green and variegated filth thrown up by them, would seem to shew that the plan is judicious. But the benefit hence obtained is very transient; and the morbid secretion of feculent and bilious matter is promoted and augmented by the irritation of emetics; so that a succession of this porraceous recrement may be continually procured by vomits, and the medical attendant may flatter himself that he is removing the cause, while he is only increasing the disorder. And hence we should rather endeavour to abate the secretion by opiates and other sedatives, than excite it by emetics. I do not mean to say that emetics have never been serviceable, for where the disease proceeds from a foul stomach they are advisable; and by producing a determination to the skin, they have sometimes succeeded as revellents: but they cannot be relied upon, except in special cases, and have oftentimes aggravated the spasm. The practice of vomiting is nevertheless supported by high authorities, though chiefly after bleeding. Dr. Stoll was in the habit of using and repeating emetics, three, four, and even five times with little interval.*

Dr. Cullen, on the advice of De Haen, recommends a continued stream of warm water thrown forcibly and with a proper syringe into the rectum, so that it may play like water from an engine upon the constricted portion of the intestine: and declares that he has found this remedy to be one of the most powerful and effectual. When the ordinary means and particularly those of warm injections and the warm bath fail, some practitioners have been courageous enough to try cold applications both external and internal. Sir George

* Rat. Med. Part II. p. 135, 138.

Baker tells us, that a physician of credit informed him he had once prescribed the cold bath with success. And Citois affirms that in several species of colic this was his constant practice, even in the midst of winter, and calls upon his fellow-citizens to attest that most of his patients thus treated had been restored to health.* Saucassani relates the case of a person instantly cured by drinking a large draught of cold water.† Professor Plonquet affirms that he has found it equally serviceable,‡ and Zacutus Lusitanus narrates the history of a patient who speedily got well by being rolled in snow.§ But these are extreme instances: and notwithstanding an occasional success, the practice is not to be depended upon. It will prove most effectual where the colic is accomponied with or produced by hysteria. While on the contrary, where it has been occasioned by too violent doses of drastric purgatives, warm stimulants, as the oil of turpentine, and even brandy,‖ have been taken with great advantage.

In an arthritic diathesis the disease has suddenly ceased upon the foot being attacked with a severe paroxysm of gout, which in one instance effected a radical cure where the colic had returned periodically for six years.¶

Dr. Percival, Dr. Warren, and various other writers upon their authority, advise that the antispasmodic plan, whether by the stomach or the rectum, or both, should take the lead, and the purgative plan follow. This will always be found the proper order in attacking the painter's colic: but we should lose much important time, and often allow the inflammatory symptoms to get fatally a-head, if we were to adopt this as a general rule in ileac passion; in which the symptoms, if not more dangerous, are more urgent, and demand a more rapid march of treatment.

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* F. Citesii, Opuscula Medica, p. 215.

† Epist. V. Haller, Bibl. Med. Pr. III. p. 601.

‡ Init. Tom. II. Colica.

§ Prax. Adm. Libr. II. Obs. 27.

‖ Clossius, Obs. 23.

¶ Van Zelst, Libellus singularis de Podagra et Colico Dolore. Lausanne, 1760.

SPECIES II.

COLICA RHACHIALGIA.

Colic of Poitou. Painter's Colic. Devonshire Colic.

THE PAIN AT FIRST DULL AND REMITTING; BUT PROGRESSIVELY GROWING MORE VIOLENT AND CONTINUED; EXTENDING TO THE BACK AND ARMS, AND AT LAST PRODUCING PARALYSIS.

From the pains striking through to the back, Astruc first distinguished this species by the name of Rhachialgia (ῥαχιαλγια) literally "back-bone-ache or spine-ache;" and as the term is highly expressive, and has been continued by most of the continental writers, it is retained as a specific name in the arrangement before us, notwithstanding that it has been dropped, or varied, or exchanged for some other, by several writers of our own country.

The pain is most commonly seated from the beginning to the end of the attack at the pit of the stomach. It is at first dull, but gradually grows more severe; and as it increases, extends upwards to the arms, and downwards to the navel, back, loins, rectum, and bladder; and frequently to the thighs and legs. From the navel it sometimes shoots with so much violence to each side, that the patient feels, and so expresses himself, as if some person were cutting him in two. Almost all the external muscles are rendered sore by the great violence of the pain, as though they had been affected with rheumatism, and can scarcely bear the weight of the bed-clothes or the slightest touch of a finger. Sometimes, however, the seat of pain alternates between the stomach, which nevertheless, as just observed, it never entirely quits, and the external muscles: it is violent in the stomach, while the lower bowels and the external muscles are at ease; or it nearly quits its hold on the stomach and lower bowels, and rages through the external muscles. Sickness is an early symptom, as well as costiveness; and as the pain in the stomach increases, the sickness increases also; even on the second day from the attack, the retchings are violent, and the discharge thrown up consists of acrid slime and porraceous bile. A momentary relief is hereby usually obtained, and the patient flatters himself that he has thus ejected the fomes of the disease and is about to recover. Too soon, however, does he find himself disappointed: as long as the pain continues, the same morbid matter is secreted, and thrown into the stomach, and the retchings return with perhaps accumulated violence; or, if they do not, their place is supplied with bitter eructations and hiccoughs. The pulse, notwithstanding the severity of the sufferings, is little affected at first, and for several days continues as quiet as in health. After the fourth or fifth day, however, it sometimes becomes quicker, but not

always, and it may admit of a question whether the acceleration be not even at this period rather the effect of the medicines taken to procure relief, than of the disease itself.* The urine varies so much in different individuals that no stress can be laid upon it. Towards the close of the disease there is generally a pain round the edges of the feet and at the extremities of the toes, which are often red, and swollen, and to appearance gouty. Relieving sweats break forth, sometimes accompanied with an efflorescence. About the same time a griping of a different kind from what has hitherto been endured, and which is more easily bearable, takes place, attended with a disposition to go to stool: and after large discharges of various kinds of excrement, frequently of scybala or hard lumps, in shape resembling sheep's dung, together with black and dirt-coloured slime, occasionally mixed with blood, the patient is perfectly relieved.

In a mild degree and under the best therapeutic plan, the disease can seldom be removed under five or six days; but if it be violent, neglected, or ill-treated, it will continue for weeks or even months, with now and then a truce for a few days; and will terminate in a peculiar sort of palsy of the upper extremities; or in death, preceded by deafness, blindness, delirium, or epileptic fits.

The remote cause appears in almost every instance to be lead introduced into the system either by the stomach, the lungs, or the skin: and hence the disease is found most frequently in those countries, and under those circumstances in which this metal is most freely used, or most readily dissolved. In the neighbourhood of smelting furnaces, pigs, poultry, ond other animals evince the same complaint. Thus too in Poitou and Devonshire, in which lead was formerly employed to destroy the acidity of the weak wines and ciders for which these provinces are celebrated, it was at one time so common as to obtain the name of Devonshire colic, and colic of Poitou. And hence house-painters, whose occupation leads them to a constant use of lead, and who are, often, too little attentive to personal cleanliness, are to the present hour so frequently affected by it, as to give it the still more general name of Painter's colic. Plumbers, potters, glaziers, workers in glass, gilders, chemists, miners, and printers, are, in like manner, exposed to its attack from the large quantity of lead contained in the materials they are continually handling. I attended some years ago a printer who had several times been afflicted with this disease, but had fortunately recovered from every attack, though each return proved severer than the preceding. The cause had never been suspected, till I pointed it out to him, by inquiring whether, after leaving the printing-office, he was careful to wash his hands before he sat down to his meals; to which he replied that he had never been put upon his guard on this subject, and had therefore never attended to it. I rigidly enforced upon him the necessity of doing so, and he

* Dr. Warren, Medical Transactions, Vol. II. p. 72.

continued for six or seven years without the slightest return. At this period he again grew careless and confident; he again suffered, and lost his life.

Crude wines and ciders, and acidulated drinks, are likewise said to be occasionally causes of this species of colic: but if accurately examined into, it will perhaps generally be found that in such cases they have been tainted with lead employed in some part of the machinery or vessels made use of. Yet suppressed perspiration, or cold from long exposure to damp, has perhaps been occasionally a source of both the present and the preceding species. Sauvages has observed that rhachialgia has also occasionally followed upon an injury to the spine by a blow or other accident: and Cullen has copied from Sauvages, as Sauvages copied from Astruc. I have never met with a case of rhachialgia from this cause, but whenever it occurs it must probably be upon the principle which Astruc has perspicuously laid down; a compression on the spinal marrow producing a paralysis of the limbs, and putting a stop to the peristaltic action of the intestinal canal, in consequence of the sensorial fluid from some of the vertebral nerves being obstructed in its course.*

Admitting that all these are distinct causes of the present species, it is possible that each may produce some slight diversity in its general symptoms: and we should hereby be presented with four varieties of rhachialgia. In Dr. Cullen's Tables these varieties are arranged in order; and in deference to this able writer they have been copied, as his, into the Nosological volume of the present system. But as it appears to me that there is no real ground for diversity in the treatment, and that lead, under some modification or other, is the common cause of the disease, I forbear to carry the distinction any farther.

For the discovery of this general cause, medical practitioners and the world at large are under almost infinite obligations to Sir George Baker, whose indefatigable pains at length succeeded in setting this subject in its true light: and in exposing the iniquitous fraud which was at one time very extensively had recourse to for sweetening acid ciders, as well as weak wines, by mixing with them litharge or sugar of lead, or employing utensils or cisterns more or less formed of this metal. In the present day, in which the study of chemistry has become popular, and every one is aware of the mischief of such a conduct, and the public good has obtained a triumph over private emolument, it is difficult to conceive the degree of opposition which this indefatigable pathologist had to encounter in establishing his theory of the disease, and calling the nation to a sense of its own danger. On the one hand all the adulteration was openly denied, and even the use of leaden utensils or cisterns, in cases in which rhachialgia made its appearance. On the other hand he was reminded even by medical writers, who

* Thes. de Rhachialg. See also Journ. de Med. Juin. 1760.

ought to have known better, that lead itself was, to say the worst of it, a harmless material; and that even as a medicine it had for ages been employed as a valuable specific in some of the worst complaints to which the human frame is incident. And when it was retorted that the colic, which at one time was endemic in Poitou, was well known to have been produced by sweetening weak, acid wines, and restraining their fermentation by salts of lead, as Tonchin, Zeller, and others, had sufficiently established, insomuch that the French government though. it right to interfere, and prohibited the use of such preparations under the severest penalties: it was still obstinately asserted, that the colic induced occasionally by cyder was essentially unlike rhachialgia, and excited not by a solution of lead, but either by a mere crudity of fruit, producing, as Dr. Huxham had not long before erroneously supposed, a gross and acid salt or tartar injurious to the blood; or by cold and obstructed perspiration; or by a gouty or rheumatic diathesis; or by a variety of other fancies which it is unnecessary to dwell upon. More than half the first volume of the Transactions of the College of Physicians is occupied by different papers written to establish the real nature of this disease.

The question was next started, and it has been started again in our own times, whether pure water, as well as acid wine, be not capable of dissolving lead in a metallic state; and, consequently, whether the community be not daily running a great risk of being poisoned by employing this metal in pumps and reservoirs? The public mind was for a long time very much agitated by this discussion, and Dr. Percival thought it right to institute a variety of nice experiments to allay the general apprehension, by showing that pure water is not in any respect a solvent of metallic lead.* Yet it was a course hardly necessary; since the daily use of leaden water-cisterns by upwards of a million of inhabitants in this metropolis, without any inconvenience whatever, was then, and still continues to be, the most decisive and satisfactory proof that can be afforded of the insolubility of metallic lead in rain or river-water. Even saturnine lotions applied to the surface of the body have rarely, if ever, been found deleterious, although these also were at one time suspected of being highly mischievous. They may perhaps prove so in a few singular idiosyncrasies, but they do not affect mankind in general.

Lead, however, so minutely divided as to impregnate the atmosphere with its effluvium, has frequently laid a foundation for the disease. But whether any preparation under the form of cosmetics has proved injurious, I cannot undertake to say. The disease has certainly been produced by sleeping in newly-painted-rooms, of which a striking instance occurred a few years ago to myself. The patient was a surgeon of highly-distinguished character in this

* Observations and Experiments on the poison of Lead, by Thomas Percival, M. D.

metropolis. When I saw him, at his particular request, he had been ill for a fortnight; and, the cause not having been suspected, his complaint was conceived to be obscure and anomalous. The symptoms, as it struck me, were evidently those of rhachialgia from lead; and upon pointing out to him my view of the case, I found that about a month antecedently he had sent the whole of his family into the country, as his house was about to undergo a thorough repair in painting, while he himself remained at home and slept there. The cause was admitted and acted upon, but the disease had gained too much ground, and was immovable; his spirits became deeply dejected, and he fell a sacrifice in about two months from the attack.

In the Medico-Chirurgical Transactions is a case communicated by Dr. Badeley, in which the patient, a domestic in his own house, lost her speech and became paralytic from being only six hours in a newly-painted room, but quickly recovered from both upon being removed:* evidently proving the deleterious influence of lead in a state of vapour; and at the same time that in different constitutions it will show it effects upon different organs or in a different manner. Is the lead in these cases in a state of regulus, oxyde or salt? Is is dissolved in the air, or merely mixed with it?

Sir George Baker asserts, that he has known the disease originate from minute corpuscles thrown off from the clothes which have been worn by plumbers while at work.† And in corroboration of this remark Dr. Reynolds observed, when he was physician to St. Thomas's Hospital, that the colic of all the workers in lead frequently returned, under any management whatever, whilst they were allowed to wear the clothes in which they had been accustomed to labour; on which account, such clothes were never suffered to lie on the patient's bed. Sentin was a witness to the same effect from hanging up labourers' wallets filled with food for the day in places impregnated with the vapours of lead.‡ And the present author has occasionally met with other instances of the disease from an habitual residence in close damp rooms, filled with *newly-printed* or *coloured* paper: for the emanation of flake-white, which usually enters into the colour, seems to have the same power of affecting or being affected by the surrounding atmosphere as that of lead in a finely attenuated metallic state.§

I have said that pure water does not act upon lead in a metalic form: but while we see lead thus easily disintegrated and reduced to an oxyde or a carbonate by acids existing in the atmosphere, or even by the atmosphere itself, we may readily conceive that aerated waters are capable of decomposing it in a slight degree, and of forming oxydes or salts that may be injurious to the health. And

* Vol. IX. p. 238. See also Seguin, Annales de Chimie, LXXXVIII. 263.
† Essay concerning the Cause of the endemial Colic in Devonshire.
‡ Memorab. p. 114.
§ Med. Trans. Vol. III. p. 420.

hence, where lead is required in the form of reservoirs for waters of this kind or for culinary vessels, it should, by all means, be united with tin, in equal proportions as recommended by M. Prout,* or with a slight surplus of the latter as proposed by M. Vauquelin.† For, first, tin is a harmless metal, as well in its salts and oxydes as in its reguline state, at least in any quantity in which we can conceive it possible to be swallowed by mistake. And, next, as it is more readily oxydable, and has a closer affinity for all the acids than lead, when united with the latter it must completely draw away all the acid it can come in contact with, and detach every atom of oxygen which might even previously have been united with the lead.

The paralytic effect produced by the action of lead is one of the most formidable symptoms to be encountered in the therapeutic process: in laying down which, our first efforts should not be different from those in the preceding species, excepting that, in an attempt to remove the spasmodic pain, opiates may be allowed to precede the use of purgatives. The paralytic effect has been attempted to be subdued by the counteraction of other metals introduced into the system for this purpose; and especially mercury and silver. Both have, indeed, been given from the commencement of the attack by many practitioners; and, as themselves relate, with great success. Dr. Warren and Dr. Biss were in the habit of persevering in the mercurial process till they obtained a salivation; and assert, that they found the dull griping pain give way as soon as this was accomplished. And hence, perhaps, Dr. Clutterbuck, with a view of turning the tables upon mercury when continued so long as to prove mischievous to the constitution, inquires whether some preparation of lead might not in these cases be given internally to counteract the ill effects of the mercurial medicine?‡ The silver employed in rhachialgia has usually been in the form of its nitrate or lunar caustic, to the amount of four or five grains in the course of the day. Dr. Roberts has published two cases of a cure obtained by this remedy; the one that of a young man, the other of an old. The cases were both of considerable standing, and the joints of the wrists were weak almost to paralysis. Even this symptom, however, yielded by degrees. The salt was given from three to five grains at a dose three times a day in the form of pills: and in the last case five grains every six hours. It has the advantage of being a laxative as well as an antispasmodic: so much so, that a small quantity of opium was on this account added to the nitrate when given in its most frequent doses.§

Alum was at one time another popular remedy both in our own

* Annales de Chimie, Tom. LVII. p. 84.
† Id. XXXII. p. 243.
‡ On the Poison of lead.
§ Med. Trans. Vol. V. Art. V.

country* as well as abroad.† The German physicians gave it in the proportion of from twelve to eighteen grains three or four times a day; and by Dr. Grashuys it was even regarded as a specific.‡ Dr. Percival advanced the quantity to fifteen grains repeated every four, five, and six hours, and affirms with unvarying advantage; the third dose seldom failing to mitigate the pain, sometimes entirely to remove it.§

In treating of active hemorrhage we shall have occasion to observe, that whatever deleterious property the superacetate of lead may possess, it is entirely removed by a judicious mixture of opium with it, so as in this state of union to become a most valuable styptic. It is possible that under the form of a superacetate, lead may be less injurious than under some others, for it has not unfrequently been given alone in the same complaint without any rhachialgic pains where the bowels have been kept in a soluble state. But with opium every mischief seems effectually to be guarded against: and the beneficial influence of opium upon lead in this case should induce us to employ it, and that very freely, as an antidote in every case, and especially in the disease before us; and to counteract its constringency by an union with calomel. This rational practice, which has been pursued in our own country by several physicians ever since Dr. Reynolds first called the attention of the profession to the corrective power of opium when combined with lead in the case of hemorrhage, has now for many years been also tried with success in various parts of the continent. In France the dose of opium has been usually only a grain or a grain and a half every night; but in Spain, as we learn from the memoirs of the *Real Academia Medica de Madrid*, a much bolder and more satisfactory employment of this medicine has been exhibited by a physician of distinguished judgment, Don Ignacio de Luzuriaga, who prescribed a grain of opium every three hours; and it will often be found necessary to augment this quantity.‖

As the sulphate of lead is a compound insoluble in the stomach, and consequently altogether inert, M. Orfila has ingeniously attempted to reduce the superacetate and other preparations of this metal to the form of a sulphate, by giving large quantities of sulphate of magnesia; and he thinks he hereby succeeded in effecting a decomposition in the stomach of two dogs upon whom he made experiments to ascertain this point; and in producing sulphate of lead in their stead. The experiments, however, proved fatal in both instances, though some portion of sulphate of leads seems to have been

* Percival, Essays I. II. Edinb. Med. Comm. II, 305.

† Crell. Bald. N. Mag. B. III. p. 4. Lindt. Diss. de Aluminis Virt. Med. Goet. 1784.

‡ Tentam. de Colica Pictonum. et App.

§ Observations and Experiments on the Poison of Lead.

‖ Disertacion Medica sobre el Colico de Madrid, inserto in las Memorias de la Real Academia, &c. Madrid, 1796.

formed, and the death of the second dog to have been retarded. As the want of complete success may be ascribed to the want of a sufficiency of sulphuric acid in the re-agent employed, it would be better to try the experiment for the future by giving the purgative salt in infusion of roses, or any other liquid adequately charged with the acid to answer the purpose; or by a free exhibition of the acid in a diluted state alone.

Those who have had this disease, are liable for a long time to fresh paroxysms; and the slightest exposure to the same cause will be sure to reproduce it; yet the appearances in different persons, as well afterwards as during the attack, are extremely variable, from difference of idiosyncrasy: a correct idea of which may be best, perhaps, obtained from Dr. Warren's description of thirty-two domestics of the Duke of Newcastle's family then residing at Hanover, who were all seized with rhachialgia after having used, as their common drink, a small white wine that had been adulterated with some of the oxydes of lead. They were attacked in the common way, except one, whose first assault was an epileptic fit. This patient, as soon as the pain in the bowels which succeeded to the fit had ceased, had his head again affected, was troubled with a St. Vitus's dance, and died epileptic in less than a fortnight. Three were feverish from the beginning to the end of the disease. The rest were without fever till the fourth or fifth day, their pulse becoming quicker as the pain began to abate. In some the mouth was made sore by the acrimony of the matter vomited up. Four fell into a salivation for several hours every day, and said that their pain was abated during the spitting. Many had profuse sweats, and a few an eruption of red and white pimples just before the disorder terminated. One was delirious during a part of the time, but recovered. All relapsed within four or five days after they seemed to be cured. Some relapsed several times for several years. One only was rendered permanently paralytic and costive.*

The most useful means of guarding against a paralytic diathesis, or of removing the paralytic sequel, where recourse can be had to them, are the Bath waters. And where the circumstances of the patient will not allow him to have the benefit of these, the spine may be advantageously rubbed night and morning with the warm balsams or rosins dissolved in spirits: and the common restorative process of air, exercise, friction, and tonic medicines should at the same time be had recourse to, and persevered in for many weeks or even months without remission.

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* Medical Transactions, Vol. II. p. 86.

SPECIES III.

COLICA CIBARIA.

Surfeit.

THE PAIN ACCOMPANIED WITH NAUSEA, HEAD-ACHE, AND DIZZINESS BEFORE VOMITING; AND AFTERWARDS TERMINATING IN A GRIPING LOOSENESS.

I HAVE already had occasion to remark, that the stomach is one of the most capricious organs of the entire system; and hence we often find persons in an unsuspected state of health complaining that even the ordinary meal to which they are accustomed sits upon it with a less degree of comfort and satisfaction than usual. And it is hence not at all to be wondered at that, when the stomach is overloaded with plain food, and still more with high seasoned dishes and heady malt liquors and wines, the pain and sickness of colic should ensue, and that those organs which are in closest sympathy with the stomach, and particularly the head, should participate in the affection.

The same effect is not unfrequently produced by swallowing the husks, stones, or kernels of fruit with the fruit that is eaten, all which the stomach may at the time, or perhaps at all times, be incapable of digesting, and some of which have in a few instances remained so long as to germinate before their rejection; examples of which are given in the author's volume on Nosology.

When the stomach of the new-born infant is filled with any other food than its mother's first flow of milk, which is purgative, and removes the viscid meconium with which the alimentary canal is gorged, tormenting pains of a like kind follow: for the feeble action of this canal is incapable of moving this tenacious material downward, and the stomach is overloaded, or the food becomes acrimonious by retardation. And if much air be extricated, the infant is overpowered by flatulency; and the present species becomes connected with the ensuing, and exhibits the oppressive distention of wind-colic.

These are the common causes of the species before us, which is characterised by a greater or less intensity of the symptoms enumerated in the definition. But we often find it also originating after meals from causes that are more obscure, and with various other symptoms of a still more violent and distressing nature, as though the food itself had proved poisonous, or some poisonous substance had been intermixed with it. These additional symptoms are of two kinds: in the one, we meet with an intolerable sense of suffocation, the throat constricted, the face and eyes swollen, inextinguishable thirst, a burning heat all over the body, a quick small pulse, an intolerable itching or pricking in the skin, and an efflo-

rescence on the surface, sometimes in the form of minute red millet-seed papulæ, sometimes in that of weals; twitching of the tendons, and a peculiar kind of delirium; the cuticle peeling off on the subsidence of the attack: the whole evincing great malignity of action, as though the cause were of a septic nature. Under the other set of symptoms, in addition to those noticed in the definition, we meet with great anxiety and difficulty of breathing, dejection of spirits, spasms in the limbs, as well as in the abdominal organs and muscles, tenesmus, coldness of the extremities, loss of sight and hearing, convulsions or coma: the whole evincing great exhaustion of the nervous energy, as though the cause united an acrid with a narcotic principle.

The symptoms, however, vary considerably, according to the general nature of the constitution. For the most part they are sufficiently distinct, but in many persons they are strangely united: and the lethargy, tenesmus, or coldness of the extremities, are combined with the cutaneous eruption. And hence esculent colic may be justly contemplated as ramifying into the three following varieties:

α Crapulosa. Common Surfeit.	The symptoms indicating an overloaded stomach, and usually ceasing on the evacuation of its contents.
β Efflorescens. Eruptive Surfeit.	The symptoms evincing a highly malignant acrimony, the skin covered with an efflorescence.
γ Comatosa. Comatose Surfeit.	The symptoms evincing great nervous irritation, with a rapid exhaustion of the sensibility.

In the first or simple form of the disease the violence of the symptoms generally work its cure. But if the nausea should exist without vomiting, a simple emetic of ipecacuan should be given to excite the stomach to a more perfect inversion of its action, which should be followed the next morning by a brisk purgative. In the colic of new-born infants from viscid meconium the purgative alone will be sufficient, and the best medicine for this purpose is castor oil, which, at the same time that it stimulates the alvine canal, insinuates itself more easily than most other cathartics between the obstructive slime and the interior tunic of the intestine. If the congestion should proceed from an enfeebled state of the stomach, and too long a retention of the food in its cavity, it will be afterwards requisite to put the patient on a course of stomachi or general tonics, of which we have taken a sufficient survey in the preceding description of dyspepsy.

It is possible that the second variety may occasionally proceed from a morbid irritability of the stomach operating upon a tolerably full meal of the most bland and innocuous viands: but it more ge-

nerally proceeds from *animal* foods of a particular description, or eaten under particular circumstances, as comatose surfeit does from poisonous *vegetables* intermixed with common food. The animal substances that chiefly operate in the manner above described, producing a dreadful feeling of suffocation, swelling of the face and eyes, intolerable thirst, a burning heat on the surface, pricking or itching on the skin, succeeded by an eruption of some kind or other, and accompanied with the specific symptoms of griping pain, vertigo, and vomiting—are shell-fishes, and fishes of a few other kinds, as muscles which are perhaps the most frequent of all causes, some species of scallops and other coarse ostraceous worms, the land-crab (cancer *ruricola*,) lobster (c. *gammarus*), conger eel (muræna *major subolivacea* of La Cépède), grey-snapper (coracinus *fuscus major*,) and yellow-billed sprat (clupea *Thryssæ* Lin.), the baracuta, the king-fish, and several other species or varieties of scomber, as the bottle-nose and ambar, the smooth-bottle fish (ostracion *glabellum*), and the rock-fish (perca *marina* of Catesby.) There are also many others, but these are sufficient as specimens.

As all these are among the edible productions of the ocean, and hence are eaten very generally as nutritious foods, it is a question of great importance, and which is yet open to discussion, what are the circumstances in which they occasionally disagree with the stomach and produce the above symptoms?

It has been supposed by many pathologists, that the mischief is occasioned by some poisonous property being conveyed into the body of the fish in the form of food: by others, that it is the result of a change taking place in its general frame by the approach of the spawning season or some other period of life, or in consequence of its removal into a different climate: and by others again, that it depends altogether upon the idiosyncrasy or peculiar state of the constitution, or of the digestive organs of the persons that are thus affected.

It is not necessary to inquire which of these opinions is best supported, because each of them can appeal to so many facts in their favour as to prove very clearly that there is a foundation for the whole of them in different cases, and, consequently, that sometimes the cause is of one kind and sometimes of another.

That many of the animals which prove thus noxious have derived their mischievous quality from some poisonous mineral, vegetable, or animalcule on which they have fed, seems probable from the well-known fact, that many of the most harmless and easily digestible species, if eaten without being disentrailed, grievously disorder the stomach, and occasion many of the symptoms above noticed; while even the baracuta, which is ordinarily one of the most deleterious in its effects when eaten whole, becomes bland and innocuous to most persons when thoroughly cleaned, gutted, and salted. There is also, in many cases of the disorder hereby produced, a strong metallic and especially a coppery taste in the offending substance when rejected into the mouth, and which continues to affect the fauces for a long

time afterwards. M. Orfila has accurately noticed this last symptom in several of the cases he has enumerated; and especially in an example of this disorder originating in a mixt company of whites and blacks, who had fed on the conger eel, in the island of Grenada, in April 1791. "The negroes," says he, "suffered more than the whites; they all experienced a coppery taste in the mouth, and a sensation in the œsophagus, as if it were excoriated."*

It is in vain to urge that what is thus poisonous to man must have been at least noxious to the animals that fed upon it: for poison is a relative term, and it is highly probable, that there is scarcely a vegetable or mineral substance but may be eaten, I do not say harmlessly, but even as a safe and nutritious food by animals of some kind, however destructive to others. The land-crab is well known to feed on the manchineel tree (hippomane *mancinella*); the loxia or gross-beak of the Bahamas on the fruit of the amyris *toxifera*, or poison-ash; partridges on the leaves, and bees on the flowers of the kalmia *latifolia*, which are death to sheep, to horned cattle, and to man. So the cicuta *virosa*, or long-leaved water-hemlock, the most virulent plant that grows spontaneously in England, though fortunately not very common to our pastures, is fatal to cows, while sheep and horses eat it with impunity, and goats devour it with greediness; a fact well known nearly two thousand years ago, to the first naturalist of ancient Rome, and thus fully described in his poem, De Rerum Natura:

> Videre licet pinguscere sæpe CICUTA
> Barbigeras pecudes, homini quæ est acre venenum.†

On the contrary, while horses feed with avidity, and thrive to fatness on the agrestis *arundinacea*, or reed bent-grass, Linnéus, as he tells us in his Travels in Shäne, found a number of goats perishing in an island in which this was the chief herbage.

This interesting subject is pursued with great spirit, and high advantage to the most important purposes of practical husbandry, in several articles published in the Swedish Amœnitates Academicæ; which give us tables of the best and most agreeable foods for cattle and other domestic animals, deduced from an exercise of that wonderful instinctive power of selection, which enables them to discern and to crop those that are a nutritious food for their own species, and to reject the rest. By one of these tables it appears, that of four hundred and ninety-four species of indigenous plants of Sweden, three-fourths of them common to our own country, which were offered to horned cattle, two-hundred and seventy-six were eaten, and the rest refused; that goats, out of four hundred and forty-nine species, rejected a hundred and twenty-six; sheep, of three hundred and eighty-seven, would not touch a hundred and forty-one; horses turned away from two hundred and twelve out of two hundred and

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* Traité sur les Poisons, &c. Tom. II. § 1006.
† Lib. v. 897.

sixty-two; and swine, out of two hundred and forty-three, made choice of only seventy-two.* In another volume of the same interesting work, we have a like series of experiments on a great diversity of insects and worms, with a view of ascertaining how many of them are devoured or rejected by our common poultry ;† to which, however, I can only refer, and must leave the reader to consult it at his leisure.

It is hence perfectly clear, that no argument against the existence of esculents in the interior of animals, deleterious to the health of man, can be drawn from the position that such esculents must also prove noxious to the animals that feed on them.

I am given to understand, that even coppering the bottoms of vessels is no security against their being incrusted with serpulas and other minute testaceous worms, which appear to feed harmlessly on the copper as it becomes decomposed, and perhaps assist in the decomposition itself. It is not unlikely that some of these may, in their turn, become food to several of the edible fishes and worms before us, and that the coppery taste so common to many of them may occasionally be derived from this source. Yet the general origin of a metallic principle in the structure of animals, and even of vegetables, is among the deepest arcana of nature, and perhaps will always remain so. And before we attempt to account for the presence of copper, in an oxyde state, in shell-fishes, or what is more singular, that of gold in metallic streaks in oriental bezoards, it will become us to unfold the process by which iron obtains an existence in the blood of our own kind, and this too in an equal proportion, under circumstances of like health, over all the world, whatever the nature of the soil that forms the seat of habitation.

It is, at the same time well known, that a considerable change takes place in the taste and nutritive qualities of many species of fishes, at various seasons and periods of life, by which they are divested of their nutritive power, and are rendered far less easily digestible; and, which consequently lays a foundation for various affections of the stomach. This is particularly the case with the more luscious or oily kinds; as the herring, mackerel, eel, and salmon, all which are unwholesome, if not pernicious, when out of season. We may also reasonably conclude that climate has a considerable influence upon them, since the most pernicious species are those that exist in the intertropical seas.

It is, however, equally certain, that the disorder before us is, in many instances, rather dependant upon idiosyncrasy or a peculiar condition of the stomach at the time, than upon any quality essentially noxious in the fish itself: for out of twelve or more persons dining together from the same diet, we often find only a single individual affected with the disease before us, while all the rest not

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* Vol. II. Art. 25. Pan Suevicus. Resp. N. L. Hesselgren. 1794.

† Vol. VIII. Art. 163. Esca avium domesticarum. Resp. P. Holmberger, 1774.

only escape, but have made a nutritious and a healthy meal. Even in the same family we occasionally meet with almost as many distinct idiosyncrasies in this respect as there are individuals. Of three sisters, M. Orfila tells us, that one was incapable of eating muscles, at any time, without great disorder of the system at large, as well as of the stomach; that the second experienced a like effect from herrings; and the third, from feeding on strawberries. And hence many pathologists have been induced to ascribe every case of colic, from the variety of surfeit before us, to idiosyncrasy alone. But the frequent examples we meet with of the affection extending through every individual of a large party that has fed on the same food, forbid us to limit our ascription of the disease to this cause only, and compel us to unite it with those we have already considered.

The principles of cure are of easier comprehension than the etiology. The peccant matter must first be discharged from the stomach, by an emetic of rapid action, as about half a scruple of white vitriol; shortly after which, the lower belly should be stimulated to a like discharge, so that as little of the material as possible that disagrees with the digestive organs may remain in them. The history of the symptoms shows us that the living power is rapidly, prodigiously, and sometimes alarmingly exhausted, whence indeed the tremors, sense of suffocation, faintness, sinking of the pulse, and general depression of strength, as also the swellings that take place through every organ where the cellular substance exists in considerable abundance; for in consequence of this exhaustion, the absorbents, whose action ordinarily closes sooner than that of the secernents, are incapable of carrying off the fluid which is secreted into these parts, and an extensive suffusion takes place of necessity. It is hence necessary to rouse the system with all speed, by means of the most diffusable stimulants, and warmest cordials and tonics, which may be commenced as soon as the stomach has been evacuated: the most useful of which are sulphuric ether, capsicum, and vinegar diluted with water, sweetened and drunk in abundance. The acids obtained by fermentation answer better in this case than any others, because they possess more of an alcoholic principle. And it is truly striking to notice the almost miraculous power which is sometimes exhibited by this cordial plan of attack. Upon the administration of a single strong dose of ether, the patient, apparently in the act of expiring, has in various cases felt all his symptoms in a very few minutes as by enchantment;* the pains have ceased; the absorbents, and indeed every other set of organs, recovered their wonted energy; the general intumescence has subsided, and the nettle or other rash disappeared. If, however, the system have been shaken more deeply, and the symptoms do not yield with much readiness, the tonic plan must be persevered in for many days or even weeks.

The third variety is usually produced by pernicious vegetables,

* Orfila, Tom. IV. § 1008. Dulong, Gazette de Santé, Oct. 1, 1812.

instead of animals that have been taken for food, or along with food; or esculent vegetables that disagree with the stomach, as in the preceding variety; from a morbid state of the organ; or from a peculiarity of constitution. I have already observed that the symptoms, in this modification of the disease, evince great nervous irritation with a rapid exhaustion of the sensibility. There is severe spasmodic pain in the intestinal canal, with cramps, spasms, or convulsions, extending over the system more or less generally, accompanied with or succeeded by a lethargic drowsiness, from which it is often difficult to rouse the patient; and from which, also, when roused, he instantly relapses into convulsive agitations: evidently proving that an acrid and a narcotic principle are combined in the unsuspected cause. This cause is usually mushrooms, or rather deleterious funguses that have been mistaken for the genuine edible mushroom, or agaricus *esculentus*. The agaric is so extensive a genus and many of its species to an unpractised eye have so near a resemblance to each other, that it cannot be wondered at that such a mistake has been committed; though perhaps the plants that through such an error have been most frequently gathered are, the bulbous agaric, the Medusa's head, the raven's eye, the hemlock-mushroom, and the agaricus *muscarius*. It is possible, indeed, that even the genuine mushroom may itself prove deleterious to some idiosyncrasies, or to some stomachs in a morbid state of constitution; but then the mischief is in almost every instance confined to an individual alone, the rest of the company eating of the same dish with satisfaction and pleasure.

As there is no critical mark to determine at once between poisonous and salutary mushrooms, we may lay it down as a general rule, that those should be suspected and avoided that grow in moist and marshy grounds, and especially in the shade; that have a dirty looking surface, and whose gills are soft, moist, and porous. For the most part the smell of these is virulent, and they are covered with a calyptre or veil.

There are, however, a considerable number of other vegetables that produce a like effect when taken by accident for food, or along with food; as the cicuta *virosa* or water hemlock, the leaves of which have been mistaken for smallage, and the tap-roots for parsnips; the æthusa *cynapium* or fool's parsley, which has been culled for common parsley; and the secala *cornutum* or spurred rye. The last is productive of very serious evils in different forms, and we shall hence have occasion to return to it when describing erythematic pestis, and mildew-mortification, both which also result from its use. Rye becomes spurred or horned in the shape of its ear, apparently from having numerous punctures made by different insects in the fresh pullulating grains of the glume as a nidus for their minute eggs, in the same manner as the nut-weevil (curculio *nucis*) pierces the young and tender nut of the hazel for the same purpose. And as the effects produced by the grain thus diseased are very different in different seasons or climates, we have reason to believe that its juices are

themselves rendered noxious in a different manner according to the species of insect that makes the attack. It is also said that the common garden rue (ruta *graveolens*,) when eaten to excess, is succeeded by the same symptoms of ventricular pains, spasmodic action and coma, though in a less degree; but I have never seen any such mischievous consequences, and have reason to think that they have been much overrated.

Most of these symptoms are also produced by feeding on soups, or other dishes, that have been cooked in copper vessels containing verdigris. We have the same violent gripings and muscular commotions excited by the acid quality of the plant just noticed, and in almost all instances ache and confusion in the head, and sometimes coma, though the last seems rather to be the result of a determination of blood to this organ by the violence of the vomiting. In all these cases, however, we can easily detect the nature of the poison, by the intolerable coppery taste in the mouth, and the green or greenish-yellow colour of the matter ejected from the stomach.

The cure, as in the preceding variety, must be promoted by evacuating, in the first instance, the poisonous principles as largely as possible from the stomach. Where the local irritation is great, demulcent mucilages should succeed; or soap where the effect has been produced by salts of copper. After which, if there be much general convulsion or other irritation of the nervous system, it must be allayed by opiates.

SPECIES IV.

COLICA FLATULENTA.

Wind-Colic.

PAIN ACUTE, EXTENDING TO THE PIT OF THE STOMACH, OFTEN IMPEDING RESPIRATION; ACCOMPANIED WITH GREAT FULLNESS AND FLATULENCY: AND RELIEVED BY PRESSURE, BENDING THE BODY FORWARD, OR EXPULSION OF WIND.

This species is produced by crude and flatulent fruits, and whatever lowers the tone of the alimentary canal; as too long fasting, fear or grief, and all the causes of dyspepsy, with which it is often complicated, and to which the reader may turn. Like dyspepsy, indeed, it seems to depend upon local debility, whose seat is in the small intestines, and consequently in the direct neighbourhood of the stomach. It is often accompanied with great costiveness, from the spasmodic action which runs, in a larger or less degree, through the whole of the intestinal canal, and considerably adds to the torture, and increases the tumefaction and tenseness of the abdomen;

which are sometimes so extensive as to resemble emphysema *abdominis* or tympany.

The last symptom is peculiarly striking and oppressive in persons of an hysteric diathesis; who are attacked with this complaint from very slight causes: and with whom it is often combined with syncope, or clonic spasms of various kinds.

In attending to the means of cure, we may here proceed at once with some degree of boldness; since, notwithstanding the violence of the pain, it is not often that inflammation is to be apprehended, at least in the commencement of the disease: and hence the warmest carminatives, and even alcohol may be had recourse to: for whatever will carry off the flatulency, will carry off the pain and costiveness. Hence a spoonful of brandy, or, which is better, a dose of tincture of rhubarb, volatile alkali, infusions of herbs containing essential oils, as mint, pepper-mint, penny royal, are in general, consoling, and salutary. For the same reason, the aromatic spices may be had recourse to with success, and particularly in connection with opiates. Of the spices, the nutmeg, on account of its greater volatility than most others, and especially on account of its established reputation for producing quietism and even sleep, as I have already had occasion to observe when treating of dyspepsy, has a peculiar claim to attention.

The only disadvantage of opium is that it has a tendency to diminish the intestinal, and indeed all the secretions, excepting that of sweat: and on this account it has been objected to by many physicians: but from its power of allaying spasmodic irritation, and consequently of producing ease, it becomes of so much importance that it ought unquestionably to be called into use: and there are cases in which, from this very power alone, it may indirectly act the part of an aperient. The opiate confection, as combining an aromatic with a narcotic principle, is a highly valuable as well as elegant preparation. And after the pain has subsided, an active purgative according to the course recommended by Dr. Cullen* may be given with great advantage.

Opium may also be given in the form of an injection: but in this case the injection should not exceed five or six ounces, for otherwise it will probably be thrown back. And it will be often of great use to unite with the narcotic a pretty free dose of turpentine, or some of the warmer balsams, especially that of copaiva; as it will be also to apply rubefacients to the epigastric region.

The convalescent treatment may be the same as already recommended under dyspepsia.

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* Mat. Med. Vol. II. p. 249.

SPECIES V.

COLICA CONSTIPATA.

Constipative Colic.

THE GRIPING PAIN SEVERE; THE COSTIVENESS OBSTINATE; GREAT TENSION, WITH LITTLE FLATULENCY: THE VOMITING SOMETIMES ACCOMPANIED WITH FECES; THE COSTIVENESS WITH BLOODY STRAININGS; TERMINATING, WHERE NOT FATAL, IN A FREE DEJECTION OF THE INFRACTED MATTER.

The pain is here produced by indurated meconium, or feces, or other intestinal concretions, and especially those which are known by the name of bezoards, and will be hereafter described under the genus Enterolithus: and we hence obtain the following varieties:

α Meconialis. Colic of new-born infants.	From viscid meconium.
β Fæcosa. Stercoraceous Colic.	From indurated feces.
γ Enterolithica. Stony Colic.	From bezoards, and other intestinal concretions.

The first two of these varieties are the result of a superabundant action of the intestinal absorbents, or of a deficiency in the peristaltic power of the intestinal tube; in consequence of which, from the length of time the confined materials occupy in completing their descent, the meconium in infants becomes so viscid as not to be urged downwards, and remains in the intestines till it grows acrid from acidity or putrescency: and the feces of later life, exhausted of moisture, harden into one solid mass, possessing the figure of the intestine; or, separating into smaller pieces, appear, when discharged, in the shape of balls or buttons, often as hard as sun-burnt clay, and have been called, though not quite accurately, scybala; though sometimes they make a near approach to this substance, and consist of masses of indurated feces combined with a certain portion of mucus or oleaginous matter secreted into the intestines, and producing a cetaceous or soapy feel.

Of the stony variety, the following is an extraordinary example related by Dr. König, of Bern, and inserted in the Philosophical Transactions.* A young woman of twenty-five years of age, by name Margaret Lauwer, after an anomalous and general disorder, discharged continually the contents of the intestines, and even the clysters that were injected, by the mouth, and at length a number of stones as hard as flint, some in fragments, some of the size of

* Phil. Trans. Year 1686.

peas, others of that of filberts. A clashing of stones against each other was felt by pressing the hand upon the abdomen: there was great constipation, severe gripings, and dysury; and the urine, when voided, was often loaded with a gravelly matter. The aliment and injections being constantly returned by the mouth, Dr. König desisted for four months from offering her either meat, drink, or medicine of any kind, excepting occasionally a spoonful of oil of almonds. Blood was now and then vomited from the violence of the spasmodic action of the stomach; and frequently urine, to the amount of three or four ounces at a time, of a strong taste and smell. The disease seems to have lasted with remissions from January 1681 to February 1683, at which period the history is abruptly dropped, though the patient seems to have been in a state of recovery. It was preceded by the appearance of vesicular eruptions in the skin, and was probably produced by their repulsion. The chemical examination of the calculi is loose and unsatisfactory.

The oleaginous purgatives, soap injections, and mucilaginous diluents, to diminish the irritation of the intestinal absorbents, will here be found most successful. Small doses of neutral salts, sulphur and acidulated drinks, may also be of service in promoting the latter intention. If the griping be severe and the case urgent, terebinthinate injections, in the last two varieties, will also be highly expedient, and not unfrequently produce speedy relief. In these cases, the injections should be copious, so that the fluid may readily insinuate itself between thee imprisoned matter and the coats of the intestines: and the turpentine should not be less than from half an ounce to an ounce, diligently triturated with yolk of egg, so as to be perfectly diffused and suspended in the menstruum. "Thus prepared, we have found it," says Dr. Cullen, "to be one of the most certain laxatives that can be employed in colics and other cases of obstinate costiveness."*

SPECIES VI.

COLICA CONSTRICTA.

Constrictive Colic.

A SENSE OF STRICTURE IN SOME PART OF THE INTESTINAL CANAL; OFTEN OF FLATULENCY, GRADUALLY PASSING OFF BY THE STRICTURE; THE BOWELS TARDY; DISCHARGING WITH DIFFICULTY SMALL LIQUID STOOLS.

This species bears a near approach to proctica *callosa*, or the callous contraction of the rectum; which last, however, as accompani-

* Mat. Med. Vol. II. p. 181.

ed with less griping and flatulency, and consequently having less of the character of colic, and more particularly from its being in most cases within the reach of manual examination and surgical aid, and capable of assistance by a different mode of treatment, is entitled to a distinct consideration.

The proximate cause of the disease before us is a permanent stricture existing in some part of the intestinal canal beyond the reach of the finger, from callosity, schirrhosity, a ring of tubercles or caruncles, or whatever else has a tendency to thicken its coats and diminish its diameter. A proof of this morbid state of the intestine is discoverable during life from the feces being never discharged excepting in a liquid state, or, if figured, of an extremely slender calibre. After death the stricture has frequently been traced by dissection, and according to M. Gauteron, from whom M. de Suavages and Dr. Cullen have successfully drawn their statements, has been most commonly discovered in the colon. Other cases are given by Bonet, Wahrendorff, and Morgagni; in some of which it was found, on a post-obit examination, to exist in the rectum, the coats of which in one instance had coalesced. Haguenot relates a case in which it terminated in an intestinal hernia.

These parts, highly sensible in a state of health, are peculiarly irritable from the diseased action, and the specific symptoms are the consequence of irritation produced by the mechanical pressure of the feces; and often by acrimony from their retention. In most cases the stricture lies beyond the reach of topical applications. It is generally a hopeless, but happily a very unfrequent affection. The cicuta has, of late, been chiefly trusted to in conjunction with the mercurial pill. But I am not aware that in any case these have proved decidedly advantageous. The spasmodic attacks must be encountered by the remedies already recommended in spasmodic and flatulent colic: and the habitual uneasiness felt in the intervals will be best alleviated by a rigid attention to a light, liquid, and aperient diet. Unfrequent as this disease is in general practice, I happen to have at this time two patients labouring under it: one a lady of about thirty-five years of age, who has been subject to it for ten years, and is incapable of passing feces more voluminous than those of an infant; and the other, a man of forty-nine years old, who has laboured under the disease for twenty-one years and can never pass a motion larger than a crow-quill. Yet, by strict attention to diet, both are able to exist with only occasional inconvenience and pain; the last married about two years since, and his wife has lately brought him twins. He lives upon liquids altogether.

GENUS VII.

COPROSTASIS.

Costiveness.

OBSTINATE RETENSION OF THE FECES IN THE INTESTINES.

The generic character is expressed in the generic name, which is a compound term importing emansion or retension of feces—κοπροστασις, from κοπρος and ιστημι, whence the well-known and opposite terms *cophragoga* and *eccoprotica* to express purgatives or such medicines as quicken the passage of the feces.

Tardiness of evacuation, however, it not always a disease: for some persons are accustomed to have their bowels moved not oftener than twice a-week; and to such a week's costiveness is attended with no inconvenience. Rhodius gives a case of feces retained nearly a month;* and Panarolus, one of three months' retention without mischief.† Chaptal relates the history of a female who for four months had no discharge either from the bowels or the kidnies, and as little evacuation by sweat, notwithstanding that her diet was confined to milk-whey and broths. She was at length cured by using the cold bath for eight days successively. The disease was ascribed, and perhaps rightly so, to too copious a flow of insensible perspiration: in which case rigors, excited by nauseating medicines, as squills or small doses of ipecacuan, might have had a spedier success than the use of the cold bath. When but a very small quantity of food is taken habitually, the ejesta bear a like proportion, are small in amount, and usually slender in volume. This is particularly the case with those who are enabled to endure long periods of fasting, as we have already had occasion to observe under Limosis *expers protracta:* and hence the collectors of medical curiosities have furnished us with various examples of feces retained for half a year,‡ two years,§ and in one or two instances not less than seven years,‖ without serious mischief.

Hence costiveness is not necessarily connected with colic or flatulency, or any other severe pains; though, as already observed, under particular circumstances it may become a cause of all these. In its simple and constitutional form, it is, indeed, rather a troublesome than a violent or dangerous complaint, and may proceed from

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* Cent. II. Obs. 61.
† Jatralog. Pentecost. I. Obs. 1.
‡ Salmuth, Cent. I. Obs. 24. II. 65, 98. III, 26, 45.
§ Samml. Medic. Wahrnehmungen, Band. IV. p. 294.
‖ N. Samml. Med. Wahrnehm. Band. I. p. 423.

two very distinct sources; and as each of these possesses symptoms of its own, and considerably discrepant from each other, we are enabled with ease to contemplate the genus under the two following species:

1. COPROSTASIS CONSTIPATA.	CONSTIPATION.
2. ———— OBSTIPATA.	OBSTIPATION.

SPECIES I.

COPROSTASIS CONSTIPATA.

Constipation.

THE FECES WHEN DISCHARGED CONGESTIVE AND VOLUMINOUS: THE TEMPERAMENT FIRM AND RIGID.

In persons of a compact and robust habit, with hearty appetite and strong digestive powers, the intestinal absorbents occasionally evince an excess of action; and the feces, while they become hardened in consequence of such action, assume, from their copiousness, the figure and volume of the large intestines through which they pass.

The increased action of the absorbents, which is the common proximate cause of the present species, may be produced by violent exercise, which heats the blood and throws off an excess of fluid in the form of perspiration from the surface; by too stimulant a diet, particularly of rough port-wine, which, by exciting the sphincter of the rectum to an augmented action as well as the absorbents of the intestines, lays a double foundation for an accumulation of feces; or by too small a portion of fluids compared with the allowance of solid substance; for in this case the recrement, too inspissated from the first, gradually becomes still more so by the hardness with which they vellicate the mouths of the absorbents, and thus increase their activity.

The same effect may also follow from too astringent a diet; as where bread, for instance, is adulterated with a considerable quantity of alum: for the mouths of the secernent vessels of the intestines, which should pour forth a large portion of fluid, become hereby contracted, and secrete but a small portion. Astringents also, by giving some degree of rigidity to the muscular fibres of the intestines, retard the peristaltic action, and thus become a second cause of constipation.

I have said that this complaint is often produced by violent exercise that heats the blood and excites a free flow of sensible perspiration. But in many persons it is occasioned by merely a small

increase of exercise, and of perspirable fluid passing off imperceptibly. And it is hence that such persons find their bowels constipated on horse-exercise or on travelling in a carriage: insomuch, that it is no uncommon thing for a looseness to yield to these means, which has resisted the use of ordinary astringents.

As the feces are forced forward by the peristaltic action of the intestines, it is obvious, moreover, that whenever this action is weakened there must necessarily be a retardation, and consequently an accumulation of the feces. This sluggishness or torpitude of the bowels is produced by various causes: for sometimes the food is too insipid and destitute of stimulants, and sometimes there is a deficiency in the secretion of bile, which appears to be a natural stimulus to the internal surface of the intestines; and we have reason to believe that the latter is sometimes secreted in too dilute a state or without its proper pungency: and sometimes also the muscular fibres of the larger intestines lose a considerable degree of healthy irritability, and are reduced to an extreme of paresis that amounts almost to paralysis. And, if this occur, as it does occasionally without much failure of the appetite, the accumulation of feces will be in some instances prodigious. In the case of a young woman aged twenty-eight, the distension of the abdomen from this cause was so general as to be mistaken for pregnancy, especially as there was occasional sickness, with menstrual suppression and a sympathetic enlargement of the breasts. The disease terminated fatally in about three years from its commencement. The colon, which was among the late Mr. Taunton's preparations, he was so obliging as to show me: it measured in circumference more than twenty inches, and on dissection was found to contain three gallons of feces.

A stricture in any part of the intestinal canal, from whatever cause, has a tendency to produce a like accumulation, in the same manner as it produces one species of colic. But colic does not always follow; for the bowels are occasionally less irritable than usual, and the stomach continues sound. Intestinal strictures, as I have already had occasion to observe, are more frequently to be found in the large than in the small intestines; and, when in the colon, have sometimes existed without being suspected. Dr. Baillie has given a striking example in a case related to him by Mr. now Sir Everard Home, but a still more striking one from his own practice.* In the last the patient, a shoe-maker aged thirty, subject to habitual costiveness, became at length much more so; and from having motions three or four times a-week, passed them not oftener than once or twice in a week or a fortnight, and this, moreover, with considerable pain in the lower part of the belly; and at length was incapable of passing a motion by any means. The real cause of the disease not being very clearly suspected, the strongest purgatives were given to him, both by the mouth and in the form of clysters, as five

* Trans. of a Society for Med. and Chir. Improvement.

grains of calomel and ten of gamboge; ten grains of calomel and thirty of jalap; and at one time four grains of elaterium, which made him sick, but produced no other effect. Two drachms of gamboge were given in the form of an injection, and afterwards tobacco-smoke, but altogether in vain; as were also draughts of crude quick-silver by the mouth, shocks of electricity through the abdomen, and the affusion of cold water on the feet. His appetite was but little interfered with, and he passed water freely. A scoop was introduced into the rectum, but this gut was found empty. Under this state of things the belly swelled gradually, and at length arrived at an enormous size, and the patient died in the fifteenth week from the last evacuation. An examination after death showed the real nature of the cause; for at the lower end of the sigmoid flexure of the colon there was a narrow stricture, which would hardly admit the passage of a goose-quill, accompanied with an ulcer, which was partly in the situation of the stricture, and partly in the gut above it. This intestine was peculiarly loaded with feces, and enormously distended; the mean of the transverse diameter being above six inches. All the large intestines, where the distention was considerable, had their muscular coat a good deal strengthened, and the longitudinal bands had become twice as broad and thick as in their natural state; the system thus wonderfully accommodating itself for many weeks to circumstances which seemed incompatible with the continuance of life.

The effects of constipation, when long continued, are pains in the head, nausea and sickness at the stomach, febrile irritation, general uneasiness in the abdominal region, congestion in the abdominal organs, and hence an impeded circulation of the blood, piles, varices in the lower limbs, and, as we have already seen, colic.

The best aperients in the present species of costiveness are those which quicken the descent of the feces with as little increased action as possible; as diluent drinks sweetened with manna, sugar, or honey, the expressed oils of mild vegetables, as the pistachio, olive, and almond; the oleaginous farina of the cocoa-nut in the common form of chocolate; figs, tamarinds, the pulp of cassia alone, or in the compound of lenitive electary; neutral salts. Dr. Arbuthnot advised the use of butter, marrow, and fat; and it is probable these may have some effect. Dr. Cullen tells us he has found four ounces of fresh butter taken in the morning produce a stool or two more than usual in the day. Nauseating doses of calomel and ipecacuan, or of calomel and antimonial powder, will also frequently be found of use; and the patient should habituate himself to evacuating the bowels at a certain hour of the day, and should even accustom himself to an effort to this effect, though he may not always be successful. And where this milder process fails, the more powerful purgatives must be had recourse to.

In some instances of very great difficulty, and of an anomalous kind, an affusion of cold water has been accompanied with great success after every other device has completely failed, and oily, re-

sinous, and mercurial cathartics, quicksilver in its metallic state, antimonials of various kinds, and injections of every sort, have been tried in vain. Two striking examples of this occur in a letter from Dr. Spence of Guilford to Dr. Reynolds, published in the Medical Transactions of the College. The patients were from fifty to sixty years of age, the one of temperate habits, the other addicted to spiritous liquors. As a last resort, they were led into a wash-house, laid on a cold, wet, brick-floor, and the water was dashed over the lower extremities and the pubes for a quarter of an hour at a time. In addition to which, cold wet towels were applied to the abdomen of one of them in his bed. Cold water was also drunk at the same time by the mouth. Both patients recovered.

SPECIES II.

COPROSTASIS OBSTIPATA.

Obstipation.

THE FECES, WHEN DISCHARGED, HARD, SLENDER, AND OFTEN SCYBALOUS; THE TEMPERAMENT WEAKLY, OR THE HABIT SEDENTARY.

This is in most cases the result of a sluggishness of the peristaltic motion, in persons of infirm or delicate health; in consequence of which the refuse matter of the aliment usually small in quantity, is a long time passing through the intestinal tube, and hence becomes indurated, shrunk, and shrivelled, so to speak, by the length of time it is exposed to the power of the intestinal absorbents, notwithstanding they may have no such increased action as occurs in the preceding species. This form of costiveness is most frequently found in persons of advanced life; in whom the feces, minute in quantity and deprived of moisture, are sometimes discharged in the form of a scroll, and sometimes in small lumps, of the shape of buttons or balls, as I have already observed when treating of colica *constipata*; which affection also, as there remarked, is often produced by the irritation that these retarded materials at length excite. So feeble, indeed, is the expulsive power of the intestines in many cases of old age, that it is sometimes necessary, as recommended by Dr. Warren, to introduce a sort of marrow-spoon up the rectum for the purpose of bringing away the dry masses that have lodged there.

It sometimes happens, however, that a contrary temperament prevails in old age; that the bowels are irritable, and the motions loose. Celsus has laid it down as a maxim, that when the bowels are loose in youth they commonly become confined in advanced life, and that if confined in youth, in advanced life they are often laxative. Quibus juvenibus fluxit alvus, plerumque in senectute

contrahitur; quibus in adolescentia fuit adstricta, sæpe in senectute solvitur.* I cannot say that I have been able to confirm this position by my own observation or experience.

In costiveness from this cause, our aperients must be derived from other materials than those recommended under the last species; for here we have far less reason to be afraid of the warmer and aromatic purgatives. And hence, while we allow a freer use of wine, we may successfully have recourse to aloes, the compound pill of this name, and the balsam of copaiva.

The analeptic pill of Dr. James, which combines a preparation of antimony with resinous purgatives, is often a very serviceable medicine: as is also the form recommended by Dr. Parr, which consists of half a drachm of the gum pill, the same quantity of the pill of Rufus, with ten grains of antimonial powder, made into fifteen pills.

GENUS VIII.

DIARRHŒA.

Lax. Looseness.

THE ALVINE EVACUATIONS CRUDE, LOOSE, AND TOO FREQUENT; WITH LITTLE OR NO GRIPING OR TENESMUS.

Of all the specific forms of this disease, the chief proximate cause, as it is called, or the symptom that gives rise to all the other symptoms, is an increased peristaltic action throughout the whole or a great part of the intestinal canal: and as this may be produced by various means and under different circumstances, it must often stamp a peculiarity on the character of the disorder, and lay a foundation for numerous species.

The peristaltic action of the intestines may be increased, and, consequently, looseness or diarrhœa occasioned, firstly, by irritating materials thrown into them by the mouth; secondly, by a morbid change in the fluids which are naturally secreted into the intestinal canal; and thirdly, by an irritable state of the intestines themselves or the membrane that lines their inner surface. Independently of which, the same effect may follow, in a variety of ways, from the readiness with which the intestines associate in the action of remote organs. Thus sudden passion or commotion of mind will frequently excite looseness; sudden cold or heat applied to the surface of the skin will do the same. So the fluid of dropsies, the morbific matter of exanthems, and even pus absorbed from other cavities, are not unfrequently, by a transfer of action, thrown upon the intestines, sti-

* Medicin. Lib. I. iii.

mulate them to an increased vermicular motion, and, consequently, produces looseness. But as all affections of this last kind are evidently cases of mere sympathy, they must be excluded from the history of diarrhœa considered as an idiopathic disease; and even in their treatment can only be remedied by remedying the primary complaint. Dr. Cullen, in his Nosology, has given them a very copious admission, and, in his First Lines, a very extensive and elaborate consideration; but he has hereby deviated from one of the most important rules with which he started, which was to exclude from his genera all the sympathetic species with which the pages of preceding nosologists are overloaded; and has given intricacy instead of perspicuity to the subject.

However numerous therefore the subdivisions of diarrhœa that are to be found in the writers upon this disease, who have not been sufficiently on their guard in drawing a line of limitation, those that really belong to it, as genuine and distinct species, may, I think, be resolved into the eight following.

1. DIARRHŒA FUSA.	FECULENT LOOSENESS.
2. ———— BILIOSA.	BILIOUS LOOSENESS.
3. ———— MUCOSA.	MUCOUS LOOSENESS.
4. ———— CHYLOSA.	CHYLOUS LOOSENESS.
5. ———— LIENTERIA.	LIENTERY.
6. ———— SEROSA.	SEROUS LOOSENESS.
7. ———— TUBULARIS.	TUBULAR LOOSENESS.
8. ———— GYPSATA.	GYPSEOUS LOOSENESS.

SPECIES I.

DIARRHŒA FUSA.

Feculent Looseness.

THE FECES OF COMMON QUALITY, BUT IMMODERATELY LOOSE AND COPIOUS.

This species generally works its own cure without the aid of medicine: for its common causes are food eaten to excess, or intermixed with an undue proportion of irritating materials, saline, saccharine, or vinous: in consequence of which they pass rapidly, and not thoroughly digested, from the stomach, and urge the intestines to an undue degree of activity. Hence often antecedently to the looseness, there is a sense of sickness, and perhaps a few slight torminal pains. But if the disorder do not prove its own remedy, it is easily removed by any common purgative. In weakly stomachs, or where the intestines are sluggish, this mode of diarrhœa is also occasionally produced by a retardation of the aliment, till it irritates

form acescency, putrescency, or superabundant accumulation; and where it is not checked in due time, it will occasionally, like several of its cognate species, run into a chronic form and prove extremely troublesome and obstinate. In some cases it has lasted for two* and even for three years,† and it then requires to be restrained with caution; for a sudden cure, and especially a sudden transfer to a state of costiveness, has often produced some severe complaint; and in one or two instances epilepsy‡ and phthisis.§ And the same remark may be applied to the diarrhœa that occurs during dentition, which ordinarily keeps off febrile irritation, and, when violent, should be moderated but not subdued.

This species is also produced occasionally by sudden exposure to cold, and especially by cold bathing; by great agitation of mind, and particularly that of fright or anger, sometimes even when those passions have merely existed in dreaming;‖ and occasionally also by the bare sight of a purgative or other medicine which the patient is reluctant to swallow. All these are instances of sympathetic action, which has sometimes shewn itself in perhaps a still more extraordinary way, where there has been a peculiar irritability of habit. Thus Borrichius relates a case in which it was produced by introducing a globule of black hellebore into an issue in the arm;** Schrader another, where it was occasioned by using, as a collyrium, a solution of crocus metallorum,†† which is a sulphuretted oxide of antimony; and our own countryman, Dr. Birch, a third, that followed upon washing the hands in water containing in solution a portion of some other preparation of antimony.‡‡

SPECIES II.

DIARRHŒA BILIOSA.

Bilious Looseness.

THE FECES LOOSE, COPIOUS, AND OF A BRIGHT YELLOW.

From the highly bilious tincture of the dejections, there can be no doubt that the bile, in this species, is secreted in a greater

* Riedlin, Cent. iii. Obs. 90.
† Forestus, Libr. XXII. Obs. 3.
‡ Ephem. Nat. Cur. Dec. i. Ann. i. Obs. 85.
§ Id. Ann. x. Obs. 68.
‖ Id. Ann. iii. Obs. 234.
** De Qualitat. Occultis, Dissert. et Orat. Acad. Hafn. 1715.
†† Observ. Anatom. Med.
‡‡ Hist. vol. iv.

quantity than usual, and perhaps with an unusual degree of pungency; and hence the excess of peristaltic activity.

The most common remote cause of this species of diarrhœa is a great and sudden increase in the temperature of the atmosphere, or a less than its mean degree of heat, operating for some weeks or months. Dr. Lind has justly remarked, that a rapid change of climate, whether from a colder to a hotter, or from a hotter to a colder state, is equally apt to excite diarrhœa. But the complaints hereby produced are of very different characters. That occasioned by sudden cold consists of an acrid mucous discharge, and will be treated of and explained under the next division. The diarrhœa excited by passing rapidly from a cold into a hot climate, belongs to the division before us, and depends upon an increased secretion of bile in many cases worked up to a higher degree of acrimony. The calorific rays of the sun exercise a peculiar influence upon the organ of the liver, and soon stimulate it to an augmented action. In the intertropical regions, the quantity of bile hereby secerned is even more than the bile ducts can conveniently carry off: whence some portion of it retrogrades, and is carried by absorption into the system, and is one of the causes, though not the only cause, of the darker hue of the skin in those quarters. In our own country this species of diarrhœa is, therefore, found most commonly in the earlier part of the summer, when suddenly and vehemently bursting upon a cold spring; or in the autumn, when the liver has for many weeks been exposed to the effects of a very vigorous sun, and the whole system has become relaxed and debilitated. If at this time the atmosphere be pure, the disease is simple, and may be subdued without much difficulty; but if the rays of the sun should carry off the greater part, but not the whole of the stagnant water from the fens and marshes of a country, and convert them into corrupt and offensive swamps, the atmosphere will be loaded with an effluvuim of decomposed organised matter, animal or vegetable, or both, and the simple bilious diarrhœa will be converted into a remittent bilious fever; and hence in a few words, the common origin of the bilious autumnal fevers that so frequently prevail at the close of the summer season, as will be further explained in its proper place.

Where the bilious diarrhœa is simple and unconnected with fever, it is seldom a formidable disease; a few doses of calomel with a view of emulging the bilious pores of the liver, correcting the irritation of the organ, and taking off its increased action, with the assistance of mild diluents and demulcents, as infusions of linseed, quince seeds, or comfrey roots, for lubricating the intestinal canal, which has participated in the irritation, will usually prove a successful practice. The last was at one time a popular medicine in diarrhœas, and Dr. Cullen objects to its being omitted in the materia medica of the Colleges. And if the flux, and consequently the excitement of the liver, should still continue, opiates may afterwards be employed with advantage.

Subacid fruits and agreeable astringents will here also be found

highly useful. In India, the fruit of the bilimbi (averrhoa *Bilimbi* Linn.) forms a pleasant remedy; and is found to allay the morbid action, and even the griping, if there be any, as well as to diminish the discharge. The preserved fruit of the barberry is equally grateful, and will answer the same purposes at home. It is an old medicine, and was formerly employed very largely in the east for the present species.*

SPECIES III.

DIARRHŒA MUCOSA.

Mucous Looseness.

THE DEJECTIONS CONSISTING OF, OR CONTAINING, A COPIOUS DISCHARGE OF MUCUS.

THIS species bears a striking resemblance to the defluxion from the nostrils in catarrh. Its common cause is cold, particularly in the feet; the motions are acrid, often with but little bilious tinge; and like the nostrils in a catarrh, the lower part of the rectum is excoriated. It is hence denominated by many writers *catarrhus intestinorum*, and by Dr. Boerhaave, *diarrhœa catarrhalis;* and it is not improbable, as is asserted by this distinguished writer, that, in this case, the discharge is produced not only by a transfer of the matter of perspiration from the skin, but by a deglutition of other fluids at the same time secreted in great abundance, and with considerable acrimony, by the nostrils, palate, and fauces.†

The disease is, perhaps, also sometimes produced by acrid ingesta, as a coryza is occasionally excited by sternutatories in those not accustomed to them. Here the process of purging will rather add to the complaint than diminish it; and copious diluents and demulcents afford the most rational mode of treatment; with which plan the daily diet should be made to coincide.

This species of mucous or catarrhal diarrhœa, like the two preceding, is also frequently produced by any sudden change in the temperature of the atmosphere from great heat to great chillness; and hence its frequency and severity in passing rapidly from a warmer to a colder climate, as into the North Seas in the summer time. "In the outward bound passage of the vessels employed in the whale fishery on the coast of Spitzbergen," says Mr. Macartney Ross, "I have more than once had occasion to remark the very great effect of a transition into a cold latitude in

* Alpin. De Medicin. Egypt, lib. IV. cap. 1.
† De Viribus Medicament. cap. V.

deranging the state of the alvine discharge. The vessels destined for this often perilous voyage generally leave England about the end of March, when the weather is comparatively temperate. A week or two serves to convey them within the arctic circle, in the course of which time few cases are beginning to appear. But after being fairly within the limits of the frozen sea, and encompassed with ice, so that the wind even carries with it a strong and penetrating frost, the cases daily increase both in number and severity. The weather becoming progressively milder after the beginning of May, and the seamen by this time being more inured to the climate, few or no cases are met with; and such as do occur, I have always found to arise from the patient having been called suddenly from bed in the course of duty, and exposed to an intensely freezing atmosphere."

Where the looseness, of whatever species, in produced by a sudden chill on the surface, small doses of ipecacuan, with or without opium, have generally been given with advantage.* Fernelhuys† and Dr. Fothergill‡ recommend it alone: Dr. Storck.§ with more reason, in combination. And if the disease should become chronic, the warmer bitters and astringents should be had recourse to, as columbo,—to which also Dr. Storck recommends an addition of laudanum,‖—cusparia, and arnica (doronicum *Pardalianches*, Linn.), which, though rejected in our own country, maintains its reputation all over the continent. Of the arnica-root Dr. Stoll used to give a drachm every two hours.**

SPECIES IV.

DIARRHŒA CHYLOSA.

Chylous Looseness.

THE DEJECTIONS CHYLOUS OR MILKY.

THE colour of the stools in this species affords evident proof, firstly, that the bile, which gives the usual tinge to the feces, is either not secreted, or impeded in its flow into the intestines; and secondly, that the food, after being converted into chyle, is not absorbed and carried into the system.

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* Toxe, Bibl. I. p. 118.
† An omni alvi fluxui radix Brasiliensis? Paris, 1706.
‡ Med. Observ. and Inquir. Vol. VI. Art. 18.
§ Klinische und Anatomische Bemerkungen, p. 7.
‖ Ibid.
** Nat. Med. Part. II. p. 307. Part III. p. 163.

The non-absorption of chyle must proceed from some mischief in the lacteals or mesenteric glands; which may either labour under such an inertness or torpitude as to render them incapacified for carrying on their proper function; or may be so obstructed in their course, as to be prevented from exercising their function, notwithstanding their being in a state of health.

It is not easy to distinguish between these two states: yet the distinction is of importance, as the mode of treatment that will be found serviceable in the one case will often be injurious in the other. Obstruction is, for the most part, a sudden cause; and if the disease should make a sudden appearance, and the feces, from being habitually of a proper colour and consistency, should abruptly exhibit a loose and milky character; and, more especially if the general temperament should hitherto have evinced strength and firmness of fibre; we may reasonably refer the affection to an obstruction of the orifices of the lacteals, or an obstruction of the mesenteric glands. If, on the contrary, the feces have been for some time assuming a looser consistency, and a whiter hue than is natural, and the temperament have been weakly, and the flesh flabby, we may fairly suspect imbecility and inertness in one or other of the above organs, or a scanty supply of bilious fluid, which, by some physiologists, is conceived to be a stimulus to the action of the lacteals as well as of the intestines.

In the former case, our direct object is to remove the obstruction; which may be best accomplished by active stimulants, as calomel. In the latter, we have to give energy and elasticity to the torpid organs; and here strong stimulants would be mischievous: and tonics, useless in the first instance, will be our grand sheet anchor in the present. If calomel be in this instance given at all, it should be in doses so small as to be of no service in cases of obstruction; but the common preparations of zinc and iron offer a better chance of success: and the rheum *Rhaponticum*, or English rhubarb, being very slightly aperient, and far more astringent than the rheum *palmatum*, a useful medicine in various kinds of looseness from relaxation, may here also be employed to advantage in doses of a scruple taken twice a-day; and where a more powerful vegetable astringent is required we may find it in the leaves and young twigs of the rhus *coriaria*, or common sumach; which, however, are chiefly cultivated in our own country for dyers and tanners. The berries possess a like property, and are acid, austere, and cooling. To these medicines may be added blisters, or rubefacients to the abdomen.

It should not, however, be forgotten, that, as already observed, the absence of a bilious hue from the evacuations shows clearly enough that the liver or its appendages are also in fault, and that the flow of bile is deficient or impeded. Most commonly the former; for such is the irritability of the bile-ducts, that they cannot be plugged up with any material without great pain, which is rarely felt in the disease before us; and hence the treatment calculated to stimulate and strengthen the mesenteric glands and the mouths of the lacteals, will also tend to stimulate and correct the hepatic ducts or secernents.

SPECIES V.

DIARRHŒA LIENTERIA.

Lientery.

THE DEJECTIONS CONSISTING OF THE ALIMENT PASSED RAPIDLY, AND WITH LITTLE CHANGE.

THE signs entering into the definition of this species prove sufficiently, in the first place, that the stomach is in a morbid state, and that the gastric juice is not secreted in a proper quantity or with proper qualities; and next, that the bile, as in the case of chylous diarrhœa, is also not duly secreted, or obstructed in its passage; of which the former is most likely to be the case, from the absence of severe pain; for were there a free flux of bile, the feces, however crude and unconcocted, would display their common yellow hue, which they rarely exhibit. Lientery (λειεντερια,) lubricitas intestinorum, was the name given to this disease by the Greeks, and it is here retained. The Latins, with a loose translation of the term, called it *levitas intestinorum;* and the general idea expressed by both is, that the aliment passes lightly or fleetly along, and with little elaboration by the intestines; whose peristaltic action is at the same time quickened by the crude or unaltered condition of the aliment thus applied to their internal surface. The general plan recommended in dyspepsia will be the best mode of treatment in the present disorder: which is chiefly, perhaps entirely, confined to the stomach; and most probably consists in an imperfection of the gastric secretion alone; for were the general tone of the stomach affected at the same time, we should have cardialgia, flatulence, nausea, and other dyspeptic symptoms, accompanying the looseness, which is not usually the case: on which account, the earlier writers down to Sylvius, and even Friend, ascribe the disease, but erroneously, to the same cause as operates in chylous diarrhœa, namely, an obstruction of the lacteals or intestinal glands.

SPECIES VI.

DIARRHŒA SEROSA.

Serous Looseness.

THE DEJECTIONS ALMOST ENTIRELY LIQUID AND LIMPID.

From the thin fluidity of the stools in this species, Hoffman has described it by the name of diarrhœa *aquosa*. It is evidently dependent upon a very irritable state of the excretory vessels of the intestines; and sometimes holds the same relation to the third species, diarrhœa *mucosa*, as the limpid defluxion of an incipient catarrh does to the mucous discharge in which it terminates. Yet the irritation is here much greater than in mucous diarrhœa, often produced by different causes, and frequently requires a different mode of treatment. The mucous diarrhœa, or indeed any of the preceding, may run into it if long continued; for the common cause of the irritation is debility of the excretories. Here, again, it must be obvious that purging of any kind would be mischievous: and the most effectual plan of success that has occurred in my own practice, has been the use of warm astringents and gentle stimulants or tonics.

The simarouba (quassia *Simarouba*) is particularly entitled to our attention, and will indeed be found useful in most of the species of the genus before us; as will also, in many cases, the lopez-root (lopezia *Mexicana*,) which by Gaubius* was preferred to the simarouba, and, which seems to operate at least as much by tranquillizing the irregular or spasmodic action of the intestinal canal, as by any astringent power it may possess. The geum *urbanum*, Linn. better known by the officinal name of caryophyllata or herb bennet, was formerly in high repute for all complaints of this kind, and from its astringent and tonic power deserves to be revived. Its taste is aromatic and austere.

The punica *granatum*, balaustine or pomegranate tree, is still continued in several pharmacopœias, and employed in practice in this and the preceding species, both in the flower and bark: the latter seems to have been a favourite medicine with Dr. Mead, who prescribed a decoction of it with red roses and cinnamon, in various diarrhœas proceeding from debility. Cullen† and Strandberg‡ think highly of it. It is, indeed, a powerful astringent, and as such is entitled to attention; but it has a roughness so unpalatable, as to disqualify it for general use in this respect, though it makes a valuable

* Adversar.
† Mat. Med. Vol. II. p. 44.
‡ Tal om de Fel. 31.

material in injections and gargles of various kinds; and was deservedly recommended by Sydenham, in connexion with port wine, as a fomentation in cases of prolapsed rectum and uterus. Where these cannot be retained on the stomach, alum alone may often be had recourse to with advantage; and Dr. Cullen expresses his surprise that it is not employed more frequently or more freely. His dose is four grains at first, and afterwards a scruple several times a-day.

Where the disease is of very long standing, we often gain great benefit by uniting a tonic or astringent with a diaphoretic, thus strengthening the bowels, while we take off irritation by exciting a transfer of action on the skin. Upon this principle Dr. Fordyce proceeded when he prescribed a combination of tormentil and ipecacuan: and the success he met with was worthy of the ingenuity he thus displayed. A like transfer of action has sometimes been attempted by issues and setons; and some writers, as Vialez and Hantesierk, assert that they have tried them with success. Hippocrates, with more reason, employed for the same purpose emetics, and has been followed by Fontaine and other practitioners;* and Malvachini, with the same view, recommended diuretics.† Dr. Lind‡ and Dr. Adair,§ have recommended the native carbonate of zinc, or officinal calamine in fine powder, apparently with a view of combining an absorbent with a metallic tonic: and they speak of its having been employed with advantage.

In a very obstinate case that fell to my lot a few years ago, in which the patient, a young woman of twenty-four, had, for ten years, never passed fewer than nine or ten watery stools a-day, sometimes tinged with blood, and often accompanied with great spasmodic pain, I found the disease yield in a few weeks to camphor mixture and pills of the resinous gums, after, as I had reason to believe that all the usual routine of astringent earths and salts, astringent purgatives, and narcotics, had been tried and spent their force in vain. It is probable that in some cases of this kind the superacetate of lead, in doses of a grain combined with three or four drops of laudanum, might prove equally useful.

This disease is also occasionally produced by drastric purges, as elaterium: and is often critically employed by nature, as a metastasis to carry off dropsies, and some other remote accumulations of fluids.

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* Περι παθων, Lib. III. p. 523.

† Utiles Collectiones.

‡ On Diseases in Hot Climates.

§ Medical Commentaries, &c.

SPECIES VII.

DIARRHŒA TUBULARIS.

Tubular Looseness.

THE DIGESTIONS CONSISTING MORE OR LESS OF MEMBRANE-LIKE TUBES, WHITISH, VISCOUS, AND INODOROUS.

I HAVE never hitherto seen this species arranged, and not often described, but it occurs frequently in practice; and appears to depend upon a peculiar irritability of the villous membrane of the larger intestines, which, in consequence, secrete an effusion of coagulating fibrin, fibrin mixed with gluten, instead of secreting mucus, occasionally accompanied with some degree of chronic inflammation. It has a striking resemblance to the fibrous exudation thrown forth from the trachea in croup, but is usually discharged in longer, firmer, and more compact tubes. There is commonly a considerable sense of heat and uneasiness in the rectum; and upon evacuations, the sphincter, partaking of the irritability, contracts so forcibly that the feces are discharged with great pain, and of very small calibre.

From the laminated appearance of this effusion, it has generally been mistaken for a separation of the mucous membrane of the intestines; with which it seems to be confounded by Dr. Simson, of St. Andrews, in the Edinburgh Medical Essays;* but the exudation has no vascular structure, will not bear extension, and loses its form as soon as handled. At the time of writing I have a case of this description under my care, in a lady of delicate habit, twenty-eight years of age, who has been long labouring under a peculiar irritability of the rectum, giving rise to some degree of chronic inflammation, and a forcible contraction of the sphincter on evacuations. She has already discharged this kind of effusion for six weeks, and in tubes so perfect as at first to have excited no small alarm in the attendants who noticed it. It is now, in some degree, on the decline both in quantity and tenacity.

M. Bauer, in his letter to M. de Hahn,† gives similar examples; and a like case is described by Spindler, in which the secretion was worked up into a "materia alba, longa, compacta."‡ It has sometimes assumed the exact shape of the intestine, as though it had cast off a tunic.§

I have said, that the discharge in this species proceeds chiefly from the large intestines: and I have seen it so often as to have

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* Vol. V. Part. II. Art. lxvii. p. 153.

† De Morb. Intest. Dresd. 1747.

‡ Obs. 45.

§ Act. Nat. Cur. Vol. V. Obs. 126.

had sufficient opportunity for determining with tolerable accuracy the part of the canal affected. From a valuable article, however, of Dr. Powel's published in the Medical Transactions,* it appears at times to take place in the narrower portion of the intestinal tube, as high up, indeed, as the duodenum; for we are told that it was accompanied with acute pain in the epigastric region; that the stomach was highly irritable; and that it was followed by symptoms of jaundice or obstructed bile; in which case the irritability of the intestine was most probably extended by continuous sympathy to the mouth of the ductus choledochus communis, which had become spasmodically closed.

From a small increase in the pulse, and a coating on the tongue, there seems to have been here also a slight degree of inflammatory action, though so inconsiderable that Dr. Powell questions whether there was any whatever; but adds, which my own experience leads me most fully to confirm, that the disease is certainly not "disposed to assume that peculiar irritative quickness of pulse which marks enteritis."

That the affection described by Dr. Powell belongs to the present species, will appear evidently from his description of the material evacuated, which seemed "to have formed parts of an extensive adventitious membrane of no great tenacity or firmness. In the first of the cases," he adds, "which came under my notice, this membrane was passed in perfect tubes, some of them full half-a-yard in length; and certainly sufficient in quantity to have lined the whole intestinal canal. In others also, the aggregate quantity has been very large, and it has continued to come away for many days, but it has been in thin irregular flakes, of not more than two inches extent, and not, as far as I could discover, of the perfect tubular form." And he afterwards compares the membranous material thus excreted to that "formed in the trachea, under croup; but the symptoms," says he, "are there more violent and destructive from locality of situation."

From the acute degree of pain, which the disease thus situated produced, and must necessarily produce in the smaller intestines; as also from the spasmodic constriction of the bile-ducts, and the common symptoms of jaundice, the passage of gall-stones was at first suspected, till the character of the intestinal discharge spoke for itself.

From a like effusion of fibrin in the uterus, Blumenbach has shown, that a tunica decidua has been occasionally produced through the excitement of an aphrodisiac passion alone, without copulation, or impregnation;† and Morgagni has given examples of so perfect a formation of the same membrane, by the irritation that takes place in painful menstruation (paramenia *difficilis*,) as to render it difficult

* Vol. VI. Art. vii.

† Comment. Soc. Reg. Scientiæ Gotting. Vol. IX.

to be distinguished from that belonging to an ovum.* So corpora lutea have been formed, and their cicatrices occasionally found in the ovaries of virgins.

The milder preparations of mercury employed as altrants rather than aperients, have frequently proved serviceable; and the balsam of copaiva still more so. The last is indeed generally useful in a chronic inflammation or irritable condition of the secernents of mucous membranes; and in the disease before us, where I have not been able to induce the patient to take it by the mouth, I have recommended it in the form of injections. In one case in which I prescribed it in this form, three drachms intermixed with three ounces of mucilage of linseed, being thrown up three times a-day, it proved eminently useful.

Common emollient injections, moreover, employed in much larger quantites, when the sphincter will allow the pipe to pass up, afford temporary ease: and a diluent and anodyne injection of warm water and laudanum alone, repeated twice a-day, still more so. For the water is absorbed by the hot villous tunic of the intestines very rapidly, which is hereby rendered lax and flexible, while the muscular fibres associate in the change. "I have known," says Dr. Cullen, "two pounds of water absorbed from the rectum in the space of an hour." In the mean while, the mercurial preparations just adverted to, and especially the blue pill, or Plummer's, which is still better, (the pil. hydrarg. submur. comp. of the London College,) should be taken in a dose of four or five grains every night; and, if necessary, the bowels be kept open by two drachms of sublimed sulphur daily.

SPECIES VIII.

DIARRHŒA GYPSATA.

Gypseous Looseness.

THE DEJECTIONS LIQUID; GYPSEOUS; WITH A FROTHY SCUM.

The present, like the two preceding species, is produced by an irritability in the excretory vessels of the intestines, occasioning an increased secretion. But in each of these species the secretion differs considerably. In the first, it is dilute and serous: in the second, viscid and compounded of fibrin: in the present, serous and compounded of earth of lime.

Almost all animals are possest of a power of forming this earth, or separating it from the blood, for we do not precisely know

* De Sed. et Caus. Morb. Ep. XLVIII. 12.

which, for various important purposes; as that of giving firmness to the bones, or induration to the shell. It is hence a power that we trace in animals of all classes and all ages, and that shows itself in a state of health or disease in almost all organs. Among mankind it commences and grows with the fetus; it accompanies us through mature life; and in advanced years not only continues without failure, but occasionally increases with the failure of other secretions, so as to convert the blood-vessels, in a greater or less degree, into bony canals. It enters, as a constituent part, into the saliva, settles in the form of tartar around the necks of the teeth, and is found in nodules, or masses, on the surface or in the substance of the lungs. It lays, therefore, a foundation for many diseases, and in the next genus but one, that of Enterolithus, will be seen to exist occasionally in the form of large balls in different parts of the alimentary canal.

There is no difficulty, therefore, in tracing the source of the gypseous or limy material, which forms the peculiar character of the disease before us. In general, when this is secreted into the intestinal tube in superfluity, it unites itself with some glutinous animal matter, assumes solidity, and augments by a deposit of fresh concentric layers. In gypseous diarrhœa, however, from some cause or other, no such tendency to a combination exists; and the earthy particles are diffused loosely and separately through the fluid with which they are discharged.

The disease, however, has never hitherto, so far as I am acquainted with, entered into the arrangement of any nosologist; and for its description I am chiefly indebted to a valuable paper of Dr. Baillie, communicated to the London College, and published in its Transactions.* "The evacuation," says he, "consists of a matter resembling in its appearance a mixture of water and lime, which is generally very frothy on its surface. When the disease is violent, the discharges are copious and very numerous, of a pale colour and sour smell, and the froth looks like yeast. When it changes to a milder form, the evacuations are still more or less pale, but of the consistence of pudding, and do not occur oftener than two or three times in twenty-four hours. The appetite is often good, but sometimes defective. The countenance thin and sallow, but not much emaciated. The pulse varies but little from the standard of health, but is rather disposed to acceleration. The tongue is generally covered with a white fur of moderate thickness: the urine of a somewhat deeper hue than natural, generally clear, occasionally turbid. An examination of the abdomen discovers nothing unnatural. The bowels are apt to be distended with wind, but there is no tumour or sense of pain upon pressure."

The disease occurs most commonly in persons who have resided for a considerable time in a warm climate, or who have suffered

* Vol. V. Art. XII.

from affections of the liver: but it is sometimes met with in persons who have never left England, or been conscious of any hepatic complaint. It takes place more commonly in men than in women, though chiefly so, perhaps, because men endure the evils of hot climates more frequently than women.

Sometimes, there will be a state of amendment indicating a cure. The motions become figured and of a darker hue, but rarely of the deep colour of health. This improvement, however, is mostly of only a short duration, and the patient soon relapses into the habit of frothy dejections. Those who are afflicted often live for several years, but the disease continues with the changes just noticed; and they hardly ever fully recover. The mind, as in other diseases of irritable temperaments, seems to exercise some influence; for the symptoms are aggravated, or the exacerbations appear more frequently, under the embarrassments of business, or the agitations of anxiety. Repeated returns of the complaint at length wear out the constitution, and the patient sinks from corporeal exhaustion.

The influence of medicine Dr. Baillie estimates as very inconsiderable, and rarely permanent. Half a grain of calomel, three grains of pilulæ hydrargyri, or a few of the hydrargyrum cum cretâ, taken every night or second night, have occasionally produced some advantage, by stimulating the liver to a better and more plentiful secretion of bile, without impairing the strength of the constitution: and bitters, as cascarilla, or cusparia, combined with a few drops of laudanum, have also occasionally had their use, by rendering the motions more solid and less frequent, and increasing the strength of the constitution. But the benefit is too often merely temporary, and cannot be depended upon.

It is in truth a chronic malady evidently dependent upon a broken or a very infirm state of the digestive organs: for the symptoms enumerated show sufficiently an impaired secretion of bile, and, if I mistake not, great debility in the general action of the stomach, and the secretion of gastric juice; for to this we are chiefly to ascribe the perpetual acidity and flatulence, the frothy appearance, and sour smell of the evacuations, the abdominal distention, and perhaps the secretion of lime, by which the disease is characteristically distinguished. We call it a secretion of LIME, because it has all the appearance of being so; but I have promised Dr. Baillie, who has just seen this sheet while passing through the press, to add, that its calcareous character has not yet been put to any chemical test.

GENUS IX.

CHOLERA.

Vomiting and Purging.

ANXIETY, GRIPINGS, SPASMS IN THE LEGS AND ARMS; WITH VOMITING AND PURGING; OR FLATULENT ERUCTATIONS AND DEJECTIONS.

CHOLERA has, by several late and present writers of distinction, been regarded as a mere species of some other genus, as DIARRHŒA, which is the view taken of it by Dr. Young; or as a mere variety of some particular species, as *vomitus*, which is the place it holds in Dr. Parr's Nosology. It is not always, however, accompanied with a diarrhœa; and, even where it is so, the constant tendency it evinces to an extensive chain of spasmodic actions, gives a striking character to the disease, and justifies its being arranged and treated of as a distinct genus. From vomitus it is still more widely discrepant.

The term CHOLERA is of ancient use, for we trace it in the writings of Hippocrates. Celsus derives it from χολη and ῥεω, literally *bile-flux*, and Trallian from χολας and ῥεω, literally *intestinal-flux*, as though the matter discharged from the alimentary canal were excerned by the intestines rather than by the liver. It is highly probable that in all its species we shall have to contemplate the liver as morbidly affected from the commencement, and the bile as some way or other damaged in its secretion; yet not always, by two rapid and copious a flow, to which the disease has been generally referred. This, indeed, will be found ordinarily to take place in the first of the three following species; but, in the second, it appears to be injured by suppression rather than by excess; and in the third, by a change in its natural qualities, if, indeed, much of the fluid discharged in this species be not, as suspected by Trallian, in some instances, secerned by the excretories of the intestines. Under either derivation, however, the term is not incorrect; for the alimentary canal and the liver uniformly co-operate in the morbid action, and the fluid discharged is the result of such concurrence.

Some writers formerly, and many in the present day, have expressed this disease by the pleonastic term of cholera morbus, pretending that cholera, of itself, imports *anger* as well as the disease before us, and that *morbus* is added to distinguish between the two. I am not aware that the word cholera has ever been employed in a mental sense by any Greek writer, though several of its co-derivatives have been. It stands alone in Celsus and Galen; and if a distinctive adjunct were not necessary in their days, it must be

wholly superfluous in ours. The following are the species that seem clearly to belong to this genus;

1.	CHOLERA BILIOSA.	BILIOUS CHOLERA.
2.	——— FLATULENTA.	WIND CHOLERA.
3.	——— SPASMODICA.	SPASMODIC CHOLERA.

SPECIES I.

CHOLERA BILIOSA.

Bilious Cholera.

THE VOMITING AND PURGING FREQUENT AND COPIOUS, WITH A REDUNDANCY OF BILE.

This species is both sporadic and epidemic. Under the first form it is usually of slighter and shorter duration; and its common causes are superabundant and perhaps acrid bile; suppressed perspiration, particularly by cold or damp applied to the feet, as in standing long on a moist soil in foggy weather; cold drinks, especially when the body is considerably heated by exercise; cold, indigestible fruits, as unripe apples or pears, cucumbers, melons, mushrooms; drastic purges taken in excess; and in one instance an excessive dose of emetic tartar:* a sudden fright, and particularly from thunder;† or any other rapid exhaustion of the sensorial power.

The causes are, therefore, many of them the same as those that produce several of the species of diarrhœa and colic; particularly cholica *cibaria*, or surfeit. Sydenham, indeed, observes, that the symptoms of the last and of cholera are alike, and the cure the same; yet adds that the diseases are of a different kind. In effect the last is peculiarly distinguished by its wandering or universal spasticity; and hence becomes a far more dangerous, because a far more general, affection.

The epidimic form of the disease shows itself commonly at the close of summer, or the beginning of autumn—Sydenham says, as certainly as the appearance of swallows in the spring, or cuckoos about the dog-days. One of the immediate effects of the calorific rays of the sun is to stimulate the liver to an excessive secretion of bile; hence the alimentary canal is overloaded with it, and perhaps the blood impregnated; while the liver itself is debilitated by undue exertion. And hence again, the greater violence of this complaint and its accompaniment with peculiar symptoms in hot cli-

* Henrici Dissert. de Cholera Morbo, Hal. 1740.
† Phil. Trans. 1667. Henric. Diss. supra cit.

mates, as we shall have occasion to observe presently. In addition to this cause, however, which operates directly upon the body, there is another which operates indirectly upon the body, and directly upon the atmosphere; and that is the ascent of an unhealthy effluvium from the decomposition of animal and vegetable substances that form the face of swamps, marshes, and other moist grounds; which predispose the body to the action of this and other diseases as well: unless it be conceived that the particular epidemy results from a particular combination of the decomposing elements, so as to produce a choleric miasm, as under another combination they produce a febrile miasm: a subject well worthy of consideration as it relates to the third species of cholera.

It is not to be wondered at, therefore, that this disease should, in many instances, prove peculiarly severe. Its symptoms, indeed, are often dreadfully violent and rapidly fatal, as may be seen from Dr. Sydenham's description which is as follows: Vehement vomitings, and difficult and painful dejections of ill-conditioned fluids; agony, and inflammation of the intestines and abdomen, cardialgia, thirst, a quick pulse, often small and unequal, heat and anxiety, nausea and colliquative sweat, and spasms of the arms and legs, fainting, coldness of the extremities, and other symptoms of equal danger, which terrify the by-standers, and kill the patient in twenty-four hours.*

Celsus, who has entered with more minuteness than is common to him, into the diagnostics of this species, explains, more fully than Sydenham has done, the exact nature and appearance of the ill-conditioned discharges to which the latter refers. "Bilis supra infraque erumpit, primùm aquæ similis, deinde ut in eâ recens caro lota esse videatur, interdum alba, nonnunquam nigra, vel varia."† "The bile bursts forth both upwards and downwards; at first like water, afterwards as though fresh flesh had been washed in it; sometimes white, sometimes black, or variegated." And he adds, accordantly with Sydenham, "quibus concurrentibus, non mirum est, si subito quis moriatur." "All these symptoms associating, it is not to be wondered at that the patient should die suddenly."‡

As the general commotion of the alimentary canal is to be referred in this species to a superabundance of bile thrown into it, and probably possessing a peculiar acrimony, our first object in attempting a cure should be, not to excite an additional flow by stimulants of any kind, and especially by violent purgatives and emetics, but to dilute and wash it out of the stomach and intestines by a free exhibition of mild demulcent fluids, as well injected by the anus as given by the mouth. And when this has been accomplished, the spasmodic action of whatever parts are affected may be advantageously at-

* Sect. IV. Chap. II. As also Epist. de Morb. Epidem. 1675—1680.
† Medicin. Lib. IV. Sect. XI.
‡ Loco citat.

tacked with opiates. This was Sydenham's practice, and it cannot well be improved upon.

Those diluents and demulcents are to be preferred which agree best with the stomach, and sit easiest and longest upon it. Celsus recommends a free use of water not quite cold, but only just deprived of its chill; "aqua, neque ea ipsa frigida, sed potius egelida, danda est."* Lienard, half a century before the time of Sydenham, gave it cold and fresh from the fountain, and, as he assures us, with great success.† And Cleghorn has recommended the same practice even in hot climates in our own times. Dr. Douglas was peculiarly attached to toast-and-water, which he made with oat-bread boiled in the water; the bread so thoroughly toasted that the decoction was as brown as coffee. This has a slight astringency and a little mucilage, and may be a useful diluent; Dr. Douglas declares that he never knew it rejected in any case of cholera. Infusion of spearmint proves, also, a good anti-emetic, but it should be made with leaves fresh from the garden. Sydenham prescribed weak chicken-broth for the same purpose, and applied it, by injection, to the rectum, as well as to the stomach. Linseed-tea or barley-water with a little gum-acasia dissolved in it, may answer as well. As soon as the alimentary canal is thus cleared of acrimonious matter, and the sickness subsides, opium, with or without relaxants, should be administered in repeated doses to subdue the spasmodic action. Sydenham employed it alone, and in his favourite form of liquid laudanum, varying the dose from twelve to twenty drops in mint-water. Dr. Fordyce, with still more judgment, united it with small doses of antimonials, and thus increased its relaxant power.

But if the onset of the disease be very violent, and the pulse and the general health sink rapidly, opium must be given, and very freely, from the commencement. Cholera is in all cases a very acute disease, and of short duration. I have already observed that it has destroyed in twenty-four hours; these cases, however, are rare. The symptoms generally abate on the second or third day, and the patient recovers rapidly. If there be, however, any considerable degree of weakness on the decline of the disease, it may be necessary to have recourse to the warm and bitter tonics, of which columbo will be found one of the best.

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* Loco supra-citat.

† Dissert. Ergo Choleræ Morbo Frigidus Potus? Paris 1626.

SPECIES II.

CHOLERA FLATULENTA.

Wind Cholera.

THE VOMITING AND PURGING RARE, OR ABSENT: GREAT AND OPPRESSIVE FLATULENCE; RETCHING; FLATULENT DEJECTIONS AND ERUCTATIONS.

This species I have continued from Hippocrates, who denominates it, from the absence of liquid discharges, cholera ξηρη, as Sydenham, by translating the Greek term, has done, cholera *sicca*.*

In this species, the bile, instead of being excessive in its flow, is obstructed or diminished in its quantity, and perhaps secreted with too low instead of too high a degree of pungency. The liver is evidently torpid and enfeebled; and as flatulency is always a sign of debility, we have a full proof that the stomach and intestinal canal is in the same state. We have here, therefore, cholera grafted upon a dyspeptic habit; and as in dyspepsy some quantity of air is let loose from most foods, whether solid or liquid, and an immense portion from many kinds, we are at no loss to account for the flatulency. The absence of evacuations is partly from spasmodic constriction, and partly from a want of wholesome bile, and the retching does not pass into vomiting, because the diaphragm, on whose expulsive co-operation the action of vomiting chiefly depends, forms a link in the entastic chain, as is obvious from the increased anxiety of the præcordia.

When cholera, therefore, is an epidemic malady, it will show itself under this form in persons of a highly dyspeptic idiosyncrasy, still more generally than when it appears as a sporadic disease. But the form is not a common one: and hence in the epidemic cholera of 1669, Sydenham declares that he met with not more than a single instance of it: "unicum," says he, "duntaxat exemplum me vidisse memini ineunte hujus anni autumno."† And on this account Dr. Cullen has rejected the species altogether; as others have transferred it to the genus Colica. But the disease does not exist, though it does not occur often, and as the distinguished symptoms of anxiety and spasms of the extremities, which peculiarly draw the line between cholera and colic, are equally present in this and the other species, we cannot disjoin them without confusion. They are produced by the same occasional causes, as surfeit, cold drinks upon a heated body, cold vegetables, as melons, inedible fungusses mistaken for esculent mushrooms, poisonous animal and mineral substances: they all take place sporadically, and all are at times

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* Sect. IV. Cap. II. † Sect. IV. Cap. II. ‡ Sect. IV. Cap. II.

epidemic. Worms have, also, proved an occasional cause of the disease under one or other of these forms; and sometimes gout. In very irritable habits, indeed, it has been produced by suddenly drying up a chronic issue; and in a few instances by terror, or some other violent emotion of the mind.

The cure should be commenced with warm cathartics alone, or intermixed with opium, as the compound tincture of rhubarb, or of aloes. Usquebaugh, or the tincture of capsicum, has often also been found useful: and when the paroxysm is removed, the restorative plan should be pursued which has been already recommended for dispepsy.

SPECIES III.

CHOLERA SPASMODICA.

Spasmodic Cholera.

THE DEJECTIONS WATERY; INEFFECTUAL RETCHINGS, OR VOMITINGS OF A WHITISH FLUID; SPASMS SUCCESSIVE AND VIOLENT, OFTEN EXTENDING TO EVERY ORGAN; GREAT DESPONDENCY AND PROSTRATION OF STRENGTH.

THERE is no species of disease that has of late years attracted more, perhaps none so much, attention, both at home and in the east, as the fatal colic we are now about to consider.

We dare not say that it is an epidemy of modern origin, since it is distinctly described by Bontius, and is supposed by some writers, though without sufficient authority, to be glanced at by several Greek physicians, and even by Celsus. But we may, at least, affirm, that it has of late years assumed an activity, fatality, and extent of range, that it does not seem, from any history that has descended to us, to have possessed in earlier times; and that cannot be contemplated without horror: on which account it has been compared by Mr. Orton to the sweating sickness, and various other pestilences that, with great fury and mortality, have ravaged the world in former periods.*

Some of the cases that occurred to Dr. Sydenham in the first species of cholera, and which we have already noticed, were so rapidly fatal that this distinguished pathologist has also been conceived to have been acquainted with the present species, and to have included it under them. But his description does not seem to warrant any such conclusion. Dr. Cullen, in like manner, upon a cursory view, might appear to have had his eye directed to it;

* Essay on the Epidemic Cholera of India, passim, 2 Vols. 8vo. Madras, 1820.

for he has loosely copied Sydenham's remark, that cholera is sometimes so severe in its symptoms as to destroy life in twenty-four hours. But on a more attentive survey, it will be perfectly clear that Dr. Cullen does not even, under this character, refer to the species before us; for he considers an increased secretion and discharge of common or yellow bile as a symptom belonging to every species of the genus; and contends that those cases which have not this mark are samples of diarrhœa, or some other disorder, but do not appertain to cholera. His mode of treatment moreover shows evidently that he regarded it in no species as a serious complaint; for he prescribes nothing more for its cure than "a plentiful exhibition of mild diluents," without evacuant medicines of any kind, which "are not only," says he, "superfluous but commonly hurtful." To which he adds, "that when the redundant bile appears to be sufficiently washed out, and even before that, if the spasmodic affections of the alimentary canal become very violent, and are communicated in a considerable degree to the other parts of the body, or where a dangerous debility seems to be induced, the irritation is to be immediately obviated by opiates, in sufficiently large doses, but in small bulk, and given either by the mouth or by glyster."*

Sauvages seems to have regarded cholera in all its species as a less momentous disease than even Cullen: for though he professes to follow Sydenham altogether in the mode of treatment, he takes no notice whatever of Sydenham's remark, that its symptoms are sometimes so violent as to destroy life in twenty-four hours. He has given, indeed, from Dellon, a species which he calls cholera *Indica*, but which differs very materially from the present, in being distinguished by delirium, a *strong* though unequal pulse, and a free flow of urine, both red and white, yet always limpid; as though the complaint were accompanied with a cauma or inflammatory fever. Yet in the curative process he advises to abstain from bleeding, and to administer only the milder purgatives.

It is to India, nevertheless, that we must look for the most striking, if not the only form of this species of cholera; and our information must be derived from those who, in modern times, have incidentally noticed it as travellers, or professedly written upon it as practitioners. And from the last quarter we have lately received so extensive a mass of communication, much of it of very great importance that we are no longer in any degree of ignorance of the general nature of the disease, how much soever we may still be of its remote cause.

Among those who have distinctly noticed it, though in a cursory way, are Sonnerat and Bartolomeo: the first of whom tells us that it is called by the natives *mordezym*, a term which, according to Bartolomeo, Sonnerat has transformed rather than translated, into

* First Lines, Book III. Sect. III. Chap. X.

mort de chien; but which I am more disposed to think is a corruption of the Arabic MORDEKIE or MORDECHIE, the very name by which Dellon says the natives denominated it, and which significantly imports "the death-blow:" according to Golius, *actio inferens mortem;* and hence synonymous with "mors repentina," or "mors violenta."

By the name of *mort de chien*, however, in what way soever derived, it is, according to Mr. Curtis, most generally known in the present day, and particularly at Madras; and under this name therefore, he has described it.

To this gentleman we are indebted for one of the earliest histories of the disease that within the last fourteen or fifteen years have reached our own country; and which, added to Dr. Girdlestone's statement, began first of all to draw the attention of British practitioners to its truly formidable character. Since which time, and especially within the last three years, the accounts have been so numerous, that it is impossible to pay that attention to all of them which they deserve. The friendship of Sir James M'Grigor, who has kindly given me an access to all the documents both printed and manuscript, which from time to time have been received at the Army Medical Board, has put me into possession of such of them as I have required: but in the ensuing sketch I have chiefly availed myself of the labours of Mr. Curtis, Dr. James Johnson, to whose bold but judicious practice the hospitals of the east are principally indebted for the means of combating this fearful enemy with success, Dr. Heyne, Mr. Orton, and especially the comprehensive reports of the Medical Boards at Bengal and Bombay. I have also felt greatly indebted to a very valuable letter from Mr. Corbyn of the Bengal Establishment to my learned and distinguished friend Sir Gilbert Blane, Bart. inserted in the Transactions of the Medico-Chirurgical Society, which details at full length the history of the cholera as it appeared in and devastated the provinces under the Bengal government, during the years 1817 and 1818.

Mr. Curtis, whose history was published in 1807, regarded it, at that time, as a new disease; and, finding no name for it in the nosological classifications, proposed, from its leading symptoms, to call it SPASMODIC CHOLERA; and as a better name cannot be invented, it is thus denominated in the present work. From the absence of yellow bile, and perhaps of bile of any kind, by which the disorder is peculiarly distinguished, some of the writers in India have objected to the term cholera, as conceiving that it necessarily imports a redundancy of this fluid, and that too of its natural colour and other qualities: yet, as I have already had occasion to show that there is no such necessity whatever imposed on the term, but merely an understanding that the bile is morbidly affected in its secretion, either in quantity or quality of any kind, there is no reason for changing the term on this ground. Nor are there always spasms in any part of the body; for the disease, at least as it has of late shown itself, in some cases destroys instantaneously, and before it

has assumed its regular character; but I do not remember to have met with a single instance of its having run on for twelve hours without having developed this essential symptom. It appears, nevertheless, to have raged with much greater and more sudden fatality in 1817 and 1818, than when Mr. Curtis wrote, and it is highly probable that at that period there was no case in which spasms did not occur.

Mr. Curtis informs us, that soon after the attack "the spasms began to affect the muscles of the thighs, abdomen, and thorax, and lastly passed to those of the arms, hands, and fingers: but I never, says he, then or afterwards saw those of the neck, face, or back at all affected. The rapidity with which these spasms succeeded the attack, and their severity, especially as affecting the muscles of the thorax and abdomen, denoted in general the degree of danger in the case. The affection is a fixed cramp in the belly of the muscle, which is gathered into a hard knot with excruciating pain. In a minute or two this relaxes; is again renewed, or the affection passes to others; leaving the miserable sufferer hardly an interval of ease; and lastly it passes from one set to another, leaving the former free."

This account is supported by Dr. Johnson in his valuable "Essay on the Influence of Tropical Climates." Yet, as a proof that the eastern cholera has of late assumed a severer and more fatal character, not only in the Bengal presidency, but in that of Bombay, it is only necessary to observe that the subsequent cramps regarded by Mr. Curtis, and no doubt justly so, as indicative of the highest degree of danger, have since, as will appear in the sequel, been hailed as less ominous than many of the symptoms with which the disease now occasionally opens; and contemplated as a reaction of the system, struggling against the first shock; proving that it has not been totally and instantaneously exhausted of sensorial power, as a Leyden phial is exhausted of its electricity by the discharge of the brass rod when applied to it.

The later and more fatal ravage I am now referring to, commenced its attack in August 1817, at Jessore, about a hundred miles to the north-east of Calcutta; and spreading from village to village, reached Calcutta early in September, having destroyed thousands of inhabitants in its course. From Calcutta it extended to Behar, depopulating many large cities, and compelling the residents to flee for safety to other spots. Benares, Allahabad, Goruckpore, Lucknow, Cawnpore, Delhi, Agra, Muttra, Meerat, and Barcilly, all suffered in succession; the pestilence not diffusing itself at once, but travelling by a chain of posts, and attacking a second district after it had ravaged a first.

At length it reached the grand army, and spread through its different divisions at Mundellah, Jubbulpore, and Sauger, marching in terrible array over the Deccan. At Hussingabad its havoc was dreadful for several days; when taking a course along the banks of the Nerbuddah, it alighted at Tannah. Having visited the famous

cities of Arungabad and Ahmednugger, it spread to Poonah, and, in the direction of the coast, to Panwell, where it ramified north and south, crossed Salsette, and arrived at Bombay in the second week of September 1818, a twelvemonth after its appearance at Calcutta.

While this was passing in the west of the peninsula, the epidemy was making a like progress to the east and south, progressively extending over the whole Coromandel coast; whence it was reported to have spread, and a report that afterwards proved to be but too true, to Ceylon; to the pure air and temperate climate of Siam; to Malacca; and, across the straits of Sunda, to China: since which time it has reached the Mauritius; and made its appearance on board vessels both in harbour and at sea.

The diagnostics of this new kind of pestilence are admirably furnished, for the period before us, by Mr. Whyte, assistant-surgeon to one of the divisions of the army, whose description I shall copy, premising that while in the centre division the spasms preceded the vomiting and purging, in the others they generally came on after the appearance of these symptoms.

The disease, says Mr. Whyte, generally begins with a watery purging, unattended with griping or any pain. At an interval of generally from half an hour to five or six hours, and sometimes without any interval, the patient vomits a white fluid, uncombined in any instance with bile, of which there is abundant evidence in every quarter. The spasms, in the division of the army from which this description is drawn, made their attack at no determinate period of the disease, but in general not for many hours after the commencement of the vomiting and purging. There was soon great debility and sinking of the pulse; the extremities became cold; the eyes sunk in their sockets; the vessels of the tunica adnata were injected with red blood, over which, if the disease advanced, a film was formed: the features expressed the deepest anguish; and the eye-lids were either wholly or half closed. The patient invariably complained of great heat at the stomach, and called incessantly for cold drink, although warned of the danger attending its use. The tenesmus now became violent, while nothing was discharged but the fluid just noticed, and a substance like the coagulated white of an egg. The uneasiness and jactitation were so great, that it was with the utmost difficulty an opportunity could be gotten of feeling the pulse, which by this time was not always perceptible, although it was generally so till the spasms came on. Those were always of the rigid kind, attacking first the toes and legs, and then extending to the thighs, chest, and arms. When they reached the chest, the breathing became so difficult, and the sense of suffocation so extreme, that the diaphragm most probably associated in the spasmodic action.

The most unfavourable and dangerous signs in the ordinary progress of the disease were, a coldness of the surface, extending over the region of the heart and stomach. The skin, under the nails, became incurvated; the tongue was icy-cold; an universal

colliquative sweat broke forth, with a shrivelling of the palms of the hands and soles of the feet; the spasms gradually declining as these symptoms increased. In general all pain and spasm left the patient before death; and even when the heart could not be felt to beat, he expressed himself easy, and said he was better. Sometimes, however, he was, at this period, in the greatest agony, rolling himself on the ground, groaning, and even bellowing most piteously: signs chiefly occurring in patients who lingered three or four days before death came to their relief.

The following appearances are worthy of notice on dissection: an enormous distention of the stomach and bowels, not from air, but a gelatinous substance; little sanguineous turgescence on the surface of the organs, but an absence of the moisture and glossy character of health; the liver much enlarged from the quantity of blood contained in its vessels, and on one part of its convex surface, a considerable extravasation of blood; the gall-bladder filled with bile, and projecting beyond the edge of the liver; the bile of a very dark colour, and the gall-ducts pervious. The contents of the small intestines were dark-coloured, apparently from an admixture of bile: the contents of the large intestines resembled the white and alluminous matter that was discharged before death. The urinary bladder was quite empty and wholly shrunk into the pelvis: the kidneys apparently diminished: the lungs so much collapsed as hardly to fill one half of the cavity of the chest: no fluid in the pericardium. Of the heart itself, or the brain, we have no account.

Such were the appearances in the body of a Sepoy. In the European subject, they were the same, with the two following exceptions: the stomach and intestines were distended with wind, instead of with gelatinous fluid, and hence collapsed upon puncturing them: the veins on the outer surface of both, as well as of the mesocolon, were turgid with blood.

The disease proved every where more fatal to natives than to Europeans: and among the former no blood could, in numerous instances, be drawn from the arm, however urgent the symptoms.

The Bombay accounts differ in only a few particulars: the spasms were sometimes clonic or agitatory, instead of being entastic or rigid. "In a large proportion," says Mr. Orton, "there is no appearance of spasm in any part of the system. In many there is no purging; in some, no vomiting; and, in others, neither of these symptoms. I have already observed, that these last were by far the most dangerous cases, and that the patients died under them, often in an hour or two, the nervous power appearing to be exhausted almost instantaneously, like the electric fluid from a Leyden jar. Mr. M'Cabe, Depôt-Surgeon, at Poonamallee," says the same author, "informs me, that he has found the cases which to common observation might appear the most desperate, (those which were attended with spasms and retchings of extreme violence,) actually amongst the most tractable: a truly valuable remark, which my own experience fully confirms. Dr. Burrell saved eighty-eight out

of ninety of his later cases* (meaning those of this kind.) And in his general description of them, he says, "that the retching was constant, and the spasms so violent as to require six men to hold the patient on his cot." On the other hand, nothing can be more evident, than the intractable and fatal nature of those cases in which the pulse, instead of rising, sinks at once; in which there are no spasms, and scarcely any vomiting or purging; and in which not only the excretion of bile, but of all the secretions, appears to be entirely suspended.†

In a few cases, there was even an overflow of yellow bile itself, making an approach to our first species: but these were uniformly of the slightest kind. "The bile," says Mr. Orton, "appears in excess only in the milder cases.‡" And to the same effect Mr. Curtis: "The cases which appeared after this were all of a different nature, much less severe, and none turned out fatal. They were all of them combined with bilious accumulations."§

The rapid or sudden fatality of the disease, in its severest onsets, is very singular. Even Sonnerat affirms, "that the patient was frequently carried off in twenty-four hours." But, in the latter epidemy of 1817 and 1818, this term was wonderfully abridged. "In the second, and very fatal visitation," says Mr. Orton, "of the epidemic experienced by Brigadier General Pritzler's force, I am informed that vomiting, purging, and spasms were very frequently, in a great measure, if not entirely absent: all the powers of the system failing at once, and death commonly ensuing in three or four hours from the attack."‖ Several instances were heard of at Hoobly, and other places, of natives being struck with the disease whilst walking in the open air; and who, having fallen down, retched a little, complained of vertigo, deafness, and blindness, and expired in a few minutes. Mr. Gordon gives a history of many cases of this kind. At Bellary, a tailor was attacked with what was supposed to be cholera, and instantly expired, with his work in his hands, and in the very attitude in which he was sitting.¶

The dissections in this presidency seem to have shown even a more extensive range of visceral effusion, congestion, and extravasation than those in Bengal. Not a single thoracic or abdominal organ was to be traced unmarked by vascular rupture, or turgescence of black blood, or unstampt with some other morbid appearance; the stomach and liver, however, were chiefly affected, and the urinary bladder was always shrivelled.** The blood, when drawn from the

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* Bombay Report, p. 68—80.
† Essay on the Epidemic Cholera, p. 29.
‡ Id. p. 71.
§ Diseases of India, p. 66.
‖ Essay on the Epidemic Cholera, p. 41.
¶ Bombay Reports, p. 82.
** Reports of Dr. Burrell and Mr. Whyte.

arm, was found to coagulate very loosely, and sometimes not at all:* and the arterial and venous blood were of a like purple hue.

Of the dreadful spread and havock of this cruel Asiatic scourge, we may form some idea, from the report to the Medical Board at Bombay, by George Ogilvy, Esq. secretary. The population in this district alone is calculated at from 200,000 to 220,000; the total number of ascertained cases amounted to 15,945; giving a proportion of seven and a-half per cent. Of these cases 1294 sick had been without receiving medicine, or medical aid; and there is reason to believe that of these every individual perished. Mr. Ogilvy, indeed, expressly asserts, that it was not ascertained that any case had recovered in which medicine had not been administered: while it is gratifying to learn, on the other hand, that, among those who had received the advantages of the judicious and active plan concurrently pursued, the proportion of deaths was reduced to 6 .6 per cent., an alarming mortality still, but a marvellous improvement upon the natural course of the disease. In other parts of India indeed, the deaths, under the same plan of treatment, seem to have been still fewer: for Dr. Burrell, surgeon to the sixty-fifth regiment, at Seroor, out of sixty cases, makes a return of only four deaths; and Mr. Craw, on the same station, asserts, that, on an early application for relief, the disease in his opinion "is not fatal in more than one in a hundred cases."

The curative plan pursued with so much success, consists in bleeding, according to the strength of the patient; calomel in free doses of from fifteen to twenty grains in a dose; with one or two grains of opium, repeated, if necessary, every four, three, and in some cases every two hours, till the urgency of the symptoms abated: to these were added a liberal use of the most diffusible stimuli, as the spirit of nitric ether, ammonia, camphor, hot arrack-and-water, mixed with spices and sugar, camphor-mixture, essential oil of peppermint, the hot-bath, stimulant embrocations; and sometimes the antimonial powder in doses of five grains given in conjunction with the calomel.

We are informed of a fortunate blunder in one instance, capable of being laid hold of and applied with great practical advantages. "By mistake, twenty grains of calomel and sixty minims of laudanum were given at an interval of less than half an hour. The patient was inclined to sleep; nothing more was done; and in two hours and a-half he was as well as ever he was in his life."

Many of the cases proved successful without the use of the lancet: but, from a return of Dr. Burrell, the hazard of omitting it, whenever blood could be made to flow, seems rather unjustifiable: for according to this return, out of a hundred patients, eighty-eight were bled, and twelve not; of the former, two died, being one to forty-four; of the latter, eight, being two thirds or nearly thirty to

* Orton's Essay, p. 69.

forty-four. It is altogether idle therefore to depend upon stimulants alone, and to boast of their power to subdue the disease without active evacuants in the beginning of the curative process, as Hufeland and other writers on the continent appear to have done, without a sufficient knowledge of the real nature of the disease;* if, indeed, it be this species which they have undertaken to describe of which there is great reason to doubt.

Of the remote cause of this extraordinary malady we know nothing. That it is an epidemy, and of a most malignant character, is unquestionable; but whether dependent upon an intemperament of the atmosphere, or upon specific contagion, is by no means ascertained. The first was the most obvious mode of accounting for it, and that which was earliest adopted; but by many practitioners it has been rejected, for the following reasons. The disease, instead of spreading from a centre to a circumference, or following the course of the wind, or of the sun, or obeying any other meteorological power, marched by a chain of posts, often in direct opposition to all kinds of atmospherical influence, and in the immediate track of human intercourse. "It prevailed," observes Sir Gilbert Blane, in his remarks upon Mr. Corbyn's letter, "to a degree equally violent in all seasons of the year: in regard to temperature, from 40 or 50 degrees of Farenheit to 90 or 100; in regard to moisture, during the continuance of almost incessant rain for months, to that dry state of the atmosphere which scarcely leaves a vestige of vegetation on the surface of the earth." To which I may add, that it often fought its way in the very teeth of the most powerful monsoons, and left untouched various districts that bordered on its career, and whose less salubrious features seemed to invite an acquaintance with it. It appeared also and vanished in all the changes of the moon, and in all states of atmospheric electricity: and at sea as well as at land. Mr. Corbyn, indeed, gives an account of its having made an attack upon the Lascars of an Indiaman, in its passage from England to the Cape of Good Hope, in 1814; and that too in the month of January, when the weather was intensely cold.†

It has, hence, by many pathologists been supposed to have been propagated by a specific contagion: and in support of such opinion they have endeavoured to show, that it appeared in no town or district where a direct communication had not been maintained with some place in which it was prevalent. In this endeavour, however, they do not seem to have been successful. Nor is it easy to reconcile the suddenness of its appearance and disappearance with the laws of contagion, so far as we are acquainted with them; a subject we shall have occasion to examine at large, when treating of fevers. Mr. Allardyce, surgeon to his majesty's thirty-fourth, informs us, that in this regiment the disease appeared on the twenty-first of

* N. Annalen. I. 404. Gazette Salutaire de Bouillon, 1787.
† Treatise on the Epidemic.

September, and committed dreadful ravages before night. On the twenty-fifth it abated remarkably, and in three days more entirely vanished.* In like manner, the severe attack, which was experienced by the Bengal and Madras troops at Nagpore, occurred at the end of May 1818. On the tenth of June, the rains appeared with great violence, when the epidemy abated, and immediately afterwards ceased. Neither is the idea of a contagious propagation reconcileable with the escape of the great body of persons exposed to the influence of the disease, considering that, from its not being apprehended to be contagious, no means, as is usual in other cases, were employed to avoid the infection.

The state of the atmosphere, as described by Mr. Allardyce, did not differ materially from that in Nagpore. The disease made its attack in close and sultry weather, and vanished after thunder-storms and heavy rains. But we can draw no conclusion from these phænomena; since it seems to have shown itself quite as frequently and fatally after a long succession of rain; and, as already observed, sometimes in very cold and dry weather. The remote cause, therefore, of this mysterious scourge remains yet to be ascertained; and affords further proof, if indeed proof were wanting, of our general inacquaintance with the nature and economy of epidemics.

With the exception of the plague, there is no epidemy on record that seems to have been so strikingly marked by violence and irregularity of action, and especially by a rapid exhaustion of living power; the patient, as we have seen, often expiring within twelve hours from the attack, and sometimes sooner.

The first characteristic feature that occurs to us on a review of the disease, is the total absence of the bile from the whole range of the alimentary canal in every case, while this fluid was as generally found in abundance in the gall-bladder: and, perhaps, the next is, the turgid, and, in some instances, the ruptured state of the liver from the quantity of blood with which it was distended. The general battery of symptoms appears, therefore, to have been opened by a spasmodic constriction of the bile-ducts; for without such an obstruction, we cannot account for an exclusion of all bile from the intestines. From this point, as from a centre, the spasmodic action seems to have spread in every direction, and under a clonic or entastic form to have seized upon slmost every organ: preying with greater violence according to the greater degree of debility, and hence, perhaps, of irritability of the system; into which law we are to resolve it, that the natives, supported by a less rich and nutritive diet than Europeans, suffered more severely and died more frequently. The stomach and intestines, generally speaking, first participated in the spasm of the bile-canals, and hence the griping pains, the nausea and violent commotions which spread from the one to the other.

* Reports communicated to the Bombay Medical Board.

In all cases of nausea, from whatever cause, we see the brain and the surface of the body peculiarly diminished in their energy, whence the skin, to the remotest extremities, collapses beneath a deadly chill, and the heart sinks with insupportable languor. In the ordinary course of sickness, the nausea subsides, and the general organization recovers its balance, or it terminates in full vomiting, which excites an universal re-action. And where any such re-action occurred in the disease before us, it was hailed as a favourable change; and hence, the wisdom of the stimulant plan so frequently had recourse to by the medical staff for the purpose of producing a revulsion. But where this was not accomplished, the living power, feebly recruited from its fountain from the first, or not recruited at all, became exhausted in every organ apace, the strength failed, and hope gave way to despair. While the general mass of blood, thrown back by the contraction of the vessels of the surface upon the deeper and larger organs, produced effusion, congestion, and extravasation, wherever they yielded most readily; and hence chiefly in the liver, which in hot countries is almost always in a debilitated state. In the midst of these accumulated evils, the spastic diathesis, instead of being subdued or even checked, became, by the very resistance it met with, more forcible and aggravated. Every organ successively or simultaneously submitted to its torturing cramp; the heart was fixed and incapable of propelling the blood through the arteries; the muscles of respiration were incapable of expansion, the lungs were collapsed, and suffocation was threatened every moment.

None of the natural secretions took place; the bladder was shrivelled and empty; the bile, while in the gall-bladder, became discoloured and dark; there was no fluid, or only a morbid fluid in the pericardium, and the intestines were no longer lubricated with the refreshing moisture of health. But while these secretions were put a stop to, others took place in different organs from the mortal struggle of those organs themselves, and chiefly where the struggle was severest. And hence those morbid fluids, and other materials, exhibiting almost every degree of consistence, which were found in the intestinal canal, and often ejected by the mouth and anus; varying from the nature of chyle, thrown back, perhaps, by a retrograde spasmodic action of the thoracic duct, to the nature of that mucous and unctuous matter which the intestines are sometimes capable of forming even under other circumstances, and of which we shall have occasion to treat when we enter upon the genus Enterolithus, or intestinal concretions.

I have said that the living power during the whole of this melancholy contest seems to have been recruited very feebly from its fountain, or not recruited at all. The latter appears to have been the case in the island of Ceylon, where the disease raged with even more violence than on the Indian continent; and the patient very frequently expired in twelve or fifteen hours from its attack. A dissection of those who perished thus early in this quarter has put

us into possession of some interesting facts, varying in a few particulars from those that occurred on post-obit examinations in the island of Bombay, and which will, I trust, uphold me in making this remark. The brain was in these cases chiefly the congested organ, the liver sometimes appearing to have no congestion whatever; and hence the inactivity produced in the brain by the nauseating state of the stomach must have been greatly augmented by oppression. Consentaneous herewith, we are told by Dr. Davy, that in some of the cases which he dissected in this region, there was a flaccidity of all the muscular parts, as in animals killed by electricity or hunted to death. There was also a tenderness of the muscular fibres; while antecedently to death, as in many of the Bombay cases, there was no difference in the colour of the arterial and venous blood, and no instance of a buffy coat on the blood that was drawn; which in reality was so loose and uncoagulable that, when venesection was necessary, the vessels were opened with the greatest caution from the difficulty of restraining the blood afterwards.

In all these cases there can be little doubt that the supply of the living power from the brain was spent profusely, and soon altogether exhausted: in some instances, indeed, nearly momentaneously; like the effects produced upon the animal frame by a stroke of lightning, a violent blow on the stomach, or any other accident that occasions instant death by a total and immediate discharge of the vital energy.

In other cases, the oppression on the brain, produced by congestion, seems to have put an end to the conflict before the living power had completely failed, and while it was still acting with irregular accumulation in various organs: for, in these, the muscles of the extremities, and even of the face and lower jaw, were observed to move in a convulsive manner, and sometimes to be drawn into tremulous knots, fifteen or even twenty minutes after death had closed the scene. So the heart of the traitor, when extirpated after he has been beheaded, from a like accumulation of sensorial power, has been seen to palpitate, and even to leap up for several times in succession after its removal from the pericardium.

Commonly, however, the living principle seems to have been exhausted more generally and progressively; and the muscles, and, indeed, most of the organs, freed from the tetanic power that at first constringed them, to have been gradually relaxed and flaccid: and hence, that comparative absence of pain that occurred so frequently a short time before death, with the flow of a cold sweat over the surface of the body, and of bile into the smaller intestines.

I have thus endeavoured to follow up and explain the different symptoms of this complicated disease, many of which appear, at first sight, to be incongruous with each other and of difficult reconciliation. And we may hence see how well calculated the plan of treatment pursued by the different medical boards was to meet them, and may trace the ground of its success. The grand objects

before them were: to equalize the flow of the living power; to counteract the spastic action so common to the irritable diathesis of hot countries; to guard against the danger of congestion in the vital organs; and to restore the natural secretions of the system. The great danger of congestion was guarded against by bleeding; spasm and irritability were opposed by powerful narcotics; and the full and repeated doses of calomel were admirably calculated to act upon the secernents and restore them to their proper functions, and especially when united, as was occasionally the case, and, perhaps, always ought to have been, with antimonials. All this was sometimes accomplished rapidly, and the disease ceased in a few hours. But if from the violence of the attack, or from any other cause, it could not be accomplished at all, such violence could not long be resisted; and the patient in a few hours, or at the utmost in two or three days, fell a prey to its fury.

We may also be enabled to see, from the general history before us, why the present species of cholera, or that accompanied with general spasmodic contractions, should occur more severely in the hotter climates of India, or indeed of any other torrid region, than in the more temperate ones of Europe. Cholera is peculiarly characterised by a tendency to spastic action: but hot climates have a peculiar tendency to excite a general spastic diathesis, and to develop this diathesis in some degree or other in all diseases; whence, more especially, the frequency of tetanus upon slight wounds of the extremeties, or an exposure of them to sudden chills: and hence, from the co-operation of these two causes, the graft of a spastic disease upon a spastic temperament, the effect must be of a highly multiplied aggravation. It is well known however, that this spastic temperament, though common to such climates, is by no means equally common to every inhabitant: and hence again we see a predisposing cause existing in some cases, which does not exist in others, and are able to trace out something of the reason why the epidemy should not have been able to fasten upon every individual with equal ease.

It still remains, however, to be ascertained, besides inquiring into the nature of the remote cause, why this disease should have been so much more severe as well as so much more frequent within the last six or seven years, than in former periods; as also, why an affection of the liver, or of the bile-ducts, should be capable of exciting so extensive a chain of influence on the nervous, rather than on any other system.

Whilst revising this sheet for the press, Sir James M'Grigor has informed me, that the disease in the Mauritius did not appear till after the arrival of a ship on its coast from Ceylon, where the epidemy was raging; some of the crew of which were seized with it on their passage, though all were well at the time of sailing. As a single fact, this is not sufficient to prove contagion; but, in the present uncertainty of the subject, it is a fact worth treasuring in mind.

GENUS X.

ENTEROLITHUS.

Intestinal Concretions.

STONY CONCRETIONS IN THE STOMACH AND INTESTINAL CANAL.

WHATEVER be the degree of merit or demerit that belongs to this genus, the author suspects he must take to his own share: since, so far as he knows, it is yet new to the domains of nosology.

In treating of the genus coprostasis, we had occasion to observe that the natural feces, under circumstances there explained, become at times indurated, shrivelled, and broken down into small balls and buttons as hard as sun-burnt clay, occasionally intermixed with mucus or oleaginous matter. And in treating of colica, we referred to concretions of a still harder substance, and of a stony appearance, which, though formed in the intestinal channel, are compounded of other materials than the constituent principles of feces.

It is for the purpose of including substances of this kind, and which are of very different descriptions, that the present genus has been devised, whose name ENTEROLITHUS, or INTESTINAL CONCRETIONS, sufficiently indicates a comprehensive scope.

We, have, indeed, on various occasions had to give a casual glance at this subject before: and under DIARRHŒA GYPSATA have observed that almost all animals are endued with a power of separating or secreting lime and other earths from the blood for particular purposes, as that of forming a shell-covering in insects and worms, and of giving hardness to the bones in all other animals. Under a morbid action of single organs, or of the system generally, this secretion often takes place in an undue abundance, and is poured forth into cavities, where its accumulation and crystallization must be attended with mischief. Such, at times, is the case in respect to the stomach and intestines. But, independently of concretions derived from this source, we often meet with others produced by an agglutination or crystallization of the juices which are contained in the aliment, and which, not unfrequently, give immediate proof of their origin by the aromatic taste, smell, or other qualities which they exhibit. There is also a third species of concretion, occasionally to be traced in the alvine channel, of a harder or softer structure, and of a cetaceous or saponaceous feel, which consists of feces or the refuse matter of the chyle, more or less combined with oil or mucus, and sometimes consisting almost entirely of the two last.

As the subject has been never before pursued with a view to any critical examination or systematic arrangement of the tribes of sub-

stances that appertain to it, we have not yet perhaps arrived at a knowledge of their different forms or combinations, as met with in the intestines of man, or the animals of the mammalian class, to which man is degraded by Linnéus: but we may at least venture upon the three following, each of which will furnish a distinct species:

1.	ENTEROLITHUS BEZOARDUS.	BEZOAR.
2.	——————— CALCULUS.	INTESTINAL CALCULUS.
3.	——————— SCYBALUM.	SCYBALUM.

SPECIES I.

ENTEROLITHUS BEZOARDUS.

Bezoar.

FOUND IN CONCENTRIC LAYERS, CLOSELY AGGLUTINATED OR CRYSTALLIZED; CAPABLE OF A FINE POLISH; FREQUENTLY WITH A METALLIC LUSTRE ON THE SURFACE OF EACH LAYER, AND AN ACCIDENTAL NUCLEUS IN THE CENTRE; OF A SPHEROIDAL FIGURE: CHIEFLY CONSISTING OF VEGETABLE MATTER.

Bezoardus, or bezoar, is derived from the Persian compound *Padiseher*, or *Pad-sehr*, corrupted into bedzohr, and bezoar. Literally translated, it is *depellens venenum*, and consequently a direct synonym with the Greek term, alexipharmic.

It is found occasionally in the stomach of some of the camel tribes, but more frequently in that of the smaller ruminating quadrupeds, as the goat, and two or three species of the antelope genus, as the chamois, or *wild-goat* as it is sometimes incorrectly called (the antelope *rupi-capra* of Linnéus,) and especially that beautiful and elegant animal the *gazhal* (antelope *gazella*, Linn.), the tzebi of the Hebrew poets, or *roe* of our Bible versions.

The bezoar was formerly employed as a febrifuge and alexipharmic in medicine, and worn as an amulet by the superstitious, who have sometimes purchased a single one from the east at six thousand livres when very fine, and hired them in Holland and Portugal on particular occasions at a ducat a-day.

It is not accurately ascertained that this species has ever been found in the human stomach; we have, indeed, assertions to this effect in various foreign miscellanies,* and I have hence introduced it into the present place. But it does not appear that the substan-

* Samml. Medicinischer, Wahrnehmungen, Band. II. p. 418.—Ferri, Galeria de Minerva, 1696.

ces referred to were examined with sufficient attention, while the authors seem to have used the term bezoar in a very loose and indefinite sense.

The bezoar, as already observed, is chiefly obtained from the stomach of the smaller ruminating animals, whose food, from the complexity of the organ, lies for a long time quiescent in a state of subaction, and is thus enabled to give forth the whole of its juices under circumstances that afford them much easier opportunity of agglutinating or crystallizing than in many other animals. In the goat kind these concretions are called ægagropilæ, a Greek term signifying mountain-goat balls. They are of different sizes and figures, the last being chiefly determined by the nature of the nucleus, which, in different individuals, is marcastite, talc, flint, gravel, straw, glass, seeds of plants, &c. In colour they are white, yellow, or brownish; that of the gazhal is greenish blue; and, when recent, highly aromatic from the odour of the plants on which the animal feeds. The most singular circumstance belonging to them is the bronze or metallic lustre that appears on the surface of the different layers, and does not strike deeper than the surface. This, however, is said to be a property peculiar to the western bezoar, and seldom or never to be found in those of the east, which are often of as beautiful a glossy white as ivory. Daubenton ascribes the gilt appearance to a vegetable dye fixed by the tartaric acid of the plants in which the dye exists; and observes, that he has remarked a like appearance on the grinding teeth of many of the ruminating tribes. A few of them rattle on being shaken, the nucleus having contracted and become loose. La Fosse* asserts that he has occasionally met with genuine bezoars or ægagropilæ in the stomach of the horse; and similar concretions seem at times to be formed, out of the animal body, as tubercles to the roots or other parts of certain plants: for Fourcroy affirms, that in the cabinet of Jussieu, he was shown some curious bezoars of the Oriental appearance, white or yellowish, glossy as ivory, and of a spheroidal figure, which were said to be produced by the cocoa.

From the supposed value of bezoars in medicine, they were at one time imitated, and the false sold as genuine. These supposititious stones, according to Bomare, were compounded of lobsters' claws and oyster shells, levigated on porphyry, made into a paste with musk and ambergris, and formed into balls of the shape of bezoars; and, where the metallic were aimed at, afterwards rolled on gold leaf. The pierres de Goa or de Malacca, as they were called, were, at last, generally factitious bezoars of this kind; and their spuriousness was capable of proof, by drawing a line with them on a piece of paper previously rubbed over with cerusse, chalk, or lime: the line of the genuine bezoar turns greenish or of an olive-yellow; that of the factitious remains unaltered. The imposition, however, seems to have been very unscientific, as formed principal-

* Cours d'Hippiatrique, p. 158.

ly of earths, instead of being elaborated from crystallized vegetable juices, which produced this change of colour.

SPECIES II.

ENTEROLITHUS CALCULUS.

Intestinal Calculus.

RADIATING FROM A COMMON CENTRE, OR FORMED IN CONCENTRIC LAYERS; MOSTLY WITH AN ACCIDENTAL NUCLEUS; MORE OR LESS POROUS; SPHEROIDAL OR OBLONG; ADMITTING AN IMPERFECT POLISH; COMPOSED CHIFLY OF EARTHS AND ANIMAL MATTER.

This species is treated of so fully in the commentary to the Nosological Synopsis, that I have not much to add to what is there observed.

It is by no means unfrequently found in the human stomach and intestines, but far oftener, as remarked above, in the digestive channel of other animals, and particularly in the large ruminating quadrupeds, or those with a long complicated digestive organ, where the food, as in the formation of bezoars, is slowly carried forward; and in tardy draught-horses, particularly those of millers that are fed largely on bran, which seems to yield a ready basis for these concretions.* In Dr. Watson's case, the disease had existed for years: the animal died aged twenty-one, near foaling; but gave no signs of pain or inconvenience till three months before her death. The calculus weighed 15lb. 12 oz.; average diameter 8½ inches by 8 inches.

When chemically analyzed, they are chiefly found to consist of a triple or ammoniaco-magnesian phosphate, like the earthy or white-sand calculi of the human bladder; though it is difficult to conceive from what quarter the magnesia is obtained. In the case of millers' horses, some portion of this earth may perhaps be derived from the brain, in which it is always to be traced; but the difficulty still remains with respect to other animals. The figure, whatever be the size of the calculus, is usually spheroidal, except where broken into separate fragments: the matter is deposited for the most part, as in the former species, upon a nucleus of some sort or other, as a small piece of flint, an iron nail, a seed or husk, a piece of hay or straw—the structure sometimes radiating from such common centre to the surface, and sometimes evincing distinct plates more or less united to each other. In the human subject these calculi

* Phil. Trans. XXIV. 1705, Thoresby. Id. XLIV. 1746, Bailey. Id. XLVIII. 1754, Watson.

vary from the size of a pea to that of a filbert, chesnut, or hen's egg, and are often still larger. In the case of Margaret Lauer* (see Colica *constipata*,) they were usually of the two former sizes, and appear to have been formed in great abundance and with wonderful facility—for her abdomen, upon pressing it, often rattled from the quantity it contained, with the sound of a bag of marbles. Many of these were rough and sharp-pointed at the edge, evidently fragments or nodules of larger concretions, and gave great pain in the rejection, whether above or below, for they were discharged both ways. The larger-sized weighed rather more than two drams; and Dr. König, who relates the case, calculated that the whole that were discharged during the continuance of the complaint could not amount to less than 5lb. avoirdupois. In a case related by Mr. *Martineau*,† five calculi, some of them much larger than the preceding, were voided per anum, by a poor woman in the third month of pregnancy, after having suffered from colic about four or five days; of these, the largest, 8 inches in circumference and $6\frac{5}{8}$ in length, weighed two ounces sixteen pennyweights and twelve grains. In this case, and in various others, the calculi seem to have been in the intestines for a considerable period of time without inconvenience; for it is hardly possible to conceive that all these should have been produced in the course of a week. In another case in the same journal,‡ related by M. Mackarness, a calculus of this kind was extracted with some difficulty from the anus by the surgeon who attended, which weighed eight ounces and a half, and was ten inches and a half in circumference. It is described as "a hard, unequal, ragged, flinty stone," but was not examined chemically. There is some doubt whether this had not forced its way from the bladder into the rectum; but there is little doubt that it had been present in the one organ or other, and nearly of its full size, for several years before its extraction; for the patient's stools were always obtained with difficulty; and three children, which she had successively borne in the three preceding years, were all marked with a large hollow or indentation in some part of the head; in one instance, of sufficient extent to hold the moiety of a small orange.

Other examples, however, have occurred both of as large a size, and of as firm or flinty a crystallization. Thus in a foreign miscellany of authority, we have the case of a calculus discharged by the anus of half a pound weight;§ and M. Daabel has published a full account of fragments of stony calculi (saxea fragmenta) evacuated from the same organ:‖ as Sir H. Sloane has another case in which the concretions amounted to two hundred.¶

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* See Colica constipata, p. 145.
† Phil. Trans. Vol. XXXII. 1722—3.
‡ Id. Vol. XLI. 1739—1741.
§ Samml. Med. Wahrn. Band. IX. p. 231.
‖ Discursus Academicus de Esthera Norra. Lund. 1715. 8vo.
¶ Birch, Hist. 1685.

In draught-horses and oxen this species of calculus is generally found single and much larger, and often of little inconvenience for years. They vary in size from three pounds avoirdupois to ten or twelve. Of this last weight the author once met with an instance in a horse belonging to Mr. Hayward, a respectable miller of Brundon, near Sudbury in Suffolk; and Mr. Watson gives an account of two considerably heavier, one already noticed, and the other weighing nineteen pounds, exclusive of the outward shell or crust which was broken off in several pieces, with a circumference of twenty-eight inches. Both these were laminated, but "had the appearance of a pebble;" yet the specific gravity was much lighter, the first weighing in water not more than six pounds. At other times the crystallization is more like that of gneis or of grit-stone, and almost always light and porous.*

Occasionally, however, this species is found gregarious instead of solitary. Mr. Watson, in the article just quoted, mentions a case of *several* found in the intestines of a mare, and presented to the Royal Society by the Duke of Richmond in 1746, the nucleus of two of which was found to be an iron nail. And, by turning to another volume of the same journal,† we find these calculi described by Dr. Bailey (for the two articles appear to relate to the same case) as consisting of five in number, of different sizes, some triangular, and resembling a horse-bean, of an olive colour and finely polished; and one much larger, weighing nearly sixteen ounces troy, and measuring twelve inches by eleven.

Several of these concretions, we have observed, had the appearance of crystallized gneis, or of grit-stone; and it is probable that they were partly of these very minerals; for it is of such that mill-stones are very generally composed: and, by the friction they are perpetually undergoing, there can be little doubt that much of the mill-dust intermixed with bran, with which millers' horses are fed so largely, is derived from the powder furnished by these stones.

In man, the calculus is often dependent upon a like accidental origin: for it not unfrequently follows upon a long, free, and injudicious use of prepared chalk, magnesia, or other calcareous earths, for the purpose of correcting acidity in the stomach. I have known this in many instances in dyspeptic cases: and once attended a lady who, from the same cause, laboured under a most painful constipation, till a large mass of what may be called intestinal mortar was removed by a scoop from the rectum. The case related by Dr. S. Fritzgerald, of Mullingar, was apparently produced by a like cause.

The lady had suffered great torture in the hypogastric region, particularly towards the back and os sacrum, for eighteen months; during the last three of which she could not leave her bed, except for tepid bathing, which afforded her transient ease. Upon the re-

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* Phil. Trans. Vol. XXXIV. No. 391.
† Vol. XLIV. 1746.

jection of an emollient anodyne clyster, she discharged with it a large hard calcareous ball of an oval figure, weighing eight ounces and three drams, exceeding in seize an ordinary orange, and so solid, that nothing less than the stroke of a hammer could break it. A total liberation from pain immediately followed, and the patient progressively recovered.*

The curative process may be comprised in a few words. If the concretions proceed from an injudicious use of calcareous or magnesian earths, both these must be avoided for the future; and the calculi actually existing be diminished in their diameter by the use of mineral acids, and quickened in their passage by cathartics. If magnesia be pretty certainly the agglomerating base, the sulphuric acid will be preferable; as this will have a tendency to convert it into Epsom salts, and thus produce a purgative as well as a solvent effect. If we have reason to suspect a calcareous diathesis as a sole cause, since this diathesis usually depends upon debility, we must endeavour to invigorate the system generally, and the stomach more particularly, by the course of regimen and medicines already prescribed under DYSPEPSY.†

SPECIES III.

ENTEROLITHUS SCYBALUM.

Scybalum.

CONCRETION SOAPY OR UNCTUOUS; MOSTLY CONTINUOUS; SOMETIMES IN LAYERS; SPHEROIDAL OR OBLONG; CONSISTING CHIEFLY OF MUCOUS OR OLEAGINOUS MATTER, MORE OR LESS INTERMIXED WITH INDURATED FECES.

THIS species has not hitherto been sufficiently attended to; and even Fourcroy and Walther seem to have mistaken it for a biliary calculus; an error which the writer has seen in several instances repeated in this metropolis. The specific character sufficiently expresses the general nature of the concretion, and is drawn up from various examples that have occurred to himself, or have been shown him by others.

The concretions belonging to this species, if carefully watched and analysed, would probably be found very numerous; but, in the present state of our knowledge upon this subject, we must confine

* Edin. Med. Commun. Vol. VIII. p. 329.

† Marcet, Essay on the Chemical History and Medical Treatment of Calculous Disorders, 1817.

ourselves to the three modifications of feculent, oleaginous, and ambraceous, or that of ambergris.

When, from a feeble peristaltic action, the feces have remained long in the colon, they are frequently found to undergo a considerable change; for they become harder as their more liquid parts are absorbed; and, in consequence of becoming harder, frequently stimulate the mucous glands by which they are surrounded to a more copious secretion, which intermixes with them; and, as they break into indurated balls or fragments, gives them a less rough or a more greasy or unctuous feel. These are the common scybala of medical writers.

But we occasionally meet with balls, buttons, or globules of a still more cetaceous, fatty, or oily substance, discharged, sometimes solitarily, sometimes gregariously, from the rectum, of very different diameters. Occasionally we can trace them to a like origin, as in a case quoted by Sir Everard Home* from Dr. Babington, in which the lady who voided them had regularly, before their appearance, taken one or more doses of olive oil to appease severe pains of the stomach which were ascribed to the passing of gall-stones, for which these concretions were at first altogether mistaken. They were of a globular form, "varying in size from that of a small pea to the bulk of a moderate grape, of a cream-colour, and slightly translucent, of a sufficient consistence to preserve their form and to bear being cut with a knife, like soft wax."

In general, however, we cannot trace these concretions to any unctuous material introduced into the stomach; and have reason to believe them produced by intestinal secretion, or a chemical change effected on the recrement of the food after it has passed into the larger intestines. Dr. Babington has also furnished, in the same article, a case which can only be resolved into an origin of this kind. The patient was here a little girl of four years and a half old. At the age of three, "her mother observed something come from her as she walked across the room, which when examined, was found to be fat in a liquid state, which concreted when cold. Ever since that time to the present she has voided, at intervals of ten or fourteen days, the quantity of from one to three ounces, sometimes pure, at others mixed with feces: when voided, it has an unusually yellow tinge, and is quite fluid like oil. Her appetite is good, as well as her spirits, and her flesh firm: her belly rather tumid, but not hard: she is subject to occasional griping."†

Globules and balls of fat discharged from the rectum are noticed in various medical collections of high authority, both domestic and foreign.

Thus, in the Edinburgh Medical Essays, we have an instance of a whitish substance like tallow or hardened marrow, being a conge-

* Phil. Trans. Year 1813, art. XXI.
† Loco citat.

ries of globules, passed among the excrement, the entire mass making the size of a walnut; other masses having been passed several days afterwards of the size of so many peas.* The Paris Academy of Surgery have published similar accounts.† So Dietrich gives the case of a waxy mucous matter—materia ceracea mucosa—passed by the rectum, weighing more than an ounce:‡ and Paulini notices several instances that had fallen within the range of his observations;§ in one of which the concretions were of a green hue. Vander Wiel describes a case of the same appearance:‖ and Zeller has found them loaded or covered with hairs,¶ probably swallowed accidentally. So in the Acta Naturæ Curiosorum,** we have an instance very like the first of Dr. Babington's cases; the concretions were dejected in a paroxysm of colic, and are described as "excreti globuli, quasi saponacei, cedente dolore hypochondriorum." And I suspect we are to refer to the same species a case ascribed by Dr. Scott, of Harwich, Roxburghshire, to hydatids, or something resembling them.†† The patient had for many months been occasionally subject to colic and dyspeptic affections, accompanied with great pain and faintness. He at length "began to void by stool substances of a brown colour, some about the size of nuts, and some as big as walnuts, which were bags that contained matter of a yellow hue like pus, besides a great many empty ones that had broken. I have seen eight or ten passed in one stool." This continued for eight or ten days, and the patient then recovered.

In all these cases we find proofs of morbid intestinal action, commonly accompanied with pain and coprostasis *obstipata*, or costiveness from weakness and torpitude, in the vermicular movement of the intestines.

It is under like circumstances that the substance called ambergris is found in the larger intestines of the cachalot or spermaceti-whale (physeter, *macrocephalus*, Linn.,) which generally contains sixty per cent. of fat, and is never higher up than six or seven feet from the anus. It appers to be more completely elaborated in proportion as the animal is more sickly and affected with costiveness, and does not dung on being harpooned; and hence, the most valuable, according to the report of the South Sea whalers, is that which is extracted from animals that have died of the complaint. It is found in masses of from fourteen to more than a hundred pounds weight; and appears at first to bear a close resemblance to the feces of the

* Vol. I. Part. II. Art. lxvi. p. 145.
† See especially Hist. de l'Acad. Royale de Chir. III. p. 14.
‡ Observationes quædam rariores, &c.
§ Cent. I. Obs. 15.
‖ Stalpart Vander Wiel, Cent. I. Obs. 61.
¶ Dissert. Molæ viriles memorab. Tubing. 1696.
** Vol. III. Obs. 51.
†† Edin. Med. Comm. Vol. V. p. 183.

whale, but hardens on exposure to the air. The largest lumps have probably not been discharged, but separated from the body of the animal during the process of putrefaction after death. Neumann gives an account of one mass found on the coast of the island of Tidor, that weighed not less than a hundred and eighty-two pounds.* It was purchased of the king of Tidor, by the Dutch East India Company, in 1693, for eleven thousand dollars, and measured five feet eight inches in thickness. It was long exhibited at Amsterdam, at length broken up and sold. Other masses of many pounds weight have been found floating on the sea; and the concretions, thus detached and of different bulks, are carried into every quarter by tides and currents, and have sometimes been found on the shores of the West Indies; whence Waller:

> Bermuda, walled with rocks, who does not know
> That happy island, where huge lemons grow?
> Where shining pearl, coral, and many a pound,
> On the rich shore, of AMBERGRIS is found.

Sometimes, however, it is traced in great abundance in the intestines of whales that are harpooned, and which, probably, would soon have died of an obstruction in the bowels, if they had not been taken. A captain in the Southern Whale Fishery, examined before the Privy Council in 1791, related that he had found three hundred and sixty-two ounces of this substance in the intestines of a female, struck off the coast of Guinea; part of which was voided from the rectum on cutting up the bladder, and the remainder traced in the intestinal canal.† The mass is usually loaded with hard bony fragments, by the seamen called squids, which are the beaks of the cuttle-fish, on which the whale is known to feed.

When recently taken, the smell of ambergis is very strong, and rather fetid, but, by keeping, the offensiveness goes off, and it acquires a faint musky odour. It has scarcely any taste. Its colour is ash-grey or brown, somewhat mottled: its hardness is sufficient to render it easily friable, but not to bear a polish: when broken down, it has a soapy feel like steatite.

Sir Everard Home has endeavoured to account for the production of all these varieties of scybala, in an ingenious article published in the Philosophical Transactions, in which he attempts to show, that while it is the office of the stomach and intestines to furnish nutriment for the muscles and membranes out of the finest part of the food, which is separated from the rest for this purpose, it is in like manner the office of the larger instestines, and especially of the colon, to convert a considerable part of the refuse matter into fat, by combining it with the bile, and to send it, thus changed in its nature, by channels of which we know nothing, into the circulation, and deposit it in almost every part of the body, to lubricate the

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* Phil. Trans. Vol. for 1734.
† Id. Vol. LXXXI.

whole, and especially to promote the growth of the animal frame in youth.*

It is unquestionable that, with all our advances in the knowledge of physiology, we are, to this hour, in great ignorance of the means by which the fat of the different parts of the body is produced, or the quarters from which it is drawn. But it militates against the hypothesis before us, that we have no instance of the existence of fat in the larger intestines when they are in a state of health; and that to produce scybala of every kind, and particularly those that are more oleaginous, a weak and diseased condition of the intestinal canal appears to be indispensable. Whilst in the second case related by Dr. Babington, in which the fatty material seems to have been elaborated in its most perfect state, the bile does not appear to have been at all transformed from its natural to any new character, nor indeed to have been in any degree operated upon: for we are expressly told that the material when voided had "an unusually yellow tinge," notwithstanding that it was quite fluid like oil."

The subject, however, is worth pursuing: and Sir Everard has endeavoured to support his views by a later article, inserted in the same work, on the transmutation of the tadpole into a frog,† in which, after showing that the intestines of the tadpole are much larger and more complicated than those it possesses in its frog state, he argues that this more extensive and elaborate machinery is for the purpose of forming a larger abundance of oleaginous matter as food, at a period when the animal is less capable of obtaining food from without; and he observes further, that the intestinal canal of the tadpole is surmounted with, and, in some species, imbedded in fat.

GENUS XI.

HELMINTHIA.

Enverminatiou. Worms.

WORMS OR LARVES OF INSECTS INHABITING THE STOMACH OR INTESTINES.

The subject of our last genus, I observed, was new, or nearly so, to the science of pathology: that of the present is equally new to nosological arrangement: for it is a singular fact, that while almost all systems contain a distinct genus under the name of phthisiasis, or malis, or cocyta, and some of them two distinct genera, for the purpose of arranging such insects, larves, or vermicles as are occasion-

* Phil. Trans. for 1813. Art. XXI.
† Phil. Trans. 1816. p. 301.

ally found infesting the surface of the body, and which, to avail ourselves of a significant term derived from old English botany, may be called animal *dodders*, few or none of them comprise any division whatever for intestinal larves or worms, notwithstanding the infinitely greater mischief they often produce, and the far greater difficulty of getting rid of them.

Dr Cullen, indeed, in the latter part of his life, was sensible of the importance of this omission, and would most probably have corrected it in his own system, had he found leisure or inclination for a revisal of it, since he has introduced the term VERMES into his "*Catalogus Morborum*, a nobis omissorum, quos omississe fortassis non oportebat."

The physiologists, however, and pathologists have, in many instances, abundantly supplied the deficiency; for there is scarcely a disease of any kind which has not been referred by some of them to vermination as its origin. This is particularly true of the School of Linnéus, though it is not confined to that seminary. Thus Linnéus himself laboured hard to prove that dysentery is the effect of a peculiar larve or grub belonging to the acarus or tick genus, which he has ventured to introduce into his Natural History under the name of acarus *dysenteriæ*. So Kircher has ascribed the plague to another kind of animalcule; Langius, the measles; various authors, the itch; Sigler, petecchiæ; Lusitanus and Poncellus, small-pox; De Sault lyssa, or canine madness; Hauptman, syphilis; Martin and Udman, both pupils of Linnéus, elephantiasis; and Nyander, another pupil of the same great teacher, contagious diseases of most, if not of all kinds. Some, again, have ascribed piles to the same source; others, the inspissated and vermiform mucus squeezed out occasionally from the excretory ducts of the small mucous glands of the forehead, in the present system described under the genus and species Ionthus *varus*; and others, again the tooth-ache: which last opinion seems at one time to have been adopted generally; for we find Shakspeare making one of his best drawn characters exclaim—

> What! sigh for the tooth-ache!
> Which is but an humour or *a worm*.

It is not very wonderful, therefore, to behold the extensive use to which the tænia *hydatis*, or hydatid, is applied in modern times, so as to be regarded as the parent of almost every limpid cyst discoverrable in the body; nor that cancer of the breast should be ascribed to a similar generation; and the less so, since it is not a century ago that it was gravely argued by the most enlightened physiologists of the day, and supposed to be ocularly and irrefragably demonstrated, that man himself is, in every instance, the progeny of a similar kind of maggot, which, it was said, might be seen by any one who would take the pains to look for it, vivaciously frolicking in the vast ocean of a drop of male semen.

We are, at length, approaching to more sobriety in our observations and inquiries; and it is high time such a period should ar-

rive; for we were in great danger of running into the wildest fancies of equivocal generation, and of equally relinquishing all principles and all limits in natural history. We now know, that an incipient stage of putrefaction, or a very short quiescence and exposure of animal fluids to a warm atmosphere, is sufficiant to load them with animalcules of some kind or other; not, indeed, by fortuitously converting the constituent and decomposing principles of such fluids into the simple forms of microscopic life, (for of this we have no proof whatever,) but rather, by affording to some few of the myriads of invisible ovula with which the atmosphere swarms, and which it may convey to them, the proper nidus, or the quickening stimulus they stand in need of.

That the atmosphere is freighted with myriads of insect-eggs that elude our senses; and that such eggs, when they meet with a proper bed, are hatched, in a few hours, into a perfect form, is clear to any one who has attended to the rapid and wonderful effects of what, in common language, is called a blight, upon plantations and gardens. I have seen, as probably many who may read this work have also, a hop-ground completely overrun and desolated by the aphis *humuli*, or hop-green-louse, within twelve hours after a honey-dew (which is a peculiar haze or mist loaded with a poisonous miasm) has slowly swept through the plantation, and stimulated the leaves of the hop to the morbid secretion of a saccharine and viscid juice, which, while it destroys the young shoots by exhaustion, renders them a favourite resort for this insect, and a cherishing nidus for the myriads of little dots that are its eggs. The latter are hatched within eight-and-forty hours after their deposit, and succeeded by hosts of other eggs of the same kind; or, if the blight take place in an early part of the autumn, by hosts of the young insects produced viviparously; for in different seasons of the year the aphis breeds both ways.

Now, it is highly probable that there are minute eggs, or ovula, of innumerable kinds of animalcules floating in myriads of myriads through the atmosphere, so diminutive as to bear no larger proportion to the eggs of the aphis than these bear to those of the wren, or the hedge sparrow; protected at the same time from destruction by the filmy integument that surrounds them, till they can meet with a proper nest for their reception, and a proper stimulating power to quicken them into life; and which, with respect to many of them, are only found obvious to the senses in different descriptions of animal fluids. The same fact occurs in the mineral kingdom; stagnant water, though purified by distillation, and confined in a marble basin, will in a short time become loaded on its surface or about its sides with various species of confervas; while the interior will be peopled with microscopic animalcules. So, while damp cellars are covered with boletuses, agarics, and other funguses, the driest brick-walls are often lined with lichens and mosses. We see nothing of the animal and vegetable eggs or seeds by which all this is effected; but we know that they exist in the atmosphere, and

that this is the medium of their circulation. How far the tales may be true, of living animals found in abcesses in different parts of the body, and especially in scirrhous and pustulous exanthems, this is not the place to inquire; but, conceding the fact, we can only account for it by supposing their respective ovula to have been admitted into the system with the air or food we take in; and to have been separated as soon as they acquire possession of a proper nursery.

We have strong reason to believe, however, that many of the eggs or animalcules that are traced in animal fluids occasionally find other receptacles out of the body that answer their purpose as well, and seem to keep up their respective species; and, consequently, that provide a stock of eggs, larves, or insects prepared to take possession of any decomposing animal substance as soon as it is ready for their reception. And we are hence able to account for the presence of animalcules in such situations, without being driven to the necessity of supposing them to have been generated therein; and see how it is possible that they should continue to exist in a regular chain of succession, instead of being produced anomalously, and equivocally by the *bildungstrieb* (as the German physiologists call it), or formative effort of a living principle, in substances in which life has confessedly ceased to exist.

Thus Rolander, who, like Linnéus, ascribed desentery to the dysentery-tick, or acarius *dysenteriæ*, and who himself laboured under this disease while residing in Linnéus's house, contended, that he had discovered the same insect in a water-vessel made of juniper-wood; and conceived that it was conveyed in great numbers into his body by the water which he drank from the cistern. So Lister affirms, that he has seen the ascaris *vermicularis* (the maw or thread-worm,) which is usually found burrowing in the lower part of the intestines, infesting the surface as well. In like manner Palmærus has rendered it at least probable that the young, or ova of the fasciola *hepatica*, or fluke, found so abundantly in the liver of sheep that die of the rot, and the origin of which has so much puzzled the naturalists, are swallowed by the sheep in marsh or stagnant waters. And Linnéus himself pointed out, that the tænia *solium*, or tape-worm, the cause of whose existence in the alvine channel has been a source of equal difficulty to the physiological inquirer, exists, though much smaller, in muddy springs; and notwithstanding that Pallas, at first, expressed doubts upon this point, the assertion has been since confirmed by satisfactory and additional observations.

Nor is it surprising that doubts should at times exist in the mind of the precise and cautious inquirer in many cases of this kind, which can only be removed by a long and attentive investigation of the history of the minute animals which gives rise to them: for, first, the very same species assumes so different an appearance in different stages of its existence, that nothing but the most patient prosecution of the same individual through all his metamorphoses could induce us to put any faith in its individuality. For who, for example, if he

did not know it by the repeated experience of himself or of others, could believe that the black and the white carrion-vulture of America (vultur *Aura*, Linn.), which, when teased, emits a cry like a mouse, are the same bird, merely changing from white to black as it grows old? Who could divine that the tadpole, possessing gills and a fish-tail, and without legs, should be the same animal, only younger, as the four-legged frog, that has neither tail nor gills? or that a like identity should apply to the catterpillar, the aurelia, and the winged moth? But, secondly, we often see an almost equal change produced in a few generations of the same species, and occasionally in the same individual, by a change of food or habitation, or both. How widely different is the domestic sheep from the argali; or the ox from the bison! yet these are the stocks from which they have proceeded. A difference of food alone produces a growth and development of sexual organs in the honey-bee, and converts what have hitherto been called neuters (but which are really imperfect females) into queens, or bearing bees. In many instances, we can trace changes as considerable (and shall presently have occasion to remark them) in worms, or the larves of insects, introduced accidentally into the human intestines from without. Many of these, however, are animals with the whole of whose history we are acquainted: but we are not acquainted with the whole of the history of the ascarides, the tænia, and various other intestinal worms; and hence might not know them out of the body, even though we should actually meet with them under some form or other.

As animalcules are parasitic to plants, so are plants at times parasitic to animals. I have seen funguses spring up night after night on the sheets of patients with gangrenous limbs, where the corrupt discharge has soaked into the sheets, and rendered them a quickening nidus. Several species of clavaria grow on the chrysalis of one or two species of cicada, and even on the perfect insect itself, as others do on the May-fly.* Were this indeed the proper place for pursuing so interesting a study, I could show not only that there is scarcely an animal of any class or order, from the highest to the lowest, but is a prey to other animals of a minuter form, that infest its interior as well as its surface, but that there is scarcely a vegetable which has not also its parasitic plunderers, and is infested in like manner. But the subject would carry us too far: yet, a few additional hints in relation to it are given in the comment to the Nosological System; and those who are desirous of extending the study may turn to them at their leisure.

The various kinds of worms traced in the human stomach and intestines have been differently arranged by different writers: but they have been chiefly assorted into *round* and *flat* worms; or into *indigenous* and *exotic*: in other words, into those which we are told are *generated* in the alvine channel, and those which enter it *from*

* Mémoires sur des Insects sur lesquelles on trouve des plantes, par M. Fougeroux de Bouderoy. Vide Hist. de l'Academie Royale des Sciences, Ann. 1769.

without. The first method is too limited; and the second, as we have already seen, not only hypothetical, but built on a false basis; for we have reason to believe that every species found in this channel, primarily existed out of it. In unfolding, therefore, the subject further, we shall employ a different arrangement, and comprehend, under the genus HELMINTHIA, three species of diseases, equally distinguished from each other by symptoms and by the different tribes of animals which give rise to them; viz. those which are nourished and find a proper habitation throughout every part of the alvine canal; those whose proper habitation is limited to the extremity of the canal; and those which have no proper habitation in any part of it, and enter into it erroneously or by accident.

1.	HELMINTHIA ALVI.	ALVINE WORMS.
2.	——— PODICIS.	ANAL WORMS.
3.	——— ERRATICA.	ERRATIC WORMS.

SPECIES I.

HELMINTHIA ALVI.

Alvine Worms.

WORMS EXISTING AND FINDING A PROPER NIDUS IN THE STOMACH OR ALVINE CANAL, CHIEFLY OF CHILDREN, AND SICKLY ADULTS; PRODUCING EMACIATION, A SWELLED HARD BELLY, GNAWING OR PUNGENT PAIN IN THE STOMACH, PALE COUNTENANCE, FETID BREATH, AND IRRITATION OF THE NOSTRILS.

THE worms that chiefly infest this region, and produce these symptoms; may be arranged under the following varieties:—

α Ascaris lumbricoides.	Long round-worm.
β Trichocephalus.	Long thread-worm.
γ Tænia solium.	Long tape-worm.
δ Tænia vulgaris.	Broad tape-worm.
ε Fasciola.	Fluke.

The head of the LONG ROUND WORM is slightly incurvated, with a transverse contraction beneath it; mouth triangular; body transparent, light yellow, with a faint line down the side; gregarious and vivacious; from twelve to fifteen inches long. In habits principally the intestines of thin persons, generally about the ileum, but sometimes ascends into the stomach, and creeps out of the mouth and nostrils: occasionally travels to the rectum, and passes away at the anus.

This animal will sometimes remain so quiet in its proper region, as to give no signs of its existence but by its discharge. Frequently, however, it is a troublesome and mischievous intruder, producing an intolerable feeling of faintness, great emaciation, and most of the symptoms enumerated under the specific definition. In its general appearance it bears so striking a resemblance to the earth-worm (lumbricus *terrestris*, Linn.) that by many naturalists it has been regarded as the same. Yet, to an attentive observer, there is a considerable difference both in their form and movements. The body of the intestinal worm is round, its colour is a pale red, its head is furnished with three vesicles placed triangularly, and, in moving, it curls its body into circles, from which it extends its head. The earth-worm is flat towards the tail, and has bristles on its under-side which it can erect at pleasure. Its colour is dusky red; its head has but one vesicle, and it moves by a continuous course of action propagated from ring to ring

The body of the LONG THREAD WORM is, above, slightly crenate; beneath, smooth; finely striate on the forepart; head obtuse, and furnished with a slender retractile proboscis; tail or thinner part twice as long as the thicker, terminating in a fine hair-like point, about two inches long; in colour resembles the preceding: gregarious, and found chiefly in the intestines of sickly children; generally in the cœcum. It is found also in many animals besides man, as the horse, boar, fox, and mouse. Goeza considers the proboscis as the male organ.

In the LONG TAPE WORM the articulations are long and narrow, with marginal pores by which it attaches itself to the intestines, one on each joint, generally alternate; ovaries aborescent: head with a terminal mouth surrounded with two rows of radiate hooks or holders; and a little below, on the flattened surface, four tuberculate orifices or suckers, two on each side: tail terminated by a semicircular joint without any aperture: from thirty to forty feet long, and has been found sixty. Inhabits the intestines of mankind generally at the upper part where it feeds on the chyle and juices already animalized. Is sometimes solitary, but commonly in considerable numbers; and adheres so firmly to the intestines that it is removed with great difficulty. It is said to have a power of reproducing parts which have been broken off; but this assertion wants proof. The animal is oviparous, and discharges its numerous eggs from the apertures on the joints. The broken-off joints have, when discharged, the appearance of gourd-seeds: and it is hence denominated gourd-worm by many medical writers; and is the lumbricus *cucurbitinus* of Dr. Heberden. In the collections of the Medical Society of Copenhagen, Dr. Sibbarngaard gives the case of an adult female patient who was infested with a tape-worm of enormous length, measuring not less than thirty-eight yards, or one hundred and fourteen feet. It was expelled from the anus

after taking three doses of a bolus, consisting of two drachms of tin filings and half a drachm of jalap mixt up with honey.*

The articulations of the BROAD TAPE-WORM are short and broad, with a pore in the centre of each joint, and stellate ovaries round them: body broader in the middle, and tapering towards both ends; head resembling the last, but narrower and smaller; tail ending in a rounded joint. Like the last, inhabits the upper part of the intestines, and feeds on the chyle; from three to fifteen feet long; usually in families of three or four.

The body of the FLUKE is flattish, with an aperture or pore at the head, and generally another beneath; intestines flexuous; ovaries lateral; hermaphrodite, and oviparous.

Of all intestinal worms this is one of the most common to animals of different classes. It is sometimes, though rarely, found in man;† but in different species, or under different modifications, we meet with it very frequently and very abundantly in quadrupeds of almost all kinds, reptiles, fishes, and even in worms themselves of a larger growth, for it is occasionally met with in the intestines of the cuttle-fish. Its ordinary seat is in the stomach or alvine channel; but in swine, black-cattle, deer, and sheep, its favourite haunt is the liver, to which it probably creeps forward through the bile-ducts, and where it burrows and breeds in innumerable hosts. This is particularly the case with the fasciola *hepa'ica*, as it is called by way of emphasis, found so commonly and so abundantly in the liver of sheep that labour under the disease called the rot; though whether it be the cause or the effect of this disease, has not yet been ascertained. Most probably the effect: for the rot is certainly an infectious complaint, and is sometimes caught by a whole flock in a single night. The cause has been supposed to be hydrogenous gass; but of this we have no proof. There can be little doubt, however, that it is produced by some deleterious miasm in the atmosphere originating in the pasture itself, or conveyed there in the form of a haze, in the same manner as vegetable plantations are often blighted, of which I have just offered an example from hop grounds. Yet by what means the liver of sheep rather than any other organ is hereby debilitated and rendered gangrenous, we have still to inform ourselves. As the animal is oviparous, the minute eggs may be borne by the haze itself, or exist in the stagnant atmosphere of the sheep-ground; or they may already, in the body of the parent-worm, be infesting the alimentary canal, and only waiting for accidental circumstances to exert the full range of their prolific powers. For it is not in the rot alone, but in other cases of visceral diseases, that this animal is traced in sheep, and especially in dropsy, whether connected with the rot or not; and in both diseases they are frequently found vomited up in brooks.

As the treatment of all the species should be established on the

* Societatis Medicæ Havniensis Collect. Vol. II. 8vo.

† Doever, Verm. p. 54. Clerk, Lumbric, p. 119.

same principle—that of invigorating the alimentary canal and surrounding viscera,—and the vermifuges adapted to many of the different tribes, though not to all, are the same, it will be better to reserve this subject till the nosological characters of the remaining species have passed in review before us.

SPECIES II.

HELMINTHIA PODICIS.

Anal Worms.

WORMS, OR THE LARVES OF INSECTS EXISTING, AND FINDING A PROPER NIDUS WITHIN THE VERGE OF THE ANUS, EXCITING A TROUBLESOME LOCAL IRRITATION, SOMETIMES ACCOMPANIED WITH TUMOUR; FREQUENTLY PREVENTING SLEEP, AND PRODUCING PAIN OR FAINTNESS IN THE STOMACH.

UNDER this species are included the following varieties:

α	Ascaris vermicularis.	Thread-worm. Maw-worm.
β	——— Scarabæus.	Beetle-grubs.
γ	——— Œstrus.	Bots.

The head of the THREAD-WORM is subulate, nodose, and divided into three vesicles, in the middle of each of which is an aperture by which it receives nourishment; skin at the sides of the body finely crenate or wrinkled; tail finely tapering and terminating in a point; the female has a small punctiform aperture a little below the head, through which it receives nourishment: gregarious; viviparous; about half an inch long; sometimes wanders into the intestines, and occasionally as high as the stomach.

The sexes of this variety are distinct, but the male organs have not been discovered. The animals are of a yellowish white colour, and have a general resemblance to the *ends of threads* cut off, and about half an inch in length, whence the name of THREAD-WORMS and probably of BOTS, which is often but erroneously, applied to it, and which I suppose to be a corruption of the French *bouts*, "ends" or "extremities." The term MAW-WORM, according to Dr. Harvey, is derived from the occasional visit which this animal makes to the maw or stomach in migrating from its proper region, which is the rectum;* but, more probably, from the peculiar effects which it often produces on the maw or stomach by sympathy and without

* On Consumptions.

quitting its home, as a perpetual and gnawing pain and insupportable faintness from the intolerable itching it excites in the anus. Sometimes these worms wander in a different direction, for they have been found in the pudenda. Very generally, however, they remain quiet and inactive, convoluted in mucus and feces, and are only known to exist by their discharge. Yet occasionally they produce so much irritation as to cause a sensible tumour, or a congeries of small tumours around the anus.

The larves of the second variety embrace several species of the SCARABÆUS or BEETLE,* which have not hitherto been accurately described, or enumerated; but of which the following seem to be the chief: grey larve, with yellowish legs and ferruginous head, of s. nobilis; and those of s. Schœfferi and s. volvens, which, when out of the body, deposit their eggs in round balls of animal dung, which they roll up and bury with their hind feet. Almost all the grubs of the genus Scarabæus delight in, and feed on dung; and hence the eggs find a convenient nidus and the grubs a ready supply of food in the rectum, when accident has conveyed the former into this organ. These grubs have six feet; are annulate, hairy, vesicular at the end of the abdomen, and furnished with a horny head.

The larves of the ŒSTRUS, BREEZE, or GAD-FLY, are called bots, and are of a round figure; pale-green; tail obtusely truncate; head tapering; mouth horny, with two lips, and two recurved black claws on each side of the mouth. Found convoluted in the mucus and feces of man, but far more frequently of other animals, and especially of the horse.

The genus œstrus is not numerous, containing in all not more than twelve species. Of these the greater number deposit their eggs on the skin of animals, and are there hatched. The œstrus *ovis* fixes them on the interior nostrils of the sheep; from which, when hatched, they travel into the frontal sinuses or horns, and, when full fed, are discharged through the nostrils. They excite great irritation, often compelling the sheep to shake their heads violently, and rub or hide their noses in dust or gravel, and sometimes produce inflammation in the brain.

There are three species, however, whose larve seem only capable of being hatched in the intestinal canal. These are œstrus *equi*, œ *hæmorrhoidalis*, and œ. *veterinus*. The eggs of the last are found deposited on the skin of cattle in general, and all on the skin of the horse: the part of the horse preferred by the hemorrhoidal breeze, being the lips. The eggs excite a troublesome titillation, which induces the animal to bite the part and lick it with its tongue, in consequence of which the eggs are transferred from the skin to the tongue itself, and find a ready conveyance to the rectum, which is their proper nidus.

It is the hemorrhoidal breeze, whose eggs are chiefly, if not solely, hatched in the human intestines, and especially those of grooms

* Paulini, Cent. IV. Obs. 8. Timæus, Cas. p. 120.

and other persons whose duty leads them to associate much with horses, and other large domesticated quadrupeds. And it is the grubs or larves of this genus, when discharged from the anus, that constitute the proper *Bots* of veterinary writers, though the term is often misapplied to the ascaris *vermicularis*, as observed already, to which, indeed, they have some resemblance.

SPECIES III.

HELMINTHIA ERRATICA.

Erratic Worms.

WORMS, OR THE LARVES OF INSECTS INTRODUCED BY ACCIDENT, AND WITHOUT FINDING A PROPER HABITATION IN THE STOMACH OR INTESTINES; PRODUCING SPASMODIC COLIC WITH SEVERE GRIPINGS; AND OCCASIONALLY VOMITING OR DEJECTION OF BLOOD.

Of this subdivision we know but little: yet the ensuing instances may afford sufficient reasons for forming it. It might easily be enlarged; but the authorities for extending it further are doubtful.

α Gordius.	Hair-worm.
β Hirudo.	Erratic leech.
γ Musca.	Maggots.

The gordius is the seta equina, or horse-hair worm, of the old writers. It is found in soft stagnant waters: from four to six inches long, twisted into various knots and contortions; colour pale brown, with dark extremities.

This disease is most frequent among the peasants of Lapland, and was suspected by Linnéus, and has been since proved, or thought to be proved, by Dr. Montin, one of his most celebrated disciples, to be occasioned by their drinking the half-putrid water of stagnant marshes or ditches inhabited by the gordius. It is not known on the Lapland mountains. The gripings are often so violent, that the patient rolls and writhes on the ground in severer agony than a woman in labour, and discharges bloody urine. After many hours, sometimes an entire day, the disorder terminates in a profuse pytalism, that continues for a quarter of an hour. The Laplanders call the disease *Ullen*, or *Hotme*.*

The second variety includes several species of the LEECH, swallowed, when minute and young, along with the muddy and stagnant water they inhabit.

* Linn. Flor. Lap. de Angelica. Montin, Amœn. Acad. Splachnum, ii. 26.

Apparently both the medicinal and the horse-leech, (h. *sanguisuga*) have been thus found; but the exact species has not been sufficiently indicated. Sauvages, in his genus Hæmatemesis, quotes Galen, Schenck, and Wedel, but does not describe the species. Upon turning to Galen, iv. 411. D. the reader will find that he briefly adverts to the disease, and quotes from Asclepiades and Apollonius the remedies that were employed in their respective days: but he does not characterize the worm.

Of helminthia, from this cause, we have numerous examples in foreign writers and journals;* but we need not travel from our own country for instances. Of domestic examples, several are related in the comment to the volume of Nosology; and, though apparently, well attested, are of a truly marvellous character. The fact appears to be, that, from fixing on the internal tunic of the stomach, or intestines, these worms riot on so rich and plentiful a repast, that they grow to an enormous size, and evince such a deviation from their common shape, as in some instances to be recognized with great difficulty. It is highly probable, however, that they can only live in dyspeptic patients, or persons whose digestive powers are infirm: for there are few or no animals capable of resisting the solvent power of the gastric juice when secreted in full health and vigour.

One of the most extraordinary instances among those entitled to attention, is related by Mr. Paisley in the Edinburgh Medical Essays.† In this case, there were two worms, whose heads the author compares to that of the horse-leech, and which appear to have been tolerably quiescent in their growth, till the general system was disturbed by a wound on the breast received by the patient in consequence of a duel with the small sword. The general symptoms of this species of helminthia appeared about the third day afterwards, and continued with many variations for several weeks, when the patient discharged inferiorly one of these worms, measuring a foot and a half in length, and an inch and a half in diameter, dead, but full of blood, and accompanied by a large dejection of grumous blood, "to appearance some pounds;" and not many weeks afterwards, the other still larger. A worm, apparently similar, is stated by Dr. Bond of Philadelphia, 1754, to have been discharged downwards by a female patient of his, who had been long subject to an hepatic disease, which gradually changed to violent helminthic symptoms in the stomach. These, at length, suddenly vanished, and within twenty-four hours the worm was dejected, dead, and in two parts, the whole making twenty inches in length. The patient died soon after; and on opening her, this worm appears to have worked its way, when small, into the liver by the course of the common duct, to have committed great depre-

* Eph. Nat. Cur. Cent. VII. Obs. 25.—Rhodius, Cent. II. Obs. 72.—Blancard, Collect. Med. Phys. Cent. I.

† Vol. II. Art. XXVI.

dation here, and afterwards, with considerable difficulty and dilation of the duct, to have travelled back again. Dr. Bond ventures to call it an *hepatic leech:* though he calculates its course as now stated.*

The third variety consists of the grubs of different species of that subdivision of the genus MUSCA, or FLY, whose sucker is possessed of a single bristle without a sheath, and short; clavate, furnished with a lateral hair. These deposit their eggs in game and other meats that have been long kept, and are approaching a putrid state, as musca *carnaria*, or flesh-fly; m. *vomitoria*, or blow-fly; m. *cibaria*, or pantry-fly; or perforate and lay their eggs in cheese, bacon, hams, or other salted and high-tasted viands, as m. *putris*, the larves of which are known to the housewife by the name of *hoppers*, as those of all of them are by that of *maggots;* which last has often, though in a looser sense, been applied to the grubs of insects generally.

From the deposite of the eggs of these species of the fly in so many branches of the common food of man, there is no difficulty in conceiving how they may pass into the human intestines. In a sound state of the stomach, indeed, we have little reason to believe that they could be hatched and live in that organ: but they may find a convenient nidus, and live comfortably in a debilitated stomach, and apparently through the entire range of the intestinal canal.

The cases of this affection are numerous. One of the best related is that of Dr. White in the Memoirs of the Medical Society of London. The patient, aged thirty, was emaciated, of a sallow complexion; had gripings and tenderness of the abdomen; costiveness, rigors, and cold extremities. Took columbo root, and occasionally calomel and other purgatives. In a month was better, and the appetite good. The next purgative brought away an immense number of pupes or chrysalid worms; some of which, being preserved, were transformed into the musca *cibaria*.

We have also examples of the larves of other insects that have entered the stomach by some accident or another. Thus Mr. Church, to whose entomological skill Dr. White confided the examination of the above paper, asserts, that he once knew a child discharge a larve of the caddy insect (phryganea *grandis*; and that the phalæna *pinguinalis* lives and is nourished in the stomach; and, after sustaining several metamorphoses, is thrown out, and proves its proper genus.† Mr. Calderwood has published a like case;‡ Riedlin, examples of other fly-maggots;§ other writers, of the larves of the bee discharged by the anus after violent gripings;‖

* London Med. Observ. and Inq. i. 68.
† Vol. II. ‡ Edin. Med. Com. IX. 223.
§ Cent. III. Obs. 85.
‖ Obs. Med. Cur. de excretione vermis nunquam ante excret. Wolffen. 1723.

while Planchon describes a live spider thrown forth from the same opening.*

Weikard gives an instance of a triton *palustris* discharged by vomiting;† and many of the continental writers have examples of rejection by the same passage of the lacerta *aquatica*, unquestionably swallowed when minute and unperceived, with the water obtained from ponds and lakes.‡ In one instance not fewer than five of these were thrown back at a time.§

To all these will apply the remark I have already made upon a single variety; that they appear, from the luxuriance of their haunts and repasts, to be in various instances peculiarly enlarged, and altered from the structure they exhibit out of the body:‖ whence the great difficulty of determining in many cases the exact external species to which a larve, worm, or animalcule found within the animal body may belong. Yet of all the erratic worms and grubs, the horse-leech, hirudo *sanguisuga*, appears to undergo the greatest metamorphosis: and, as observed in the comment to the Nosology, is reported, in one instance to have reached the size of a man's first, and to have contained a pound and a half of blood.

GENERAL DIAGNOSIS AND TREATNENT.

We have had occasion to observe that the stomach is the great organ of sympathy, and associates in affections of the most remote parts of the system. It follows necessarily that other parts of the system must, in various instances, associate in affections of the stomach. This is particularly the case with respect to the irritation produced by worms, and especially those that exist in the stomach itself, or the upper part of the alvine canal, as lying nearest to it.

"The evils¶ which hence arise," says Dr. Heberden, who has well drawn up the general train of symptoms, "and which cease on their expulsion, are head-aches, vertigo, torpor, disturbed dreams, sleep broken off by fright and screaming, convulsions, feverishness, thirst, pallid hue, bad taste in the mouth, offensive breath, cough, difficult breathing, itching of the nostrils, pains in the stomach, nausea, squeamishness, voracity, leanness, tenesmus, itching at the anus towards night, at length dejection of films and mucus. The broad tape-worms produce the severest mischiefs on the body;

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* Journ. de Med. IV. p. 203.

† Vermichte Schrifter, IV. 127. Kl. Schrift. p, 82.

‡ Journ. de Medicine. Tom. IX. p. 447.—Schwarz, Med. Wockenblatt. 1780. No. 27.

§ Observ. Med. Cur. de excretione vermis, &c. ut supra. Wolffenb. 1723.

‖ Bremsur, Ueber lebende Wurmer in lebenden Menschen.

¶ Mala, quæ ex his oriuntur, quæque his expulsis finiuntcr, sunt dolores capitis, vertigo, torpor, somnia, &c. Cap. LIX. p. 243.

the teretes and ascarides (round and thread-worms) sometimes lurk scarcely suspected, unless there is itching of the anus, or they are traced in the feces. I have seen a broad tape-worm expelled from the intestines four ells in length. The long tape-worm (lumbricus *cucurbitinus*) seems to be a series of many worms, a single joint of which will sometimes live when separated from the rest. The round worms have ascended into the mouth, and have even lived two or three days after they have been discharged. In two patients under my care there was room for suspecting that the gourd-worm had induced epileptic fits, mania, and idiotism."

Upon this passage it is only necessary to observe that the long tape-worm, tænia *Solium*, or, as Dr. Heberden calls it, lumbricus *cucurbitinus*, is not a series of many worms, as this elegant writer suspected, and as, indeed, is generally suspected at present; and although its different joints, when separated from the rest, are capable of maintaining for a short time an independent life, they neither continue alive long, nor are competent to produce any increase. They have, however, been sometimes found alive at the time of expulsion.

There are other mischievous effects than Dr. Heberden has here pointed out occasionally to be traced in remote organs, from the sympathetic action of worms lodged in the intestines. Thus the lungs, as well as the brain, have frequently been found to participate in the disease, and at times the uterus; and a profuse hemorrhage has ensued from the one or the other organ, and very frequently from the nostrils, and been repeated at uncertain intervals, in some instances without any suspicion of the real cause, and consequently with an erroneous practice. Mr. Rumsey, of Beaconsfield, has published an instructive paper upon this subject,* in which various cases of sympathetic hemorrhage and pulmonary affection seem to have been relieved by an anthelmintic course.

There is yet great space for improvement in the mode of treating this complaint. The larger worms unquestionably are found most frequently in young persons, or persons of weakly and inelastic fibres, and dysthetic habits; and hence our first intention should be to invigorate the system generally, and the stomach and intestines particularly, by bitter and other tonic medicines: for it is not often that they resist a very strong living action. And yet I have sometimes found the long round worm in persons who have made no complaint of ill health, of regular habits, and in the middle of life. And it is a known fact, that they have occasionally infested the alvine channel for years without any serious evil—the ascarides, indeed, as Dr. Heberden informs us, for thirty years, or even for the whole of a long life, without any reason to suspect that they had hastened its end;† whence some writers have been fanciful enough

* Transact. of the Medico-Chir. Soc. Vol. IX.

† Transact. of the College of Phys. of London, Vol. I. p. 54.

to conceive, that, in animals of most genera, they form a mean of maintaining the general health, and are a regular part of the economy of perfect life. "Worms," says Dr. Parr, "seem to form a part of a healthy constitution, and are scarcely injurious but from accidental circumstances." This quaint though common paradox, however, is somewhat shaken by the doctrine contained in the next paragraph; in which a very unnecessary and untenable distinction is drawn between the law which in this respect regulates animals and vegetables; and followed up by a remark at variance not only with general observation, but with the import of Dr. Parr's own reasoning upon the subject. "This circumstance," says Dr. Parr, "forms a striking distinction between animals and plants. Parasitic animals attack only debilitated plants: but the healthiest animals are chiefly affected with worms; and the observations which seem to contradict this, arise from a neglect of the distinction between the existence of worms and their *appearing* a source of disease from their *accumulation*. Their formation is assisted by accumulations of mucus; and, consequently, in children, sometimes in cachectic patients, they become *inconvenient*."

Inconvenience is a somewhat gentle term for expressing the fearful host of effects which we have just enumerated from Dr. Heberden, and which Dr. Parr himself has in other places arrayed in form and number quite as appalling. But if this *inconvenience* be mostly promoted by an accumulation of mucus, and if children and cachectic patients be mostly exposed to such accumulation; these worms do not seem, properly speaking, to form part of a healthy, but rather of a weakly constitution; nor can the healthiest be said to be chiefly affected by worms. And the same general law applies equally to animal and vegetable life. In both, the most imbecile are the most affected; and the strongest, when affected, are the least injured, for the very reason that they are the strongest.

The disease called *rot*, in sheep, to which I have already alluded, is a further illustration of this remark. Here the fasciola, or fluke, makes its appearance in prodigious numbers in the liver of the animal, which is sometimes entirely preyed upon and destroyed. Though there is some doubt among physiologists whether this worm be the cause or the effect of the disease, all are agreed that the malady never appears in a wholesome atmosphere, and a strong and vigorous state of health: and it has of late been sufficiently ascertained that tonic stimulants, and especially the stimulant property of sea-salt, whether mixed with the food mechanically or chemically, as in salt marshes, is the best and most effectual mode of cure. The food of merinos, in Spain, is therefore constantly enriched with salt; and Lord Somerville justly attributes the health of his flock, of upwards of two hundred merinos, which he purchased in Spain, to the use which he has for years made of this article on his farm. A ton of salt is the proportion employed annually for every hundred sheep.

One mean, therefore, and perhaps the most powerful in our pos-

session, of getting rid of intestinal worms, is that of strengthening the system generally, and the alvine canal particularly. Our next mean is, the use of what have been called anthelmintic medicines, or those which either destroy worms, or drive them from the body by qualities which torment or distress them. Both these intentions may sometimes be persued simultaneously; and where they cannot from the weakness of the patient, we should commence with the former. A decisive vermifuge process is yet a desideratum in medical practice: for, first, worms lie for the most part so low in the intestines, or are so completely involved in viscid mucus or other slime, that oil of turpentine, tobacco-water, and mercurials, which readily enough destroy them out of the body, seldom go directly home to them when within it; and, next, most of the medicines that promise fairest to produce this effect have a tendency at the same time to weaken the action of the stomach and intestines, and consequently to render them a fitter habitation for such unwelcome tenants.

"So that," says Dr. Heberden, "till some more certain remedy shall be discovered, nothing will be more serviceable than to keep the bowels loose, during which they may be easily submitted to, and by degrees may be safely evacuated."

By having the bowels loose, we prevent the accumulation of the slime in which the worms burrow: and if we have reason to believe that such accumulation has taken place, the best plan is to give active purges, as calomel, jalap, scammony, gamboge, or an intermixture of these, for its removal: and having thus, as far as we are able, exposed the naked bodies of the worms to the action of anthelmintics, we should proceed with the latter without loss of time.

The list of these is almost innumerable; and the very length of the catalogue serves to show us how little we can place a positive dependence, even at the present hour, upon any one of them as a specific.

Anthelmintics may be conveniently divided into two classes. Firstly, those that dislodge and drive away intestinal worms by some mechanical or other external action; and, secondly, those that destroy them by some narcotic or other internal means.

In the former we may rank all the drastic cathartics; all the oleaginous vermifuges, as oil of olives, beech-nuts, castor, and turpentine; sulphur, petroleum, and sea-salt; tin-filings; crude quicksilver, or Plenck's grey mucilage of it; the lunar pill of Boerhaave, formed from a preparation of silver, which may be regarded as a mild lunar caustic; and the bristly down of the pods of cowhage. In the latter we may place the male-fern, hellebore, fetid hellebore, cevadilla, tansy, savine, rue, dittany, tobacco, worm-seed (artemisia *santonica*, Linn.), bark of the bulge-water tree (Geoffroya *inermis*,) and of the cabbage tree (areca *oleracea*); the spigelias, and scabiosa *Indica*. Many of these are hardly worthy of notice: upon those that are, I shall offer a few observations.

Simple purgatives, even the most active and drastic, seem to have little other effect than that of clearing away the mucous and other

viscid materials, in which most of the intestinal worms are fond of burrowing, and thus exposing their naked and tender bodies to the action of other and more direct anthelmintics. Even colocynth, which unites a bitter principle to a cathartic power, and which on this account was for ages regarded as an anthelmintic doubly armed for the field, is now well known to be incapable of poisoning them —as Redi has exposed various kinds of them to a strong decoction of this medicine for four-and-twenty hours without serious mischief.

It is nevertheless obvious, that these medicines have their use, and are in fact of very great importance; and especially in the case of children, whose bowels are more easily loaded with mucus than those of adults, and who, on this account, bear active purgatives with much less inconvenience. In an attack upon worms brisk cathartics should always take the lead.

Upon the oleaginous vermifuges we can place but little dependence, if we except the terebinthinates. Olive and castor oil may be of slight subsidiary benefit, by mixing with the surrounding slime, and removing it by what purgative power they possess; but their chief benefit, if they be serviceable at all, is probably in illining the bodies of the worms, and blocking up their stigmata or respiratory pores: in which view of them they are better adapted for the cure of worms, that infest the stomach and upper intestines, on which they can exert their power at once, and without dilution or chemical change, than for those that take up their habitation lower; and especially for the cure of the long round and the long thread worms, as these are killed more readily than the tape-worms, which often only perish by separate joints. For the cure of vermicular ascarides, or maw-worms and bots, these oils have been used in the form of injections; but we have no decided proofs of any great benefit that has been derived from their use in either way, and they are rarely to be recommended.

The terebinthinate oils are far better entitled to our attention, and appear to act as purgatives upon the bowels, and external irritants upon the worms exposed to them. The vermicular ascaris rarely resists its use when given in a dose sufficiently large to reach the rectum, or when injected into this organ: and has been discharged in great abundance. The alvine worms, if not equally affected, are nearly so; even the tænias have yielded to its acrimony. The rectified oil of turpentine is that in common use, and was first, I believe, recommended by Dr. Fenwick. It is usually given in doses of from half a drachm to a tea-spoonful to an infant, and from an ounce to an ounce and a half to adults, alone, or with a little peppermint or some other distilled water; though for infants the best medium is milk. These doses, however, may be considerably increased, and will in many obstinate cases be found inefficacious. A child of ten or eleven years old may take an ounce without any evil effect in ordinary cases: but, in delicate habits, a full dose sits uneasy on the stomach, and disquiets the system generally, though in different ways; for it sometimes produces a general chill and pale-

ness, sometimes a tendency to sleep, and sometimes an alarming intoxication.

The subject requires further attention than it has hitherto received; for it is probable that some of the terebinthinate essential oils, while equally deleterious to worms, are less disposed to disagree with the stomach and affect the system, as the Hungarian balsam, or distilled oil of that variety of the pinus *silvestris* which has been called MUGHOS; or the distilled oil of the green cones of the same tree, formerly called oleum *templinum*; and at one time sold at a high price and as a great secret by German itinerants under the name of KRUMMHOLZÖHL.

The petroleum, pisselæum, and animal oil from horns, all of them highly esteemed as vermifuges in former times, possess like virtues, but in a subordinate degree, and are more unmanageable in preparing them for the stomach.

Sulphur, the sulphureous and Harrowgate waters, appear to act in like manner: they are double irritants, and probably goad the worms while they stimulate the bowels. But the efficacy of all these is far less than that of the essential oil of turpentine.

Concentrated sea-water, or a briny solution of sea-salt in spring-water, has been recommended from very high authorities, and has been found in many instances highly advantageous. It acts upon the same double principle as the preceding, though probably with more energy. The acrimony of sea-salt is troublesome to every variety of intestinal worms whatever. I have already observed, that it is the best prophylactic against the attack of flukes in sheep, while it gives at the same time a healthy stimulus to the visceral organs; and where leeches, or indeed any of the erratic division of worms or larves, are suspected, we are nearly certain of its proving a ready cure for its effects on the same animals out of the body. In the case of maw-worms, it is better to throw up the brine in the form of an injection; but where these are found to be migrating up to the stomach, it should be taken by the mouth. There is a striking example of the benefit of this treatment in an article published in the Medical Transactions of the College, from the pen of Mr. Leigh Thomas, of Hawarden, Flintshire. The patient is stated to have been reduced to a very high degree of danger, and to have suffered from the disease, almost without intermission, for five years, perpetually wishing for death to put an end to his tortures. He was cured by the accidental recommendation of this remedy of salt-and-water, which was stated to have wrought wonders in a similar case. He accordingly swallowed two pounds the next morning dissolved in two quarts of spring-water: he was vomited and purged violently, but discharged, by both apertures, a prodigious quantity of ascarides involved in mucus. He suffered, at the same time, much from the common effects of so large a portion of sea-salt, and particularly from strangury; but finding that he had now obtained an engine with which to move the invading host, he repeated the same dose a few days afterwards, and with the same effects both

good and bad. In a few days, however, he lost every painful symptom, and gradually recovered perfect health.*

On what the anthelmintic virtue of tin-filings depends is somewhat doubtful: nor can it be regarded as an efficient medicine. Yet Dr. Alston was much attached to it, and especially as a cure for the tænias, and gave it in doses of from two drachms to an ounce in treacle. He ascribed its benefit to a slight combination with arsenic; but it is now fully ascertained that the metal is at least as successful in its purest state; and its effects are generally supposed to be altogether mechanical. This is certainly the case with crude quicksilver; though not with the grey mucilage of mercury, or the lunar pill; which probably stimulate the tender skin of intestinal worms, and especially those that are fond of burrowing in the mildest mucus to some spastic and painful retraction. The last was a favourite vermifuge with Boerhaave; and Baldinger was as fond of the first, and asserts that it is peculiarly efficacious in expelling the long thread-worm.

Perhaps the most powerful and successful of the irritants that act by an external power, is the prickly and pungent down of the pods of the cowhage (dolichos *pruriens*, Linn.,) which has long been held in deserved estimation. This plant is a native of India. One of the first accounts, if not the earliest, published of it in this country, is that of Mr. Kerr, at that time a resident at Patna; it was addressed to the Professors of Medicine at Edinburgh, and was given to the world in the Medical Commentaries.† Its powers as an anthelmintic were at the same time detailed by Mr. Cochrane, whose character of it was soon afterwards fully confirmed by Dr. Bancroft, from long personal observation in South America.‡ After stating the frequency of worms of all kinds in that quarter, and endeavouring to account for it, he adds, that, from whatever cause these worms originate, their number is so great and their power so prolific that the usual remedies are insufficient for their destruction; for which reason the planters in general have been induced to employ cowhage. "Who first suggested it," says Dr. Bancroft, "I know not; but its efficacy is indisputable. The part used is the setaceous hairy substance growing at the outside of the pod, which is scraped off and mixed with common syrup or molasses into an electuary: the dose, a tea-spoonful to a child, and double to an adult, in the morning fasting, and repeated the two succeeding mornings, after which a dose of rhubarb is usually subjoined." The planters in this manner commonly give it once in three or four months to their slaves in general, and especially the children of their slaves; and the author tells us that he has known it thus administered to hundreds from one year old and upwards. The

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* Med. Trans. of the Col. Vol. I. Art. IV. p. 54.

† Vol. II. p. 82, 202.

‡ Essay on the Natural History of Guiana, London. 1770.

patients, after the second dose, usually discharge an incredible number of worms, mostly the long round and the long thread worm, amounting to more than twenty at a time, the stools consisting of hardly any thing else. And irritating as these spiculæ are to our own skin, when involved in the viscid materials with which they are mixed up, they do not seem to form an inconvenient medicine; and Dr. Bancroft never saw any evil produced by it. Of its effects upon the vermicular ascaris, he says, he cannot speak, as he has not seen it tried for this variety of invermination. For this last purpose the best mode of employing it is in the form of mucilaginous injections. It was a favourite medicine with Dr. Macbride, who has warmly recommended it.*

Of the vermifuges that seem chiefly to operate on worms by attacking them internally, and to expel them by destroying their life, it may be observed that almost all of them possess great pungency and bitterness; but that those which have obtained this character, and are bitter alone, are but little entitled to it, and are only of use when combined with some acrimonious irritant. We have already remarked, that even the intense bitter of the colocynth does not destroy worms: and Dr. Cullen judged the same respecting the seeds of the artemisia *santonica*, from their repeated anthelmintic power, vernacularly called WORM-SEED, so warmly espoused by Baglivi, and supposed at one time to be a specific against the long worm. "It is said," says Dr. Cullen, "to be the lumbrici teretes (the long round-worm, ascaris *lumbricoides*, of the present system) to which they are especially adapted; but, from Redi's experiments, it appears that bitters are not an immediate poison to these animals; and Professor Murray properly observes, that "if the semen santonicum (worm-seed,) according to Baglivi's experiments, operates more quickly, it must be by something else than its bitterness that its seed operates. I am uncertain if I have ever been possessed of the best kind of this seed; but must say, that what I have seen has hardly ever appeared to me to be a powerful medicine."† So far as my own observations extend, I can confirm this opinion. But the seeds are so often adulterated with those of other plants, and especially those of southern-wood, that it is difficult to speak with precision.

The same remark may be made in respect to tansy, savine, rue, bastard dittany, or fraxinella (dictamnus *albus*, Linn.,) and not the dittany of Crete, which is an origanum, the seeds of the chenopodium *anthelminticum*, or worm-goose-foot, angelica, and many other leaves and seeds of slighter efficacy, which have had their day, and are forgotten; some of them undeservedly so. They have all more or less a bitter principle in combination with some acrid quality which exacerbates the energy of the bitter, and renders it doubly obnoxious to these internal parasites. Linnéus asserts the angelica (angelica *archangelica*) to be peculiarly serviceable in ex-

* Introduction to the Theory and Practice of Medicine.

† Mat. Med. Part I. Chap. II. p. 62.

pelling the gordius, or hair-worm; and that it is in common use for this purpose in Lapland, where this variety of vermination is indigenous.

On what ground assa-fœtida is to be held as an anthelmintic, I do not exactly know. Hoffman regarded it as one of the most powerful medicines in the vermifuge class; and Dr. Cullen tells us that he has no doubt of its being entitled to a place in the class, though he confesses that he has seldom found it effectual; which, however, he imputes to our not having it in so recent and diffusible a state as were to be wished. It is very probable, indeed, that it loses much of its virtues with the loss of its freshness; for Kœmpfer informs us, from his own observation, that a single drachm of the recent juice smells stronger than an hundred pounds of such as is commonly sold in Europe. Like the preceding medicines, therefore, it is not improbable that whatever anthelmintic virtue assa-fœtida possesses when fresh, depends upon a bitter principle combined with a pungent and volatile aroma.

The hellebores, helleboraster, and cevadilla, which is usually regarded as a species of veratrum, or white hellebore, though the specific characters have not been very clearly ascertained, are pungent bitters united with a strong cathartic power, and are hence very active vermifuges: but they are too violent for common use; for they often do more mischief than the disease for which they are a remedy. The seeds of the cevadilla are so pungent as to be caustic in their pure state, for they are usually contaminated with parsley and hellebore seeds; and are hence often employed in decoction or some other form externally, to destroy bugs, lice, and other vermin. The dose for a child from two to four years old, is two grains; at eight, five grains; from eight to twelve, ten. These are all powerful errhines. Tobacco is possessed of all these qualities, and unites with them a deadly narcotic power. It is hence, therefore, a decisive vermifuge; but from its violence can rarely be used except in injections, in which form it succeeds admirably against the small ascarides.

Gamboge seems chiefly to act as a drastic purgative, bearing down all before it; for though, when held some time in the mouth, it discovers considerable acrimony, it has few pretensions to bitterness. Yet it is said to be peculiarly efficacious in detaching and expelling the tape worm rather than the other kinds, it probably acts also by some specific power with which we are not acquainted.

There are some medicines, however, that may be regarded as specific vermifuges; or, in other words, as acting upon worms, and detaching or destroying by some simple quality which proves highly offensive or poisonous to them without affecting the bowels; and which, therefore, prepare them for rejection by any purge that may be given afterwards: the chief of which seem to be the bark of the shoots of the cabbage tree (areca *oleracea*, Linn.), the bark of the bastard cabbage-tree (Geoffroya *inermis*, Linn.), and the male fern.

The two former are West Indian and American plants, and the barks are employed in the form of infusion, decoction, syrup, and even powder. Both have a mucilaginous and sweetish taste, and the first a disagreeable smell. Their destructive power depends upon no sensible quality: for though, when given in large doses, they will vomit and purge violently, they prove far less anthelmintic in this proportion than when administered in doses that lie easy on the stomach and bowels, and do not pass away with rapidity. By such retardation the worms are exposed to their full influence, and are either killed or rendered sickly, so that it is necessary to take a dose of jalap or calomel, or both, for their removal. The vermifuge is given in the morning for eight or nine days in succession, and the purgative on the day ensuing. From the offensive smell of the Geoffroya, it has also been called bilge-water-tree. It was first brought into notice in our own country, as a common and almost infallible vermifuge in Jamaica, by Mr. Duguid;* and afterwards more fully described and recommended by Dr. Wright.† The decoction is made by boiling an ounce of the fresh-dried bark in a quart of water till it acquires the colour of Madeira wine: the syrup is prepared by adding sugar to the decoction. The former has found a place in the extant Edinburgh Pharmacopœia.

The areca *oleracea* has been long known to the world as a valuable plant, for other purposes than the present. Its medulla, or pith, forms an excellent sago; and its green tops are cut and eaten as cabbages, whence indeed its vernacular name of cabbage-tree. For a knowledge of its virtues as an anthelmintic, we are, however, chiefly indebted to Dr. Rush, who principally tried it in the form of syrup, which is of a pleasant taste, and which he asserts to be an infallible antidote. It is used, he tells us, very generally by physicians in the West Indies; and he himself has employed above thirty pounds of it without knowing it to fail in a single instance. It is especially available against the long worms. It was, antecedently to this, tried at Edinburgh in the form of powder, but relinquished, as too rough and violent a medicine. In that of syrup it is sufficiently mild, and neither purges nor vomits, but in an over dose.‡ Dr. Munro has since introduced it into St. George's Hospital, and in various cases found it successful.§

The filix *mas*, or male fern, is not the only species of the ferns whose roots have been employed as simple vermifuges; for the osmundia *regalis* has acquired, with some practitioners, as high a reputation; but the favour of the public has been so much more extensively bestowed on the former, as to enable it altogether to eclipse the pretensions of its rival. It is very difficult to say on what the destructive power of the male fern over worms, and es-

* Essays Physical and Literary, Vol. II.
† Phil. Trans. Vol. LXXVII.
‡ Edin. Med. Comm. Vol. I. p. 329.
§ Id. Vol. II. p. 97.

pecially the tænias, depends; for, to the taste, it discovers but little activity, and has little or no aroma. It is glutinous, sweetish, very slightly bitter, and subastringent, may be taken in very large quantities, and appears to be incapable of expelling worms, how much soever it may destroy them, without the aid of active cathartics. And hence, many writers of authority, and among the rest Dr. Cullen, are doubtful of its possessing any anthelmintic power whatever.* The German writers, however, give examples of tænias discharged whole, or in long portions, and perfectly dead, after an exhibition of repeated doses of this medicine, where no cathartic whatever was made use of; and Dr. Parr asserts, that he has met with like examples in his own practice. And hence it appears to exercise some poisonous effect on worms, though harmless to the human stomach.

From its want of sensible qualities, however, it has been perpetually varying in its reputation. It was esteemed in the time of Galen and Dioscorides; appears afterwards to have sunk into oblivion; and again rose into reputation in the days of our venerable countryman Gerard, who not only enumerates its virtues, but establishes the dose in which it should be taken. "The roots of the male fern," says he, "being taken to the weight of half an ounce, driveth forth long flat worms out of the belly, as Dioscorides writeth, being drunk in mead or honied water; and more effectually if it be given with two scruples, or two-third parts of a dram of scammony, or of black hellebore. They that will use it," he continues, "must first eat garlick. The female fern is of like operation with the former, as Galen saith."†

After the time of Gerard, it appears again to have fallen into oblivion; till it was once more called into notice by various successful accounts of its utility, published by Messrs. Andry and Marchant about a century ago. It again became neglected in medical practice till about the year 1770, when it was revived in Switzerland and France by the celebrated Madame Nonffler, who, under her own process of using it, boasted of it as a specific; but kept the process to herself. The secret was at length purchased by the king of France, and liberally communicated to the world. The patient, according to M. Baume's statement,‡ after being prepared at night by an emollient clyster and a supper of panada, is, early the next morning, to take three drachms of the fern at a dose, and to repeat it instantly if the stomach should reject it. Two hours after which, he is further to take a bolus, consisting of twelve grains of calomel, twelve grains of resin of scammony, and five grains of gamboge, which, it must be confessed, seems admirably calculated for a triumphant issue in some way or other; for it will, probably, either kill

* Mat. Med. Part II. chap. I. p. 41.

† Hist. of Plants, p. 1130.

‡ Elemens de Pharmacie.—Precis de Traitement, &c. publié par odre du Roi. Paris 1775.

the worm, or kill the patient. It is by no means necessary to give so violent a cathartic.

It is far less difficult to account for the real or supposed specific virtues of the Indian-pinks, or worm-grasses, for there are two species of the spigelia that have been employed for this purpose: s. *Anthelmia*, and s. *Marylandica*; and for those of the Indian scabious shrub, called by the natives cattu schiragaam. These are all acrid narcotics; in large doses, as above two drachms, or two drachms and a half, sometimes purging violently, sometimes producing vertigo, dimness of sight, drowsiness, and clonic convulsions; and sometimes producing all together; and hence the same violent effects being excited, perhaps, in the parasitic worms as in the patient, it is not to be wondered at that they should fall a sacrifice to them, or endeavour to save themselves by a timely and rapid escape. The scabious shrub, however, seems to act more feebly than the Indian-pinks, and is little to be depended upon; while the latter are far too acrimonious for general use.

Before closing the subject, I will just observe, that Dr. Friske, of Brunswick, has lately employed electricity as an anthelmintic, or rather with a view of killing the worms in their mucous domiciles, by passing powerful shocks through the abdomen. He thinks he has, by this plan, destroyed even the tænias; yet he does not chuse to rely upon this practice without the use of active cathartics.

There is also a much milder remedy, that has for some time been adopted in Germany, upon the efficacy of which I cannot speak from personal knowledge, but which is well worthy of attention; and particularly in respect to patients of irritable stomachs and emaciated constitutions; and that is, the use of mare's milk, and particularly in cases of tænia. While this worm appears fond of cow's milk, there are various facts that seem to prove it has a very strong antipathy to that of the mare; and that upon being exposed to its action, it either quits the intestines a few days after its use, in a living state; or, if it remain beyond this period, is expelled piecemeal and in a corrupt condition.

Dr. Kortum, of Stalberg, has related a striking case of this kind in Hufeland's Journal. The patient was a lady, between thirty and forty years of age, whose stomach was in such a state of irritability as to reject whatever vermifuges had hitherto been tried. Having heard of the success of mare's milk, drunk morning and evening when fresh drawn, she took two tea-cups of it one evening, and soon afterwards complained of violent pains in her bowels, which continued till the morning, when she took an additional cup. The pains, from this time, gradually subsided; and in a few days a long piece of a dead and offensive tænia was discharged; and not long afterwards, another piece, with the narrow tapering end of the worm. After this, all the symptoms of disease disappeared.

GENUS XII.

PROCTICA.

PAIN OR DERANGEMENT ABOUT THE ANUS, WITHOUT PRIMARY INFLAMMATION.

THE name for this genus has been taken from Linnéus; Sagar and Macbride have formed a like genus under that of Proctalgia. In the scope in which it is here employed, it will include the six following species; all of them occasionally met with as idiopathic diseases, though several of them are, perhaps, more generally found as symptoms or sequels of other affections.

1. PROCTICA SIMPLEX.	SIMPLE PROCTICA.
2. ——— SPASMODICA.	SPASMODIC STRICTURE OF THE RECTUM.
3. ——— CALLOSA.	CALLOUS STRICTURE OF THE RECTUM.
4. ——— TENESMUS.	TENESMUS.
5. ——— MARISCA.	PILES.
6. ——— EXANIA.	FALLING DOWN OF THE FUNDAMENT.

SPECIES I.

PROCTICA SIMPLEX.

Simple Proctica.

SIMPLE PAIN AT THE ANUS.

THIS, when a primary affection, and unconnected with any other disease, is usually produced by cold, especially by sitting on a damp seat, as a piece of wet timber, a wet fragment of a rock on the sea-coast, or moist grass. Local irritation will also produce it; as hardened and constipated feces, passed with considerable straining, and especially in irritable habits. It is sometimes intolerably severe, and has all the characters of chronic rheumatism.

In the last case, I have known hard local pressure of essential service in diminishing the pain and shortening the paroxysm. On other occasions, it has best yielded to an opiate pill, introduced within the verge of the anus, or to a local warm bath, obtained by sitting in a bidet prepared for the purpose.

SPECIES II.

PROCTICA SPASMODICA.

Spasmodic Stricture of the Rectum.

PAIN IN THE RECTUM REMITTENT, SOMETIMES INTERMITTENT; INCREASED DURING EXPULSION OF THE FECES; VOLUME OF THE FECES SLENDER BUT VARIABLE; RIGID GRASP OF THE SPHINCTER ON INTRODUCING THE FINGER; STRUCTURE OF THE BOWEL SOUND.

STRICTURES of the rectum are produced by a spasmodic contraction of its sphincter muscles, or by a thickening and induration of its coats. The first forms the species before us: it is the simplest, and least formidable of the two affections, though generally very obstinate; it also occurs by far the least frequently, and has hence attracted but little of the attention of medical writers. The second, which often terminates in a scirrhous disease, will be found to constitute the next species.

The glandular structure of the rectum renders it peculiarly irritable, and the natural arrangement of the fibres of its sphincters, give it an habitual tendency to contract. It is hence easy to conceive, that any undue stimulus may excite an inordinate degree of contraction in the sphincters, which may be propagated to a greater or less degree of ascent through the muscular tunic of the bowel. This inordinate action will, at first, be disposed to cease on a cessation of the stimulating cause; but if the stimulating cause be frequently repeated, or of long duration, the contraction may become permanent, and continue to exist after the cause has been removed.

A like predisposition to inordinate and permanent contraction may take place, as Mr. Copeland has ingeniously remarked,* from the peculiar structure or peculiar extent of the sphincter fibres in particular individuals. Anatomists have not come to an unanimous agreement, whether these fibres, issuing from the exterior and the interior surfaces of the extremity of the rectum, and freely decussating and intermixing in its substance, be two distinct muscles, or only a single one. The older anatomists seem to have been of the latter opinion; Dr. Baillie, M. Petit, and M. Portal speak of them, and describe them as distinct sphincters. Be the fact as it may, we sometimes find, that the two layers of fibres do not act correspondently, and that the contractile power of the one follows, instead of keeping pace with, that of the other, or evinces some other mode of inaccordancy, so that the entire muscle is seldom left in a state

* Observations on the principal Diseases of the Rectum and Anus, Sect. IV.

of perfect rest and relaxation. And we also find, that in some individuals, even where the action is harmonious, the contractile organ is too broad or two powerful to be overcome by the expulsory power of the abdominal mucles; and, consequently, that the feces are expelled less frequently and less freely than they ought to be; whence a habit of costiveness is induced, and the confined excrement, becoming acrimonious by its lodgement, forms a permanent source of irritability, and is constantly augmenting the contractile propensity.

Any other local irritation, under such an irregularity of muscular structure, must have a like effect: as a daily use of acrid purgatives, in small quantities, with a view of counteracting costiveness; irritable caruncles, or excrescences at the verge of the anus; a turgescent, and especially a varicose state of the internal hemorrhoidal vessels. And even where there is no such irregular construction of the sphincters as we are now contemplating, any of these accidental sources of stimulus, in a debilitated and irritable habit, or a debilitated and irritable state of the alimentary canal, in which all of them are most prone to occur, may lay a foundation for the same complaint.

Yet the complaint does not appear to have occurred frequently, though it is probable that it has occasionally been mistaken for the indurated and thickened contraction which forms our next species, and described and treated accordingly. A few cases of it, and only a few, have occurred in the course of my own practice; but as one of these was the lot of a near relation, my attention was turned to it very minutely; and it is from the observations I have hence been induced to make that I have drawn up the specific definition.

Mr. Copeland has favoured the world with some valuable and ingenious remarks upon this disease;* but the only writer who has hitherto, so far as I am acquainted with, distinctly described it, by what may be called a close and full length portrait, is Dr. Baillie;† and, as his account minutely corresponds with what I have been an eye-witness to, I shall avail myself, to some extent, of his words, as containing a more correct expression of the complaint, than any I could hope to offer.

After noticing, that strictures of the rectum are almost constantly produced by a thickening of its coats, in the progress of which ulceration very commonly takes place on the inner surface of the bowel, and the patient is ultimately destroyed, as the ulcer has no tendency of itself to heal, and the art of medicine has hitherto failed in communicating to it any healing disposition; this distinguished pathologist proceeds as follows:—

"Another kind of stricture, however, occasionally occurs in the rectum, much less formidable in its nature, which is very rare, and

* Observations on the Principal Diseases, &c. Sect. IV.
† Med. Trans. Vol. V. Art. IX.

has hitherto been taken little notice of by practitioners. This is not attended with any diseased structure of the coats of the rectum, but depends upon a contraction, more or less permanent, of the sphincters of the anus.

" A good many years ago, a very well marked case of this kind fell under my notice, an account of which it may not be improper to communicate to the College.

" The patient, in whom this disease occurred, had been long subject to an herpetic eruption on his right leg. This suddenly disappeared, and a certain quantity of blood was then daily evacuated by the bowels at the time of passing a stool, for five or six months. When the discharge ceased, there came on a good deal of difficulty in having a motion, which was immediately followed by a considerable sensation of pain in the very lower part of the rectum. This pain generally continued from a quarter to half an hour, and then subsided entirely until the next time of having a motion. When the stools were examined, they were found to be very small in their diameter, to be flattened upon their surface, and to be serpentine or twisted. In the course of the disease, when there was an effort to have a motion, the external sphincter of the anus would sometimes hardly open itself, so that fluid fæces only would escape at such times, and in small quantity; or if any solid fæces were allowed to pass, they were so squeezed by the very narrow aperture of the sphincter, as to become nearly as thin as a ribbon. At other times, the sphincter was much more disposed to open itself, and the stools were then of a considerably larger size, and of a less flattened shape. At no time, however, the motions were of the usual size, or of a perfectly cylindrical form. An examination of the rectum was occasionally made per anum, and the rectum was always found to be so much contracted, as to admit with difficulty the fore-finger. This contraction extended to the upper limit of the internal sphincter of the anus, above which the cavity of the bowel was of its usual size. The internal membrane of the rectum in the contracted part was perfectly healthy. It was soft, and thicker than usual, and moved very readily on the inner surface of the contracted sphincter. The patient was in good general health, looked well in his countenance, was not the least emaciated, and his pulse was of the natural frequency.

" The patient was very averse to the introduction of a bougie, and this instrument was never passed into the rectum. Nothing therefore was done, except keeping the bowels free from costiveness, and pursuing a very temperate mode of living. The disease gradually became very much less, and although it has not altogether subsided, yet hardly any inconvenience is felt from the remaining degree of contraction. It is now nearly 17 years since the commencement of the disease.

" This case is very different in its nature from the usual stricture of the rectum, and it is of considerable importance that it should be distinguished from it in practice. In the one case, the prognostic

would be favourable; and in the other case, it would be generally very much the contrary. Upon a slight degree of attention, the two cases might be confounded, but when accurately examined, they may at all times be clearly distinguished from each other. In both cases, the fæces will be found to be flattened in their shape, small in their size, and in some degree serpentine or twisted; but the other symptoms will be found to be very different. In the common stricture of the rectum, the situation of the stricture is generally two or three inches above the outer sphincter, and there is a sound capacious portion of the bowel between the stricture and this sphincter. At the seat of the stricture, the coats of the rectum are felt to be more or less thickened, and not uncommonly, in the cavity of the stricture, there is a hard irregular ulcer. Although this disease has in its early stages little influence upon the constitution, yet when it has made a further progress, the powers of the constitution become very much weakened, great emaciation generally takes place, and the patient is destroyed. In the other species of stricture, produced by a contraction of the sphincters of the anus, the contraction is found upon examination to be at the anus, or very lower extremity of the rectum, the inner membrane of the rectum is discovered to be sound, and the general health is not impaired."

The case, to which I have alluded above as having occupied a great share of my own attention, occurred in a young person, who, on its commencement, was about nineteen years of age. The symptoms were precisely those described above, excepting that it was preceded by a sluggish state of the bowels, which induced a habit of taking aloetic pills without proper advice; and, by degrees, excited on the verge of the anus a ridge of carunculate piles highly irritable and distressing; but which, from delicacy, were not attended to as early as they ought to have been. It was now, that any considerable degree of pain was for the first time expressed upon passing evacuations, and the feces assumed a much narrower calibre than is natural. The excrescences were carefully removed by my excellent friend, the late Mr. Ware; the mariscal distress ceased, and the discharged feces were of a larger volume. But some accidental irritation soon renewed the spastic action of the sphincters, and there was not only great pain felt during the expulsion of the feces, but a considerable degree of soreness, and even of troublesome heat, afterwards, so as to render both sitting and walking inconvenient, and sometimes almost impossible. On examination, the forefinger was admitted with the greatest difficulty, and with a re-active compression that was painful to the finger itself. Yet, with this exception, the intestine felt perfectly healthy; the internal membrane, upon the contracting muscles themselves, was moveable, smooth, and unthickened, and all was perfectly sound above the upper limit of the inner sphincter.

The disease still continues, and has now continued for nearly six years with little variation, or disturbance of the general health: the patient being sometimes able to use a little exercise without much

discomfort, and to have motions of a larger diameter, and appearing to be suddenly getting better; and sometimes, without any obvious cause, subject to considerable exacerbations, during which some degree of inflammatory action throughout a considerable extent of the intestine has appeared to take place, accompanied with that species of diarrhœa, which in the present arrangement is denominated *tubular*, and consists in the discharge of whitish, viscid, and membrane-like tubes, sometimes with lax feces, and sometimes by themselves.

Bougies of all sizes and descriptions, from the soft and unctuous tent of Desault to the stiff paper rollers of the present day, were tried in succession. With no small degree of heroism the patient has sometimes succeeded in introducing the latter, of the largest bore and of nearly fourteen inches in length, and has let them remain in the rectum for an hour at a trial, repeating the introduction daily for a month at a time. Yet the spastic constriction, though thus mechanically overcome during the experiment, has recovered its force with little difference as soon as the bougie has been withdrawn; and the same or nearly the same painful straining has been encountered in dislodging the feces from the rectum. It is, nevertheless, singular, and very clearly proves the nature of the contraction, that whenever the sufferer has laboured under any general disease of a violent kind, as at one time an inflammation of the brain, and at another time a synochus, the constriction has altogether ceased, and the feces have been discharged of a natural calibre, without more than the ordinary expulsive power.

During the six years which have elapsed since the commencement of this obstinate complaint, almost every plan has been tried and duly persevered in that the judgment of many of the most skilful surgeons within and without this metropolis could suggest; in every instance without advantage, and in several with an evident increase of violence. At one time, when at a considerable distance from town, and without my knowledge, a circle of tubercles were supposed to be felt on the surface of the membrane that covers the inner sphincter, and it was added that the actual cause of the irritation was now fortunately detected, and that a removal of these would be certain of producing a radical cure. I have reason for believing that this supposed discovery was a most unhappy mistake, and that the imaginary cluster of tubercles was nothing more than a puckering of the inner membrane produced by the laxity of its texture in consequence of the narrowness of the passage itself. The proposed operation, however, was courageously submitted to; but instead of being followed by the cure and comfort that were predicted, it was followed by a most violent aggravation of all the symptoms, particularly on every attempt at evacuation, and with an extension of the spasmodic action to the bladder, so as to produce a most formidable retention of urine; which continued more or less till the wound healed, which, under the irritable condition of the organ, it did with difficulty.

Bougies have again been tried since, but with less facility of introduction than before, and without any apparent benefit whatever. In consequence of which, for the last two years I have advised an entire truce with all mechanical, and indeed all local means whatever; that the bowels should be merely kept in a relaxed state by such mild aperients as may be found to agree best with them; and that the rectum, being thus freed from all artificial irritation, should be left to recover, if possible, a healthy tone of action by tranquillity and quiet.

This plan there has been no reason to repent of; the patient is upon the whole in a progressive state of improvement; the habitual feeling of constriction is less troublesome, and sometimes nearly ceases altogether for hours; the motions pass with less force and less after-pain, and carriage exercise is more easily endured; the canter of an easy pony is the recreation which is found most agreeable; and obstinate as the case has proved, and intractable to the art of healing, I look forward to the day, in which the morbid entony on which the disease depends will subside, and the sphincters become duly pliant.

I cannot, however, but regard the present as an extreme case; and, in those of less violence, should still recommend the daily use of bougies of as large a size as can at first be borne without much inconvenience, gradually increasing them in diameter: for where the resistance is capable of being overcome, this is the most effectual method. In the mean time, vapour baths, or the warm bath of a bidet, may occasionally be used with advantage: and where there are exacerbations of pain, they may often be taken off by small opiate injections, not exceeding an ounce or an ounce and a half in quantity.

In the case above related, little benefit was ever derived from local applications of any kind, whether in the form of vapour, warm water, or cataplasms. It was most unfortunate that opium could not be had recourse to; for in every proportion, whether large or small, it threw out a lichenous rash over the surface of the body, but more especially over the extremities, possessing a heat, itching, and pricking, more intoleable than the prickly heat of the West Indies, and which was almost sufficient to produce madness. From the dilation produced in the orbicular fibres of the iris by a drop or two of infusion of belladonna, I recommended that the bougies, when they were employed, should be smeared with a preparation of the same plant; but no sensible benefit was hence obtained. The belladonna was afterwards employed in the form of pills, each containing a grain of the extract. One of these, introduced into the rectum by a small ivory tube with a piston, that thrust it out when it had ascended about an inch high, was at first employed every night alone; in a few days, night and morning; and then one in the morning and two at night. No effect of any kind was experienced till the dose was thus enlarged; and here all the mischievous results of belladonna were produced, and nothing else. The tongue

swelled, and lost its power; the head was confused and giddy; the mind wandered; and the sight and hearing were obtunded. Having been warned of such possible effects, and the means of removing them if they should occur, the friends of the patient had immediate recourse to the plan laid down; and, by means of copious stimulating and cathartic injections, and cordial draughts, a recovery was accomplished in about twelve hours.

It is obvious, however, that this case was governed by an idiosyncrasy not often to be met with: and hence, notwithstanding the failure both of opium and belladonna in a single instance, I should feel it my duty to try either or both with unhesitating freedom in other examples, and should do it with a strong confidence of benefit. Mr. Copeland informs me, that he has often been successful with the latter; and, in some instances, where every other attempt at relief had failed.

I will just notice farther, that in the above case, after a trial of almost all the aperients in the Materia Medica, the most convenient has been found about eight or ten grains of the black sulphuret of mercury, with about two drachms of sublimated sulphur in addition.

Other cases that have occurred to me of the same complaint have been less painful and far more easily overcome. In a young lady of eighteen, whom I now see only occasionally, and who could never be persuaded to use a bougie, it has given way, after nearly two years standing, principally to a use of the hip-bath for half an hour every morning before she made an effort to evacuate the bowels.

SPECIES III.

PROCTICA CALLOSA.

Callous Stricture of the Rectum.

DIFFICULT AND PAINFUL EXPULSION OF THE FECES; FECES LAX, OR OF INVARIABLE SLENDERNESS; PERMANENT CONSTRICTION FELT BY THE FORE-FINGER ABOVE THE SPHINCTERS; STRUCTURE OF THE BOWEL THICKENED AND INDURATED IN THE CONSTRICTED PART.

A CAREFUL attention to the pathognomonic characters laid down in the above definition, will easily distinguish this species from the preceding, which, though more troublesome in its commencement, is far less formidable in its issue; since the latter, if not timely attended to, is frequently found to terminate in an ulcerated scirrhus, and sometimes a cancer.

The disease for the most part commences its attack so insidiously that the patient has no suspicion of the real nature of the case.

He feels a troublesome costiveness, which he ascribes to almost every thing rather than the real cause, and endeavours to relieve it by various kinds of cathartics. These while they afford temporary relief, add, by the habitual irritation they produce, to the primary and unsuspected malady; and the next symptom, perhaps, is that of piles, or what is so conceived from a varicose state of the hemorrhoidal vessels, and the natural tendency of all mucous canals to evince most excitement at their extremities.

In the mean time the morbid part of the gut continues to thicken and harden in its coats, its bore diminishes in diameter, and the efforts to expel the recrement become more violent. The stools are now of a still slenderer and often of a twisted or serpentine form, and have the appearance of convoluted earth-worms, or butter squeezed by a piston through a confectioner's syringe.

Thus far, however, the constitution suffers perhaps but little; and the patient, to his friends, may appear to be in the zenith of health. But if the rectum be tried by the finger, or a bougie, a morbid change of structure will be perceived, that threatens the most alarming results. The sphincters will probably be found pliable and free from disease, and the part of the gut immediately above them, for two, three, or more inches, will be equally healthy; but the stricture, as soon as it is reached, will, perhaps, scarcely admit the passage of the finger, and oppose its entrance by the semblance of a hard cartilaginous ring; or if it be not thus indurated and rendered scirrhous, it may be studded by a circle of tubercles, or intersected by a net work of membranous filaments. And if a sound or bougie be passed through the neck of the stricture, another stricture may be found an inch or two higher up, and again repeated to the sigmoid flexure of the colon; where perhaps the disease originated, and whence it has worked its way downwards; the colon possessing naturally its least diameter at this point, and the feces being here most easily delayed in their progress, not only from this increased narrowness of the passage, but also from the curved line in which they have to move forward into the rectum.

Whether the stricture be thus complicated or not, the narrower its aperture becomes, the greater the difficulty of passing the recrement, which necessarily accumulates and distends the bowel above; acquires acrimony by retardation; excites eructations and gripings; and occasionally lays a foundation for that species of colic which we have already described, as issuing from this source, under the term Colica *constricta*. The feces can now be discharged only in a fluid state; and there is a sanious oozing from the anus accompanied with a certain degree of tenesmus which is rather troublesome than severely painful.

"At this period," observes Mr. Copeland, who has admirably described the progress of the disease,* abscesses very frequently

* Observations on the principal Diseases of the Rectum and Anus. sect. I. p. 11.

form in the neighbourhood of the anus, and sometimes break into the vagina in the female, and the feces are discharged through the fistulous orifice. In the male, an adhesion takes place with the bladder, and the abscess* discharges itself with the urine, and sometimes feces and wind are voided by the urethra. But more frequently the matter makes its way through the nates, as in cases of common fistula, for which disease it is not unfrequently treated. The patient often continues a long time in this distressing situation, for none of the vital organs are affected; till, at last, worn out with the pain and the discharge, or perhaps a total obliteration of the rectum, he yields to his fate. This is usually the progress and issue of the disease when it is not early discovered; and, I must confess also, sometimes the termination when it is: that is, when the parts are attacked with cancerous ulceration."

All the causes of the preceding species may become causes of the present. The common, in M. Desault's opinion, are hemorrhoids in a violent degree, rheumatism, gout, herpetic and other cutaneous eruptions when they extend or are transferred to the inner membrane of the alimentary canal. To which we may add, an irritable or varicose state of the hemorrhoidal vessels, an unscientific management of fistulous sores about the anus, and extirpation of mariscal excrescences; venereal infection; and a cancerous diathesis.

Where the cause is syphilis, the disease before us is said sometimes to form part of a secondary affection; but of this we have few, if any, decided examples. Yet cases of affection from local irritation, in consequence of a communication of the virus of chancres in the pudendum, or of venereal ulcers in the perinæum, to the rectum, are so common, and so well supported, that it is impossible to deny their existence. And that they are chiefly, if not always, to be traced to this origin, is clear from their occurring so much more generally in women than in men. Wiseman appears to have been the first writer who pointed out this source; and he has since been followed by Petit, Desault, and Richerand.†

The existence of transverse filaments, like that of cancer, is generally preceded by scirrhosity, as remarked in the following passage of Dr. Baillie. The scirrhus "sometimes extends over a considerable length of the gut, viz. several inches; but generally it is more circumscribed. The peritoneal, muscular, and internal coats are much thicker and harder than in a natural state. The muscular, too, is subdivided by membranous septa, and the internal coat is sometimes formed into hard irregular folds. It often happens that the surface of the inner membrane is ulcerated, producing cancer. Every vestige of the natural structure is occasionally lost, and the gut appears changed into a gristly substance." These remarks are

* Petit, Œuvres Posthumes, tom. II. p. 93.

† Nosographie Chirurgicale, Paris, 1808, Tom. III. p. 418.

strikingly illustrated by well engraved figures in the author's Morbid Anatomy.*

Ruysch gives an instance of a schirrhous stricture of the rectum, which produced great agony, and terminated fatally, excited by a stricture in the urethra, in consequence, as he argues, of the violent exertions the patient was incessantly making to evacuate the bladder, which, after all, he was never able to accomplish but by drops. It is highly probable, however, I think, that in this case there was a strumous diathesis, which predisposed the bowel more readily to assume this morbid action, from the excitement produced by the strangury. The patient was his friend; and as the picture is drawn with a masterly hand and much feeling, the reader will thank me for copying it.

"Amicus quidam, flore ætatis, temperamento melancholico, ante triennium in Hyberniam ob negotia peragenda profectus, de mingendi difficultate conqueri cœpit, quæ, brevè, tantum sumpsit incrementum, ut assiduè ad urinam guttatim egerendam invitaretur, idque tanto cum cruciatû et continuo conatû, ut perferre non potuit. Quid fit? Brevè post, alterum non minoris momenti malum, caput quoque exerere cœpit: nimirùm fæces alvinas liberaliter excernendi impotentia, dubio procul ab illis continuis conatibus urinam reddendi, unde intestinum rectum non solùm fuit incrassatum, et scirrhosum factum, verùm etiam in totum ferè coaluit: vix enim ac ne vix quidem, stilum straminis crassitie in universum admittebat, unde miser nec urinam nec fæces alvinas excernere potuit, nisi guttatim, et quidèm continuè ichorosâ et purulentâ materiâ remixtas, cum assiduis, tantisque cruciatibus, ut omnes homines ejus præsentiam refugerent. Denique in patriam redux, contulit se ad Amstelodamum, et me aliosque consuluit, ast incassùm, morbis factis insanabilibus. Hisce malis perpetim incrementa sumentibus, tandèm animam deo reddidit æger, occasionem nobis relinquens malum penitius perscrutandi."†

On dissection, the pelvis of each kidney, and the middle of the right kidney, were found loaded with calculi; the rectum, through its entire length, was nearly of the thickness of the thumb, and so indurated as to render it difficult to say whether the incrassation should be called flesh or cartilage: the canal was not wider than a straw; and so firmly had the intestine adhered to the sacrum, that it could only be separated by a mallet and chisel, the point of a knife having been previously tried in vain.

In the earlier stages of this disease, the steady use of a bougie, firm but not harsh, and lubricated with oil, of a size adapted to the diameter of the stricture, so that it may press against its sides with a force short of uneasiness, will afford, in conjunction with gentle laxatives, the best chance of cure, and has in very numerous instances completely succeeded. The bougie may be retained at first

* Plate IV.

† Observ. Anatomico-Chir. Cent. Tom. iv. 95.

for only a few minutes, as on its earliest use it will probably give pain, and irritate; but by degrees it should be borne for a longer period of time, and at length for several hours in a day. The pressure will promote absorption, and consequently reduce the morbid thickness of the coats, and hereby enlarge the diameter of the intestine; and as this last change occurs, and advances, it should gradually be met by a bougie of larger calibre, till the canal is restored to its proper dimensions. And even after this, it will be proper to return to the bougie occasionally, for a few minutes at a time, that there may be no relapse from the existence of a predisposing habit.

Nothing is so well calculated as the bougie, moreover, to break away that net-work of filaments, which, as we have already observed, is sometimes united with an incrassation of the rectum, and spreads from one side of it to another. In this case, there will usually be found at first a considerable degree of pain, and sometimes a considerable degree of hemorrhage; but a courageous perseverance will triumph over these, and amply reward the patient's exertions. And the tubercles, which are so apt to form on the loose and inner coating, will often yield and be carried off by the same means.

When, however, the disease does not yield to this plan, or has reached a more serious stage in its destructive progress, it becomes a direct subject of operative surgery: and a cure may yet be obtained by a removal of the tubercles by ligature or the knife; or a division of the thickened ring by a curved and probe-pointed bistoury. When, indeed, the disease is of so complicated a character as to embrace at the same time a contraction of the sphincter, M. Boyer has proposed also to divide this muscle; and asserts, that he has often done it with success. But as it is not the intention of the present work to enter upon the province of practical surgery, I shall not pursue the subject any farther; and shall conclude with observing, that, whatever be the stage of the complaint, if there be any reason to suspect that it has originated in a syphilitic taint, the ordinary use of mercurial preparations must be conjoined with the treatment thus far laid down.

SPECIES IV.

PROCTICA TENESMUS.

Straining.

PAINFUL AND PERPETUAL URGENCY TO GO TO STOOL, WITH DEJECTION OF MUCUS ALONE, AND IN SMALL QUANTITY.

The seat of this species, as of proctica *spasmodica*, is in the sphincter ani; and, whenever idiopathic, it is the result of local irritation, mostly produced by cold, the passage of acrid humours, the mechanical pressure of confined enterolithi, chiefly minute scybala, or an injudicious use of acrid cathartics, especially of aloes, which have a peculiar tendency to stimulate the lower part of the rectum. It is sometimes intolerably vehement, and accompanied with a protrusion of the gut; the mucous discharge is bloody; and the straining continues long after the intestine has emptied itself of every particle of its contents. And even when the patient has risen from stool, he will still perhaps be tormented with a burning pungent heat, and a perpetual urgency to expulsion. It is this violence of attack, indeed, that chiefly distinguishes this species from the symptomatic straining that occurs in the preceding, which is attended with but little comparative pain, and generally ceases upon the discharge of even a small portion of feces. The constant urgency and torment wear away the sufferer's strength, and sometimes extend the irritation to the bladder.

Most commonly, however, tenesmus is nothing more than a symptomatic affection, excited by some disorder of the bladder; as inflammation in its neck, or a calculus in its cavity; or by dysentery, chronic diarrhœa, costiveness, piles, worms, pregnancy, or, as just observed, by a stricture of the rectum or its sphincter.

In all these cases, tenesmus can only be removed by a cure, or palliation of the disease on which it is dependent: but where it is an idiopathic affection, a more direct course of treatment may be adverted to. If a lodgment of acrid materials form the cause, these should be freely discharged, and the irritation they have excited be subdued by bleeding with leeches, and a local application of opium, intermixed with soap and wax to prevent its being too quickly dissolved; or by small doses of ipecacuan, as recommended by Piso,* or of Dover's powder, which is still better. In very painful extremes, opiate† and mucilaginous injections, as proposed by Mr. John Hunter‡ and others, will often alleviate the distress; or lime

* De Medicinâ Brasiliensium, Lib. II.
† Comment. Liter. 1742.
‡ Observations on the Diseases of the Army in Jamaica.

slaked with milk, or Goulard water with oil, both which were favourite remedies with May.* Occasionally it assumes a chronic character, and the Ephemerides of Natural Curiosities gives an instance in which it continued for six months.† In such cases, bitters and other tonics may be advisable, though injurious, as Mursinna has justly observed, on other occasions.

SPECIES V.

PROCTICA MARISCA.

Piles.

LIVID AND PAINFUL TUBERCLES OR EXCRESCENCES ON THE VERGE OF THE ANUS; USUALLY WITH A DISCHARGE OF MUCUS OR BLOOD.

This species has generally been described by modern writers under the name of *hæmorrhois*, whence *hemerods* or *emrods* in old English, and *hæmorrhoids* in the English of our own day. Now the literal meaning of *hæmorrhoids*, αἱμορροΐς, is "flux of blood;" and in this sense the term was used by the Greek and Roman writers, sometimes generally, and sometimes with a special application of it to menstruation, and particularly profuse menstruation, or uterine hemorrhage, but never with a *special* reference to hemorrhage from the anus, as I have already remarked in the Preliminary Dissertation to the volume of Nosology,‡ to which I refer the reader: and hence again, Aristotle denominates, by the term Hæmorrhois, a serpent whose bite was said to be succeeded by a violent and fatal flow of blood from the bitten vessels.§ The name is, therefore, highly inadequate to the purpose of expressing, with any degree of clearness, tubercles, or even discharges from the anus: yet it becomes not only inadequate, but absurd, when employed generally to indicate a family of diseases, some of which have a discharge of mucus instead of a discharge of blood, and others no discharge of any kind.

For these reasons, as well as others stated at large in the comment to the volume of Nosology, I have deemed it expedient to adopt the Latin term *marisca*, in the stead of *hæmorrhois;* and to limit the genus to those tumours or excrescences about the verge of the anus, which, under every view of the disease, form its prominent character.

* Miscellaneous Writings.

† Dec. III. Ann. IV. Obs. 53.

‡ Page lv.

§ De Partibus Animal. Lib. III.

These enlargements commonly, and perhaps in every instance, derive their existence from a turgid and varicose state of the anal or hemorrhoidal veins; for in their simplest forms piles consist of nothing more than varices of these veins, covered with a slight thickening of the inner membrane of the rectum, as Dr. Baillie has sufficiently shown in his illustrative plates.*

From local irritation, produced by indurated and retained feces, or purgative stimulants, and especially aloetic purgatives; or from an undue determination of the blood to the hemorrhoidal vessels; by excessive walking or riding; or a congestive state of the liver or adjoining viscera; and often by a peculiarity of the constitution itself; the extremities of the hemorrhoidal veins are apt to become varicose, and swell into tumours; and very frequently excite inflammatory action in the surrounding mucous follicles. These also, in consequence of such excitements, gradually enlarge into caruncular excrescences, pea-sized, fig-sized, or of various other figures, sprouting about the verge of the anus within or without; and are often so painful as to prevent either walking or sitting. Sometimes the caruncles, thus produced, are hard, florid, incompressible, without discharge, and intolerably sore to the touch. Sometimes the irritation induces a secretion of whitish mucus from the neighbouring glands. Sometimes the hemorrhoidal vessels themselves, that form or supply the sprouting tumours, are so distended as to burst, and bleed freely. And occasionally the inflammatory action gives rise to the formation of caruncles of different shades and sizes, sometimes spreading about the perinæum, but mostly existing within the verge of the anus. Whence we obtain four distinct varieties as follow:

α Cœca.	Blind piles
β Mucosa.	White piles.
γ Cruenta.	Bleeding piles.
δ Caruncularis.	Caruncular piles.

Under the one or the other of these forms, the disease is also met with occasionally as a symptom or sequel of parabysma (indurated and enlarged abdominal viscus,) gout, asthma, rheumatism, various affections of the bladder, hypochondria, hysteria, and ecphronia, or insanity. It is also said, by some writers, to be in a few instances hereditary; and as such, to appear in infancy, or at an early age, chiefly, however, in connexion with gout or a gouty diathesis.

We have just observed that the piles in their simplest state consist of nothing more than varicose tumours of the anal veins, covered with a slight thickening of the inner membrane of the rectum: and I have pointed out a variety of causes predisposing to such tumours. Mr. Copeland has ingeniously suggested another, and which, so far as it operates, is peculiarly calculated to produce the first before

* Morbid Anatomy, Plate V. Fig. 2, 3. p. 78.

us, to which the trivial term *cæca* or *blind*, though not peculiarly expressive of the idea intended to be conveyed, has been applied for ages, as being void of every kind of discharge, whether mucous or sanguinous, and having no *eyelet*, or aperture, through which such discharge may flow, and carry off the accumulation. Mariscal tumours, Mr. Copeland conceives, are most common in persons who possess a very strong action of the spincter ani, and are hence habitually predisposed to a spasmodic stricture of the rectum. In such persons he supposes, that, on every expulsion of the feces, the internal membrane of the rectum, together with the vessels it contains, is protruded, and caught or detained, and some of its veins strangled, by the forcible constriction of the muscle. That this is a frequent cause of piles I have no doubt, though, from their occurring in such numerous instances in persons of lax fibres and debilitated habits, it appears to me to operate less frequently than is suspected by Mr. Copeland. But, occur whenever it may, it has a peculiar tendency to produce the variety before us, since the constitutional firmness of texture on which it depends must necessarily prevent the walls of the distended vessels from giving way and producing a hemorrhage.

It is, hence, easy to conceive, that mariscal excrescences must be the hardest, the sorest, and the most florid of the whole, when the result of this second cause. When they proceed from a mere relaxation of the vascular system, or a diseased state of the larger abdominal viscera, they will sometimes acquire a considerable bulk without being highly painful: but in this case they are usually soft and compressible.

It will be better and more compendious, to take a survey of the other varieties before we proceed to the curative intention.

In some persons the mucous follicles of the interior membrane of the rectum are far more easily excited to secretion than in others; as we see in many individuals the mucous membrane of the nostrils pour forth a readier and more abundant defluxion. It is in this state that the tumours assume the name of WHITE OR MUCOUS PILES; and as the excretories thus easily evacuate themselves, there is much less soreness and irritation, and the tumours or tubercles are comparatively pale as well as moist: and, though often not admitting of so rapid a cure as some of the other varieties, are considerably less distressing.

It often happens that, from distention, the walls of the anal varices give way and form BLEEDING PILES. Yet it does not always follow that blood is hereby discharged or the tumours are diminished. For it occasionally occurs that the surrounding membrane does not give way at the same time, and consequently that the extravasated blood is accumulated in the contiguous cellular substance, and the tumours, instead of diminishing, increase from the size of a pea to that of a pullet's egg, block up the entire passage of the rectum, and are a source of very great evil. If, however, this take place at some distance above the sphincter ani, where the parts

yield more easily, the pain may not be excessive; but if these enlarged tumours be seated on the sphincter, or within the range of its contractile influence, the torment induced is often intolerable.

From this difference of seat, piles from of old have been denominated external and internal; and it was imagined by Dr. Stahl and his disciples, that the former were produced by a gorged state of branches from the vena cava, and the latter from a like congestion in branches of the vena portarum. No benefit, however, can possibly result from such a distinction; nor is the distinction itself founded in fact: for all the arteries and veins that appertain to the lower part of the rectum arise so diversely, and anastomose so frequently, that an affection of one must be communicated to another, and the general result be participated by the whole.

In most cases, however, in which the varicose vessels burst, the distended and attenuated membrane that surrounds them bursts at the same time, and the blood flows externally. The hemorrhage is, in some cases, very considerable: and as this variety, more than any of the others, is apt to run into a habit, the constitution occasionally becomes greatly debilitated, and often dropsical; and the hemorrhage has, in a few instances, been so profuse as to endanger the life. When, moreover, a hemorrhoidal habit is once established, the flux, even if it do not undermine the health by its quantity, often becomes periodical, enters into the chain of constitutional actions, and becomes a condition of the corporeal weal; so that its suppression is attended with serious mischief.

It often happens, and especially during the first variety, which evinces the highest degree of inflammation, that an effusion of coagulable lymph takes place around the mariscal varix, which terminates in vascularity, and the production of a fleshy substance, that still continues even after the overloaded vessels have recovered their proper diameter and tone. It is these CARUNCLES, which are rather the sequels of piles than piles themselves, that constitute the fourth variety. They are of different shapes and sizes, bulbous, soft, and compressible, red or reddish; and not unfrequently the base shrivels into a narrow neck, while the body of the caruncle enlarges and elongates so as to assume a polypous appearance.

Caruncles, not very unlike, are frequently found sprouting from the cuticle or cutis that surrounds the anus, often assuming the appearance, and having much of the nature of warts; solitary or clustering, with a broad or narrow base; and which are sometimes regarded as piles, but are altogether of a different origin.

In attempting a cure of this complaint, our first attention must be directed to the cause, as far as we can ascertain it. If the bowels be habitually costive, gentle laxatives should be employed daily; and where the complaint has been induced by excessive walking or other muscular exertion, quiet and a recumbent position must be sedulously enjoined. The laxatives in either case may be the cassia or senna confection; oil of castor, where it will sit easy on the stomach with the addition of a little spirit, which is its best cor-

rective; and sulphur. Sulphur has long been regarded as a specific for piles; but I do not know that it possesses any other virtue than that of being a mild aperient. It seems, however, to be an aperient peculiarly calculated to act upon the large intestines; since, being soluble with difficulty in animal fluids, it dissolves slowly, and does not spend itself till it has descended to a considerable depth in the alvine canal. And it is on this ground, perhaps, if any, that it sometimes proves peculiarly serviceable in the present disease.

There is a laxative of a very different kind which Dr. Cullen was in the habit of employing in this complaint; and that is, balsam of copaiva. After observing that, like turpentine, it proves laxative, he proceeds as follows:—"Whether a certain effect of balsam of copaiva is to be imputed to this operation, I cannot determine; but must observe, that I have learned from an empirical practitioner that it gives relief in hemorrhoidal affections, and I have frequently employed it with success."* His dose was from twenty to forty drops, properly mixed with powdered sugar, once or twice a day.

I have tried this medicine often, frequently without the slightest benefit, though I have varied the dose: and when it has appeared useful, it has been chiefly in the case of mucous piles; and I am hence induced to ascribe its salutary effect rather to the common principle on which it is well known to act in irritations of mucous membranes generally, than to its laxative power: I mean, that of stimulating the membrane throughout, and thus producing a revulsion in the immediate vicinity, as we take off an inflammation in the eye by applying a blister to the temple or behind the ear.

When the pain and tension are very distressing, relaxant cataplasms are generally advisable. The common bread-poultice with a solution of opium will form one of the best; or we may have recourse to the old specifics of boiled chervil leaves, whether of the scandix *cerefolium*, or chærophyllum *sylvestre*, or those of English mercury (chenopodium *bonus Henricus*,) which last was at one time esteemed a certain cure; but all of which only operate by an emollient and relaxant power.

The butter of chocolate may be advantageously employed for the same purpose, either as a most mild emollient ointment, in the form of a suppository, with a small portion of spermaceti, or as an exquisitely bland bougie with a nucleus of cotton. It has long been used in all these ways on the continent;† and has for some time been prepared after the second mode in this metropolis.

If we can clearly refer the disease to a gorged or obstructed state of the liver, or any other abdominal viscus, the purgatives we employ may be of a more active kind, and a free use of the lancet should precede them. And if the piles should depend upon a strong entonication of the sphincter ani, bleeding from the arm will also

* Mat. Med. Part. II. cap. v. p. 190.

† Mangeti, Biblioth. Pharm. Art. Cacoa.—Gardane, Gazette, 1775. p. 15.

be highly useful; but a local application of leeches will in this case answer far better than the lancet.

In every variety, indeed, in which there is much heat, hardness, and irritation, leeches will be found an important remedy; and when these symptoms are hereby removed or mitigated, or the tumours evince vascular debility alone, or exist without these concomitants, we should have recourse to local tonics and astringents. The patient may sit frequently in a bidet of cold water, or apply cataplasms of cold water and crumbs of bread; or, if the tumours be seated above the sphincter, use injections of cold water.* With the water we may often advantageously intermix the earthy or metallic astringents, as alum, sulphate of zinc, or the superacetate of lead. Where the tubercles are not very sore, they will often yield to a layer of gypsum, or, what is better, Fuller's earth, which, however, should be rubbed into as soft a paste as possible. This is a remedy which has been long employed on the continent;† and I have sometimes prescribed it with singular success, and have known piles, when softish and compressible, removed by it in a single night.

There are various vegetable astringents that are well entitled to our attention for the same purpose; and especially the powder or extract of catechu, which I have known to be serviceable applied to the tubercles in the form of an ointment when external, and injected in the form of infusion when deeper seated. And Dr. Cullen speaks with equal favour of finely pounded oak-galls, in cases where the disease is not connected with the general habit.‡

If these should fail, the pressure of bougies should be had recourse to, and especially in piles supposed to be produced by a constitutional entonic constriction of the sphincter muscle; for in this case it will have a tendency to remedy both the cause and effect at the same time. Suppositories and bougies for this purpose are of long standing and high recommendation. With a view of uniting the two advantages of pressure and cold, they were formerly recommended to be made of slices of any of the cucurbitaceous fruits, as cucumber, gourd, or melon;§ but none of these are sufficiently stiff to obtain an adequate expansile force; and hence the large rectum bougies in common use have been advised, and with good reason by Monteggia, and Mr. Copeland.‖ I have sometimes seen them made of very fine polished ivory, of a conic shape, about the length of the fore finger, with a ringlet at the base; and the exquisite smoothness and equality of pressure they possess peculiarly fit them for the purpose. Mr. Bell proposes a bougie or tent formed

* Trewart, Beobachtungen.—Richter, Chirurgische, Biblioth. Band. v.
† Eph. Nat. Cur. Dec. III. Ann. III. Ob. 162.
‡ Mat. Med. Part. II. Chap. I. p. 46.
§ Morgagni, De Sed. et Caus. Morb. Ep. XXXII. Art. 12.—Lange, Miscell. Verit. p. 104.
‖ Observations on the Principal Diseases, &c. p. 68.

of a silver tube, wrapped round with soft linen, or a piece of sheep's gut tied at one end, and then pushed to a sufficient height into the rectum, and forcibly distended with water.*

Occasionally nature has effected a cure; and the effused substance has been absorbed without any artificial means whatever:† but more generally neglect produces the most lamentable consequences, and especially fistulous ulcers of very difficult removal; which have sometimes indeed, as Mr. Gooch has sufficiently exemplified, wormed a sinuous path, and opened into the vagina.‡ And hence, if none of the preceding means should be found to answer, and especially if the tubercles be extremely painful and distressing, they should be removed with all expedition by ligature, caustic, or the knife. Of these, the use of caustic is by far the most unadvisable, whether actual or potential. Of the other two methods, it is not easy to say which is the preferable; and hence each has been in favour with different practitioners. The chief disadvantage of the ligature is, that, by tying up the surrounding membrane of the intestine along with the immediate substance of the tumour, a very high degree of sympathetic irritation and even inflammation has at times been excited over the whole range of the intestinal canal, and even the perinæum, and a degree that has in some instances proved fatal: the ligature appearing to act, as M. Petit observes,§ in the same manner as the pressure of the tendinous rings of the abdominal muscles in cases of strangled, or as it is more commonly, but less correctly, called, *strangulated* hernia; and producing the same effects of incessant hiccough, vomiting, abdominal inflammation, and gangrene. This, however, rarely occurs, except when the ligature is applied round several tumours at the same time; for if only one be operated upon at once, and the rest in succession, the irritation has not been generally extensive or of longer duration than two or three days. And perhaps even this might be avoided, by denuding the tumour of its external covering, as M. Petit has proposed.

The chief difficulty that attends the operation of excision, is a very troublesome, obstinate, and debilitating hemorrhage, which is apt to follow, and which many surgeons have found very hard to restrain; chiefly, perhaps, because the veins of the abdominal viscera are destitute of valves. Excision, therefore, is chiefly calculated for the caruncular variety, and in such cases is far preferable to the ligature: but when we have reason to believe that the varicose vessels are of a large diameter, whatever means of cure be employed, this should not be had recourse to. One of the chief advocates for excision in our day was Mr. Ware: but he practised with caution in every instance. I have seen him operate in this

* Surgery, Vol. II. Chap. XVI. p. 259.
† Marigues, Journ. de Med. Tom. XXXII. 339.
‡ Cases, &c. p. 249.
§ Œuvres Posthumes, Tom. II.

way on caruncular piles, and with success; but he hesitated when there was a chance of large vessels. The cutaneous excrescences about the anus, that are erroneously denominated piles by the vulgar, may be taken off by the knife or a pair of scissors, in any number or to any extent, without reserve, and particularly when they have not rooted themselves in the subjacent muscles.

SPECIES VI.

PROCTICA EXANIA.

Falling down of the Fundament.

INVERSION AND PROLAPSE OF THE VILLOUS TUNIC OF THE RECTUM, FROM TONE OR RELAXATION OF THE SPHINCTER.

This is a very common and a very troublesome disease; but it is capable of a perfect cure in most cases, and of great relief perhaps in all. There are two varieties of it, proceeding from the two opposite causes of atony and entony, and which demand a very different mode of treatment.

α Atonica.	Relaxed Exania.
β Spasmodica.	Spasmodic Exania.

Where the action of the sphincter is feeble, it collapses readily, and often imperfectly; and the part of the rectum that always descends towards the verge of the anus upon a protrusion of the feces, instead of being retracted with elasticity, remains exposed or ascends imperfectly. Yet there is little pain or tumour, and reduction is easy. Such is often the case with weakly infants, but still more so with the aged, who possess comparatively but a small supply of irritable power, and whose muscular actions are hence necessarily weak and soon exhausted. Under such circumstances, exania, or a prolapse of the inner membrane of the rectum, will often occur on the slightest dejective effort: but if at the same time the rectum be labouring under any morbid irritability from the stimulus of scybalous feces, ascarides, or acrimonious humours, or purgatives, the protrusion will be greatly exacerbated, a much larger portion of the gut will be exposed, and its retrocession will be more difficult. Sometimes, indeed, the portion exposed has been very considerable; for Morgagni relates a case, in which the valvulæ of the colon were hereby brought into view;* and Hagen,† another, in which there was a prolapse of the entire colon itself.

* De Sedibus, &c. XXXIII. LXV. 6.
† In Schroeher verm. Schr. Band. I. p. 609.

Common, however, as is the disease before us from local or general debility, it is perhaps still more frequent from the habitual or accidental excess of contractile action in the sphincter of the anus, which we have already contemplated as the chief cause of spasmodic stricture. In this case, the tumour is large, irritable, and painful; and, if assistance be not obtained soon, a violent and serious inflammation will be sure to supervene.

In the atonic prolapse, but little aid is necessary, in ordinary cases, to return the protruded part. A simple pressure of the hand against the denuded part of the intestines, or sitting upon a plain and hard seat, will ordinarily be sufficient; and, if not, an introduction of the fore finger up the anus will always succeed. Hence patients labouring under this variety, commonly return the gut themselves after evacuation, and in many instances it will ascend of its own accord.

The chief difficulty is in effecting a cure, which can only be accomplished in two ways: by invigorating and bracing the loose and relaxed membrane; or given it in adhesion to the subjacent cellular substance from which it is detached.

The first may be aimed at, and will sometimes be accomplished, by local tonics and astringents; as cold water dashed against the buttocks, injections of cold water,* solutions of alum† or sulphate of zinc, made viscous and adhesive by uniting them with some mucilage, as that of snails, which is preferred by Gabelchoven;‡ or an infusion of catechu or gall-nuts, which last is strongly recommended by Dr. Cullen.

The second can be only accomplished by artificially exciting a slight continuous inflammation in the cellular substance, by slipping off a small piece of the protruded membrane, or passing a ligature through a small portion of it, and letting it remain after the return of the membrane, till the inflammatory action has commenced: by which means a radical cure is often obtained, in the same manner as a like cure is effected in scrotal dropsy, hooking forwards and cutting off a small piece of the tunica vaginalis after evacuating the water. Mr. Copeland has employed this method in various instances, and with all desirable success.

Where there is a prolapse of the upper part of the rectum, or of the colon, the disease is of a different kind; for, in this case, the entire parietes descend, and the upper part is invaginated in the lower, as in an intro-susception of the smaller intestines; but with less mischief in the present instance, as there is more space for play, and as the intestinal canal evinces less sensibility, and consequently admits of harsher treatment in its progress towards its

* Dauter, Vom Aüsserlichen Gebrauch des kalten Wassers. p. 106.—Hartmann; Diss. Clysmatum frigid. in ani procidentiâ usus. Fr. and V. 1780.

† Lindt. Dissert. de Alum. Virtut. Med. Goëth. 1784.

‡ Curat. Med. Cent. I. N. 71.

lower extremity. In this case, the whole we can aim at is, to strengthen the fibres of the relaxed bowel, and restore them to a healthy elasticity by the use of tonic and astringent injections, whether of cold water, or solutions of the astringent earths, metals, or vegetables noticed above.

In entonic or spasmodic exania, it will be often necessary to apply leeches, and to bleed pretty freely before a reduction can be obtained. After which, as this is chiefly a result of spasmodic stricture, or depends upon like causes, the mode of treatment already recommended for the one will be the best plan to be pursued for the other.

This complaint is also found occasionally as an effect in lithiasis, helminthia *podicis*, and hard labour. And Camerarius mentions a case, in which it was produced in an irritable habit from mere terror, excited by the threat of applying a red-hot iron to some part of the body.*

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* Memorab. Cent. XV.

CLASS I.

CŒLIACA.

ORDER II.

SPLANCHNICA.

Diseases affecting the collatitious Viscera.

DISQUIET OR DISEASED ACTION IN THE ORGANS AUXILIARY TO THE DIGESTIVE PROCESS, WITHOUT PRIMARY INFLAMMATION.

The order of diseases upon which we now enter is in the present classification denominated Splanchnica (ΣΠΛΑΓΧΝΙΚΑ,) as primarily affecting, and being seated in the viscera that are directly adjuvant to the function of digestion. The term Splanchnica is thus reduced to its more limited and emphatic sense: for, in a loose and broader signification, it imports, like its Latin synonym *viscera*, all the larger bowels or internal organs to whatever cavity they appertain, and consequently includes the brain: but in its stricter and more exact meaning, it was formerly confined to those of the upper and lower belly, constituting what we colloquially call the Entrails; and more especially those which were consulted by the aruspices, and constituted the chief parts of the sacrifice: in which sense it is mostly employed by Homer, and the Greek tragedians.

The organs, therefore, to which the term is here intended to be applied, (for the alvine canal forms the subject of the first order,) are the liver, spleen, pancreas, mesentery, and omentum; and as, in the physiological proem to the class before us, we took a general survey of the structure of these organs; and, so far as we are acquainted with them, of the parts they respectively fulfil in accomplishing the economy of digestion, we shall proceed without farther delay, to a consideration of the diseases which belong to them under the proposed arrangement.

The order embraces four genera:—

1. ICTERUS.	YELLOW JAUNDICE.
2. MELÆNA.	BLACK JAUNDICE.
3. CHOLOLITHUS.	GALL-STONE.
4. PARABYSMA.	VISCERAL TURGESCENCE.

Of these, several comprise numerous species, which will be noticed in their respective places.

GENUS I.

ICTERUS.

Yellow-Jaundice.

YELLOWNESS OF THE EYES AND SKIN; WHITE FECES; URINE SAFFRON-COLOURED, AND COMMUNICATING A SAFFRON DYE; THE COURSE OF THE BILE OBSTRUCTED.

THIS disorder was by the Greeks denominated ICTERUS (ΙΚΤΕΡΟΣ) as above, and by the Romans, as Celsus particularly notices, Morbus arquatus or Morbus regius: but on what account either of these names has been given to it, we have no satisfactory information. Arquus means a rain-bow, which requires more explanation than has hitherto been given; and the meaning of regius, as expounded by Celsus, will, I apprehend, content very few. "Its cure," says he, "is to be attempted by exertions of every kind, lusu, joco, ludis, lascivia, per quæ mens exhilaretur; OB QUÆ REGIUS MORBUS DICTUS VIDETUR:"*—'by play, jest, sports, and dalliance, on which account it seems to be called Morbus regius, or the royal disease.' It has also been named by many writers, ancient as well as modern, *Aurigo*, evidently from its golden hue. But of the origin or meaning of icterus we are left altogether in the dark by the critics and lexicographers. It appears to the present author, however, probable, if he may venture upon a subject which has hitherto been tried in vain, that all these terms are expressly of a common idea; and, though not derived from a common root, are employed as equivalents, to express its meaning. Icterus (ικτερος,) as it seems to him, is the Hebrew term כתר with a formative י producing 'icter,' and importing, as a verb, 'to surround, circumfuse, encompass;' and, as a noun, 'a royal crown or golden diadem.' Icterus was a term also given to the golden thrush or golden pheasant, on account of its golden plumage; and hence the bird was fabled to be connected with the disease; and it was believed, according to Pliny, that if a person labouring under the jandice should look at the pheasant, the bird would die and the patient recover. Regius, arquatus, aurigo, are not indeed univocals, but very clearly equivalents, and equally import gold, golden crown, golden bow, or circumfusion; the colour of the disease, and its encompassing the body.

There is, however, a far more important inquiry immediately connected with this subject, which I am afraid will be still less easily settled. We are sufficiently acquainted with the seat of

* Medicin. Lib. III. sect. XXIV.

jaundice, which is the liver, and of its proximate cause, which consists in an impeded flow of the bile; but who shall explain to us the real use of the bile or even the final use of the liver that secretes it? Considering the large size of the liver in all animals that possess it, and at the same time how very generally it is possessed, being to all red-blooded animals as common as the heart itself, there can be no doubt that it is of great importance in the animal economy, notwithstanding our uncertainty of the part it performs.

Even below the rank of red-blooded animals we often discover it, and of great extent, as in the snail, oyster, and muscle: and frequently, too, when we cannot trace an organ answerable in structure and appearance to the liver, we are obliged to admit the existence of an organ that supplies its place; for there are many insects, the larve of the cynips *querci* or gall-fly, and that of the curculio *nucis*, or nut-weevil, that secrete bile in such quantity as to tinge with a brownish yellow the tender branch, nut, or other substance in which they find a habitation, and to give them a taste as bitter as ox-gall.

Whether the liver serves, as has been supposed by Fourcroy, to separate any excrementitious material from the blood, or to produce any other effect upon it, is highly doubtful: we can trace no such effect, and know nothing of such excrementitious matter. Its direct and obvious office is the secretion of bile, which, in most animals, is suffered to accumulate in a pear-shaped reservoir, adhering to its concave surface, and denominated a gall-bladder. Yet in many animals, even of different classes, we perceive no such reservoir, as the elephant, rhinoceros, stag, camel, goat, horse, trichecus, porpoise, rat, ostrich, and parrot: while we do not know of a reptile that is destitute of it. Upon the whole, however, it may be observed, that a gall-bladder is common to all carnivorous animals possessing a liver, and that it seems to be only wanting in those that feed on vegetables alone. Yet while we see the distinction, we are ignorant of its cause, and incapable of applying it. In the human subject it has sometimes also been wanting, of which Dr. Cholmeley gives a singular example in the Medical Transactions:* but such a deficiency has only occurred in infants, who have fallen victims to it soon after birth; before which period, as there is no transit of feces through the intestinal canal, and perhaps no peristaltic action, it does not appear to be necessary. Perhaps, indeed, antecedently to birth there is no bile secreted. In the case related by Dr. Cholmeley, although the whole of the bile, as fast as it was secreted, seems to have been carried back into the system, the sallowness of the skin is not noticed to have occurred till the day after birth: from which time the child exhibited a deeper and deeper hue, till it died of convulsions at the end of five weeks.

It has reasonably, therefore, been supposed, that one chief use of

* Vol. VI. Art. IV.

the bile is to stimulate the lacteal vessels and maintain the peristaltic action of the alvine canal. Yet in jaundice the lacteals perform their office; and in lientery the peristaltic action is peculiarly brisk, though the intestines are without this fluid. Hence Dr. Fordyce regarded the bile as of no service whatever in promoting the digestive process; and Sir Everard Home* has given an example of a child that fed heartily, seemed to digest its food well, and had regular stools, and was nevertheless without a gall-bladder, or even a duct of any kind leading from the liver to the duodenum. And however stimulant the bile may be to the coats and emunctories of the intestines, it has a sedative rather than a stimulative power upon the blood; and, instead of rousing to additional energy, produces weariness and inactivity.

There are also a few other circumstances relating to the bile that yet stand in need of explanation. The hepatic bile, or that secreted into the hepatic duct, is mild and sweet; the bile found in the gall-bladder is pungent and bitter; whence we might infer that it is the gall-bladder that secretes the bitter principle. Yet in children the gall-bladder bile is as sweet as that of the hepatic duct: and in various insects, as we have already seen, a bile powerfully bitter is secreted without either gall-bladder or liver. Who shall develop the cause of these discrepancies? Who shall unfold to us the use of the bitter principle of the bile, or explain why it is necessary to the animal economy in an adult state, and not necessary in a state of infancy?

Yet whatever be the use of the bile, or the office of the liver, we know that the general symptoms of jaundice depend upon an obstruction to the flow of the bile into the alvine canal, and its retrograde passage into the blood. It has been supposed, indeed, that the bile might, after entering into the intestines, be absorbed and carried into the blood, and by this mean produce a jaundice and a jaundiced hue, without any obstruction to its flow into the intestinal channel. But, in this case, it seems impossible that the stools should not be tinged with a yellow, instead of presenting a white hue, which is one of the common characters of the disease. In order to constitute jaundice, there must therefore be some obstruction to the passage of the bile through its proper ducts into the intestinal canal. And this obstruction may proceed from five sources; each of which may be accompanied with peculiar symptoms, and consequently furnish us with the five following species:

1. ICTERUS CHOLŒUS.	BILIARY JAUNDICE.
2. ——— CHOLOLITHICUS.	GALL-STONE JAUNDICE.
3. ——— SPASMODICUS.	SPASMODIC JAUNDICE.
4. ——— HEPATICUS.	HEPATIC JAUNDICE.
5. ——— INFANTUM.	JAUNDICE OF INFANTS.

* Phil. Trans. 1813, p. 156, 157.

The disease is also found symptomatically in pregnacy, colic, and fevers of various kinds; especially epanetus *icterodes*, or yellow fever.

SPECIES I.

ICTERUS CHOLŒUS.

Biliary Jaundice.

THE COURSE OF THE BILE OBSTRUCTED FROM ITS OWN VISCIDITY: GENERAL LANGOUR; NAUSEA; DYSPEPSY; AND OCCASIONAL PAIN OR UNEASINESS AT THE STOMACH.

THE specific term cholœus (χολαιος) is here restored from the Greek writers, among whom it has been common from the time of Hippocrates.

Dr. Cullen has not noticed this species: but it occurs in Bonet, Amatus Lusitanus, Forestus, Sauvages, and most of the later writers. It is easy, indeed, to conceive that bile may become inspissated from various causes; and particularly from an absorption of its aqueous or thinner parts by the lymphatics of the ducts themselves, or of the gall-bladder; from an augmented secretion of the albumen, or, as Berzelius considers it, the mucus of the gall-bladder dissolved in the bile; and from too viscid a texture of the bile in its secretion in the liver. And in effect there are few observant practitioners but must have remarked that the evacuations, whether by the mouth or the anus, when the obstruction is just removed, consist at times of nearly pure bile, peculiarly tenacious and high-coloured.

This species is found most generally in the autumn, when the finer parts of the animal fluids have been for some weeks or months carried off disproportionately by the heat of a summer sun. The disease, in many instances, commences slowly and insidiously; there is felt a general restlessness, diminution of appetite, disturbed sleep at night, and disinclination for exertion of any kind: the urine is of a deep yellow, and deposits perhaps a pitchy sediment; the bowels grow sluggish, the dejections are clay-coloured, or whitish; the eyes and surface of the body look yellower than usual, and there is a very troublesome itching of the skin. In this species, however, there is little or no pain in the right hypochondrium, and little or no sickness at the stomach, though a frequent sense of nausea.

In an early stage of the disease, free vomiting is of essential service. During this action, the diaphragm and abdominal muscles contract concurrently: and the whole of the viscera of the abdomen are forcibly pressed upon. Such a pressure must necessarily therefore affect the gall-bladder and biliary ducts, and oblige them to pour

out their contents very freely: nor is there a more powerful mean in our possession of unloading the liver of any viscous or stagnant fluid, or of restoring and invigorating its circulation. For this purpose the antimonial emetics are preferable to those of ipecacuan. They are less readily rejected, and excite a stronger stimulus from the first; and hence the vomitings they produce will continue for a longer period of time. To these should succeed a brisk purgative or two, with a copious use of diluting, sub-acid drinks, which, in ordinary cases, will easily remove every symptom. But if the disorder, from the obscurity of its march, be not soon suspected, the obstructed passages will become more obstinately obstructed, the gall-bladder and bile-ducts will be distended; there will be a general feeling of fulness in the right side; with great irritation, and fever; which last will often continue for a week or a fortnight after the obstructing cause has been removed.

This species, however, sometimes makes its appearance suddenly, and is accompanied with very violent effects from the first; and effects which are apt to lead the practitioner astray from the real nature of the disease. Two cases of this kind occurred to me in the course of last September (1820.) I was sent for express to a gentleman of about thirty years of age, who was suddenly attacked with a slight hæmoptysis, without any other preceding symptoms than a disinclination for food, and a rather more than usual sense of fatigue after exertion. As he had lost two brothers in succession from phthisis, in the prime of life, a few years before, the attention of the patient's friends, and of a very respectable practitioner whom he had sent for at the moment, was directed exclusively to the organ of the lungs, under the full belief of their being in a diseased state, and in fearful apprehension of the result. On my arrival, I found he had experienced another slight return of hæmoptysis a few hours after the first; had taken an aperient draught, and had lost ten or twelve ounces of blood. I found him labouring under a very considerable degree of fever, with a rapid though not a hard pulse, beating upwards of a hundred strokes in a minute, a hot and dry skin, great thirst, and a clammy tongue; but without the slightest cough, beyond an occasional hawking of mucus, untinged with blood, from irritation about the larynx and upper part of the trachea. He had no pain in the chest, could lie with equal comfort on either side, and inhale a deep breath without uneasiness. He had no headache, or irregular action at the heart, and the stomach was quiescent. The aperient draught he had taken had produced one or two evacuations, but their quality had not been noticed.

Upon examining the right hypochondrium, it appeared to be rather more than usually full, though without pain; while the urine was small in quantity, turbid as though chalky, and without the slightest tinge of yellow. These two symptoms decided me. It was clear that the seat of pyrectic irritation was the liver and its appendages; which were so gorged or otherwise obstructed, that the usual quantity of bile that gives the natural yellow to the urine

could not be absorbed and carried back into the blood vessels; and it was equally clear that there was no primary disease in any other large viscus; and that whatever blood had been discharged from the mouth was merely a secondary disease resulting from such obstruction, and a plethora necessarily produced in other organs from the infarcted state of the liver.

I hence prescribed calomel and other active purgatives freely; but the bowels were so torpid as not to be affected by them, even after the exhibition of several doses. I then ordered a strong cathartic injection, which was thrown into the rectum with great difficulty, from an accumulation of flatus, that the operator found almost impossible to overcome. In the course of a quarter of an hour, the injection was returned, and brought with it a few dried, dark-coloured, slender, and cylindric scybala; which were soon afterwards succeeded by copious and numerous dejections of a viscid bird-lime-like substance, of a deep chocolate colour verging to greenish; and which, in its general appearance, had a near resemblance to the meconium evacuated by infants soon after birth. All the pyrectic symptoms abated with this discharge, and continued to abate as the motions were repeated, which amounted to not less than ten or twelve, and continued for ten or twelve hours. The strength, instead of being diminished, rose in the same proportion; loose feces of a deep yellow were at length dejected; and, from the general reaction which was now evidently taking place in the liver, in both directions, the urine not only recovered its proper dye, but was of a higher colour than natural, while a slight suffusion of yellow covered the whole surface of the body.

Through the course of this violent commotion, acidulous and diluting drinks were taken very freely: but a considerable degree of general debility was felt for many weeks; and, probably from the imbecile state of the liver and a diminished secretion of bile, the peristaltic action of the bowels was extremely sluggish; and the warm and bitter aperients, often varied or changed in succession, were called for almost daily.

No hæmoptysis or other pulmonic affection returned at any time; but for a month afterwards there was so much weakness and relaxation about the larynx and fauces, that the voice was extremely feeble, and the tonsils and uvula considerably enlarged; evidently showing that the hemorrhage, which had excited so much alarm, had taken place from the upper extremity of the trachea, rather than from the lower; and probably from an anastomosis, rather than a rupture of the bleeding vessels.

It was fortunate that the surplus of blood was directed to this outlet, where it could flow without mischief; for I was consulted, about the same time, by the friends of a lady of delicate habit, aged sixty-three, who was attacked with an apoplexy while bathing in the sea, and was brought home in a state of utter insensibility. Before I reached her, she had been seen by Sir Matthew Tierney, who had prescribed for her with his usual judgment; but her insensibility

continued with stertor, and an entire hemiplegia of the left side. There were several circumstances that induced me to regard this disease as secondary, and proceeding from the same primary cause as the preceding hæmoptysis, the blood vessels of the head giving way in this case, instead of those of the larynx. I pursued therefore the same plan, and almost with as full a success. The discharge from the bowels was of a like kind, though not quite so copious; and as the liver hereby became disgorged of its glutinous contents, and the circulating power recovered its balance, the mental faculties gradually aroused themselves; and, under a stimulant and tonic course of medicines, the whole of the muscles of the affected side have in succession resumed their activity, with the exception of those of the leg, which are still weak, though they are capable of motion, and enable the patient to walk about the room with the aid of a crutch or an assistant. About a week after the first attack, she had a second, but much slighter, and which I ascribed to a fresh hemorrhage. She has had none since. As soon as she was able to travel, she came to town to consult me generally, but I did not suffer her to continue here: I sent her to Bath, and she is now at her own home in Gloucestershire.

Where the substance of the liver has been free, and the ducts alone obstructed, the quantity of bile that has accumulated in the gall bladder has sometimes been enormous. In one instance; which terminated fatally, this reservoir was found, after death, to be so considerably dilated, as to be loaded with not less than two Scot's pints, or eight pounds of this fluid.* In these cases, there is often a paresis or hebetude of action in the bile-ducts themselves: and where we have reason to suspect this, it will be most effectually relieved by the blue pill, or small doses of calomel, or Plummer's pill, which is better than either, continued for two or three weeks at a time. If the liver partake of this torpitude, and no acute symptoms occur, the disease is apt to run into the fourth species, and must be treated accordingly.

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* Edin. Med. Essays, Vol. II. Art. XXX.

SPECIES II.

ICTERUS CHOLOLITHICUS.

Gall-stone Jaundice.

THE COURSE OF BILE OBSTRUCTED BY BILIOUS CONCRETIONS IN THE DUCTS, WHICH ARE AT LENGTH PROTRUDED AND DISCHARGED WITH THE FECES; FREQUENT RETCHING; ACUTE PAIN IN THE HYPOGASTRIC REGION, INCREASED UPON EATING.

This species is the icterus *calculosus* of most of the Nosologists. It is so closely connected with the genus Chololithus, or gall-stone, forming the third in the present order, in its general origin, symptoms, and mode of treatment, that the reader may be referred for almost all these to the latter. Yet it is necessary to give the two affections distinct places: for the yellow dye of the skin and urine, which forms a pathognomic symptom in icterus, occurs often, as we have already seen, without chololithus, even in its passing species and acute state, and very generally in its quiescent state. The liver itself is, in many cases, sound :* but it is often connected with a morbid state of this organ, and proceeds, perhaps, in some instances from a morbid secretion of bile, by which it becomes more disposed to crystallize. Dissection has shown, that the seat of obstruction is most frequently in the cystic duct: next in the ductus chole-dochus; and then in the hepatic. The rest will be explained under the genus Chololithus.

SPECIES III.

ICTERUS SPASMODICUS.

Spasmodic Jaundice.

THE COURSE OF THE BILE OBSTRUCTED BY A SPASMODIC CONSTRICTION IN THE COURSE OF THE BILE-DUCTS; THE DISEASE COMMONLY PRECEDED BY ACRIMONIOUS INGESTA, HYSTERIA, OR SOME VIOLENT PASSION OF THE MIND; AND SPONTANEOUSLY SUBSIDING WITHIN A FEW DAYS AFTER THESE ARE REMOVED.

The general symptoms of this affection are those of the preceding species, or of chololithus *means*, which so closely agree with the preceding: but the causes and mode of treatment are different; and

* Heberden, Medical Transactions, Vol. II. p. 124.

it is necessary to attend to their specific signs in order that they may be distinguished.

Spasmodic jaundice occurs for the most part in those of irritable habits, or whose liver, from a long residence in hot climates, from an undue indulgence in spirituous potations or high-seasoned dishes, or from any other cause, is in a state of chronic irritability. So far as I have observed, it occurs more frequently in women than in men; probably from their passing a more sedentary life; and chiefly after menstruation has ceased, and the general form assumes a more corpulent shape.

There is also very commonly, in those who are subject to it, a sallowness of the skin, indicative of irritability and increased action of the liver, and of a larger regurgitation of bile into the blood-vessels than is necessary for the purpose of health. Dr. Heberden has observed, that the liver is sometimes perfectly sound; and there is no doubt that this is a fact; for the irritability may originate in, and be confined to, the ducts; but it more generally commences in the liver itself, and is hence extended to the ducts, which, from their structure, are far more irritable as well as more sensible than the parenchyma, or general substance of the liver, and consequently far more susceptible of pain and spasmodic contraction.

The primary cause of this disease we cannot always trace; but it is easily reproduced in those who are subject to it, by flatulent, acrimonious, or indigestible food, or by violent mental emotion. It is often also reproduced, or even primarily excited, by cold in the feet, drinking cold water when the body is greatly heated, and a transfer of atonic gout from the extremeties to the stomach or any part of the intestinal canal.

The disease is ushered in by a sense of fulness at the stomach, accompanied with great languor and nausea; a violent pain at the pit of the stomach soon succeeds, with an almost incessant sickness, and an utter inability of retaining either food or medicine of any kind. The pain grows intolerable, and shoots towards the left shoulder, or spreads round the loins, and girds them as with a cord. The epigastric region is greatly distended, and cannot endure the pressure of the hand; while the pulse exhibits little variation.

The bowels are for the most part costive and moved with difficulty; the urine soon evinces a deep saffron tint, and the sooner in proportion to the violence of the other symptoms, and especially of the retching; and the surface of the body, and especially the fine sclerotic coat of the eye, assumes the same livery. And if the disease become chronic, the yellow dye is not confined to the skin or even to the fluids, but pervades every part of the body, the most compact as well as the most porous; so that the pericardium, the heart, the peritoneum, the meninges, the substance of the brain, the cartilages, and even the bones, are clothed with the common colour. Stoll,* Lieutaud,† Bartholin,‡ and Morgagni,§ give various

* Rat. Med. Part III. p. 386 et passim. † Hist. Anat. p. 190.
‡ Epist. III. p. 419. § De Sed. et Cause. Morb. Ep. XXXVII. Art. 7.

examples of this; though the last observes, that a yellow tinge of the brain is a rare occurrence.

One of the last fluids that becomes tinctured is the milk in icteric wet nurses; probably in consequence of its rapid passage and elaboration from the fluids introduced into the stomach. Dr. Heberden has remarked, that in wet-nurses the milk is never tainted with the bile either in taste or colour; but this assertion is too general, and at variance with the observations of other pathologists. Riedlin lays down the fact more correctly, in affirming that all the humours are *sometimes* coloured yellow.* And hence, indeed, the only reason we can assign for the bilious and bitter taste that is often present in the stomach, insomuch that every thing that the patient eats or drinks partakes of this quality; while the common bile-duct is locked firm, the intestines are without bile, and the stools are whitish or clay-coloured. The fact is, that the whole mass of blood is so impregnated with bile, that the saliva, and all the other lubricating secretions of the mouth, fauces, and œsophagus, and probably the gastric and pancreatic juices, are loaded with the same material, so that the sense of taste cannot be otherwise than affected.

The jaundiced have, from a very early period, been said to see all objects of a yellow hue, as they appear to us when looking through a yellow object-glass; from which we may judge, that the humours of the eye, like the other fluids of the body, are also tinged, as Celsus observes,† with the resorbed bile, and communicate the tinge to the picture thrown upon the retina. Lucretius, so far as I know, is the earliest writer, of those that have descended to our own day, who has made this remark, which he introduces as illustrative of another subject, and appeals to as a familiar fact:

> Lurida præterea fiunt, quæquomque tuentur
> Arquatei; quia luroris de corpore eorum
> Semina multa fluunt, simulacris obvia rerum;
> Multaque sunt oculis in eorum denique mixta,
> Quæ contage suâ palloribus omnia pingunt.‡

> The jaundiced, thus, see all things round them clad
> In yellow; every object as it flows
> Meeting new tides of yellow from their forms
> Thrown forth incessant; and the lurid eye,
> Deep, too, imbued with its contagious hue,
> Painting each image that its orb assails.

Dr. Heberden, however, affirms, that all the jaundiced patients he has at any time attended have contradicted this opinion, with the exception of two females, whose testimony he is disposed to hold

* Linn. Med. 1697. Febr. Obs. 7.
† Medicin. Lib. III. sect. XXIV.
‡ De. Rer. Nat. IV. 333.

lightly. Yet from a single case in my own person, produced, when a student, by long-continued pressure of the epigastrium against the edge of a table in copying my short-hand minutes of medical lectures, I can confirm the general opinion: for the first suspicion I entertained of my being affected with jaundice was from the yellow tinge with which every object around me appeared to be arrayed. To produce this effect, however, it is necessary, as already observed, that the chrystalline lens, and, perhaps, all the humours of the eye, should be tinged, and acquire the yellow hue of the sclerotic coat. This certainly does not at all times take place; and where the humours are unaffected, objects must certainly be seen in their proper colours; but where they are thus tinctured, and form a yellow transparent medium, it seems difficult to conceive how a picture transmitted through them can avoid catching their own dye; and hence we may see why some persons labouring under the jaundice perceive objects coloured with yellow, and others in their proper hues.

I have said that this species of jaundice, and the remark may be applied to all the species except the last, sometimes assumes a chronic form. In this case the distressing symptoms of severe spasmodic pains, intumescence, and sickness subside; but the bile does not flow freely into its proper channel, and continues in a greater or less degree to be absorbed and carried into the circulation. The cause of this seems to be an insensibility and paresis approaching almost to a paralysis in the bilious tubes, and a chronic irritability in the hepatic absorbents. Under these circumstances, moreover, the bile that thus tardily finds its way into the duodenum must be grosser and more viscous than in a healthy state, and hence another cause of retardation and irregular supply. There is also a change in the colour as well as in the consistency of the bile frequently to be met with in the chronic state of the disease; which may sometimes be the result of a morbid secretion, but is perhaps more generally that of a chemical decomposition from the joint influence of delay and animal heat. And under these circumstances the bile has at different times and in different persons been found acid, acrid, saltish, insipid, whitish, black, green, eruginous, and versicoloured. It has been found as dense and dark as elder-rob;* as tenacious and limpid as the white of eggs;† and as crowded and granular as the spawn of frogs.‡

In this chronic form jaundice has sometimes run on for a long period of time, occasionally for a twelve-month. It has alternated itself with intermittents; proved a salutary crisis to fevers; or has itself been carried off by exanthems of the more violent kind; and

* Ephem. Nat. Cur. Dec. III. Ann. IV. Obs. 86.
† Stoerck, Ann. Med. I. 124.
‡ Ephem. Nat. Cur. Dec. II. Ann. IX. Obs. 9.

especially by miliary and scarlet fever. The general functions, when it has assumed this form, and the constitution has become habited to it, are sometimes so little disturbed, that we see people of the middling and lower ranks of life, who cannot afford to keep at home, and who would certainly be the worse for it if they could, going about the streets with the jaundice hue covering their hands and faces, and not prevented from engaging in any of the ordinary concerns of life in which no great degree of exertion is required.

In the treatment of this species, emetics and cathartics, so highly beneficial in icterus *cholæus*, are of doubtful advantage. Where we have strong reason to suspect that acrimonious materials have formed a lodgment in the ducts or alvine canal, they will prove useful by evacuating them: but in all other cases they must add to the disease by increasing the irritation, and should give way to blood-letting, if the patient be in vigorous health, succeeded by opiates, the warm bath, or warm and anodyne fomentations applied to the epigastrium. The opiate should be given in pills, for the stomach will often for many hours reject liquids of every kind. Two or three grains of the extract of opium may be tried at first, and if this be insufficient, the same or even a larger dose should be repeated half an hour afterwards, and continued till the pain abates. Blistering the seat of pain has been advised by many; and I have often tried it, but without any decided effect. If useful at all, it is rather in preventing a return of the paroxysm than in shortening or mitigating it when present; and will hence be most advantageously resorted to in the interval.

The general soreness upon pressure, and the excitement of the hepatic absorbents, as already observed, continue very frequently for several weeks after the spasm itself has subsided: and, consequently, there will be great languor, indisposition to labour, and a tawny skin.

For all this, a generous diet, cheerful company, and moderate exercise, and especially riding on horseback, go very far towards effecting a cure; and perhaps farther than any course of medicine whatever. The bowels, however, must be kept open with warm aperients, and the stomach and abdominal viscera invigorated by bitter tonics.

There are few diseases, nevertheless, that have boasted a greater number of specifics; and no specifics so little worthy of the name. The curcuma, chelidonium *majus* (greater celandine,) and polytrichum (English maiden-hair,) the panacea of Geoffroy, highly as they were extolled a century or two ago, are now never heard of: and of millepedes, which, at one time occupied a place in perhaps every pharmacopœia of Europe, it may be sufficient to observe, after Dr. Lewis, that two hundred have been swallowed daily for some time without producing any effect worth noticing.* The

* Mat. Med. Aikin's Edit. Vol. II. p. 111.

cherry laurel (prunus *lauro-cerasus*) has sufficient recommendation on the score of activity; and, in the opinion of many, has proved a highly useful deobstruent in icteric cases: but the mischief it produces is so certain, and its real advantage so doubtful or unestablished, that I have neither tried it myself nor can recommend its trial to others.

Of the seeds of the common hemp (cannabis *sativa*, Linn.,) I am equally incapable of speaking from personal knowledge. In the form of an emulsion they are much commended by the German writers, and are said, even during spasmodic pain, to afford relief with astonishing rapidity. Herliz eulogizes this emulsion as having been highly successful in an epidemic icterus which prevailed at Gottingen. The seeds themselves have sometimes been swallowed, being boiled for this purpose in milk till they are cracked.

The dandelion (leontodon *Taraxacum*, Linn.) has also been highly extolled by many writers of established reputation in all obstructions of the liver, and, indeed, in obstructions generally; and has been used in its roots, stalks and leaves. All these abound in a milky, bitterish juice, which was at first supposed to be saponaceous, and hence warmly commended as a resolvent by Boerhaave. Bergius, Murray and Dr. Pemberton, have since contributed to support this character, and they are consequently in daily use even in the present day. The plant has no doubt, therefore, deobstruent virtues; but it has not fallen to my lot, though I have many times given it a fair trial, to add my suffrage in its favour. Its most obvious character is that of increasing the flow of urine.

Soap and alkalies, however, seem to have much better pretensions to favour: and have been still more generally employed in this disease, and pretty extensively regarded as general, and hence as hepatic, solvents. Yet, that they do not act as solvents in hepatic cases, is clear, from a striking case related by Dr. Heberden, who tells us, that he once attended a person, who, for a stone in the urinary bladder, had been in the course of swallowing an ounce of soap every day for seven years. His body was opened after his death; and notwithstanding such an extraordinary quantity of soap had been taken, a great number of stones were found in the gall-bladder, without the slightest marks of having been operated upon by any decomposing power.*

Soap, however, and other alkaline preparations may, perhaps, be useful in another respect: I mean in becoming a substitute for the deficient bile, and cleansing the bowels by their possessing something of the same chemical properties. Yet too much stress must not be laid even upon this virtue; for large quantities of acids, as lemon-juice, have at times been taken with so much apparent benefit, as to gain, also, the credit of a cure. There is one drawback against whatever may be the remedial powers either of soap or of the

* Medical Transactions, Vol. II. p. 165.

alkalies; and that is, their frequent and easy decomposition in the stomach, in consequence of its containing at all times some quantity, and occasionally a very large proportion, of acidity. We may often, perhaps, introduce so much of these medicines as shall be more than sufficient to neutralize the acid; but where a large quantity is wanted for this purpose, it is better to employ the alkali alone than combined with oil, as less troublesome to the stomach. And where this is done, the best, because the most manageable, preparation of the alkalies, will be that which is the purest and most concentrated, as the liquor potassæ; nor does it appear that the other alkalies would answer better if we had forms for elaborating them in the same manner. The Cheltenham spring has unquestionably been serviceable in the relics or sequelæ of the disease, and where exercise and a tonic plan are decidedly indicated. But where we have reason to believe that the bile is secreted in a depraved condition, and particularly where the disease is connected with a morbid state of the liver, the Bath waters, used both internally and externally at the same time, will be found more beneficial than those of Cheltenham.

There is yet another remedy to be spoken of, which of late years has excited great attention, and is now surmounting an ungenerous prejudice that was at first very extensively directed against it: and that is, the diluted aqua regia bath, invented by Dr. Scott, of Russell-square. For nearly thirty years he has been in the habit of using this preparation, and has tried it in almost every variety of strength and almost every variety of proportion which the two acids that enter into the composition may be made to bear to each other. He commenced his experiments in India, where, on account of the greater degree of torpitude the liver is apt to acquire than in more temperate climates, he was in the habit of forming his bath stronger and making it deeper than he has found it proper to do in our own country: and where, upwards of twenty years ago, he plunged the Duke of Wellington into one up to his chin, for a severe hepatic affection he was then labouring under, and thus restored him to health in a short time.

In England it is not often that he finds it necessary to raise the bath much above the knees, and frequently contents himself with a mere foot-bath or common wash-hand basin alone. In both which cases, however, the attendants on the patient should sponge him at the same time with the diluted aqua regia, over the limbs, and occasionally over the body.

The aqua regia should be compounded of three parts in measure of muriatic acid and two of nitric acid; and in preparing them for use, a pint of the combined acid is to be mixed with the same measure of water. This constitutes the diluted acid, or diluted aqua regia. The acid bath is to consist of three ounces of this diluted acid to every gallon of water. It should, however, be observed by those who are inclined to form this mixture extemporaneously at their own houses, that, if either of the acids be poured imme-

diately on the other, a large volume of very offensive gass will be disengaged; on which account, it will be better to pour them separately and slowly on their proper measure of water.

If the acids be of adequate strength, the mixture subdiluted for bathing will, to the taste, have the sourness of weak vinegar, and, perhaps, prick the skin slightly if very delicate, but not otherwise, after it has been applied to the surface for half an hour. But since these acids vary much in their degree of concentration, as distilled by different chemists, there will be some variation in their power. The strength of the bath, however, should not be much greater at any time than the proportion here laid down; for otherwise it may excite a troublesome rash, and give a yellow hue to the nails and skin of the feet or whatever other part is exposed to its action. A narrow tub for a knee-bath, just wide enough to hold the feet and reach the knees, should contain three gallons of the prepared bath liquor, and consequently about nine ounces in measure of the diluted aqua regia. For a foot-bath, half a gallon may be sufficient, and a common wash-hand basin may be employed as a vessel for the purpose. The feet should remain in the bath for twenty minutes or half an hour; and the legs, thighs, and abdomen be, in the mean time frequently sponged with the same. In the winter, the water may be used warm; but this is not necessary in the summer. The bath may be employed at first daily for a fortnight or three weeks, and afterwards every other day or only twice a-week.

Dr. Scott affirms that he has employed this process with decided advantage in almost all cases dependent on a morbid secretion of bile; whether the secretion be superabundant, defective, or depraved. He finds it often, within a few hours of the first bathing, increase the flow of bile and ameliorate its character; and in consequence hereof excite an expulsion of dark-coloured feces, bright-coloured bile, or bile of a brown, green, or black colour, like tar mixed with oil. He has told me also, that when employed in the midst of a paroxysm of severe pain from spasm of the biliary ducts, or the passing of a gall-stone, he has often known it operate like a charm, and produce almost immediate ease.

From the rapidity, therefore, with which it acts in some cases, he is inclined to think that it operates not by the absorbents, but by the nerves: and has made various experiments to show that it is the chlorine of the muriatic acid alone, by the present process decomposed and set at liberty, that produces the benefit of the bath. To prove this, he employed a bath of water saturated with chlorine, obtained from the muriatic acid by mixing it in a retort with the black oxyd of manganese; and the same salutary effects followed: and he has given this saturated solution in doses of half or three quarters of an ounce three or four times a-day, mixed with the same quantity of spearmint, or any other distilled water, with evident benefit, in very numerous hepatic cases of great obstinacy.

This account may be rather overcharged, from the ardent mind of its intelligent inventor; but the process is worth following up,

and varying in other proportions, as well as employing in other families of diseases. My own use of it is at present too limited to speak with decision; yet, so far as I have tried it, it has certainly appeared to me to allay irritation and produce a tonic effect. In two or three instances the advantage has been decisive; and patients, who had hitherto been seldom two months without a severe return of the complaint, have entirely escaped and apparently lost the morbid predisposition. In a few other cases it has completely failed.

SPECIES IV.

ICTERUS HEPATICUS.

Hepatic Jaundice.

THE COURSE OF THE BILE OBSTRUCTED BY A DERANGEMENT OF THE LIVER FROM SCIRRHOUS OR OTHER INDURATIONS; OCCASIONAL RETCHINGS AND DYSPEPSY: LITTLE OR NO PAIN IN THE RIGHT HYPOCONDRIUM.

In the preceding species, the appendages to the liver, as the gall-bladder or gall-ducts, are the chief seat of disease, at least in its commencement. In the species before us, the disease is chiefly seated in the liver itself. It may be a result of the preceding species when they have assumed a chronic form; but as the liver itself is often affected from the first, it is entitled to be treated of as a distinct species. The course of the bile, indeed, is evidently obstructed, but rather in its secretion or separation from the substance of the liver, than in its transmission by the biliary tubes.

This species is noticed by Boerhaave, by Sauvages, and by Dr. Cullen in his Synopsis, though he has offered no remarks on it in his First Lines. In Boerhaave, however, it imports altogether a different disease, for it is jaundice produced by hepatitis,* or inflammation of the liver; and is hence a mere symptom, to be removed alone by a removal of the idiopathic complaint. Yet the species in Sauvages is copied from Boerhaave.

It is more accurately described by Richter, who confirms and illustrates the opinion of Vogel and Selle; all of whom suppose it to depend upon some peculiar irritation in the liver itself, or in the whole hepatic, system, but an irritation not dependent upon or directly leading to inflammation. This irritation is of various kinds, and produces different effects, all of which become causes of obstruction to a free flow of the bile into its proper

* Van. Swiet. Comment. Hepatitis et Icterus multiplex, Tom. III. § 914.

channels. One of the most common effects which operate in this manner, is a scirrhous enlargement of the whole, or of some particular part of the liver. Another is an accumulation of calculous concretions in its substance; of which Richter gives a striking and complicated example in a person, who after death, was found to be without a gall-bladder, and whose liver was filled with whitish calculi of different forms and sizes, from that of a pea to that of a cherry. In this case there can be no question, that the bile, whose colouring matter was diffused over the entire body, was not only formed in, but immediately absorbed from, the penecilli, or pores of the liver, in consequence of obstruction, without being collected into a reservoir.

This is the worst state in which jaundice can possibly make its appearance: for though there is little or no pain, it shows disease in the structure of the liver, and is frequently a mark of a broken-up constitution. It is in fact found rarely in the young and vigorous; but almost always in those who have drunk hard, or lived hard, and especially have been exposed to much labour in hot climates, or have suffered under repeated attacks of quartans or other chronic intermittents.

The art of medicine can here do but little; and we have too often to witness the picture drawn so feelingly of the Athenians during the plague:

> Defessa jacebant
> Corpora; mussabat tacito Medicina timore.*

It is only in an early stage of this disease, if happily we should be so soon consulted, that mercury has any chance of being successful; and it should be given rather as an alterant in small doses pertinaciously followed up, than in large proportions so as to excite a ptyalism; for we have here neither local nor general strength to draw upon without injury. Small doses of calomel in combination with conium appear to have been serviceable in some cases: and I have certainly found benefit from covering the hypochondriac region with a large plaster of the emplastrum hydrargyri cum ammoniaco. For the rest the patient must be put upon a general tonic plan: his diet should be generous without being highly stimulant; he should use such kind of exercise and in such proportion as best agrees with him; and the chalybeate springs, corrected as those of Cheltenham by neutral salts, form the best mineral invigorant to which he can have recourse. Possibly in this species also, the diluted aqua regia bath may be of service, employed as recommended under the last species.

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* Lucr. De Rer. Nat. VI. 1176.

SPECIES V.

ICTERUS INFANTUM.

Yellow Gum. Jaundice of Infants.

THE COURSE OF THE BILE OBSTRUCTED BY VISCID MECONIUM; WITHOUT PAIN OR DYSPEPSY; EASILY REMOVED BY PURGATIVES.

This is the mildest form under which jaundice makes its appearance, and that which is carried off with least trouble. In ordinary cases, the only symptoms are the pathognomic colour, and a degree of languor and drowsiness beyond what is common to infants on birth, or shortly after.

A yellow hue, however, on the surface of infants, is not necessarily a symptom of jaundice, properly so called; for Lentin,* Cullen, and many others, have well observed that such a discoloration may also be the result of a peculiar yellowness of the serum of the blood, unconnected with bile;† analagous to the golden tint which we so frequently find diffusing itself over the surface of a contusion, when the finer and more limpid parts of the effused fluid have been carried off, and the colouring matter of the serum that still remains behind is hereby become more concentrated: as we shall have to notice more at large when treating of this affection under the name of *Aurigo*, constituting the fifth species of the genus EPICHROSIS.‡

A dose of castor-oil, or any other active purgative, will generally be sufficient to remove the obstruction, which in almost every instance proceeds from meconium more than ordinarily tenacious, and consequently will carry off the disease. But sometimes the mouth of the ductus choledochus communis is so completely infarcted with this viscid matter that purgatives are insufficient; and in this case an emetic should be given, and repeated a few days after if necessary: for want of which the discoloration of the surface has sometimes continued for weeks.

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* See Baume's Description de l'Ictere des nouveaux nés, &c. Nimes 1788—Cull. Synops. Nosol. Gen. XCI. 5. note.

† Müller, Diss. de Origine Icteri, maximè ejus, qui infantes recens natos occupat. Jen. 1788.

‡ Cl. VI. Ord. III. Gen. X.

GENUS II.

MELÆNA.

Melena.

THE COLOUR OF THE EYES AND SKIN YELLOW-GREEN, FULIGINOUS, LEADEN, OR LIVID; THE DEJECTIONS PALE, OCCASIONALLY DARK-COLOURED; ANXIETY; DEPRESSION OF SPIRITS.

THIS is the Melæna, or Μελαινα νουσος of the Greeks: a name given to it by Hippocrates, who has been followed up by the Latin writers; among whom, with a mere translation of the term, it is called MORBUS NIGER, or the *Black-disease*, whence the name of BLACK JAUNDICE in our own country and on the continent.

The colour of the skin under this disease is always dark, but differs considerably in its shades, and even in its hue, in different individuals.* It sometimes approaches to a green; whence by Forestus, Razouz,† and other writers, it has been called icteritia or icterus, *viridis*; on which account it has of late been described under the name of *Green Jaundice* by Dr. Baillie, in a valuable article upon this subject, from which I shall beg leave to enrich the diagnosis before us.

This versatility of colour is not to be wondered at; for I have already had occasion to observe, that the bile, under different states of a diseased liver or its appendages, exhibits very different appearances. In respect to consistency, it has sometimes been found watry,‡ viscid, or, flaky; in respect to colour, green,§ muddy, pale-white,‖ pitchy black, eruginous,¶ and versicoloured; in respect to internal properties, insipid, salt, acid, or acrid and effervescent. De Haen, from Citois,** affirms that it has been discharged green from a tumour between the coats of the jejunum. In the disease before us, however, it is always of a dark, and often of a black or pitchy hue. The stools, as in the preceding species, are generally pale from obstruction; and as the absorbed bile is more viscid than in yellow jaundice, it is not so easily dissolved in the blood or separated from it by the kidneys, whence the urine is sometimes pale, and generally clear.

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* Lib. XIII. Obs. 23.
† Tables Nosologiques, p. 129.
‡ Bianchi. Hist. Hep. p. 129. Sebiz, Exercit. Med. p. 93.
§ Augen. Hor. Tom. I. lib. XI ap. 5.
‖ Eph. Nat Cur. Dec. I. Ann. IV. Obs. 194.—Cent. III. IX. App. 9.
¶ Stoll, Rat. Med Part. I. p. 292.
** Rat. Med. X. 32.

Dr. Cullen seems to have been doubtful how to dispose of the genus MELÆNA. In his Synopsis, he has omitted it altogether: in his First Lines, he has briefly noticed it, first under hæmatemesis, and again under diarrhœa, as though melæna were a variety of both these. But not satisfied with this distribution, he afterwards introduced it into his "Catalogue of Diseases omitted, but which ought not to have been omitted," in his Nosology. And in truth the very different appearances and qualities of genuine bile, when occasionally discharged with the feces, or by the mouth, and the chlorotic or livid discoloration of the skin under the present disease, are sufficient to show that it ought to have a distinct generic place allotted to it.

With these occasional dejections of viscid and pitchy bile, and sometimes even without them, there is also frequently a discharge of dark grumous chocolate coloured blood, accompanied with or preceded by a considerable pain in both hypochondria, and clearly evincing a decayed condition of the liver, or spleen, or both, and the rupture of some blood vessel in the one or the other of these organs.

These symptoms have been accurately distinguished by Hippocrates, who in consequence hereof has noticed the two following species of the disease, which I have copied with little variation into our Nosological Synopsis, as forming the best arrangement, and giving the best view of melæna that I am acquainted with.

1. MELÆNA CHOLŒA.	BLACK JAUNDICE. GREEN JAUNDICE.
2. ——— CRUENTA.	BLACK VOMIT.

SPECIES I.

MELÆNA CHOLŒA.

Black Jaundice. Green Jaundice.

OCCASIONAL DEJECTIONS OF DARK OR PITCHY BILE, INTERMIXED WITH THE FECES; OCCASIONAL VOMITINGS OF YELLOWISH-GREEN AND ACID COLLUVIES; GREAT LANGUOR; OFTEN VERTIGO; HYPOCHONDRIA FREE FROM PAIN, BUT TENDER UPON PRESSURE.

THE liver is here evidently diseased in its structure, and a morbid deep-coloured bile, fulvous, greenish, or fuliginous, is secerned, instead of the natural excretion; from general hebetude and a want of the ordinary propulsive power, it lingers in the biliary passages, if it get into them at all; the finer part of the fluid is first absorbed, and afterwards the grosser; and what remains becomes still more viscid, more stagnant, and of a deeper hue.

"In the ordinary use of the term," observes Dr. Marcard of Hanover, "black jaundice means nothing more than yellow jaundice of a more than usual deep dye: yet when the real disease exists to which this name ought to be limited, no practitioner, who closely examines the very dark colour of the skin and of the defluxions, and especially the danger that accompanies it, can avoid concluding that it has something peculiar in its nature, and cannot be merely an intense degree of yellow jaundice. It is highly probable," he continues, "that a part of the dark colour may depend upon the hue of the bile itself in a state of morbid secretion; but along with this there is also a very great structural decay in the biliary organs as well; a decay which gives the chief character to the disease; prevents so frequently all beneficial effects from the best medical treatment; and consequently renders the disease so often fatal."*

The green jaundice is sometimes to be found in young persons, but far oftener in the middle and more advanced periods of life. In men it occurs more frequently than in women, probably on account of the greater wear and tear of their constitution, as more exposed to all weathers and all climates; and appears to be less connected with intemperance than the yellow jaundice; and less disposed to terminate in abdominal dropsy.

The hardness and enlargement of the liver, in many instances, runs through the entire structure of the organ, but is perhaps more frequently confined to some particular part. Upon pressing the region of the liver, the patient is commonly sensible of some degree of tenderness, but otherwise he feels no pain whatever; though he has the same distressing itching of the skin which I have already noticed in yellow jaundice; and has sometimes a troublesome sensation of heat in the palms of the hands and soles of the feet.

The pulse, as observed by Dr. Baillie, continues "natural both with respect to strength and frequency, unless some circumstance may have occurred to irritate the constitution for the time." In the more striking cases, however, that have occurred to myself, the pulse has been peculiarly slow in some instances not amounting at any time to more than fifty beats in a minute, and occasionally to not more than thirty. The stools are generally pale; but from some irregular excitement of the liver, they appear sometimes tinged with bile of a peculiarly dark and pitchy hue; a part of which, from its overflow, rushes into the stomach, and is discharged by the mouth. The urine is deeply loaded with the same, and tinges the linen of a dark tawny hue; it flows freely, and sometimes deposits a pinky sediment.

The appetite varies, not only in different persons, but even in the same. Some patients eat with a pretty good habitual inclination. In others the stomach is extremely capricious; at one time without any desire for food of any kind, at another only relishing

* Medicinische Versuche, &c. Leipsic, 8vo. 1779.

particular kinds; and perhaps a few days afterwards evincing a general taste for whatever is introduced upon the table.

In the preceding species jaundice is not a dangerous disease, except where the substance of the liver is very generally affected, so as to make an approach to the species before us. In green jaundice the patient rarely recovers. The progress of the disease is always slow, and the patient may labour under it for three, four, five, or even seven years. I have lately lost a patient, who had suffered under it for this last term of time, and was not more than forty-two at his death. He was a captain in the royal navy, of regular habits, who had seen hard service, and been severely tried by a change of climates.

Contrary to what occurs in all the modes of yellow jaundice, the morbid hue is here so deeply rooted in the system that it never quits it. If the patient recover, it may become a few shades lighter, but it never leaves his person altogether, and is always visible in the countenance.

In those instances in which the pulse has been very strikingly slow, I have commonly found it connected with some affection of the head, and particularly apoplectic or epileptic fits; evidently from the sluggishness of the circulating powers, and the necessary predisposition to congestion. And I have seen a patient at length carried off by a paroxysm of the one or the other of these affections, after having for years completely recovered, in every instance, from their previous effects, and sometimes, in the intervals, rising from deep depression into hilarity of spirits.

As there is much obscurity in this disease, its medical treatment is indecisive. Mercurial preparations, which so often aid us in the first species, are rarely of service in the present. Dr. Baillie thinks he has found neutral salts, taken daily as an aperient, of palliative use; but of a radical cure he seems altogether to despair. It has appeared to me, that though mercury fails when employed alone, combined with antimonials it is often highly beneficial; and of all preparations of this kind, I have by far preferred the form of Plummer's pill, or, in other words, the submuriate of mercury in union with the precipitated sulphuret of antimony, with a warm stimulant of gum resin. I have also found unquestionable benefit from a union of alkalies and bitter tonics; particularly the liquor potassæ with infusion of columbo. The aqua regia bath is another tonic well worth trying. I think I have found it serviceable; and I am trying it at this moment, but have not yet employed it on a scale that enables me to speak peremptorily.

SPECIES II.

MELÆNA CRUENTA.

Black Vomit.

OCCASIONAL VOMITINGS AND DEJECTIONS OF GRUMOUS BLOOD, INTERMIXED WITH DARK COLOURED BILE; PUNGENT, TENSIVE PAIN IN BOTH HYPOCHONDRIA; COMPRESSIVE PAIN AT THE PIT OF THE STOMACH, AND FAINTING.

In this species the organs subservient to the formation of bile are in a more debilitated and decayed condition than in the preceding: and it may hence be contemplated as a disease compounded of melæna *cholæa* and hæmatemesis *passiva*, or passive hemorrhage from the vessels of the liver, spleen, or both.

Little as we know of the exact part performed in the animal economy by these organs, we see enough to convince us that the functions of both is, in many respects, one and the same; the blood in both is highly carbonated, as even the natural colour sufficiently indicates, and the closest alliance subsists between them. On which account Hippocrates calls the spleen the *left*, and Aristotle the *bastard* liver. Sir Everard Home, as we have already had occasion to observe, regards the spleen as the medium of communication between the stomach and the liver; and has gone far towards establishing, that part of the liquids received into the stomach are conveyed by it (though through vessels not yet discovered) directly into the circulation of the liver. It is a singular property of the blood of the spleen, that, like the catamenial discharge, it does not coagulate.

Dr. Home took a like view of this disease: and affirmed it to be produced, not by a mere effusion of bile of a darker colour, as in black or yellow jaundice, but by an effusion of blood also, which, however, he imagined to proceed from the meseraic veins. He relates three cases in which the disease appeared to be carried off by a critical discharge; the first by a diarrhœa, and the other two by an efflux of sweat and thick urine.

As a symptom, this disease is met with in severe attacks of the yellow fever, and especially that variety or stage of it which by some writers has been distinguished, though perhaps unnecessarily, by the name of Bulam fever, as will be hereafter noticed. In this case the black matter is often formed in a few hours, and at once thrown in great abundance from the stomach before it has time to be absorbed and enter into the circulation, so as to produce the true atrabilious tinge upon the skin which distinguishes the idiopathic malady.

In a case of this disease related by Dr. Marcard of Hanover, the

morbid blood or bile seems to have proceeded from an encysted atheroma in the stomach or liver, as the matter discharged was of the consistence of a poultice, but more granular; quite black, without inclining to red or yellow, and passing off clear from white paper when rubbed upon it, without leaving a stain. The patient said it had no particular taste; the quantity thrown forth at a single discharge amounted to at least sixteen ounces: and the vomiting was preceded by excruciating pains about the region of the stomach.*

In so worn out and exhausted a state of the affected organs, or perhaps of the constitution generally, as this disease indicates, little benefit is to be expected from medical treatment. Our first duty, however, is to clear the impeded passages of the grumous matter that obstructs them; and our next, to prevent as much as possible a fresh flow of it. For the former, gentle means, whether in the shape of purgatives or emetics, or both, will answer best; as we have a shattered fabric to work upon, and violence will only add to its weakness. For the second purpose, the alkalies have very generally been had recourse to, sometimes alone, and sometimes in the form of soap: but I have rarely found them of decided benefit. For these I have often substituted acids, and have preferred the vegetable to the mineral, particularly where the constitution has appeared to be broken down generally; as the patient is able to take a much larger proportion of the former than of the latter, because of the corrosive quality which the latter possess: and of the vegetable acids, the fermented or acetous have answered better than the native. Mercurials seem to be of as little service as in the preceding species; except where we have reason to expect a fresh accumulation of the morbific material, in which case they may be employed as a purgative. But between the paroxysms, bitter tonics, as columbo and simarouba, with such gentle exercise as may be engaged in without fatigue, a light but generous diet, and the use of the Cheltenham waters, are what should chiefly be insisted upon, as best calculated to postpone the fatal issue, which, after all, can only be postponed.

* Edin. Med. Comment. Vol. IV. p. 203.

GENUS III.

CHOLOLITHUS.

Gall-Stone.

PAIN ABOUT THE REGION OF THE LIVER CATENATING WITH PAIN AT THE PIT OF THE STOMACH; THE PULSE UNCHANGED; SICKNESS; DYSPEPSY; INACTIVITY; BILIOUS CONCRETION IN THE GALL-BLADDER OR BILE-DUCTS.

In the preceding species we have had occasion to observe that the bile is frequently found peculiarly viscid or tenacious, either from original secretion in this state, or from an absorption of its finer and more attenuate parts in the gall-bladder or appended ducts. In the disease before us, we find certain portions of it indurated, and assuming a concrete form, often of a crystallized, sometimes of a laminated structure; and perhaps most commonly of both, evincing a tendency towards crystallized rays in the centre, with concentric laminæ towards the surface.*

These concretions were supposed by Fourcroy to consist of a resinous matter combined with a peculiar oil, and a certain quantity of albumen, forming three of the constituent principles of bile. All these principles, however, have of late been denied by Berzelius, who has discovered that the bile becomes resinous only in the process of experiment, by supersaturating it with acids, while the material hitherto regarded as albumen is nothing more than a small portion of mucus furnished from the gall-bladder.

In all instances, perhaps, gall-stones are inflammable; and, when dry, blaze like wax in the flame of a candle. And in some instances Dr. Darwin suspects them to dissolve in the matter of the feces, and to pass away invisibly. It is possible, however, that the cases here alluded to were only examples of spasmodic jaundice; for nothing but the actual appearance of bilious concretions in the feces can fully prove their existence; while the general symptoms may be produced by other causes. Gall-stones differ in specific gravity: some have been found heavier than water; others, a little lighter, bearing the proportion of nine to ten. In colour they are mostly dark brown; a few are white externally, though still brown within.†

It is possible that minute biliary concretions may be occasionally formed in the penicilli, or the pores of the liver, perhaps in the ducts; but the gall bladder is the common seat of origin: and they are here found of every diversified size, from that of a mustard-seed to that of a pullet's egg; often, indeed, not only completely blocking

* Baillie, Morbid Anatom. Fol. 5, Pl. vi. p. 109—113.
† Heberden, Med. Trans. Vol. II. p. 137.

up the cavity, but distending the bladder far beyond its natural dimensions; and the passing such large concretions shows what wonderful efforts nature is capable of making towards freeing herself from a morbid incumbrance; for the natural size of the ductus communis choledochus scarcely exceeds that of a goose-quill. The change thus occasioned is often very slow; and consequently accompanied with less derangement of the general health than we should expect; but as the bitter of the bile is produced in the cavity of the gall-bladder, and this cavity is hereby generally obliterated, the bile loses a considerable proportion of its bitter taste; and, possibly from the want of bile in the intestines, the evacuations are very irregular. The gall-stone, thus closely impacted, will sometimes remain quiet, and without being detached for many years, with, only occasional uneasiness in the hypogastric region.

"In some patients," says Dr. Heberden, "the jaundice will disappear in two or three days: in others I have seen it continue near a twelvemonth before the gall-stone could pass into the intestine, or fall back into the bladder: nor will this long obstruction of the natural course of the bile have any lasting ill effects, or hinder the patient from being soon reinstated in perfect health after the removal of the obstruction." And as little real inroad upon the constitution takes place, in many instances, from a continuance of the concretion in the gall-bladder: "for many," observes the same excellent writer, "have been opened after their death, in whom a very large stone, or many small ones, have been found, without their ever having had in their lifetime any complaint which could certainly be imputed to this cause. A gall-stone weighing two drachms was found in the gall-bladder of the late Lord Bute, though he had never complained of the jaundice, nor of any disorder which I could attribute to this disease."*

The irritation of a gall-stone has occasionally excited inflammation, and, where the gall-stone has existed in the liver, a large abscess; and the inflammation, in the latter case, assuming the adhesive form, the abscess had opened externally, and the calculus been discharged in this direction, of which we have a curious case related by Mr. Blagden in the Medical Transactions.† The calculus, on examination, weighed nearly an ounce and a quarter, and was of an oblong shape. The patient, who was a lady of sixty-six years of age, gradually recovered.

From the absence or presence of pain, the rest or transit of the gall-stone, which give rise to a considerable diversity of symptoms, as well as mode of treatment, the genus is divisible into the two following species:

1. CHOLOLITHUS QUIESCENS.	QUIESCENT GALL-STONE.
2. ——————— MEANS.	PASSING GALL-STONES.

* Medical Transactions, Vol II. p. 134.
† Vol. IV. Art. XVI.

SPECIES I.

CHOLOLITHUS QUIESCENS.

Quiescent Gall-Stone.

PAIN ABOUT THE LIVER, AND AT THE PIT OF THE STOMACH, OBTUSE AND OCCASIONAL; THE BILE LESS BITTER THAN USUAL; THE DEJECTIONS IRREGULAR.

In the quiescent species, the gall-stone remains usually at rest in the gall-bladder or the liver; and whatever be its size, the growth takes place, and the containing organs dilate so gradually as to produce little or no inconvenience. In Dr. Baillie's plates there is an example of a concretion of the size of a pullet's egg, which filled up the whole of the fundus. Yet so perfect was the adaptation of nature to the case, that the bladder not only became sufficiently enlarged at its base to hold the concretion, but was also sufficiently enlarged immediately above it to form a new reservoir, and contain, very nearly, the usual quantity which the gall-bladder is capable of holding in its healthy state.

At times, however, even in this quiescent form of the disease, we meet with some degree of pain; occasionally, perhaps, produced by a sudden deposit of fresh concrescent matter; occasionally by abrupt starts of some propulsive power which it is difficult to explain; and occasionally by some peculiar and temporary irritation in the coats of the surrounding organ, by which the bowels are apt to be considerably affected.

In this species, however, little medical treatment is necessary: for we have only to correct the commotion of the alvine canal when thus excited, or to quicken its motive power when sluggish; and to have recourse to anodyne fomentations and narcotics internally, if there should at any time be severe pain. And by palliatives of this kind many a patient, as I have already observed, had been enabled to have a comfortable enjoyment of life to old age, whose gall-bladder has, after death, been found loaded with concretions which, there has been good reason to conclude, had been gradually accumulating for thirty or forty years.

SPECIES II.

CHOLOLITHUS MEANS.

Passing of Gall-Stones.

PAIN AT THE PIT OF THE STOMACH ACUTE, EXTENDING TO THE BACK: FREQUENT VOMITINGS: DEJECTIONS WHITE; AND AT LENGTH LOADED WITH ONE OR MORE BILIOUS CONCRETIONS.

It is not a little singular that during the great anguish sustained in the transit of a gall-stone, the pulse is rarely or never quickened. "Insomuch," observes Dr. Heberden, "that this natural state of the pulse, joined with the vehement pain about the pit of the stomach, affords the most certain diagnostic of this illness. I have seen," says he, "a man of patience and courage rolling upon the floor, and crying out through the violence of this pain, which I was hardly able to lull into a tolerable state with nine grains of opium given within twenty-four hours, to which he had never been accustomed: and yet his pulse was all the time as perfectly quiet and natural as it could have been in the sweetest sleep of perfect health."*

Together with the pain at the pit of the stomach, which is acute in almost every instance, there is sometimes a pain also in the region of the liver; and not unfrequently it commences here. For this it is not difficult to account. Membranous canals, with a very few exceptions, are most sensible at their extremities; and an irritation excited in either extremity acts by sympathy upon the other. A stricture in the prostate gland produces pain while making water in the glans penis; and notwithstanding the comparative insensibility of the rectum, which forms one of the exceptions to which I have just referred, faintness at the stomach is almost always accompanied with a relaxation of the sphincter ani, so that the stools issue involuntarily. Now in passing a gall-stone the pain is greatest on its first entrance into any one of the ducts, or on its reaching the extremity of the ductus communis just before it is disgorged into the duodenum, in consequence of the greater sensibility of these parts. In the former instance, its direct seat is in the origin of the canal, near the liver; in the latter, in its termination towards the pit of the stomach: but as the one extremity acts by sympathy on the other, both these organs must be affected in a greater or less degree; and as the duodenum and stomach possess a finer sensibility than the liver, we perceive readily why the pain is more pungent in the former than in the latter region. When the concretion has fairly entered the ductus communis, the pain remits, but generally

* Med. Trans. ut supra.

returns with sudden violence on its reaching the duodenal point: and we hence see the reason of that additional attack of severe agony which a patient often sustains after having flattered himself that the disease was completely subdued.

In the medical treatment of this complaint, all that we have in our power to accomplish is, to ease, and as far as possible, to accelerate the course of the gall-stone. Formerly, when the gall-bladder was suspected to be completely gorged, its walls thickened from long continued irritation, the concretions too large to be forced forward, and the pain permanent and severe, attempts were made to remove them by a section into the cyst. Bloch* gives a singular case of this kind, in which not fewer than sixty-two distinct calculi were taken away with success. But in general the operation has not answered, or has been followed by a formation of other crops of concretions; so that Morgagni, and many later writers† of eminence have strongly reprobated the use of the knife, and it is rarely or never had recourse to in our own day. In reality there seems to be no just cause for its use. At the time that the gall-stone is in the bladder, to whatever extent it enlarges, the progress of enlargement is slow, and the capacity of the gall-bladder will, in most cases, without much irritation, and sometimes with very little inconvenience, expand to meet its growth: while the moment it has quitted the cyst, and has entered into the duct, it is in vain to attempt to follow it up to any particular spot.

Our best and wisest exertions, therefore, must be of a palliative kind, with a view of easing and quickening the passage of the gall-stone. We have no direct means, however, of doing the last: and all we can hope to accomplish is that of rendering a little collateral assistance to the expulsive efforts which are made by nature herself. The duct becomes dilated by the circumambient pressure of the concretion as it gradually passes forward, urged on by the same action that propels the bile in a state of health. Vomiting, therefore, by compressing the whole abdominal viscera, and, particularly, the full and distended gall-bladder and biliary vessels, may afford one mean of pushing forward the concretion: but a gentle force, and consequently gentle vomits, will promise fairer than those which act violently. Dr. Darwin affirms, that in two instances he saw from thirty to fifty gall-stones voided after taking only an oil vomit. If the patient be of tolerable vigour, and inflammation be apprehended, bleeding should precede the exhibition of emetics. Cathartics, by exciting the action of the intestines, and directly stimulating the mouth of the common bile-ducts, contribute, also, to excite action through its entire range, and thus farther favour the expulsion of the concretion. And as we often find its passage evidently opposed by spasmodic constriction, opium, given very freely

* Medic. Bemerkungen. N. 5.

† De Sed. et Caus. Morb. Ep. XXXVII. Art. 52.—Sharp's Critical Enquiry, Ch. VI.—Le Dran, Consultations sur la plupart de Maladies, &c.

and repeated every hour or two, and relaxing the skin by fomentations or the warm bath, will in such cases be of essential service. Horse exercise cannot always be made use of: but where it can be submitted to, it is one of the best auxiliaries we can recommend.

We know of no solvent of biliary concretions worth attending to. The essential oil of turpentine was at one time regarded as a very powerful medicine of this kind, and, as such, was strongly recommended and very generally employed by Van Sweiten,* Block,† Durande,‡ and many other celebrated characters, sometimes alone, but more generally combined with alcohol, or the sulphuric or nitric ether. More recent practice, however, has not justified its possession of this virtue; and, if it were ever serviceable, it must have been as an antispasmodic rather than as a solvent. Durande, indeed, seems to have acted upon this view; for his formula consisted of three parts of sulphuric ether to one of the oil. Yet where there is danger of inflammation, such a medicine must be always too stimulant; and Dr. Percival has good grounds for remarking that its internal use is productive of mischief.§ It is not often that this disease proves fatal, or even essentially injures the constitution, except when there is an habitual predisposition to the generation of gall-stones, and the frame is worn out by a chronic succession of irritation and pain.

GENUS IV.

PARABYSMA.

Visceral Turgescence.

KNOTTY OR UNEQUAL INTUMESCENCE OF THE ABDOMEN FROM AN INDURATED ENLARGEMENT OF ONE OR MORE OF THE VISCERA CONTRIBUTORY TO THE DIGESTIVE FUNCTION; DERANGEMENT OF THE GENERAL HEALTH.

This genus is intended to comprise a natural and extensive division of disease, consisting in an infarcted protuberance of one or more of the collatitious organs of digestion; commonly produced by a deficient action in the absorbent vessels of the part affected.

The form under which the disease has been described by Hippo-

* Constit. Epid. Lugd. Batav. p. 102.

† Bemerkungen, N. 5.

‡ Observations sur l'Efficacité du Melange d'ether sulphurique et d'huile volatile de terebinthine, &c.—Strab. 1790.

§ Essays, II. p. 232.

crates is, *megalosplanchnus* (μεγαλοσπλαγχνος) or "big-bowel:" which Cusson and others, on account of its length, have exchanged for PHYSCONIA, a word literally importing "inflation;" and so used by both Greeks and Latins. For dismissing the former, there is, perhaps, sufficient reason; but physconia ill supplies its place, as conveying no correct or definitive meaning; whence it has been employed by different writers in so loose a manner as to comprise a variety of organic tumours that have no relation whatever, in origin, position, properties, or mode of cure. The word, therefore, is not worth preserving, either in respect to its primary or general sense: and it is on this account I have ventured to exchange it for PARABYSMA (ΠΑΡΑΒΥΣΜΑ,) from παραβυνω, a genuine Greek term, in use among the Greek classics, and distinctly signifying morbid *congestion*, *coacervation*, or *infarction*, which is the prominent character of the genus.

As all the viscera of the abdomen are subject to an indurated enlargement of this kind, we are furnished with numerous species, which may be arranged under the following heads:—

1.	PARABYSMA HEPATICUM.	TURGESCENCE OF THE LIVER.
2.	——— SPLENICUM.	TURGESCENCE OF THE SPLEEN, &c.
3.	——— PANCREATICUM.	TURGESCENCE OF THE PANCREAS.
4.	——— MESENTERICUM.	TURGESCENCE OF THE MESENTERY.
5.	——— INTESTINALE.	TURGESCENCE OF THE INTESTINES.
6.	——— OMENTALE.	TURGESCENCE OF THE OMENTUM.
7.	——— COMPLICATUM.	TURGESCENCE COMPOUNDED OF VARIOUS ORGANS.

SPECIES I.

PARABYSMA HEPATICUM.

Turgescence of the Liver.

HARD TUMOUR IN THE RIGHT HYPOCHONDRIUM, VERGING TOWARDS, AND SOMETIMES APPEARING AT, THE PIT OF THE STOMACH; GENERAL LANGUOR; PALE OR YELLOW COUNTENANCE; DYSPEPSY; DEJECTIONS IRREGULAR OFTEN WHITISH.

THIS disease originates from different causes, and is marked by symptoms and effects of very different kinds. The diversity of the symptoms, however, is not always sufficient to point out the real nature of the swelling, which, in many instances, can only be determined by a post-obit examination. Yet the following varieties may be noticed, as frequently distinguishable during life:—

α Coactum. Atonic turgescence.	From simple parenchymatous coacervation.
β Scirrhosum. Scirrhous turgescence.	Accompanied with a hard and scirrhous feeling.
γ Chololithicum. Gall-stone turgescence.	Accompanied with an occasional discharge of bilious concretions.
δ Helminthicum. Vermicular turgescence.	Accompanied with an occasional discharge of worms or larves.

The first of these very generally paves a way to one or other of the three ensuing; and is found most frequently in feeble children who secrete little bile, and have the cells of the liver clogged with mucus from an atony of the absorbents. It is also found very frequently in intemperate eaters, and in foreigners who reside in hot climates; an equal degree of atony, at times amounting to a paralysis, being produced in the liver from the exhausting stimulus of the rays of the sun, and an excessive use of spirituous potations.

In a scrophulous, habit, a liver, thus enlarged and infarcted, is apt to become scirrhous in children, if not early attended to, as it is also in the gormandizers just alluded to, who have long habituated themselves to the luxuries of the table. Sometimes the scirrhus is confined to a part of its margin; sometimes it appears partially on its surface; sometimes it runs through one or the other, or both its lobes: and sometimes also, the portion that becomes scirrhous evinces a tuberculate structure, and consists of clusters of simple tubercles before the schirrosity takes place.

It is not always, however, that a scirrhous or even a tubercular structure of the liver occasions its enlargement. In many instances, indeed, it does so; but Dr. Baillie has just given examples, illustrated by plates, in which the liver has hereby shrunk into a size considerably below its natural proportion.* This disease may be generally detected by an accurate examination of the hypochondrium with the hand.

All the affections of the liver appertaining to the division before us, appear to owe their origin to atony or hebetude in the organ: and hence the common rise of that variety of turgescence which is accompanied with bilious calculi. These are sometimes diffused like granules over the substance of the liver, or amongst the biliary pores; they are sometimes confined to, and load one or more morbid cysts existing in the liver; and are sometimes naked, concrete, and crystallized; of which I have referred to various examples in the volume of Nosology. These are occasionally to be found in the dejections.

In the variety distinguished by the existence of grubs and worms, the fluke is, perhaps, sometimes to be found even in the human liver. Doever and Clarke, as already observed, assert this, and Darwin confirms their assertion. That they are found in almost all

* Morbid Anat. Pl. II. fig. 2. p. 102.

other animals, is admitted by every naturalist; although Dr. Harrison, of Horncastle, has lately ventured to deny that they are to be traced in sheep in the well-known disease called the rot. But the vermicles chiefly observable in the variety of parabysma before us, are hydatids.

"These," says Dr. Baillie, "consist of spherical bags of a white or light amber colour, more or less transparent, and are lodged in cartilaginous cysts. The cysts are lined with a brownish pulpy membrane, resembling very much the coagulum of the blood; but this membrane is more or less distinctly marked in different cases. The cysts are sometimes surrounded on every side by the substance of the liver, and sometimes are formed at the surface, so as to be partially seen without dissection. The hydatids themselves contain a transparent fluid, which is capable of being coagulated by heat and by acids, and sometimes contain also smaller hydatids floating in this fluid. On many occasions very small hydatids are found adhering to the coats of the larger hydatids, and appear to the eye like small pearls. Hydatids of this species seem to be animalcules of a very simple structure; and although they are not often formed in the liver, yet they grow more frequently in this gland than in any other of the body."*

The hydatids die in process of time like other animal forms, and their place is supplied by their progeny. When they die, the bags and cysts are often broken up, and become frittered into minute tatters and filaments, fragments of which pass occasionally by the biliary ducts into the duodenum; and, being rejected with the feces, are often mistaken for portions of the villous coat of the intestines.

As this species of the parabysma depends almost entirely on an atony of the liver, the intumescence increases in many instances in proportion to that atony, and particularly when debility of the liver is combined with a general debility of the entire system. And hence the liver is frequently known to enlarge in proportion as every other organ becomes torpid and decays. On which account the liver is often found of an enormous size in dropsical patients. Mr. Gooch gives a case, in which, during dropsy, it acquired the monstrous weight of twenty-eight pounds.† Baldinger reports another instance in which it reached twenty pounds;‡ and Bonet, a third, in which it weighed only two pounds less.§

In recent stages, and especially in children and young persons, this disease may often be successfully attacked by warm purgatives and tonics; and especially by those valuable alterants that change the action of both the excretory and absorbent system, diminishing

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* Morb. Anat. p. 107. Pl. V.
† Med. and Surg. Obs.
‡ N. Magaz. Band. VII. p. 275.
§ Sepulcr. Lib. 1. Sect. XVIII.

the irritability of the first and restoring the power of the second, and thus re-invigorating them alike. Many of the metallic salts and oxyds have a tendency to do this, and especially those of zinc, copper, iron, and silver. But those of mercury are, for the present purpose, far more valuable than any of the rest. It should be given in milder forms and gentle doses only, so that it may be persevered in for a considerable period of time. The black or red sulphuret of mercuray, or the blue mercurial pill, has been employed indiscriminately; but small divisions of calomel, as a grain or a grain and a half a-day for an adult, or the compound calomel pills, as invented by Dr. Plummer, in the proportion of five or six grains a-day, will often answer much better. In the mean time an occasional purging must be persevered in: and if worms be suspected in the intestines, they must be removed by the treatment already laid down. I have also found benefit from an application of the emplastrum hydrargyri cum ammoniaco, large enough to cover the entire hypochondrium: and, where particular circumstances have prevented me from using this, from sponging the abdomen daily with aqua regia diluted with about forty times its measure of water, which, as already observed, reduces it to the sourness of weak vinegar.

As far as my own experience goes, I have had so much reason to be satisfied with the good effects of mercury, that I have rarely employed any other medicine; and though I cannot say, with Dr. Cullen, that its effects are to be ascribed solely to the stimulus it gives "to the excretories, and not at all to any change produced in the state of the fluids;" yet the following remark of the same distinguished writer is entitled to general attention: "Universally, mercury in its active state seems to be a stimulus to every sensible and moving fibre of the body, to which it is immediately applied; and, in consequence, it is particularly a stimulus to every excretory of the system to which it is externally or internally applied. Besides its noted effects upon the excretories of the saliva, it seems to operate upon the whole of those of the alimentary canal. It proves often diuretic; and I have particular proofs of its reaching and acting upon the organs of perspiration. Although it may sometimes operate more upon certain excretions than upon others, it may be presumed that, when any tolerable quantity is thrown into the body, it is in part distributed over the whole; and therefore its medicinal effect is, that it is the most universal aperient and deobstruent known."*

I have not however found that it gains much advantage, at least in the diease before us, by being united with sulphur, or subdoses of nitric acid, as the pulvis mercurii cinereus of the late Edinburgh Pharmacopœia; but the sulphurets of antimony seem to increase its effect.

M. de Sauvages relates a singular case of the disease, in which this compound effected a cure, upon the authority of M. Broussou-

* Mat. Med. Part. II. Chap. XVII. p. 433.

net, in whose practice it occurred. "The patient, who was a woman of forty years of age, had laboured for fifteen years under a tumour in the region of the liver, which had increased annually to such an extent, that, though a widow, she appeared to be pregnant with twins. The tumour preserved the external figure of the liver; was very hard, and enormously large, and would bear a forcible pressure without pain. She breathed short on walking up hill; but her feet never swelled, and the menstrual flux was regular. Being tired of the medicines which the most distinguished physicians had prescribed for many years, and myself for many months, without any advantage, she swallowed at one and the same time a drachm and a half of mercurius dulcis (calomel); a remedy which, mixed up with conserve of elecampane, and divided into various doses, I had prescribed for her to take within the course of five days. Scarcely had she swallowed the medicine three hours, when she was seized with a most violent pain in the abdomen; and exclaimed, in the midst of her agonies, that she felt something rushing from the breast to the lowermost part of the belly. Meanwhile the swelling disappeared, and the patient, almost lifeless, threw herself on the bed. Visiting her at this time, I found great prostration of strength, the pulse scarcely vibrating, the intestines, so to speak, swimming in water, and on my slightly pressing the part where the swelling had formerly existed, she felt acute pain. Within four days her powers revived, the abdomen swelled generally, a fluctuation was evident; and on the seventh day, upon a consultation with that distinguished physician Doctor Farjeon, we determined on the paracentesis: from which day to the tenth fifteen pints of limpid water were drawn off. Within three days, however, from the operation, the ascites returned, and not the abdomen only, but the whole body partook of the swelling. This dropsical habit was attacked with the vegetable hydragogues of most celebrity, but in vain: in consequence of which we had recourse to a combination of calomel and crude antimony; and by this the dropsy became so completely dispersed, and the patient so perfectly recovered, that she has now reached the third year of continued health; and the liver will bear a hard pressure without pain of any kind."*

Where the disease exists in feeble children, repeated emetics have been of service, by rousing the torpid absorbents of the liver into fresh action. As the use of the prussic acid has of late been revived for several kinds of visceral affections, I ought not to omit stating, that in the form of an infusion of laurel-water (cerasus Laurocerasus) it is said by various writers to have been serviceable in the disease before us, some of whom have tried it externally, others internally, and a few both ways:† but as I know nothing of it from my own experience, I limit myself to give this hint.

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* Class X. Ord. II. Gen. IX. Physconia. § 3.

† Baylie's Pract. Essays.—Percival, Pract. Essays, Vol. I. 36.

SPECIES II.

PARABYSMA SPLENICUM.

Turgescence of the Spleen.

INDURATED TUMOUR IN THE LEFT HYPOCHONDRIUM, VERGING TOWARDS THE SPINE; PALE COUNTENANCE; GENERAL DEBILITY.

Enlargement of the spleen is, for the most part, less mischievous than enlargement of the liver; and there is hardly any organ that either nature or art may take so many liberties with, without seriously affecting the general health. It has been found wanting;* it has been found double,† and even treble:‡ and when in a state of disease, in a few rare instances, it has been utterly extirpated without injury;§ or has continued of an enormous size for thirty years and upwards.‖

The disease, as a species, is found under the following varieties:

α Coactum. Ague-cake.	From simple infarction.
β Scirrhosum. Scirrhous turgescence.	Accompanied with a scirrhous feeling.
γ Cartilaginosum. Cartilaginous turgescence.	Accompanied with a cartilaginous induration of the coats.

The first variety occurs chiefly after obstinate remittents or intermittents, in strumous or other weakly constitutions, or which have been previously debilitated by intemperance. When agriculture was in a ruder state than in our own day, and the land left in many parts swampy, and undrained of its stagnant waters; and consequently when tertian and quartan intermittents were far more common than they are at present, this disease was also far more frequent and more obstinate. An injudicious use of the bark, is said also to have contributed to this affection, and very generally to have increased it. And although we meet with no such mischievous effects in the present day, there can be little doubt that there was much ground for such a charge formerly. In intermittent fevers, Peruvian bark copiously administered, is not an idle medicine; for if it do not assist, it will be sure to injure. And as it was formerly given in large and frequent doses, in districts where the patient was daily exposed to the operation of the same swampy

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* Pohl. Pr. Casus anatomicus, &c. defecta Lienis. Lips. 1740.
† Schenck, Observ. Libr. III. N. 84. Cabrolius, Observ. N. 15.
‡ Schenck, loc. citat.
§ Valisneri, Opp. III. p. 128. Bartholin. Hist. Anat. Cent. IV. Hist. 51.
‖ Darw. I. II. iii. 18. Sauv. loc. citat.

miasm that produced the disease at first, it is difficult to conceive how it could produce any benefit whatever; but by no means difficult to account for its proving mischievous; since, by its ineffectual interference, it could only add to the violence of the contest, and exacerbate the paroxysm as it returned, and especially the cold fit, by giving rigidity to the muscular fibres. And this I apprehend to be the chief cause of what is meant by its caking or stuffing up the abdominal viscera: since the more constrictive the spasm on the blood-vessels of the surface, while the cold fit lasts, the more forcibly the blood must be driven into and distend the vessels of the deep-seated organs, and promote a tendency to parenchymatous effusion. It is in vain, therefore, to expect any substantial benefit from the use of chincona unless the patient be at the same time removed from the atmosphere of infection.

This variety of parabysma also occurs, like atonic turgescence of the liver in feeble children, the spleen being clogged with mucus and inspissating halitus from an atony of the absorbents. And, in this case, it has often been dispersed by emetics given repeatedly, which stimulate the absorbent vessels into increased activity.

Cataplasms that excite vomiting have for the same reason, in many instances, had the happiest effects. They have commonly been made of tobacco; and Mr. Stedman gives instances of its proving an effectual remedy in both the varieties now adverted to, and in an old man as well as in a boy.* The former had, in the first instance, been attacked with a general numbness in consequence of sleeping in the open air in the West Indies, while the serenadas, or night dews, were gathering around him. This was succeeded by a jaundice, and the jaundice by a parabysma of the liver, in which the spleen also appears to have catenated, the turgescence continuing to increase for five years in spite of the medicine prescribed for him. A tobacco poultice was at this time applied, and renewed daily for a month. It produced frequent vomitings, but at the end of the month the patient was cured. The quantity employed at a time was six ounces; for a child one ounce is sufficient.

Cataplasms of common groundsel (senecio *vulgaris*, Linn.), the erigerum of the dispensatories, are said to prove equally useful by exciting a like effect. Mr. Stedman asserts that he had tried them with complete success: and was at first induced to do so, from discovering that it was the chief ingredient in a poultice which was a popular remedy in his neighbourhood, the materials of which were kept a profound secret by the empiric who employed them.

The general treatment of this disease, however, should be the same as that laid down for the preceding species.

In turgescence of the spleen, whether originating from the preceding, or produced by a strumous diathesis, the organ sometimes assumes a scirrhous hardness; and, in consequence of this symptom,

* Edin. Med. Ess. Vol. II. Art. V.

is often felt more distinctly than in the first variety. It acquires, in some instances, a very large size, though often not so large as the turgescent spleen without scirrhus. Sauvages quotes from Bonet a case, in which, after death, it was found to weigh thirty-three pounds and to fill the whole of the abdomen. The complaint had lasted seventeen years before the patient died, during nearly the whole of which she pursued her usual avocations.* Dr. Baillie has given other singular examples; in one of which the spleen was three times its ordinary size, of a hard but uniformly solid texture; not tuberculated, nor disposed to suppurate.† When suppuration, however, takes place, the abscess is sometimes very bulky; and the quantity of pus lodged in it has amounted to fifteen pints.‡

The coats of the spleen are occasionally converted into a soft cartilage, and exhibit a change which is rarely, if at all, found in other viscera. The enlargement in this case, beyond the natural size of the organ, is in general but trifling; and Dr. Baillie has an instance in which there was a diminution of size; the coats, though sometimes evincing irregularities on the surface, are usually smooth and uniform; and it is by these characters that we can alone judge of the nature of the disease during life.

In the treatment of scirrhous spleen it is not necessary to add to the remarks already offered under the preceding species.

SPECIES III.

PARABYSMA PANCREATICUM.

Turgescence of the Pancreas.

HARD ELONGATED TUMOUR, RUNNING TRANSVERSELY IN THE EPIGASTRIC REGION; DYSPEPSY; GENERAL LANGUOR.

The following are the chief varieties under which this species shows itself;

α Coactum. From simple infarction.
Atonic turgescence.

β Calculosum. Accompanied with calculous concretions.
Calculous turgescence.

Diseases of the pancreas occur but rarely; and of those appertaining to the present species, Dr. Baillie affirms he has never met with more than the preceding modifications.

All the ordinary causes that produce atony in the liver and spleen

* Class X. Ord. II. Bonet. ex Hyppol. Bosco.
† Morb. Anal. Fascic. VI. Pl. III.
‡ Hist. de l'Acad. des Sciences, 1753, p. 196.

may affect the pancreas; but there is one that is peculiar to itself, and that is, an habitual excitement of the excretories of this organ by the daily use of tobacco whether chewed or smoked, probably from a sympathetic action between the pancreatic and salivary glands, whose functions so closely co-operate, and whose secretions are so nearly alike. Dr. Darwin relates a case of this kind which terminated in the death of the patient, who had been for many years a great consumer of tobacco, chewing it all the morning, and smoking it all the afternoon.* The substance of the gland is generally hardened, though not determinately scirrhous; and its lobular appearance is preserved.

In the calculous variety, the concretions are chiefly, and sometimes altogether, found in the excretory duct of the gland and its branches, which, in consequence, are often very much distended, and occasionally filled with them. They are usually of a white colour and very irregular shape, and by these characters, when discharged by the rectum, may be distinguished from gall-stones. As the duct is less sensible than the liver, the kidneys, or the bladder, it is not often that much pain or uneasiness is complained of, even when the passage, upon an examination after death, seems to have been long blocked up and upon a stretch.

Emetics, and such exercise as gives a general jar to the animal frame, as riding a hard-trotting horse, will contribute towards dislodging the pent-up concretions; and a free use of acids, acidulous drinks, and especially acidulous mineral waters, will have a tendency to dissolve them.

SPECIES IV.

PARABYSMA MESENTERICUM.

Mesenteric Turgescence.

INDURATED AND IRREGULAR MASS OF TUMOURS BELOW THE STOMACH YIELDING TO THE PRESSURE OF THE HAND; PALE, BLOATED COUNTENANCE; ATROPHY; THE APPETITE SELDOM DIMINISHED, OFTEN VORACIOUS.

This species shows itself under the following modifications or varieties:—

α Helminthicum. Vermicular turgescence.	Accompanied with hydatids or other worms.
β Strumosum. Scrophulous turgescence.	Accompanied with scrophula.
γ Scirrhosum. Scirrhous turgescence.	Accompanied with scirrhus.

* Zoonom. Cl. I. Ord. II. ii. 8.

♂ Sarcomatosum. Sarcomatous turgescence.	Accompanied with fleshy excrescences.
♀ Steatomatosum. Steatomatous turgescence.	Accompanied with adipose excrescences.
♃ Fungosum. Fungous turgescence.	Accompanied with fungous excrescences.

These varieties are often complicated by an union of one of them with several others. Thus the strumous modification is sometimes found to have sprouted with fungous caruncles; the sarcomatous evinces a scirrhous or indurated texture; and vermicles are occasionally found in most of them. It is chiefly a disease of infancy; and debility, as in all the preceding species, is the proximate cause; but the predisposing causes are numerous. Innutritious food, a chronic and exhausting sickness, invermination, an impure atmosphere, a scrophulous diathesis, may all pave the way. And when the chylopoetic organs are hereby weakened, the weakness will soon extend to the mesenteric glands, which, like the pancreas or liver, under like circumstances and for the reasons already urged, will soon become clogged and tumefied, and exhibit an irregular surface to the feel. These symptoms grow daily more manifest; because, as the lacteals which enter them are now obstructed and impervious to the chyle, the whole frame becomes emaciated, the superincumbent fat and muscles waste away, and the coacervated glands rise towards the surface, occupy their place, and are covered with a meagre shrivelled skin alone. And hence, any of the varieties of the present species may become a cause of atrophy or tabes; though both these species may also exist without such effect.

A total obstruction, however, to the course of the chyle from a parabysma of the mesenteric glands does not often occur, certainly by no means so often as is suspected. Mr. Cruikshank admits it to be "possible that children and grown persons may sometimes have died of such obstruction; but," he adds, "in such enlargement of the glands, if they ever take place, we should meet with the stagnation of the chyle in the first set of lacteals; yet I never saw such stagnation on any occasion whatever: but as stagnation of the lymph from obstructed lymphatic glands of other parts is said to have been seen, it may be possible that the chyle, from the causes mentioned, may sometimes have been prevented from getting into the blood-vessels"*

That a total obstruction to the course of the chyle does not necessarily follow upon very great enlargement of the mesenteric glands is certain, because many patients exist under this disease for a considerable number of years, in some instances not less than ten;† and seem, even at last, to be carried off by hectic fever, or some other cause of irritation, rather than by actual innutrition. In perfect quiet, and freedom from exercise of all kinds, and when the

* Anatomy of the Absorbing Vessels, Part I. Conclus. p. 115.
† Sauv. Cl. x. Ord. II. ix. 6. § 3.

form has acquired its full range of growth, it is astonishing to see how very small a portion of food entering into the system is capable of supporting life; a subject we have already touched upon under limosis *expers*;* and hence Morgagni and Dr. Hunter are inclined to believe that in old people the glands of the mesentery become obliterated; while Ruysch contended, that in the latter part of his life he lived without his lacteals, and that old people in general do the same.

In most of the varieties before us, the tumours are often very bulky and conglobated; and at times accompanied with cysts filled with a limpid fluid. In one instance, related by M. de Sauvages, these amounted to twenty of various sizes; one as large as a child's head, six as large as a man's fist, and the rest equalling hen's and pigeon's eggs. Hence the whole abdomen is in some cases so generally tumefied as to give a semblance of pregnancy, for which the tumefaction has sometimes been mistaken. This is particularly the case with the last variety; and as the appetite, state of the bowels, and bladder are often unaffected, or only affected casually and to appearance capriciously, there is not unfrequently some difficulty in determining between the two. Sometimes the parabysma is peculiarly complicated in its texture, which is glandular, scirrhous, and ossific; the glands appearing like clusters of walnuts, interspersed with glands of less magnitude of the size of peas, beans, or filberds. Dr. Donald Monro gives a case of this kind in a young woman who died of hectic fever in St. George's Hospital in 1771. Upon laying bare the mesenteric glands after death, they were in some places found to resemble spongy carious bones; not consisting of one large firm piece of bone, but a number of small pieces united by membranes.

The general outline of the medical treatment will run parallel with the plan already laid down for the cure of parabysma *hepaticum*. If worms exist, the course recommended under the genus HELMINTHIA should be carried into effect, according to the kind of worm that discovers itself; a light, nutritious food, substimulant with salt and acid or aromatic condiments, should form the daily repast, with a free exposure to pure air, and such exercise as the patient is best able to take without fatigue. Our chief dependence, however, must be on small doses of mercury, mercurial plaster with gum ammoniac, large enough to cover the entire seat of disease; or a small portion of mercurial ointment rubbed over the abdomen every night and morning with the friction of the hand, continued for at least half an hour or an hour at each time; in which case the friction will be of almost as much service as the mercury. A salivation is not desirable, for it will only add to the general weakness; and hence whatever preparations are made choice of, they should fall short of producing this effect. The less stimulant and healing of the gum-resins will often also be found serviceable;

* Cl. I. Ord. I. Gen. v. Spec. 2. γ.

and especially myrrh, either alone or in combination with the fixt alkalies. The aperients employed should be gentle; and where calomel is not thought adviseable from any particular circumstance that may occur, rhubarb alone, or in union with some of the neutral salts, will usually be found the best medicine we can have recourse to.

Yet it is only in recent and uncomplicated cases that we can fairly hope for success, let our medical plan be what it may. In the scirrhous, sarcomatous, steatomatous, and especially the fungous modifications, and, more especially still, where several of these are playing their parts simultaneously, the art of medicine may possibly retard, but can never entirely ward off, the fate that is approaching with perhaps a slow, unperceived, and insidious, but at the same time with a certain and irresistible stealth of footstep.

SPECIES V.

PARABYSMA INTESTINALE.

Intestinal Turgescence.

TUMOUR HARD OR CIRCUMSCRIBED, ROUND OR ELONGATED; MOVEABLE UPON THE PRESSURE OF BOTH HANDS: IRREGULAR DEJECTIONS: OBSTINATE VOMITING: PYREXY; AND FOR THE MOST PART EMACIATION.

In this species the coacervation exists in the coats of the intestines, and consequently is moveable with them. Almost always however a slight degree of adhesive inflammation takes place, and the tumefied part becomes united to the superincumbent parietes, or to some other part of the intestinal canal; on which account the disease belongs to the present rather than the preceding Order. It has chiefly occurred under the two following modifications:—

α Conglomeratum. Conglomerate turgescence.	Cohesive and conglomerated.
β Sarcomatosum. Sarcomatous turgescence.	The tumour circumscribed, and of a fleshy feel.

Morgagni relates a striking instance of the first variety in a man subject to hypochondriacal depressions of mind, as well as to a flux of the hemorrhoidal vessels. Upon an abrupt cessation of the hemorrhage, he soon complained of pains in the abdomen, sometimes sudden and transitory, at other times protracted, but never leaving him intervals of perfect ease. Some months afterwards a hardness and swelling were noticeable in the belly, which gradually augmented, and from the pain and emaciation, and almost incessant vomiting with which it was accompanied, at length exhausted and de-

stroyed him. The tumour lay manifest to the sight as well as to the touch, of a circular shape, equidistant from the ensiform process and the navel, in its diameter about eight fingers breadth. On dissection, the ileum and adjoining portion of the jejunum were found retracted upwards, coacervated, and firmly adhesive.*

The tumour in the second variety is often of an oblong shape, and lies below the hypochondria, inclining towards the epigastric region, prominent, with unequal hardness. Fantoni relates a case of this kind in a boy, of a corpulent make, about ten years of age. It commenced with an excruciating pain in the belly, pyrexy, and vehement vomiting; and was soon followed by a tumour of the above description, but seated on the left side, in size resembling a prolapsed spleen. The patient, worn out by the violence of the symptoms, did not long survive. On dissection, every other part being found healthy, the colon under the stomach and towards the left side, for the length of the palm of the hand, was greatly indurated and distended, with a fleshy, fibrous, and peculiarly thickened tumour, which contracted the diameter of the gut,† and, if the boy had lived much longer, would in all probability have adhered, like the last, to the surrounding parietes.

From the violence of the symptoms, and the little prospect we have of allaying them, this disease is almost hopeless. It commences with a considerable irritability of the part of the intestinal canal that is affected, and the effusion, growth of new matter, distension, and, where it takes place, adhesion, add daily to the irritable state, augment the pain, and keep up the tendency to vomit, and reject whatever is introduced into the stomach.

There are two indications to be followed up, and but two medicines that offer us any chance of success while holding the indications in view. Our first object should be to allay the irritability, and consequently the pain and sickness, which after a free loss of blood by cupping, can only be attempted by opium, given in large and repeated doses, if necessary to the amount of ten, twelve, or even fifteen grains a-day if the patient be an adult. Ten and twelve grains a-day, for three weeks without intermission, I have myself prescribed, with great comfort to the patient, and without stupor or even sleep, the night being passed in a kind of refreshing reverie, without a loss of consciousness at any time. The symptoms we thus endeavour to combat, not only bring on sure destruction by the exhaustion they produce, but very considerably promote the enlargement of the tumour, and the extent of the adhesions. If we can succeed in keeping these in subjection for a week or two, it is possible that the constitution may be broken in to submit to the new action produced by the change of structure, and the irritability may at length subside.

We should at the same time endeavour to counteract the morbid change of structure, and particularly to arrest its progress; which

* De Sed. et Caus. Morb. Tom. II. Ep. XXXIX. N. 21. 25.
† Fantoni, Obs. Med. Select. Obs. II.

constitutes our second indication; and this can only be done by mercurial preparations. Small doses of calomel should, for this purpose, be combined with the opium, while mercurial ointment should at the same time be applied, night and morning, to the seat of pain, and persevered in to ptyalism: for the case is urgent, and not a moment is to be lost. The warm bath may perhaps afford a temporary relief; but no permanent good is to be expected from it. The bowels, however, may often be conveniently refreshed and evacuated by emollient, but at the same time laxative, injections.

SPECIES VI.

PARABYSMA OMENTALE.

Turgescence of the Omentum.

TUMOUR INDURATED AND DIFFUSED: FREQUENTLY SPREADING OVER THE WHOLE OF THE ABDOMINAL REGION: DYSPNŒA: EMACIATION.

This species is especially characterized by its extent, and the want of a definitive outline, by which it is particularly distinguished from the preceding. It is usually of a complicated texture; infarcted, scirrhous, tuberculate, and cartilaginous. It has been found of various shapes and magnitudes, from a weight of five pounds to that of twenty, twenty-five, thirty, and in one instance fifty-six pounds. In the last case, the patient, a female, appeared to be labouring under an ascites, so generally was the abdomen enlarged. She sank, gradually worn out by atrophy and pains of various kinds: and on examining the abdomen, the tumour, occupying the entire cavity of the belly, instantly presented itself to view, inclosed in a pretty thick and stout membrane, chiefly adipose, partly scirrhous and glandular, with a cavity in its interior filled with a sordid and fetid sanies. Laterally and below, it adhered to the surrounding organs only slightly; but was so firmly fixed to the fundus of the stomach and parts adjoining that it could not be separated without laceration.*

In some instances the hardness has been almost stony;† in others osseous;‡ sometimes loaded with many thousand glandules;§ and in several of these accompanied with excruciating pains.‖

Whatever benefit may be expected from medicine is to be collected from the remarks already offered on the preceding species.

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* Greg. Horst. Prob. X. Dec. VI. † Panarol. Pentec. III. Obs. 10.
‡ Mongin. Hist. de l'Acad. des Sciences, 1732.
§ Seger, Ephem. Germ. ‖ Huxh. Phil. Trans. Vol. VII.

SPECIES VII.

PARABYSMA COMPLICATUM.

Complicated Turgescence.

THE BELLY HARD, ELEVATED, AND DISTENDED AS THOUGH PREGNANT, AND OFTEN SUPPOSED TO BE SO; YET MORE OR LESS KNOTTY AND UNEQUAL: RESPIRATION SELDOM IMPEDED; FOR THE MOST PART ACUTE PAIN, NAUSEA, OBSTINATE VOMITING AND THIRST.

Several of the preceding species are complicated as to the nature of the tumour with which the respective organ is affected; the present is complicated, as being compounded of various viscera which are affected simultaneously. And hence, the symptoms must often differ in different individuals, according to the immediate seat of the disease and the nature of the tumour. The liver is, in perhaps all cases, more or less concerned; sometimes in connexion with the spleen, sometimes with the mesentery; sometimes with the stomach or intestines; and sometimes with all together. Hildanus found the liver so enlarged as to pass beyond the false ribs of the left side, with the spleen equally enlarged,* and fixed to the adjoining lobe of the former organ. Huldenreich, in a woman of forty-five years of age, found the liver scirrhous, weighing fourteen pounds, with a fleshy excrescence in the mesentery, of the size of a child's head. This case was also further complicated with jaundice.† Bartholine mentions a woman of elegant form, in the flower of her age, attacked with another modification of this disease, which at length destroyed her: when all the intestines, liver, spleen, and every adjoining viscus, were found intermixed, and buried in fat: the liver being at the same time enlarged and scirrhous, and filling both hypochondria; the stomach thickened and cartilaginous.‡

Other cases of a striking character are referred to in the author's Nosological Synopsis, which might be easily augmented if necessary: but the present are sufficient to give a general view of the nature, gigantic features, and mischievous effects of this monstrous race of diseases: diseases which we can rarely hope to conquer, unless we have an opportunity of strangling them in their infancy; though we may sometimes give a check to their rapid strides, palliate their painful progress, and postpone their fatal triumph.

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* Cent. II. Obs. 45.
† Miscell. Nat. Cur. Ann. VI. VII.
‡ Cent. II. Obs. 6.

CLASS II.

CLASS II.

PNEUMATICA.

DISEASES OF THE RESPIRATORY FUNCTION.

ORDER I.

PHONICA,

AFFECTING THE VOCAL AVENUES.

II.

PNEUMATICA.

AFFECTING THE LUNGS, THEIR MEMBRANES OR MOTIVE POWER.

CLASS II.

PHYSIOLOGICAL PROEM.

BEFORE we enter on the diseases which disturb the function of Respiration, and constitute our Second Class, it may be found advantageous to follow up the plan laid down with respect to the first Class; and take a brief survey of the general nature of this function, and of the organs which form its instruments.

The respiratory function is maintained by a current of air, alternately thrown into and thrown out of the chest, and is subservient to two important purposes: that of furnishing us with speech, or the means of vocally communicating and interchanging our ideas; and that of carrying off from the blood a gas recrementory and deleterious to life, and possibly of introducing in its stead one or more gasses indispensable to animal existence. It is these two purposes that lay a foundation for the two Orders into which the Class before us is divided; the first entitled PHONICA, comprising the diseases affecting the VOCAL AVENUES; and the second, PNEUMONICA, comprising those affecting the LUNGS, THEIR MEMBRANES OR MOTIVE POWER.

I. At the root of the tongue, lies a minute semilunar bone, which from its resemblance to the Greek letter υ or *u-psilon*, is called the *hyoid* or *u-like* bone; and immediately from this bone arises a long, cartilaginous tube, which extends to the lungs, and conveys the air backward and forward, in the manner and for the purposes already mentioned. This tube is denominated the trachea or wind-pipe; and the upper part of it, or that immediately connected with the hyoid bone, the larynx; and it is this larynx or upper part, that constitutes the seat of the voice.

The tube of the larynx, short as it is, consists of five cartilages; the largest, and apparently, though not really, lowermost of which produces that acute projection, or knot in the antorior part of the neck, and especially in the neck of males, in which every one must be sensible, and which was formerly denominated pomum Adami, as though it had sprung up in consequence of Adam's having eaten the forbidden fruit. This is not a complete ring, but is open behind, the open space being filled up, in order to make a complete ring,

with two other cartilages of a smaller size and power; and which, together, form the glottis, as it is called, or immediate aperture out of the mouth into the larynx. Of these three cartilages, the first is named scutiform, or shield-shaped; the other two, arytenoid, or funnel-shaped. A fourth cartilage lies immediately over this aperture, and closes it in the act of swallowing, so as to direct the food to the œsophagus. From its position it is called epiglottis. These four cartilages are supported by a fifth, which constitutes their basis, is narrow before, and broad behind, and has some resemblance to a seal ring: on which account it is named cricoid, or annular, by the anatomists. The larynx is contracted and dilated in a variety of ways by the antagonist powers of different muscles, and the elasticity of its cartilaginous coats; and is covered internally with a very sensible, vascular, and mucous membrane, which is a continuation of the membrane of the mouth.

The form of the glottis, composed, as we have stated, of three distinct cartilages, resembles that of a small box, with a minute aperture or rima. In adults this aperture is about ten or eleven lines in length, and two in breadth at its greatest diameter. It is, however, increased or diminished by the action of the arytenoid and cricoid cartilages: and in birds, and amphibials, is capable of being so completely closed as to prevent the smallest drop of water from penetrating it, except with the will. In this way frogs confine the air in the lungs, and live without inspiration for a considerable time.

The organ of the voice, then, is the larynx, its muscles and other appendages; and the voice itself is the sound of the air propelled through, and striking against the sides of the glottis or aperture into the mouth. The shrillness or roughness of the voice depends on the internal diameter of the glottis, its elasticity, mobility, and lubricity, and the force with which the air is protruded. Speech is the modification of the voice into distinct articulations in the cavity of the glottis itself, or in that of the mouth or of the nostrils.

There is a difficulty, however, in determining by what means the air is rendered sonorous in the glottis, and various explanations have been offered upon the subject. The oldest is that of Galen, who supposed the calibre of the glottis to be alternately expanded and contracted; an idea revived in modern times by Dodart, who at the same time compares its action to that of a flute.* A second explanation is that of M. Ferrein, who supposes the variations of sound to depend upon variations of tension and relaxation in the ligaments of the glottis: and in this view such ligaments become vibrating chords, and the entire apparatus approaches the nature of a violin.† A third explanation is that of M. Richerand, who unites the two preceding conjectures, and supposes that the glottis is a wind

* Memoires de l'Academie, &c. 1700.
† Id. 1741.

and a chord instrument at the same time. To these explanations we may add that of Kratzenstein, who regards the glottis in conjunction with the whole length of the larynx as a kind of drum;* and that of M. Blumenbach, who views the former in the light of an Æolian harp. All which are ingenious sports of the imagination, but contribute little to the advancement of physiological science.†

Those animals only that possess lungs, possess a larynx; and hence none but the three first classes in the Linnéan system, consisting of mammals, birds, and amphibials. Even among these, however, some genera or species are entirely dumb, as the myrmecophaga, or ant-eater; the manis, or pangolin; and the cetaceous tribes; the tortoise, lizards, and serpents; while others lose their voice in particular regions; as the dog is said to do in some parts of America, and quails, and frogs in various districts of Siberia.‡

It is from the greater or less degree of perfection with which the larynx is formed in the classes of animals that possess it, that the voice is rendered more or less perfect; and it is by an introduction of superadded membranes, or muscles, into its general structure, or a variation in the shape, position, or elasticity of those that are most common to it, that quadrupeds and other animals are capable of making those peculiar sounds by which their different kinds are respectively characterised; and are able to neigh, bray, bark, or roar; to pur, as the cat and tiger kind; to bleat, as the sheep; or to croak, as the frog; which last, however, has a sack or bag, of a singular character, in the throat or cheek, directly communicating with the larynx, on which their croaking principally depends.

The larynx of the bird-class is of a very peculiar kind, and admirably adapted to that sweet and varied music with which we are so often delighted in the woodlands. In reality, the whole extent of the trachea in birds may be regarded as one vocal apparatus; for the larynx is divided into two sections, or may rather, perhaps, be considered as two distinct organs: the more complicated, or that in which the parts are more numerous and elaborated, being placed at the bottom of the trachea, where it diverges into two branches or bronchiæ, one for each of the lungs; and the simpler, or that in which the parts are fewer, and consists of those not included in the former, occupying its usual situation, at the upper end of the trachea; which, however, is still without an epiglottis; both food and water being, as we have already observed, rendered incapable of penetrating the aperture of the glottis, by another contrivance. The lungs, trachea, and larynx of birds, therefore, may be regarded as forming a complete natural bag-pipe; in which the lungs constitute the pouch and supply the wind; the trachea itself, the pipe; the inferior glottis, the reed or mouth-piece which protrudes the

* Tentamen de Naturâ et Charactere sonorum literarum vocalium. 4to. 1781.

† Instit. sect. IX. X subsect. 155.

‡ Blumenb. Comp. Anat. Ch. XV. § 193.—Camper. Phil. Trans. Vol. LXIX, 1779. p. 139.

simple sound; and the superior glottis, the finger-holes which modify the simple sound into an infinite variety of distinct notes, and at the same time give them utterance.

Here, however, as among quadrupeds, we meet with a considerable diversity in the structure of the vocal apparatus, and especially in the length and diameter of the tube or trachea, not only in the different species, but often in the different sexes of the same species, more particularly among aquatic birds. Thus the trachea is straight in the tame or dumb swan (anas *olor*) of both sexes; whilst in the male musical swan (anas *cygnus*,) but not in the female, it winds into a large convolution, contained in the hollow of the sternum. In the spoon-bill (platalea *leucorodia*,) as also in the mot-mot pheasant (phasianus *mot-mot*,) and some others, similar winds of the trachea occur, not inclosed in the sternum. The males of the duck and merganser (*anas* and *mergus*) have, at their inferior larynx, a bony addition to the cavity which contributes to strengthen their voice.

Among singing-birds, Mr. Hunter, who, at the request of Mr. Pennant, dissected the larynx of many distinct kinds, observes, that the loudest songsters have the strongest muscles, and that the sky-lark has the strongest of the whole, whose clear and vigorous note is often heard when he can no longer be followed in his ascent by the most penetrating eye. He observes also, that, among this division of birds, the muscles of the male, following the same rule, are stronger than those of its respective female, whose voice is always less powerful. In birds that have no natural voice he perceived no difference of muscular power in the larynx of either sex.

From this more extensive and complicated machinery in the vocal organ of birds, we find numerous species possessing powers of a very extraordinary kind. In many of them, as the thrush and the nightingale, the natural song is exquisitely varied, and through an astonishing length of scale. In the pipra *musica*, or tuneful manakin, the song is not only intrinsically sweet, but forms a complete octave; one note succeeding another, in ascending and measured intervals, through the whole range of its diapason. There are various kinds that are capable of imitating the music of human art, and amuse us by acquiring national and popular tunes; as the bull-finch, the linnet, and even the robin, when reared in a state of separation from all other birds; whilst some, again, are capable of imitating human speech, as the parrot, the jay, and jack-daw, and indeed, most of the psittacus and corvus genera, a fact which proves the possession of a powerful and retentive memory, as well as of a precise and delicate ear. A linnet, according to Mr. Pennant, was once taught the same at Kensington; and even the nightingale is said to have talents for speaking equal to those for singing. But where is the man whose bosom burns with a single spark of the love of nature, who could for a moment consent, that this sweet songster of the groves should barter away the touching wilderness of its native notes for any thing that art has to bestow?

Yet perhaps there is no species among the class of birds that is more entitled to notice in a physiological survey, on account of its voice, that the turdus *polyglottus*, or mocking-bird. This is a subdivision of the thrush-kind; its own natural note is delightfully musical and solemn; but beyond this, it possesses an instinctive talent of imitating the note of every other kind of singing-bird, and even the voice of every bird of prey, so exactly as to deceive the very kinds it attempts to mock. It is moreover playful enough to find amusement in the deception; and takes a pleasure in decoying smaller birds near it by mimicking their notes, when it frightens them almost to death, or drives them away with all speed, by pouring upon them the screams of such birds of prey as they most dread.

Now it is clear that the imitative, like the natural, voice has its seat in the cartilages and other moveable powers that form the larynx; for the great body of the trachea only gives measure to the sound and renders it more or less copious in proportion to its volume. It is not therefore to be wondered at that a similar sort of imitative power should be sometimes cultivated with success in the human larynx; and that we should occasionally meet with persons who, from long and dextrous practice, are able to copy the notes of almost all the singing-birds of the woods; or the sounds of other animals; and even to personate the different voices of orators and other public speakers.

One of the most extraordinary instances of this last kind consists in the art of what is called VENTRILOQUISM, of which no very plausible explanation has hitherto been offered to the world. The practitioner of this occult art is well known to have a power of modifying his voice in such a manner as to imitate the voices of different persons conversing at some distance from each other, and in very different tones. And hence the first impression which this ingenious trick of exhibition produced on the world, was that of the artist's possessing a double or triple larynx, the additional larynxes being supposed to be seated still deeper in the chest than the lowermost of the two that belong to birds; whence, indeed, the name of VENTRILOQUISM or BELLY-SPEAKING. This rude and early idea M. Richerand was at one time strongly tempted to revive; but a closer examination of the subject convinced him that it could not be supported, and he abandoned it, without however offering any other sufficiently matured for examination. Mr. Gough has attempted, in the Memoirs of the Manchester Society, to resolve the whole into the phænomena of echoes; the ventriloquist, on this hypothesis, being conceived to confine himself on all occasions to a room well disposed for echoes in various parts of it, and merely to produce false voices by directing his natural voice in a straight line towards such echoing parts, instead of in a stright line towards the audience; who, upon this view of the subject, are supposed to be artfully placed on one or both sides of the ventriloquist. It is sufficient, in opposition to this conjecture, to observe, that it does not account for the perfect quiescence of the mouth and cheeks of the performer while em-

ploying his feigned voices; and that an adept in the art, like M. Fitzjames, who exhibited a few years ago in our own country, or M. Alexandre of the present day, is totally indifferent to the room in which he practises, and will readily allow another person to chuse a room for him. Of M. Fitzjames, M. Richerand has given a particular account from personal examination. He observes, that he always made a strong inspiration before he commenced his performance, and could support his various voices till he required a fresh supply of air; thus evidently proving that the inhaled air was expired, though not through the lips, but, as appears from another case observed by M. Richerand, at least partly through the nostrils.

Yet the means by which the ventriloquist is enabled to modify his articulations into the semblance of distinct voices, still remains to be explained; and I shall hence beg leave to throw out a suggestion upon the subject. From various concurrent facts, ventriloquism appears to be an imitative art, founded on a close attention to the almost infinite variety of tones, articulations, and inflexions which the glottis is capable of producing in its own region alone, when long and dextrously practised upon; and a skilful modification of these vocal sounds, thus limited to the glottis, into mimic speech, passed for the most part, and whenever necessary, through the cavity of the nostrils, instead of through the mouth. It is possible, however, though no opportunity has hitherto occurred of proving the fact by dissection, that those who learn this art with facility, and carry it to perfection, possess some peculiarity in the structure of the glottis, and particularly in respect to its muscles or cartilages.

In singing, every one knows that the glottis is the only organ made use of, except where the tones are not merely uttered but articulated. It is the only organ employed, as already observed, in the mock articulations of parrots, and other imitative birds; it is the only organ of natural cries, constituting the language of all animals possessing a voice; and hence Lord Monboddo has ingeniously conjectured that it is the chief organ of articulate language in its rudest and most barbarous style. "As all natural cries," says he, "even though modulated by music, are from the throat and larynx, or knot of the throat, *with little or no operation of the organs of the mouth*, it is natural to suppose that the first languages were, for the greater part, *spoken from the throat*; and that what consonants were used to vary the cries, were mostly *guttural*, and that the organs of the mouth would at first be but very little employed."* To which I may add, that notwithstanding, in the ordinary use of speech, the tongue takes an auxiliary part among mankind, yet the numerous and well-authenticated examples on record, and to which we shall have occasion to advert more minutely hereafter, of persons who have retained a full and perfect command of speech, after the tongue has been destroyed or extirpated, proves incontrovertibly, that the glottis alone is capable of supplying in this respect, the place of

* Orig. and Prog. of Lang. v. I. b. iii. ch. 4.

the tongue, upon particular occasions, and when perhaps peculiar pains are taken to call forth the full extent of its latent powers.

This explanation, which some hundreds of persons in this metropolis may remember to have been advanced by the author, in a public lecture on the subject delivered in the year 1811, has since been embraced in France, though without adopting the hint that the full perfection of the art may possibly depend upon some slight addition to the muscular organism of the glottis, in those who are thus highly endowed with it. And hence M. Magendie asserts, that ventriloquism consists in nothing more than a delicate attention to the different effects or modifications of sounds or speech, thrown at different distances and through different modes of conveyance, and an exact imitation of them in a larynx of common formation and powers.

"Les fondemens sur lesquels repose cet art sont faciles à saisir. Nous avons instinctivement reconnu, par l'experience, que les sons s'altèrent par plusieurs causes ; par exemple, que s'affaiblissent, deviennent moins distincts, et changent de timbre à mesure, qu'ils s'eloignent de nous. Un homme est descendu au fond d'un puits, il veut parler aux personnes qui sont à l'ouverture : sa voix n'arrivera à leur oreille qu'avec des modifications dependantes de la distance, de la forme du canal qu'elle a parcouru. Si donc une personne remarque bien ces modifications, et s'exerce à les reproduire, il produira des illusions d'acoustique, dont on ne pourra pas plus se defendre, qu'on peut ne pas voir les objects plus gros lorqu'on les regarde à travers un verre grossissant : l'erreur sera complète s'il emploie d'ailleurs les prestiges convenables pour detourner l'attention.

Plus l'artiste aura de talens, plus les illusions seront nombreuses : mais il faut se garder de croire qu'un ventriloque produise les sons vocaux, et articule autrement qu'une autre personne. Sa voix se forme à la manière ordinaire. Sous un certain rapport, on peut dire que cet art est à l'oreille ce que la peinture est pour les yeux."*

But, this last view of an ordinary articulation and formation of the voice, is at variance with that perfect quiescence of the muscles of the cheeks and lips which the more skilful ventriloquists evince, and which can only be accounted for by a formation of articulations, and not merely a modification of sounds, in the larynx.

II. The lungs, whose vessels receive the air from the trachea, and in which the blood undergoes the important process of ventilation, are well known as a pair of large, light, elastic, and spongy organs, suspended by the tracheal tubes and large blood-vessels in the cavity of the chest, and in size adapted to the two sacs of the pleura, which they completely fill when inflated. They are surrounded by an exquisitely fine duplicature of this delicate membrane, which lines the entire cavity of the thorax, and separates the

* Précis Elementaire de Physiologie, Tom. II. p. 235.

lungs from each other by a process or septum, which, from its running between the two, is called mediastinum. The substance of the lungs is lobular; the larger lobes dividing into smaller, and the subdivision being continued through an almost infinite series, till the ultimate lobules terminate in very minute vesicles, which after birth, though not antecedently, are filled with air, conveyed by an innumerable host of exquisitely slender ramifications from the two grand branches into which the trachea at first forks off, so as to form a main division for each of the lungs, and which are denominated bronchiæ, as their subdivisions are bronchial vessels. The vesicles or air-cells are invested and held in connexion by the mucous web common to all animal organs, which, at the same time that it unites them and forms their boundaries, opens a communication between the one and the other, and is itself freely supplied with exquisitely fine blood-vessels, that are ramifications from the pulmonary artery, and continue to divide and sub-divide, till they at length form a beautiful net-work upon the sides of the air-cells, and ultimately become invisible from their attenuation; by which means every particle of blood is exposed, in its turn, to the full benefit, whatever this may consist in, of the gasses of the atmosphere contained in the air-cells which they thus surround.

The moving powers of the lungs consist in the bones, cartilages, and muscles by which they are encircled. The bones are the ribs and sternum, which, in their form, insertion, and general freedom of play, (for even the sternum itself seems to yield a little,) exhibit a perfection of art that the most careless among us cannot but admire, though the wisest could not have contrived:

Deus, Deus, ille, Menalca!

Antecedently to birth, the whole of this machinery, with the blood-vessels, may be contemplated as at rest, and the lungs in a state of collapse, in whose interstices there is a perfect vacuum. From the moment the infant becomes exposed to the atmosphere, the air which presses forcibly on every side, presses also upon the upper part of the trachea through the channels of the mouth and the nostrils: the motive powers of expansion, and which are afterwards those of expiration, are immediately stimulated into action; the ribs rise by the agency of the intercostal muscles, and the chest becomes elevated; the diaphragm, whose broad and muscular septum divides the thorax from the abdomen, sinks from instinctive sympathy towards the viscera beneath, and the chest becomes deepened; and into the dilated vacuum, hereby produced, the external air rushes forcibly by the trachea, and, by inflating the lungs to the full stretch of their elasticity, compresses all the surrounding organs. Yet as the force with which the air operates is very considerably, perhaps as much as three hundred times, less than that of the heart when stimulated to contract, the blood, instead of being hereby impeded in its course through the pulmonary vessels, flows far more freely, and dilates these vessels by its plenitude, as they are

already necessarily elongated by the expansion of the lungs; and the heart in this manner becomes liberated from a load, which, if it were to remain in its cavity, would oppress it and put a stop to its action. And hence we behold at once, the important connexion that exists between the sanguiferous and the respiratory systems, and how much the soundness of the one must depend upon that of the other.

Such then are the chief motive powers concerned in the act of inspiration, and the means by which they effect their purpose. The process of expiration, or that of throwing the air back again after it has accomplished its purpose, is not of more difficult comprehension. All the muscles of the body become exhausted and fatigued by their own action, and show an evident tendency to return to an opposite state, or that of rest; some indeed in a shorter, and others in a longer period of time; but all of them soonest, when, independently of ther own exertion, they are also opposed by a set of counteracting muscles, whose resistance they must subdue before they can accomplish their purpose.

Now this is precisely the state of the moving powers of the lungs, in the two alternate actions of inspiration and expiration. For while the muscles we have just adverted to are stimulated to expand the chest, there are others that by a reverse energy are perpetually striving to contract its diameter. Almost all the abdominal muscles tend to produce this effect, and particularly the oblique, straight, and transverse. Many of these are inserted into the ribs; and, as the latter become elevated, endeavour to draw them back into their anterior situations, to which also the ribs themselves have an inherent inclination to return, from their natural elasticity. Other muscles, urged into action by the descent of the diaphragm, immediately contract their fibres, diminish the convexity of the abdomen, and hereby force the abdominal viscera upwards and backwards against the diaphragm that thus intrudes upon them, and drive it into its former position, whilst all the blood vessels, and even the air-cells of the lungs, possessing an elastic power, have a natural tendency to return to their smaller diameters; and hence expiration is performed with even more facility than inspiration, and is consequently the last action of dying persons.

The powers I have thus far noticed are those which usually act without the interposition of the will, although the will possesses some control over most of them. But whenever this faculty of the mind co-operates and throws its influence into the balance on either side, other powers are sometimes called into action, and that of some of these is occasionally suspended. Thus, in the case of a fractured rib, or of pleurisy, the power of the will keeps the ribs quiescent, and the power of expansion is thrown almost entirely upon the diaphragm: while, on the contrary, when, in running, a freer supply of air becomes necessary, and the heart palpitates from the rapidity with which the blood is thrown into it, the thorax is

urged by the stimulus of the will to a quicker respiration, and the muscles that are inserted into the clavicles and scapulæ are often called upon for their conjoint assistance. And where the mind has, from an early period of life, been in the habit of exercising such a control, it is wonderful to contemplate the quantity of air which the lungs may be brought to inclose, and the length of interval through which the life may be preserved without a fresh supply: of which savage nations furnish us with striking examples, in the act of diving and remaining under water. Diemerbroeck relates the case of a pearl-diver, who, under his own eye, remained half an hour at a time under water, while pursuing his hunt for pearl-oysters.*

The will also makes use of the muscles of respiration for a variety of other purposes; sometimes for that of freeing the aerial passages themselves, or other cavities connected with them, from some material that irritates or loads them, as in coughing, sneezing, and hiccup; all which actions are sonorous from the violence with which the air is protruded, and the last of which is often exercised, even without the consent of the will, from spasm alone: and sometimes employing them as mere expressions of mental feeling at the moment, as in laughing, sighing, or weeping: the first of which consists of a mere succession of short and abrupt expirations; and the last two, of deep inspirations, succeeded by deep expirations; broken, in the case of weeping, into a quick series of sonorous snatches, and often accompanied, in sighing, with deep and long drawn intonations, which we call groans.

III. But the most important part of the general economy of respiration consists in the change which takes place in the blood in consequence of its being acted upon by the inspirated air.

We see the blood conveyed to the lungs of a deep purple hue, faint and exhausted by being drained in a considerable degree of its vital power; or immature and unassimilated to the nature of the system it is about to support, in consequence of its being received fresh from the trunk of the lacteals. We find it returned from the lungs spirited with newness of life, perfect in its elaboration, more readily disposed to coagulate, and the dead purple hue transformed into a bright scarlet. What has the blood hereby lost? How has this wonderful change been accomplished?

These are questions which have occupied the attention of physiologists in almost all ages, and were as eagerly studied in the Greek schools as in our own day. To the present hour, however, they have descended in a mantle of Cimmerian darkness; and though the researches of a more accurate chemistry have disclosed volumes of facts heretofore unknown, and the ingenuity of able theorists have laid hold of them, and applied them to an explanation of this curious subject in a great variety of hypotheses, I am afraid we

* Anatom. Lib. II. p. 464.

are still almost as much at sea as ever; and that there is no inquiry in the whole range of physiology in a more unsatisfactory state than that concerning the ventilation of the blood in the lungs.

According to a course of well conducted experiments, instituted many years ago by Sir Humphry (then Mr.) Davy, it appears that the general sum of a man's natural inspirations are about twenty-six or twenty-seven in a minute; and that thirteen cubic inches of air are, in every inhalation, taken in, and about twelve and three quarters alternately thrown out. The atmospheric or inspired air was found to contain, in the thirteen cubic inches, nine and a half inches of nitrogene, three and four tenths of oxygene, and one tenth of an inch of carbonic acid: the twelve inches and three quarters of returned air gave nine and three tenths of nitrogene, two and two tenths of oxygene, and one and two tenths of carbonic acid.

From these experiments, therefore, there should seem to be a retention in the system of a large portion of the inspired oxygene, and a small portion of the inspired nitrogene; and a discharge from the system of a very considerable portion of carbonic acid gass. And as the colour of the blood is well known to be changed in its passage through the lungs, from a deep modena to a bright scarlet hue, M. Lavoisier, following up, with additional facts, an earlier set of experiments of Dr. Crawford, endeavoured to show, that, while the modena hue is produced by the carbone with which the blood is loaded when it first reaches the lungs, its scarlet results from its losing this surplus carbone, and acquiring oxygene in its stead; during which process a very large quantity of caloric, or heat, in an elimentary form, is supposed, also, to be disengaged from the air thrown into the air cells of the lungs, and to pass into the adjoining minute blood-vessels in combination with the oxygene.

The experiments of Sir Humphry Davy were afterwards repeated by Messrs. Pepys and Allen; but these acute analysts could not discover that any part of the inhaled nitrogene was retained; since the same exact proportion appeared from their trials to be thrown back in every instance of expiration, as had been previously received in every instance of inspiration. And there have since been doubts, on the part of Sir Humphry Davy himself, respecting the supposed caloric; not merely in regard to its separation from the atmospheric air, but as to its substantive existence at all, either there or elsewhere; heat being, in his later view of the subject, nothing more than a rapid, vibratory, or repulsive action of the corpuscles of a body that exhibits this phænomenon: thus reviving the doctrine of Aristotle, and the Peripatetics, which was so ably controverted by the Epicureans, who foretasting the spirit of the Lavoisierian system strenuously contended that it was a substance sui generis.* While, to close the whole, Mr. Ellis has gone through

* See the Author's Translation of Lucretius.—Note on Book II. v. 743.

another extensive range of inquiry, and instituted or collected another numerous set of experiments, to prove that even the oxygen of the inspired air does not enter into the blood-vessels of the lungs but becomes itself converted in the air-cells of these organs, into the carbonic acid gass of the expired air, by uniting with the carbone of the blood, which he supposes, as a recrement, to be secreted in the form of a vapour, into the air-cells, by the exhalents of the lungs.* He admits, however, the existence of caloric, as an elementary principle; conceives it to be disengaged in very lage abundance from the inspired air, during its union with the secreted carbonic halitus; and ascribes the recovered scarlet hue of the blood to its combination with this invisible fluid; as he does also whatever effects are produced by the exercise of the respiratory function, not merely in animals, but in plants.

Of the facts and arguments in favour of Mr. Ellis's hypothesis, which he extends to plants as well as to animals, the two following seem to be the chief. Firstly, the seeds of qlants in germination, and plants themselves in growth, throw forth carbone in the form of aqueous vapour, or, in other words, dissolved in water, even where no oxygene is present.† And, secondly, such ejected fluid, wherever life exists, is the work of secretion. In consequence of which, he ventures to affirm, that it is a secretion of this kind which is continually taking place on the surface of the lungs, and of the skin, in animals, both which he thinks concur in a common action; and in support of this opinion refers to various insects and worms, without stigmata, or stemmata, which appear to breathe by the pores of the skin alone.

According to Mr Ellis, we have no proof of carbonic acid, or of any aeriform fluid existing naturally in the blood,‡ and consequently have no reason to expect that any can be thrown out: while, if oxygene enter from the air-cells into the system, it must be by absorption, or chemical affinity. If by absorption, it would, in animals, take the regular course of the thoracic duct, and the blood in the right ventricle of the heart would first exhibit a scarlet hue, while in the germination of vegetables, their seeds give no evidence of possessing a structure fitted to absorb and expel aeriform fluids; nor of any such fluids at any time existing in them.§ To the operation of chemical affinity he conceives an actual contact between the air and the blood to be requisite; but in the lungs we have an intervention of the coats of the cells, and of the blood-vessels. And if these be presumed so thin that when moist they will allow the air, or its oxygene gass to pervade them, the gass would rather pass into the interstices of the cellular substance, than into the pul-

* Inquiry into the Changes induced on Atmospheric air. 8vo. 1807.
† Inquiry, &c. Sect. 20. p. 23.
‡ Id. Sect. 98, p. 122.
§ Id. Sect. 16, p. 18.

monary vessels, and thus create an emphysema. But the whole of such permeation, he holds to be gratuitous, and contrary to experiment.* The diminution in the bulk of respired air, he thinks, may be accounted for by an union of the carbone of the blood with the oxygene in the air-cells, and the formation of aqueous vapour by the disengagement of the caloric from the oxygene of the atmospheric air.†

To these objections, however, it may be replied, that if caloric can penetrate animal membranes, and unite, by chemical affinity, with the blood in the blood-vessels, so, for any thing we know to the contrary, may oxygene. Mr. Porrett has shown that the voltaic fluid, when operating upon water, is capable of carrying even water itself through the bladder, and raising it into a heap against the force of gravitation.‡ A like combination may take place between the voltaic or some similar fluid and the oxygene and a part of the nitrogene gasses in the air-cells of the lungs; and a similar permeation may follow directly through the membranes of the blood-vessels; and the carbone of the system may, in consequence, pass off by the same channel instead of being secreted; and in the form of carbonic acid, instead of in that of carbonic vapour.

Next, we have no proof that carbone will dissolve in water, and produce such vapour: and hence, at present, this idea is gratuitous.

Again, air appears, in various cases, to have been actually disengaged, and is, perhaps, perpetually disengaging from the blood. Mr. J. Hunter declares he has discovered it in an abscess, in which it could neither have been derived from without, nor from putrefaction:§ and he hence adopted the opinion that air is often secreted by animal organs, or separated from the juices conveyed to them. And this opinion has not only been abundantly confirmed, but even extended to the vegetable world since his time: for Mr. Bauer appears to have shown that an elastic gass is constantly shooting forth in small bubbles from the roots of plants into the slymy papulæ by which they are surrounded; and that it is hence the slimy matter becomes elongated and is rendered vascular, or converted into hair or down. And Mr. Brande has established, by experiments, that carbonic acid does exist, and that too in a considerable quantity, in the blood of animals, while circulating through both arteries and veins; and that it is so largely poured forth from blood placed, while warm, under the receiver of an air-pump, as to give the appearance of effervescence; a fact familiar to Mr. Boyle nearly two centuries ago. The venous and arterial blood, according to Mr. Brande's experiments, seem to contain an equal proportion of this gass; and he calculated that not less than two cubic inches were

* Inquiry, &c. Sect. 101, p. 125.
† Id. Sect. 83, p. 99. Sect. 107, p. 132, and compare with Sect. 11, p. 13.
‡ Thomson's Annals of Philos. No XLIII, p. 75, 76.
§ Animal Economy, p. 207.

extricated from every ounce of blood thus experimented upon. And hence Sir Everard Home, following up the discoveries of Mr. Bauer, ingeniously conjectures that it is by the escape of bubbles of this gass from the serum of blood, in case of effusion and coagulation, that new vessels are formed; as also granulations in pus, as a like gass appears to be separable from this latter fluid.*

The observations of Mr. Ellis are, therefore, by no means sufficient to subvert the Lavoisierian hypothesis of respiration. And some late experiments, both of M. Gay Lusac and of M. Magendie, seem to support those already adverted to of Sir Humphry Davy, since they concur in proving that in the act of respiration there is a little more carbonic acid gass than oxygene consumed.

The quantity of air inhaled in a single act of inspiration, is found to vary in persons of different sized chests; but the aggregate inhaled in a given period does not essentially differ; since those who inhale most at a time make the fewest inspirations in a minute. I have said that Sir Humphry Davy calculated the average number of respirations in a minute at twenty-six or twenty-seven, and that the measure of air inspired or expired was estimated at about thirteen cubic inches each time. This breathing has since been supposed too rapid for a common standard; and the measure of air received and returned too low; but as the former error compensates the latter, the amount of air does not essentially deviate from the general allowance for a minute. And it is by this explanation alone, that we can in any way reconcile the different results which have been given by different experimenters upon this subject. Dr. Godwin calculated the inspired air at twelve cubic inches, and the expired at fourteen, being a difference produced by expansion from the heat of the lungs;† which does not essentially vary from the above estimate of Sir Humphry Davy: and he calculated the residuary air in the lungs, immediately after expiration, at one hundred and nine cubic inches, which upon inspiration was increased to one hundred and twenty-three. But Borelli states the inspired air at from fifteen to twenty cubic inches;‡ while Jurin, Haller, and Menzies, that which is expired at not less than forty.§

In good health, perfect quiet, with an open chest, few persons, perhaps, are found to breathe more frequently than about twenty times in a minute; and the quantity inhaled and exhaled, at a temperature of fifty-five of Fahrenheit, is estimated at from twenty-six to thirty-two cubic inches each time; which, however, by the heat of the lungs, and saturated with moisture, become forty or forty-one cubic inches in the chest itself. Taking, however, twenty cubic inches as the ordinary quantity of external air inhaled

* Phil. Trans. for 1818. p. 180.
† Connexion of life with Respiration, pp. 27, 37.
‡ De Motû Animal. p. 126.
§ De Respirat. p. 32.

and exhaled about twenty times in a minute, it will follow that a full-grown person respires twenty-four thousand cubic inches in an hour; or five hundred and seventy-six thousand cubic inches in the course of a day; a total equal to about thirty-nine hogsheads.

The quantity of carbone thrown out of the system of the lungs, when estimated in the gross, may afford matter of no less astonishment. For taking the gravity of the carbonic acid gas, as calculated by Lavoisier, a person in health must emit from his lungs something more than is equal to twelve ounces of solid carbone, or charcoal, every twenty-four hours.

The primary cause of the red colour of the blood is a chemical rather than a physiological question: and belongs to the sanguiferous rather than to the respiratory function; yet upon this point, also, physiologists are by no means agreed, some ascribing it to the conversion of the iron, which forms a constituent principle of the blood, into a red oxyde; and others, and particularly Sir Humphry Davy, to the affinity which the calorific rays of light have for oxygene generally, and hence for the oxygene of the animal system; against the surface of which it is perpetually impinging, and into which it is perpetually carried in combination with the inspired air; separating it incessantly from its union with the carbone of the animal frame, and transforming the carbone thus decomposed and simplified, into a dark pigment. But there are difficulties that hang about both these, and indeed, every other hypothesis that has yet been started, concerning even the primary cause of the red colour of the blood, as we shall have occasion to notice more at large hereafter, which leave the subject still open to inquiry.

Yet, whatever may be the primary cause of the red colour of the blood, we find that, in respiration, there is some other cause superadded, and which, as observed above, heightens the colour the blood possesses at the time of its reaching the lungs, and converts it from a deep purple, or modena, into a rich scarlet. This M. Lavoisier, as we have already hinted, supposed to be produced by that supply of oxygene which he conceived it was the express object of respiration to communicate to the blood; and in support of this view, a variety of experiments were appealed to, which seemed to show that the colour of the blood becomes brighter whenever exposed to the action of oxygene. Yet till the objections of Mr. Ellis are satisfactorily removed, and it is clearly established that oxygene in a free state is actually introduced from the air-cells of the lungs into the adjoining minute blood-vessels, we can place little dependance upon this explanation, however plausible and inviting.

But, may not the deepened colour of the blood be produced by the carbone with which it becomes gradually loaded in the course of its circulation, and which, by the consent of all parties, is separated from it in the process of respiration; and, consequently, may it not recover its brightness by the mere loss of this dingy pigment, whether oxygene enter at the same time into the blood-vessels or

not? If the primary colouring material of the blood be the iron which it contains, as first suggested by MM. Parmentier and Deyeux, and the carbone be a recrementory and adventitious material, this reply might be satisfactory; but if, as supposed by Sir Humphry Davy, the carbone of the blood be itself the pigment that colours it from the first, the explanation will content but very few. Yet this last hypothesis is as open to attack as any of the rest: for to say nothing of the difficulty of conceiving how the carbone of the animal fluids can give a deep dye to the blood, while it gives no dye whatever to any of the fluids besides, it is sufficient to observe, that an abstraction of a part of this dye may, indeed, form a lighter hue of the same kind, but not a different hue. The hypothesis has yet to account for that yellow or orange tint which must be added to the red of the venous blood before it can become changed into the red of the arterial; for as a simple dilution of venous blood will not furnish this tint, so neither will a simple abstraction of the only colouring material which is hereby supposed.

It may, perhaps, be said, that though oxygen do not get admission, caloric does; and this too very freely, and becomes itself the cause of this change of colour. And, in truth, this is the explanation offered by Mr. Ellis and various other physiologists; who contend, that the function of respiration consists, firstly, in freeing the blood from its load of carbone, and, secondly, in introducing a very large portion of the matter of heat in its stead; thus far advocating the hypothesis of Dr. Crawford. And as a proof that caloric, as a substance, is separated from the inspired air, they appeal to the quantity of vapour that is formed in the vesicles of the lungs simultaneously with the formation of the carbonic acid, and which they ascribe to this cause; regarding the lungs as the great laboratory in which the matter of heat or caloric is accumulated, and rendered fit for the use of the system.

But this, again, is to take for granted what yet remains an unsettled question; namely, whether caloric be a substance or a mere quality of body. Independently of which, admitting the substantive existence of caloric, and that some organ or other is especially employed in its evolution and introduction in a free state into the system, it is by no means established that this organ is the lungs; for Dr. Currie, in an ingenious paper published some years ago in the Phylosophical Transactions, attempted to show, by various experiments, that this is chiefly affected by the action of the stomach. And Mr. Brodie has long since brought other experiments that seem to refer it to the action of the brain.* Perhaps however, all these and various other organs may co-operate to the same effect.

Much, therefore, still remains to be ascertained upon this interesting subject. Even the recovery of the bright hue itself to the blood, by what ever means accomplished, and which by most physi-

* Phil. Trans. 1812. p. 378.

ologists is regarded as a fact of the utmost importance in the process of respiration, is contemplated by Mr. John Hunter as of scarcely any importance whatever, except as a proof that the blood has undergone the action of ventilation; an action which he conceives, from its being as necessary to white blooded animals as to red-blooded, produces a far greater effect on the coagulating lymph than on the red particles.* And hence, though we have an abundance of facts and experiments upon the subject before us, and an abundance of speculation in respect to them, the "COMMERCIUM MENTIS ET RERUM," as Lord Bacon has elegantly expressed it, has not hitherto led to any established doctrine, however creditable it has been to the industry and ingenuity of those who have engaged in it.

* On Blood, p. 204, 206, and following.

CLASS II.

PNEUMATICA.

ORDER I.

PHONICA.

Affecting the Vocal Avenues.

The term Phonica (ΦΩ'NIKA) is sufficiently explained in the definition. The order of diseases which it is intended to comprehend are seldom dangerous or acutely painful; and are rather characterized by trenching upon the grace or utility of the voice, than undermining the general health: It embraces the following

GENERA.

I. Coryza.	running at the nose.
II. Polypus.	polypus.
III. Rhonchus.	rattling in the throat.
IV. Aphonia.	speechlessness.
V. Dysphonia.	dissonant voice.
VI. Psellismus.	dissonant speech.

GENUS I.

CORYZA.

Running at the Nose.

DEFLUXION FROM THE NOSTRILS OBSTRUCTING THEIR CHANNEL.

In the commentary to the nosological text, I have ventured to point out what seems to be the real origin of the term coryza, concerning which the Greek lexicographers are at a loss; and have shown it to be a genuine and very extensive as well as very ancient Oriental term, common, under some modification or other, to the He-

brew, Arabic, Chaldee, and Syriac dialects, from one of which it was doubtless imported into the Greek tongue. By Hippocrates it was used in a very extensive sense, so as to signify defluxion of any kind, whether from the head, nostrils, fauces or chest. The later Greek physicians restrained coryza to a defluxion from the head and nostrils, and applied the term catastagmus to a defluxion from the fauces and thorax. Among modern writers, at least since the time of Cullen, coryza is used synonymously with catarrh, and is consequently regarded as a febrile affection. But this is rather to confound morbid affections than to simplify them. Coryza, running defluxion or distillation from the nose, may indeed occur as a symptom in catarrh, as it may also in various other complaints, as, the measles and some species of ophthalmy; but it may also occur, and as a simple and idiopathic affection does occur, without febrile action of any kind. In which cases, indeed, it is of little importance, and not often worthy of medical interposition: yet, in a general system of morbid affections, ought no more to be passed by unnoticed than a hedge or bog-plant in a system of botany.

Simple defluxion from the nostrils may proceed from two very different states of body, or of local power in the organs affected: which furnish us with two distinct species of affection, characterised by sufficiently marked and discrepant symptoms:

1. CORYZA ENTONICA.	ENTONIC CORYZA.
2. CORYZA ATONICA.	ATONIC CORYZA.

SPECIES I.

CORYZA ENTONICA.

Entonic Coryza.

THE DEFLUXION PELLUCID, MUCOUS, OR ROPY; WITH A SENSE OF IRRITATION OR INFARCTION.

In this species there will always be found an increased action of the secernent emunctories of the nostrils, while the absorbents remain little disturbed in their function; and as a morbid diminution of active power is ordinarily expressed by the terms atony and atonic, so entony and entonic are in the present work employed to express the opposite, or a morbid excess of activity. According to the difference of the stimuli, or accidental causes by which the present affection is produced, there will be some difference in the symptoms: for these causes may be sternutatories; the irritation of continuous sympathy, as in crying or weeping; a damp chill, or some other change produced suddenly in the temperature, or per-

haps temperament, of the atmosphere. And it is still more generally, and often with great abruptness brought on by a transfer of action, or a sort of reverse sympathy with some remote organ. Thus, there are many persons, who, as Dr. Darwin observes,* by sleeping at night with their arms or shoulders accidentally uncovered, become cold and torpid in the cutaneous vessels of these organs, and have their nostrils instantly affected with increased action, filled with mucus, and so thickened in the mucous membrane as to render them almost incapable of breathing.

An ozœna or nasal ulcer will also frequently produce a like effect; in which case the increased defluxion will be intermixed with a purulent or ichorous matter, sometimes throwing forth an offensive smell: and which may be arranged in a tabular form under the following varieties:

α Sternutatoria.	From sternutatories: accompanied with sneezing.
β Lachrymosa. Snivelling.	From weeping or crying: the lachrymal secretion being increased by mental emotion.
γ Catarrhalis. Snuffling.	From sudden chill or moisture in the temperature or temperament of the atmosphere.
δ Ozœnosa.	The defluxion more or less purulent; or ichorous and fetid.

The last is a case of surgical rather than of medical treatment, and is often connected with a caries of some part of the ethmoid, or even the sphœnoid bone. A warm atmosphere easily and in a short time takes off the variety produced by a sudden application of cold, or a sudden change in the temperament of the atmosphere, and which makes an approach towards a catarrh, though without any sense of heaviness or oppression in the head, or harshness in the fauces. From the obstruction of the nostrils, however, there is usually a nasal voice and a deficiency or loss of smell; and, where the discharge is acrid, an excoriation of the mucous or Schneiderian membrane. When it is the result of a reverse sympathy, with the arms or other limbs rendered chilly at night by being uncovered, it is easily and almost instantly removed by covering the chilly organs with additional bed-clothes, and thus restoring the balance of heat and cutaneous secretion.

In a singular idiosyncrasy, reported in the Ephemera of Natural Curiosities, the odour of roses, without amounting to a sternutatory, proved a stimulous sufficient to excite a coryza whenever applied.† It is well remarked by Galen, that there are various foods that produce a like effect ;‡ and Bonet, in one instance, found it oc-

* Zoonom. Cl. I. Ord. I. ii. 7.
† Dec. II. Ann. v. Obs. 22.
‡ Fragment. ex Aphor. Rabi Moyses, p. 36.

casioned by a globular tumour surrounded by a fluid in the ventricles of the brain,* probably from an excitement of the olfactory nerves which take their rise in the corpora striata, situated in this quarter of the cerebrum.

SPECIES II.

CORYZA ATONICA.

Atonic Coryza.

THE DEFLUXION LIMPID, AND WITHOUT ACRIMONY OR SENSE OF IRRITATION.

THE chief causes are exposure to a keen frosty air; the natural paresis of old age; and a long and immoderate use of strong aromatics, volatile alkali, or snuff: affording the three following varieties:—

α Algida.	From exposure to a keen frosty air.
β Senilis.	From old age.
γ Superacta.	From habitual indulgence in snuff, or nasal stimulants.

In all these, there is diminished action in both the secernent and absorbent vessels of the nostrils, but chiefly in the latter, which almost uniformly yield soonest from causes we shall hereafter have to explain. And hence, while the secernents, from a degree of torpitude more or less approaching to the nature of paralysis, are only capable of separating a thin limpid water, instead of a viscid mucus, the absorbents are too inert to carry off even this; which, in consequence, accumulates, and drips from the nostrils. A warm atmosphere, or the vapour of warm water snuffed up the nostrils, affords an easy remedy for the first variety of this species, which far more frequently occurs, and perhaps only occurs, in a dry, sharp, frosty air, than in an atmosphere rendered chilly from damp; damp being, as already noticed, rather a cause of the preceding species. In the former case, the severity of the cold overcomes all power of re-action; and hence, notwithstanding there is a defluxion, because whatever is secreted is not carried off by the correspondent absorbents, the discharge is checked in its quantity, at the same time that it is rendered more limpid. In the latter case, the tone of the excretories rise superior to the chill to which they are exposed, and the re-action ascends to something of a morbid excess. A warm room, and particularly the excitement of a gentle perspiration, will cure both; but the first is also often cured by brisk walking,

* Sepulchr. Lib. I. Sect. xvii. Obs. 10.

or any other vigorous exercise proportioned to the sharpness of the frost: for as the systsm becomes roused generally, the nasal excretories become roused also, and triumph over the cold with a re-active power, which is at the same time communicated to the correspondent absorbents, and the defluxion immediately ceases.

The two last varieties are beyond the reach of medical aid. The coryza, or snuffling of old age, is precisely analogous to its ptyalism or drivelling. In the one, the atony is seated in the excretories of the salivary glands; in the other, in those of the mucous membrane of the nostrils. There is in both a want of elasticity, which keeps the mouths of each set of vessels in a state of permanent relaxation, and consequently of permanent defluxion. Among the habitual irritants that lead to the same effect, snuffs are the worst; for the tobacco of which they consist operates with the mischief of a narcotic as well as of a stimulant; and hence the copious and foul distillation with which the nostrils of aged snuff-takers are constantly deformed.

GENUS II.

POLYPUS.

Polypus.

FLESHY, ELONGATED EXCRESCENCE, SHOOTING FROM ONE OR MORE SLENDER ROOTS IN THE CHANNEL OF THE NOSTRILS; RUNNING IN DIFFERENT DIRECTIONS, AND AFFECTING THE SPEECH.

This is the polypus properly so called, and the disease to which the term is applied by Celsus, and continued to be applied till after the days of Heister, who uses it in the same restricted sense. More lately, however, the term polypus has been employed in a much looser signification, and made to import concretions and excrescences appearing in various channels or cavities of the body, of very different origins and textures, as those of the heart, which are perhaps always grumous blood, or concrete gluten; those of the uterus and bladder, which are caruncles or sarcophytes, with a slender base, or peduncle; and those of the trachea in croup, which are also concrete gluten; whence the croup is by such writers denominated angina *polypus* or *polyposa*.

It is better with the old authors, who have been followed by Vogel, and still more lately by Mr. B. Bell, to restrain polypus as a distinct generic term to peduncular excrescences in the nostrils; and to distinguish by the phrase polypous tumours, caruncles or shoots, such adscititious productions as may have a resemblance to them in other organs.

Polypus, in this limited and proper sense, comprizes two species, from the very different texture under which it is found.

1. POLYPUS ELASTICUS.	COMPRESSIBLE POLYPUS.
2. ——— CORIACEUS.	CARTILAGINOUS POLYPUS.

SPECIES I.

POLYPUS ELASTICUS.

Compressible Polypus.

SOFT, COMPRESSIBLE, UNACHING, CHIEFLY PALE-RED; APPARENTLY ORIGINATING FROM DISTENTION, OR RELAXATION OF THE SCHNEIDERIAN MEMBRANE.

This species is very apt to be affected by the state of the atmosphere; being often retraced and shrivelled in dry weather, and enormously enlarged and elongated in thick hazy weather. There is little pain during any stage of its progress, however troublesome it may be to deglutition or the voice. If attended to when small or in an incipient state, it may often be prevented from growing large by the use of astringent applications; as a strong solution of alum, a decoction of oak-bark, or the application of vinegar or brandy. But where the excrescence becomes inconvenient from its bulk, it ought to be instantly extirpated; concerning which, however, we shall speak more at large presently.

SPECIES II.

POLYPUS CORIACEUS.

Cartilaginous Polypus.

FIRM, CARTILAGINOUS, OFTEN PAINFUL, CHIEFLY DEEP-RED; APPARENTLY ORIGINATING FROM, OR CONNECTED WITH, A CARIES OF THE ETHMOID BONE.

This species is not only painful, but, from being firm and deep-seated, very troublesome in removal. It is not always indeed that it can be extirpated entire, or that it is advisable to extirpate it when possible. When extracted imperfectly it is very apt to regenerate, and has sometimes become cancerous.

It is too generally believed, however, that polypi in all instances may and ought to be extracted; and that if the shoot can be laid hold of by the forceps, and we are not afraid of any hemorrhage, nothing is to be dreaded from the operation. Mr. Pott was of a different opinion; he had observed many, which, though neither scirrhous nor cancerous, were very unfit for any chirurgical process. Some circumstances, he remarks, may forbid the attempt from the impossibility of its being successful: others, from its being more likely to increase and exasperate the disease than to cure it. He dissuades from the operation in almost every instance of the second or coriaceous species; in all those cases in which the polypus begins with considerable pain in the forehead and upper part of the nose, or is preceded by these symptoms; and which, as soon as it can be seen, is either highly red or of a dark colour; which is never alternately smaller and larger, but rather progressively increasing: in which the common actions of coughing, sneezing, or blowing the nose, give pain, or produce a very disagreeable sensation in the nostril and forehead; in all cases of polypi, which, when within reach, are painful to the touch, or which, upon being touched slightly, are apt to bleed; those which do not seem to be moveable by the action of blowing the nose, or driving the air through the affected nostril only, when confined to one side; those which are incompressibly hard, and, when pressed, occasion pain in the corner of the eye, or in the forehead, and which, if they discharge any thing, shed blood; those which, by adhesion, occupy a very considerable space, and seem to consist of a thickening or an enlargement of the membrane covering the septum narium; those from which there is a discharge of an ulcerous, offensive, discoloured fluid; and those round the lower part of which, within the nose, a probe cannot easily and freely be passed to some height. In all cases thus characterised, Mr. Pott was of opinion that no trial should be made by the forceps; and he advised further, that no attempt to remove them should be made by any other means with which he had the good fortune to be acquainted.

But where these characters do not occur, and in general where the polypus answers to the first species in elasticity and colour, he recommends their removal, and by the forceps rather than by escharotics, ligature, or any other means; and thinks they may be extracted with great safety.*

* Chirurgical Observations relative to the Cataract, Polypus of the nose, &c. 8vo. London, 1774.

GENUS III.

RHONCHUS.

Rattling in the Throat.

HARSH, SONOROUS BREATHING FROM STAGNATION OF MUCUS IN THE VOCAL CANAL.

THERE are two species of morbid affection which may be arranged under this genus, each of which have been raised to the rank of a distinct genus by Vogel and several other nosologists; while by Cullen, and those who have followed him, they have been entirely struck out of the catalogue of morbid affections, as either unworthy of notice or merely symptomatic of some other complaint.

To a generic distinction they are scarcely entitled; but a slight acquaintance with the habits and morbid actions of the system, is sufficient to afford instances in which both sorts are idiopathic. Many persons have a thick or wheezy respiration, produced by corpulency, or by changes of the atmosphere from hot to cold, or from dry to moist, without any other diseased affection. Many persons snore habitually during sleep; and most persons have a tendency to do so as they grow old. Under such circumstances, the affections before us are strictly idiopathic. They are often indeed accompanied with much inconvenience; but, as deviations from a perfect state of health, have a full claim to their respective places in a general system of nosology. Confervas in botany, and infusory worms in natural history, are as confessedly objects of scientific arrangement and study, as the oak and the elephant.

The two species then appertaining to the present genus, are the following:—

1.	RHONCHUS STERTOR.	SNORING.
2.	——·—— CERCHNUS.	WHEEZING.

SPECIES I.

RHONCHUS STERTOR.

Snoring.

THE SOUND DEEP AND LOUD; PEODUCED IN THE LARYNX AND FAUCES.

As a symptom, this is common to apoplexy: but, as I have just ob]

served, it is found idiophathically in many instances brought on by advancing age or peculiar to the habit. A syrup made of the leaves of the erysimum *officinale*, or hedge-mustard, was for this kind of noisy breathing once popular; and the pungency of the plant may often prove useful. The common cause is here, as in atonic coryza, deficient action in the absorbents of the larynx and fauces, so that only the finer part of the mucus is inhaled by their mouths, and the tougher and denser part accumulates and obstructs the passage.

It is possible also that in some cases, as in the atonic coryza of age, the excretories of these organs may at the same time be permanently relaxed, so as to admit of a larger defluxion than in health and vigour. And hence local stimulants are particularly applicable, among the best of which may be ranked camphor, and other terebinthinate medicines, gum ammonia, and the alliacea.

SPECIES II.

RHONCHUS CERCHNUS.

Wheezing.

THE SOUND DENSE AND IMPEDED; PRODUCED BELOW THE LARYNX.

This affection, as a symptom, is common to asthma and dyspnœa; but I have already observed it is sometimes found as a primary evil, or independent of any other complaint. In the introductory dissertation to the present class, we remarked that a considerable quantity of aqueous vapour is formed in the air-cells of the lungs during the process of respiration; supposed, by the physiologists who contend for the inhalation of caloric as a distinct substance, to be produced by its separation from the inspired air of the atmosphere, and the union of a part of its oxygene with the hydrogene furnished by the lungs. In a state of health this vapour is very freely exhaled by the mouth, and forms that mist which is seen to issue from every man's lips in frosty weather, and especially when thrown upon a dark polished surface, as that of a mirror. But if the bronchial vessels be obstructed by a more than ordinary increase or accumulation of mucus, it escapes with difficulty; and, encountering the air that is thrown into the lungs, occasions that hissing or wheezing sound which is always produced by a current of air when it has to force its passage through a body of dense vapour. Commonly, therefore, this is a case of atony, local or general; and, like the last species, will be best relieved by those medicines that gently stimulate, and warm, and give power to the bronchial lymphatics,

as the resinous gums, and the bulbs of the alliaceous plants. In fat people, and especially those who are low of stature, short-necked, and oppressed with fat about the chest, the obstruction is chiefly the result of infarction and pressure; for the diaphragm and other muscles not having full play, the lungs are never thoroughly expanded, and the extricated vapour is put into a smaller space, and has a narrower exit. And here the only cure must consist in taking off the obesity by repeated venesections, active purgatives, vigorous exercise, and a low diet.

GENUS IV.

APHONIA.

Dumbness. Speechlessness.

INABILITY OF SPEECH.

We now proceed to a group of diseases that affect not so much the trachea or general avenue of sound, as the organs of articulation, fixed on its upper end, like a capital upon a pillar, as M. Blumenbach has elegantly observed, and consequently which impede or vitiate the power of speech. These have been very differently arranged by different writers, and have often been very unnecessarily extended and complicated, especially by Vogel, as may be seen by a reference to the commentary in the author's volume on Nosology. Upon the whole they will be found to distribute themselves most easily and distinctly under the three following generic divisions: defects that depend on an utter inability of speech; those in which the sound of the voice is imperfect or depraved; and those in which, while the sound of the voice continues unaffected, the articulation is incorrect or vitiated. It is the first of these divisions that constitutes the genus before us.

Inability of speech may proceed from three different causes, each of which lays a foundation for several symptoms peculiar to itself and consequently for the three following species:—

1.	APHONIA ELINGUIUM.	ELINGUAL DUMBNESS.
2.	——— ATONICA.	ATONIC DUMBNESS.
3.	——— SURDORUM.	DEAF-DUMBNESS.

SPECIES I.

APHONIA ELINGUIUM.

Elingual Dumbness.

SPEECHLESSNESS FROM DESTITUTION OF TONGUE.

This may be of two sorts; each of which lays a foundation for very different results.

α Congenita.	The defect coeval with the birth.
β Oblæsa.	The defect produced by accident, punishment, or disease.

The glottis is the chief organ employed in dividing the voice into distinct or simple tones or notes; as the tongue chiefly divides it, either singly, or by a co operation with other organs, into distinct articulations, so as to form proper language, which is hence commonly regarded as nothing more than a modification of the powers of the *lingua*, as the *tongue* is called in Latin; and hence *tongue* and *language* are often used synonymously. It is obvious therefore, that, in all common cases, the man who is deprived of his tongue, whether by congenital defect, by mechanical force, or by disease, must at the same time be deprived of the power of speech and become dumb.

I say in all common cases; for a privation of the tongue is not always accompanied with dumbness. It is not necessarily so in all cases of congenital destitution, and still less in all cases of privation that occur after speech has been acquired. In the Physiological Proem to the present Class we had occasion to remark that the glottis alone, in some instances, either from a greater pliancy and volubility of the muscles proper to it, or from the possession of some superadded muscle or membrane, seems to have a power of forming distinct articulations without the assistance of the tongue: and I hence endeavoured to account for that singular talent which we denominate ventriloquism. But there is a more singular talent still, that sometimes occurs in the history of the human voice, and which is probably resolvable into the same cause; for we have examples, supported by indisputable authentication, of persons, who having lost the entire organ of the tongue, and a few of them the uvula also, have still retained a power of speaking, and even of expressing themselves with a clear and accurate enunciation. Such examples, indeed, are not very common; but they seem to have occurred in all ages, and especially when it was the barbarous custom among the Turks, Goths, and other half-civilized nations, to cut out the tongues of the unhappy wretches whom the chance of war had thrown into their hands as prisoners.

There are some persons who profess to disbelieve all the stories of this kind that have descended to us, for the mere reason that they have never witnessed any thing of the same kind in their own age or country. But such persons would have also joined the king of Siam in disbelieving the Dutch ambassador's assertion, that the rivers in his own country became so hard and solid during the winter, that men and women could walk and skate upon them. The accounts are too numerous, and, in many instances too well supported, to be treated with scepticism; and all that is left to our judgment and ingenuity is, not to deny the evidence, but to account, as we shall presently proceed to do, for the fact.

Hundreds of cases might be quoted upon this subject; but the following may be sufficient, though others are referred to in the nosological system, which may be examined at the reader's leisure. Those now selected are taken from recent times, and from authorities that may indeed be disbelieved, but cannot be disputed.

In the third volume of the Ephemerides Germanicæ, we have the history of a boy, who, at eight years of age, lost the whole organ of the tongue, in consequence of a sphacelus proceeding from the small-pox, and who was able to talk after its separation. The boy was exhibited publicly, but a trick was generally suspected: in consequence of which the boy and his friends were summoned to appear in court before the members of the celebrated university of Saumur. In the presence of this learned body he underwent a strict examination as to the loss he had sustained, and the lingual powers he still possessed. The report was found correct; and the university, in consequence, gave their official attestation to the fact, in order, as it expressly asserts in its record, that its reality might not be called in question in succeeding times.

In the Memoires de l'Academie des Sciences for the year 1718, is an account of a girl who was born without a tongue, but had, nevertheless, learned to speak, and talked as easily and distinctly as if she had enjoyed the full benefit of that organ. The case is given by a physician of character, who had accurately and repeatedly examined the girl's organs of speech, and was desirous that others should examine them also.

About seventy years ago our own country furnished us with another equally striking example of the same power, and which forms the subject of various papers in the Philosophical Transactions, drawn up chiefly by Dr. Parsons at the time, and printed in the volumes that were published between the years 1742 and 1747. It is the history of a young woman of the name of Margaret Cutting, of Wickham-market, near Ipswich, in Suffolk; who, when only four years old, lost the whole of her tongue, together with the uvula, from what is said to have been a cancerous affection; but still retained the powers of speech, taste, and deglutition, without any imperfection whatever: articulating, indeed, as fluently and with as much correctness as other persons; and articulating, too, those peculiar syllables which ordinarily require the express aid of

the tip of the tongue for exact enunciation. She also sung to admiration, and still articulated her words while singing; and could form no conception of the use of a tongue in other people. Neither where her teeth in any respectable to supply the place of the deficient organs; for these also were but few, and rose scarcely higher than the surface of the gums, in consequence of the injury to the sockets from the disease that had destroyed the tongue. The case, thus introduced before the Royal Society, was attested by the minister of the parish, a medical practitioner of repute, and another respectable person. From its singularity, however, the Society evinced a commendable tardiness of belief. They requested another report upon the subject, and from another set of witnesses, whom they themselves named for the purpose, and for whose guidance they drew up a line of categorical examination. This second report soon reached the Society, and minutely coincided with the first: and to set the question completely at rest, the young woman was shortly afterwards brought to London, and satisfied the Royal Society in her own person.

To explain this unexpected power, we should not only turn our attention to what is actually and in our own day accomplished by ventriloquists; but should recollect that the tongue is only a single organ employed in the articulation of sounds, and that the fauces, nostrils, lips, and teeth, bear, at least, an equal part, while the glottis, which forms all the vocal or vowel sounds, is the chief organ of the whole. In reality, out of the twenty-four articulate sounds which fill up our common alphabet, the only two in which the tongue takes a distinct lead are the *l* and *r*, though it is auxiliary to several others; but the guttural, or palatine, *g*, *h*, *k*, *q*; the nasal, as *m* and *n*; the labial, as *b*, *p*, *f*, *v*, *w*; most of the dental, as *c*, *d*, *z*, together with all the vowels, which hold so large a space in our vocabularies, are but little indebted to its assistance.

It is singular that so delicately sensible an organ as the tongue should receive the severest injuries, and submit to very violent operations, with less serious mischief than almost any other organ of the same size in the body. And it is on this account that the cruel and barbarous manner in which the tongue was extirpated by the ferocious tribes that overrun Europe from the east formerly, was rarely productive of fatal consequences. Sir Everard Home published, many years ago, a paper upon the subject, containing various cases of sections of the tongue to a less or greater depth in consequence of diseased action. The operation was in every instance, performed by the ligature. He does not state what effect was in any instance produced on the speech, and we are hence led to conjecture that nothing in this respect occurred of material importance: but he draws the following conclusions: The internal structure of the tongue is less irritable than almost any other organized part of the body. Its nerves appear to be more easily compressed and deprived of their power of communicating sensation than nerves in general; and any injury done to them is not produc-

tive of diseased action in the trunk of the injured nerve. The tongue appears to have a power of throwing off its sloughs in a shorter time than any other part.

SPECIES II.

APHONIA ATONICA.

Atonic Dumbness.

SPEECHLESSNESS FROM ATONY OF THE VOCAL ORGANS.

This atony is chiefly if not altogether confined to the nerves of the vocal organs, which may be injured by violence, or exhausted by mental or other commotion, independently of the occurrence of the disease occasionally as a symptom of paralysis, quinsy, or catarrh; thus furnishing us with two distinct varieties:

α Oblæsa.	From lesion of the nerves of the tongue or glottis,
β Soluta.	From sudden or overwhelming commotion, or shock of any kind.

The instances of speechlessness produced by an injury to the lingual nerve are not common. But a division of the recurrent nerves which are offsets from the par vagum, and distributed over the larynx and glottis, produce a speechlessness that is rarely, if ever, recovered from: for here the muscles belonging to the arytenoid cartilages being rendered atonic or paralytic, can never be brought into a due degree of constriction, the glottis remains permanently open, and the diameter of the larynx suffers no variety of contraction or dilitation. Galen seems to be the first anatomist who noticed this effect, or rather ascribed it to its real cause; for it was known before his time, that, by making ligatures on the blood-vessels of the trachea, the noisiest animal is immediately struck dumb, and made quiescent. It was supposed that the state of the blood-vessels themselves, and not of the nerves included with them in the ligature, was the cause of this effect; that the blood became intercepted in its passage from the heart, and that the animal became mute because rendered comatose: and hence the name of carotids, or soporific vessels, (from κάρος, sopor,) was given to the arteries whose ligature was supposed to produce this very singular result. Galen, however, demonstrated very satisfactorily that the dumbness is, in this case, entirely owing to the pressure of the ligature on the accompanying nerves: and he afterwards produced to his opponents two cases of boys, who in a greater or less degree had lost their

voice in consequence of the recurrent nerves being cut by surgeons unacquainted with anatomy, in extracting strumous tumours from the neck. In the one case, only one of these nerves was divided, and the voice was merely much weakened, or about half destroyed; in the other, both were divided, and the voice was lost altogether. A whizzing senseless noise, indeed, remains in most instances, as Vezalius has correctly observed; but there is no vocal sound articulate or inarticulate.

Where the speechlessness has followed upon an injury to some branches of the lingual nerves, we have numerous examples of recovery. In one instance, the dumbness ceased suddenly after the patient had been speechless for not less than ten years.*

In other instances dumbness is produced suddenly, from a total exhaustion of nervous power in the vocal organs without any organic lesion whatever. A sudden and overwhelming emotion of the mind from terror, anger, or any other passion, has frequently had this effect in irritable habits. So has a violent fit of hysterics;† or any other vehement shock which‡ instantaneously exhausts the nerves of their sensorial power and the muscular fibres of their irratibility: as a stroke of lightening, or a severe and unexpected blow on the stomach, will sometimes exhaust the entire system of its vital energy, and make life immediately cease. A sudden chill, as from drinking cold water during a violent heat, or the shock of a sudden fall, has frequently produced it, of which numerous instances are recorded in the Ephemerides of Natural Curiosities. Speechlessness of this kind has sometimes arisen from deleterious exhalations; from eating mushrooms; and in one instance, recorded in Hufeland's Annals, by repeatedly rubbing the wound made by a poisonous insect with saliva, and as often putting the finger to the mouth to obtain a supply of fresh fluid.§ In like manner, Bonet informs us that the same effect has followed from putting into the mouth and swallowing a piece of money cankered with the rust of verdigrise.‖

Where medical aid is required, our dependance must be on tonics, local or general, and topical stimulants. Blisters and masticatories have chiefly been made use of, and frequently with good effect; as has the vellication of a hair-brush contrived for the purpose. The dumbness has sometimes yielded to emetics, at others to electricity;¶ and in a few cases to a severe cough;** and occasionally

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* Sammlung. 1721, II. 406, 503.—Bresl.

† Van der Hont. Verhandelingen van het geneeskond Genortsck.

‡ Büchner, Miscell. 1729.—Bartholin. Art. Hafn. I. Obs. 101. Schurig. Chilologia, p. 205.

§ See also Dupau in Journ. de Medicine, Sept. 1789.

‖ Bonet Sepulchu. Lib. I. § 22.

¶ Krazenstein, Pr. Hist. restitutæ Loquelæ par Electrasionem. Hafn. 1753.

** Iperen. Abh. aus holl. Schriften. B. I. p. 356. Morgagni, De Sed. et Caus. Morb. Ep. lxiii. Art. 15.

the same, or a like violence which occasioned the disease, has removed it, and the cause has become the cure; as is reported of Athys, the son of Crœsus. In like manner, we have examples of its having yielded abruptly to a fit of anger, or terror, in one instance to a fit of laughter,* in another to a blow on the head.†

SPECIES III.

APHONIA SURDORUM.

Deaf-Dumbness.

SPEECHLESSNESS FROM DEAFNESS CONGENITAL OR PRODUCED DURING INFANCY.

The ears are as necessary to speech, or articulate sounds, as the tongue, or even the glottis; for if such sounds be not heard, and distinctly discriminated, they can never be imitated. Persons who become deaf after the acquisition of speech, do not become dumb for the very reason that articulation has already formed a habit, and can easily be preserved by practice. But if deafness be congenital, or take place antecedently to such habit, articulation can never be acquired afterwards, unless by some rare good fortune the ears should acquire hearing; and the unfortunate individual can only receive and interchange ideas by the eye: through which medium, however, he may be taught written, though not oral language; and thus still, happily for himself, have his mind almost as richly stored, though not his ideas as readily communicated, as through the outlet of speech. This is an interesting subject, and not unconnected with pathological science, since it opens to us the only remedy that can be resorted to where the defect before us, or that of deafness prior to articulation, is the subject of discussion.

To pursue the calamity, however, into the various plans which the benevolence and ingenuity of the human mind have invented to supply the defect of speech, from the times of Ammanus of Amsterdam, and Wallis of our own country, would carry us far beyond the limits to which the present work must be confined. And I shall therefore only observe, that the grand principle laid down under all the various plans and systems that have been devised, in order to obtain the proposed remedy, and supply the want of speech, is that of commencing with picture characters, and making these the key to alphabetical and arbitrary signs: and in this manner it is that the eye is rendered subservient to the purposes of the ear. When

* Iperen. ut supr. Martini, II. Duzend Beobachtungen.
† Ephem. Nat. Cur. Dec. III. An. v. Obs. 236.

the deaf-dumb scholar is made to understand that the picture of a knife or of a ship is to be regarded as the representative of such objects or ideas, there is no great difficulty in teaching him that the arbitrary letters of which these words are composed, and which for this purpose are always written or should be written underneath these pictures, are intended to stand for the same purpose as the pictures themselves, and to import the same objects or their ideas, whenever they are met with in a certain arrangement: and so of other pictures and other combinations of letters which are equivalent to them. And hence, such combinations of letters, when the learners are accustomed to them, will as effectually become the signs or representatives of the objects they are intended to express, as the pictures which preceded their use. The power that appertains to each separate letter is a lesson to be learnt long afterwards; and still longer afterwards an idea, for it can never be any thing more, of the vocal or articulate effects produced by different movements of the lips, cheeks, and throat, which that letter is designed to express. An accurate and habitual attention, however, will teach the scholar this; and he will in a considerable degree be able to make out what is spoken by the motion of the lips and other vocal organs alone; and, if he possess a facility of copying these, he may be taught, still farther, how to measure and modulate them, so as to produce the articulations they are intended to convey, and to speak with tolerable accuracy without hearing himself: while a fellow-scholar labouring under the same defect, and having made an equal progress in the same kind of education, will understand his meaning, or the vocal terms he conveys, by the mere movement of the vocal organs alone. I have myself borne a part in such conversations at that excellent institution of this metropolis, the Asylum for Deaf and Dumb Children, and have seen scholars conversing in this manner without hearing a single syllable on either side, but at the same time with a perfect understanding of each other's meaning.

Mr. Waller relates a singular case of this kind, of a man and his sister, who lived together to an advanced age, neither of them having the least sense of hearing, but who understood each other, as well as other persons, by the motion of the lips alone; supporting themselves by daily labour. They became deaf, however, when children, after they had learned to speak, and hence in moving their lips they continued to articulate though not very distinctly.*

There are a few instances on record of a recovery from deafness many years after birth, and of a gradual acquisition of speech in consequence hereof; chiefly produced by some violent but fortunate affection of the brain. Thus Lambzweerde relates the case of a fortunate fracture of the scull, through a fall from a considerable height, by which a young person, deaf-dumb from birth, was suddenly endowed with hearing, and, in process of time, with speech.† In like

* Phil. Trans. Vol. XXV. 1707. No. 312. p. 2468.
† Append. ad. Ammenit.

manner Mr. Martin, in one of the early volumes of the Philosophical Transactions, gives an account of a native of Stratherig, near Inverness, of the name of Fraser who was born deaf and continued dumb till seventeen years of age, when he was attacked with a fever which affected his brain for some time; on recovering from this, he began to have a sense of hearing, and soon afterwards to understand speech, which he gradually imitated, and at length acquired so as to converse fluently; though, from commencing at so late a period, he never attained perfect accuracy in articulating many words,*

GENUS V.

DYSPHONIA.

Dissonant Voice.

THE SOUND OF THE VOICE IMPERFECT OR DEPRAVED.

Voice, as we have already observed, is the sound of the air propelled through, and striking against the sides of the glottis: while speech is the modification of the voice into distinct articulations, by means of particular muscles in the cavity of the glottis itself, or in that of the mouth or the nostrils, employed as signs of ideas. Hence voice belongs to many animals in common with man: speech, thus limited as to its object, belongs to man alone, for there is no other animal that can distinctly articulate and make use of articulation as signs of what is occurring in the mind; though there are a few animals that may be taught to imitate articulate sounds without having ideas attached to them. The present genus embraces the morbid affections to which the voice is subject; the next, those which appertain to the speech. It includes three species:

1.	DYSPHONIA SUSURRANS.	WHISPERING VOICE.
2.	——— PUBERUM.	VOICE OF PUBERTY.
3.	——— IMMODULATA.	IMMELODIOUS VOICE.

* Vol. XXV. No. 312. p. 2469.

SPECIES I.

DYSPHONIA SUSURRANS.

Whispering Voice.

VOICE WEAK, WHISPERING, AND SCARCELY AUDIBLE.

MANY of the causes of atonic dumbness, when operating with a less degree of violence, become causes of the present affection, while a few are peculiar to itself. The following varieties may not unfrequently be noticed:

α Oblæsa.	From lesion of the nerves of the larynx.
β Pathematica.	From sudden emotion of the mind.
γ Compressoria.	From permanent compression of the trachea.
δ Catarrhalis.	From neglected catarrh.
ε Enervis.	From simple debility of the larynx without any obvious cause.

Independently of which, the present species is occasionally met with as a symptom in melancholic, paralytic, and hysteric affections, as also in quinsey, dysphagy, and catarrh.

The nerves which, when injured, chiefly produce whispering are the recurrent. When these are divided, dumbness, as we have already observed, is the result; but they are often weakened and perhaps otherwise injured without being divided: and in this case the voice is not actually lost, but dwindles to a whisper; and is recovered as soon as the nerves resume their tone. The voice has, in this manner, frequently been injured by straining the ligaments and the minute muscles which move the parts of the glottis on each other; and in elevating the voice to a high pitch in public addresses, or striving at a note in singing which the natural compass of the voice will not reach. So Pliny tells us that Gracchus, during a violent exertion in speaking, had his voice suddenly sink to a feminine treble. Astringent gargles, blistering the throat, cold local bathing, external and internal, with perfect quiet and silence, are the best means of recovering the voice under such circumstances. The last I have found most serviceable; and have made the patient gargle four or five times a-day with ice-water; which at the same time should be applied to the throat by a wet napkin.

A sudden and overwhelming emotion of the mind from various causes will sometimes totally choke or stifle the voice, which is particularly the case with rage: but where the effect is not so violent, the voice becomes an almost inaudible whisper; and particularly when the passion is fright or terror. Rest and a restoration to con-

fidence will usually recover it in a short time, but in some instances the effect has been permament.

There are various cases in Morgagni and Bonet, in which the voice was rendered almost inaudible from the pressure of an enlarged heart, a bronchocele, or an aneurism of the aorta against the vocal avenues. Sauvages has referred to these; and it is highly probable that such a pressure, by diminishing the capacity of the trachea, may lower the power of the voice; but I have met with no such case in my own practice; and have introduced the variety altogether upon the authority of these distinguished authors.

A catarrhal whisper is a frequent occurrence, and there can be few practitioners who have not met with examples of it. The voice is often injured from the commencement of the catarrh, as well in consequence of the inflammatory affection of the membrane that lines the glottis, as of the increased secretion of mucus that issues from the interior of a great part of the trachea: and in some cases, in which the inflammation had become chronic, by pulling forward the tongue I have seen the epiglottis covered with a cream-coloured coating, which was probably extended lower, and was a chief source of the difficulty of utterance. But the variety before us is the result of that weakness which inflammatory action induces in the vocal organs, as a sequel rather than a symptom of the inflammatory action itself.

Mr. Archdeacon Squire relates a singular case of this kind in an attorney at Devizes, of the name of Axford, who at twenty-eight years of age having caught cold, was seized with a hoarseness that in six days rendered him totally speechless; in which state he continued after the cold left him; being totally incapable of distinct articulation, and scarcely able to make the least inarticulate sound. Four years afterwards he got so much intoxicated as to fall from his horse several times in his way home; and was at last taken up by a neighbour and put to bed in a house on the road. He fell asleep; and dreaming that he had fallen into a furnace of boiling wort, he was put into so great a fright that, struggling with all his might to call for help, he actually did articulate aloud, and recovered the use of his speech from that moment as effectually and perfectly as he had ever had it in his life.*

For habitual hoarsenesses leading to the present affection the siliquosæ offer the best class of medicines; and with respect to many of them there is no great difference except what results from their greater degree of acrimony. It is common to all these, on being swallowed to stimulate the fauces, and especially their mucous glands, and thus to excite a more copious excretion of mucus. Of this family of medicines, the erysimum *officinale*, or hedge-hyssop, was at one time in higher reputation for habitual hoarseness than any of the rest: and Dr. Cullen seems disposed to support this preference, chiefly upon the ground of its being less violent in its stimu-

* Phil. Trans. Vol. XLV. 1747-8. p. 148.

lant power than the generality of them. He recommends the juice of this plant mixed with an equal quantity of sugar or honey into a syrup. And where the erysimum is not at hand, he advises to supply its place with a syrup of horse-raddish, but made weak, so that it may be frequently used or long continued without rendering the fauces sore or uneasy.* For this purpose a drachm of the root fresh and scraped may be infused in four ounces of boiling water for two hours in a close vessel, and made into a syrup with double its weight of sugar. Of this a teaspoonful swallowed leisurely for a dose will often be found highly serviceable.

We sometimes meet with a debility in the organs of the voice which reduces it to a whisper, without being able to ascribe it to any particular cause. This is often temporary, and seems to occur from a sudden deliquium of nervous power in these organs; as when in the middle of speaking or reading, and this too in an agreeable tone, the voice abruptly fails, and is as abruptly resumed. In the case of the orator Gracchus, to whom I have just adverted, Pliny informs us that the voice was restored by the sound of a pipe, that, being struck by his servant, gave the proper pitch. In some instances, however, this failure of the voice has been more or less permanent or intermissive. I had lately a lady under my care of about forty-five years of age, who was usually attacked in sudden and irregular paroxysms, each continuing for several weeks. Repeated blisters, stimulant, astringent gargles, as of port-wine or alum-water with tincture of myrrh, and a steady perseverance in a tonic regimen and pure country air, succeeded. She recovered by degrees the full power of her voice, which, during the paroxysms, was nothing more than a weak and almost inaudible whisper; and has had no return of the affection for more than two years. In another case of the same kind, adverted to in the Nosology, the same plan proved less successful. The patient was a gentleman of about forty years of age, otherwise in good health, who had never spoken except in a whisper for more than eight years.

SPECIES II.

DYSPHONIA PUBERUM.

Change of Voice. Voice of Puberty.

THE VOICE DISSONANT AND UNTRUE TO ITSELF, IRREGULARLY ALTERNATING FROM HARSH TO SHRILL: CONFINED TO THE AGE OF PUBERTY.

THE change that, during the period of puberty or adolescence, takes

* Mat. Med. Part. II. Class v. p. 166.

place in the sexual system for the purpose of giving perfection to its organs, is well known to be connected, by sympathy, with an equal change in various other parts of the body. In females, the breasts assume a soft and beautiful swell, and the nipples a pleasurable irritation. In males, the chin is covered with a beard, and the voice becomes fuller, deeper, and more sonorous. Before the voice, however, acquires this important change, it often exhibits great irregularity; and the youth, incapable of modifying his own tones, passes abruptly from harsh to shrill, and from grave to acute. And it is this irregularity and uncontrollable dissonance of voice which constitutes the present species.

There is no great difficulty in accounting for this abnormal state of the voice at the period before us. The glottis is nearly as complicated in its structure as the eye or the ear, and the modulation of its tones depends upon an equal degree of elasticity and pliability in all its moveable parts, and in their perfect submission to the authority of the will. To the attainment of a correct voice it is necessary that there should be great accuracy of ear; a perfect symmetry of the vocal organs; equal tenseness in the ligaments of the larynx, which must be also nicely balanced by the powers of the muscles on each side; the cartilages of the larynx must be delicately adjusted to each other; the lateral cavities equally deep, and the cornua of the os hyoides of a like length. With such an organization the voice is perfected for exact modulation in speaking or singing; and it is from different defects in this requisite mechanism that some persons cannot speak, nor others sing, in tune.

Now in the change that takes place during puberty, every part does not always harmonize with the rest; some parts become more tense, others less, and yield more easily; some are more relaxed, others more contracted; and of the effect producible by such a state of the glottis, a tolerably distinct idea may be formed from a remark of Dodart, that a variation in the capacity of the glottis not exceeding the fifty-fourth part of a silk-worm's thread, or one three-hundred and fifty-fourth part of a hair, will occasion a difference of tone. Time, however, and repeated exercises of the will usually triumph over these discrepancies, wherever they exist, in a few months; when the voice recovers its unity of tone, and becomes graver in proportion as its motive powers become firmer and denser: and hence the reason why the voice of males is graver than that of females. In males, also, the glottis becomes more capacious, which forms another cause of gravity of tone. The deepest tones are struck by animals that have the largest glottis, as the phora, the ox, the ardea *stellaria;* while singing-birds, which sound the acutest tones, have a glottis capable of the closest contraction. The deepest roarings are produced by animals that have the cartilages of the trachea entire, or imbricated, or tesselated with bones, as the lion, the elephant, and the peacock.

SPECIES III.

DYSPHONIA IMMODULATA.

Immelodious Voice.

THE VOICE PERMANENTLY DEPRAVED, OR INHARMONIOUS.

This species offers the six following varieties :—

α Rauca. Rough, or harsh voice.	The voice naturally or habitually hoarse, harsh, or rough.
β Nasalis. Speaking through the nose.	The voice sent with a cracked and grating sound through the nostrils.
γ Clangens. Squeaking voice.	The voice shrill and squalling.
δ Sibilans. Whizzing voice.	The voice accompanied with a whizzing, or hissing sound.
ε Stertens. Guttural voice.	The voice accompanied with a snorting, snoring, guttural, or stertorous sound.
ζ Palatina. Palatine voice.	The voice hoarse obscure, indistinct, with a fissure or other defect in the palate.

Of most of these, the cause will be obvious from the observations already offered. Thus, the squeaking voice proceeds, ordinarily, from too narrow a glottis : the rough or harsh voice, from a glottis too wide, and not sufficiently moistened with mucous secretion. In the whizzing voice there is too much secretion, but of too limpid a consistence.

The guttural, or stertorous, variety is commonly the result of a relaxed glottis, or velum palati, with an accumulation of thickened mucus ; and here local stimulants, astringents, and tonics, together with a steady and determined exertion to obtain a modulated voice, will frequently prove successful. The obscure palatine voice, commonly congenital, but sometimes a sequel of lues, can only be assisted by filling up the fissure in the palate with a silver plate properly secured by a spring, or, when necessary, by an entire false palate of the same metal. Yet the most dexterous artist will sometimes find his ingenuity unavailing, and the defect beyond his skill. The nasal voice is produced, ordinarily, by an obstruction of the nasal fossæ from condensed mucus, as in a cold of the head, a polypus, or some other organic defect : the remedy or removal of which, where this can be attained, will restore the voice to its proper clearness. In common language we denominate this variety *speaking through the nose*, but most incorrectly : for it is occasioned alone

by our not having the nasal passages clear: and consequently from not being able to speak through them with our usual facility.

The last is often the result of affectation, or a foolish habit not easy to be conquered when once acquired.

GENUS VI.

PSELLISMUS.

Dissonant Speech.

THE ARTICULATION IMPERFECT OR DEPRAVED.

In the preceding genus, the imperfection or depravity exists, not in the articulation, but in the sound of the voice; whence the distinction between that and the present is clear. Psellismus embraces two species: that of STAMMERING, and that of a VICIOUS ENUNCIATION.

1.	PSELLISMUS BAMBALIA.	STAMMERING.
2.	——— BLÆSITAS.	MISENUNCIATION.

SPECIES I.

PSELLISMUS BAMBALIA.

Stammering.

THE FLOW OF THE ARTICULATION DISTURBED BY IRREGULAR INTERMISSIONS OR SNATCHES.

This affection may be regarded as a sort of clonic spasm, or St. Vitus's dance confined to the vocal organs, and offers us the two following varieties:—

α	Hesitans.	Hesitation.
β	Titubans.	Stuttering.

In the hesitating variety there is an involuntary and tremulous retardation in articulating particular syllables. The organs are generally too mobile and unsteady, and the will has lost its control over them, if it ever possessed any. By reverting to the remarks made on Dysphonia *puberem*, the physiology of the affection will be easily understood. As bad habits are more readily learnt than

good ones, because they are more striking and more strongly arrest the attention, this complaint is often caught by imitation, and especially among children; who for this reason ought never to be entrusted in the company of a stutterer till their speech has become steady and confirmed.

In the second variety we have a higher degree of stammering than in the first; accompanied with more impetuosity of effort. It consists in an involuntary and tremulous reduplication of some syllables, alternating with a tremulous hurry of those that follow. "I would thou couldst stammer," says Shakspeare, with a striking illustration of this morbid affection, "that thou mightest pour out of thy mouth, as wine comes out of a narrow-mouthed bottle, either too much at once or none at all."

The convulsive actions of the muscles of the glottis, and which are communicated to the other organs of speech, whether productive of the present or the preceding variety, may often be overcome by a firm and judicious discipline; insomuch that some of the most distinguished orators of both ancient and modern times are well known to have been subject to this affection in their youth. In ordinary conversation, or where a man has time to pick out single words, instead of speaking whole sentences, the stammerer always hesitates most; and hence always least where his attention is completely engrossed. On which account there are many stammerers that scarcely utter a word in speaking without betraying themselves, who, nevertheless, sing and enunciate the words of the song without any hesitation whatever, their whole mind being led away with the tune, and a strong desire to keep in time and harmony. While there are others who hesitate as little in reading, the words being immediately before them, and their attention being swallowed up in the subject. One of the worst stutterers I have ever known, was one of the best readers of Milton's Paradise Lost. He was a scholar of considerable attainments, and had taken some pains with himself for his natural defect; but without success; yet the moment an interesting poem was opened, his defect completely vanished, from his being led captive by the force of the subject, and the great interest he took in this branch of polite letters.

This affords us one means, therefore, of remedying the evil before us: the stammerer should learn by heart, and repeat slowly, whatever most arrests his attention. But at the same time the will must learn to obtain a control over the muscles of articulation; and for this purpose single words should be uttered for hours at a time deliberately, and when alone; and perhaps too, as was the custom of Demosthenes, a practice of haranguing by the sea-shore, or on the brink of some awful water-fall, where the fearful noise and the magnificence of the scenery have a tendency to break in upon the habit, and render the conquest the easier may be often found advantageous. It would at least stimulate the speaker to strain his voice to the full extent of its power, and thus fit him for public speaking before large bodies of people, where a loud and

elevated voice can alone be heard distinctly; which was probably the chief object Demosthenes had in view: for we are expressly told that his voice was weak, as well as his speech tremulous and hesitating. Adults, who have firmness and perseverence enough for the purpose, may undertake the task of disciplining themselves; but children should always be put under the care of a judicious tutor, whose best qualifications will be patience and good-temper. A very few words only should be marked down at a time for trial, and these should be attempted separately: nor should a second lesson be entered upon till the first had been completely mastered, although the effort should demand many weeks or even months. An acquisition of one lesson will always facilitate that of another.

SPECIES II.

PSELLISMUS BLÆSITAS.

Misenunciation.

ARTICULATE SOUNDS FREELY BUT INACCURATELY ENUNCIATED.

The elementary articulate sounds which the organs of speech are capable of enunciating are but few; and hence they are the same in all languages, which are alone founded upon them; differently, indeed, modified in several of them, and with a difference of number in still more: for diversities of language consist, not in different sets of articulations, to which the vocal organs are not competent, but only in their different modes of combination, and the different ideas which such combinations indicate. So seven notes comprise the whole of music, and by their different arrangements produce that variety of harmony which we admire in the works of Handel or Mozart. If we would ascend higher than eight notes, we only commence another series of like proportions. In the same manner to quote the words of the author of Hermes, "It is only to about twenty plain elementery sounds that we owe that variety of articulate voices which have been sufficient to explain the sentiments of so innumerable a multitude, as all the present and past generations of men."*

The twenty-four plain elementary sounds here referred to, are those which are denoted by the letters of the greater number of our European alphabets. Yet of these, many are rather mere modifications of other sounds than distinct sounds in themselves: insomuch that the ingenious Wachter has endeavoured to reduce the

* Book III. ch. II. p. 324.

twenty-four to ten primary articulate enunciations, and to show that these alone would be sufficient for the purposes of the most polished languages; and, consequently, that an alphabet of not more than ten marks or signs might be sufficient to express its entire range.* In making this reduction, he regards all the five vowels as modifications of each other, or rather of one common articulation, the simplest belonging to the organs of speech, formed with least difficulty, and, on this account, composing a very great part of the languages of savage nations. In like manner he regards all the gutturals as only modifications of another common articulation, as K, C, CH, Q, G, H. So B and P have nearly a common sound; as have D and T; and PH, V, and W. While L, R, S, M, and N, are distinct articulations, and will not readily blend with any others.

These, no doubt, might be sufficient for all the purposes of speech: for we find that ten simple numerals are adequate to all the purposes of arithmetical calculations which extend to infinity; and that able mathematician Tacquet, who has worked the problem for the purpose, informs us, that the combinations capable of being produced by the ordinary series of twenty-four letters, amount to not less than 620,448,401,733,239,439,360,000, without any repetition.† So that the richest vocabulary has made but a small inroad into that inexhaustible mine of wealth which the wisdom of Providence has bestowed upon the few distinct and primary sounds, be they more or less, which the vocal organs of man are capable of articulating; thus devising a plan which is equally entitled to our admiration for the simplicity of its design and the comprehensiveness of its power.

I have observed that some languages have more elementary sounds than others, and as these are expressed by elementary characters or letters, it follows that some language must also have a more extensive alphabet than others. The proper Phenician alphabet, which is, perhaps, the oldest of which we have any distinct account, seems to have consisted of not more than thirteen letters at first; it had afterwards three added to it, making sixteen in the whole; and in this state it seems to have been earliest employed by many of the adjoining countries, and is distinguished by the name of the Samaritan or ancient Hebrew: for the terms and characters of this last are so nearly those of the Phenician in its improved form, that it is difficult, and altogether unnecessary, to make a distinction. The Chaldeans introduced some change into the shape of the letters, rendered them more elegant, and added six other letters, as the Samaritan alphabet did not seem sufficiently full to express all the articulations of their speech; and the Jews, during the Babylonish captivity, readily adopted the improvement, and have continued the Chaldaic characters in their writings ever since. And in this manner, with various changes and augmentations, the

* Nat. et Script. Concord. p. 64.—Astle, Origin and Progress of Writing, p. 20

† Arithmeticæ Theor. p. 517, edit. Amist. 1704. Astle, ut supr. p. 20.

Phenician alphabet can be traced through every part of ancient and modern Europe, every region of Africa where writing of any kind is current, and the western countries of Asia.

Over a very extensive portion of this last continent, however, we meet with an alphabet that has no common origin or conformity of principle with any hitherto described. This is the Nagari, or Devanagari, as it is called by way of pre-eminence. It consists of not less than fifty letters, of which sixteen are vowels, and thirty-four consonants, all arranged in the order of the alphabet with a systematic precision that is to be found no where else. The vowels take the lead, beginning with those most easily uttered, and terminating with those that approach towards a consonant sound. The consonants then follow in five regular series of gutturals, compounds, palatines, dentals, and labials; the whole closing with letters symbolical of sounds that do not exactly enter into any of the preceding series, and which may be regarded as a general appendix. This alphabet is asserted by many learned Bramins to be of a higher antiquity than any other; and there can be no doubt that it has a very just claim to a very remote date. But its very perfection is a sufficient confutation of its having been invented first of all. Something far more rude and incondite must have preceded and paved the way for it; and in the complex characters of which it consists, we seem to have the relics of those emblematic or picture-symbols, which there can be little doubt were first made use of, which are still employed by the Chinese and the uncivilized tribes of America, and seem to have laid a foundation for alphabetic characters in every quarter of the world. With a few trivial variations this correct and elegant alphabet extends from the Persian gulph to China; but it has no pretensions to rival the antiquity of the Phenician. It is unborrowed, but of later origin.

Whatever be the number of simple articulations that enter into the constitution of a language, or however modified in enunciation, they can only be learned with accuracy in early life, when the vocal organs are most pliable, and the untutored infant is most prone to imitation. And hence, unless care be taken to imprint upon the organs of speech a just and correct enunciation of the first elements of words at this time, it is with great difficulty that the art can be acquired afterwards. This occurs to us under the best and most favourable circumstances. Foreigners coming into our own country after the age of thirty, though urged by an ardent desire of speaking English, seldom pronounce the language tolerably. An Englishman at the same age, can hardly be taught to utter the guttural sound which the Welchman gives to the Greek χ, or even the French sound of the vowel *u*: and of the stray and solitary savages that have been caught in the forests of Lithuania, and a few other regions, there is not perhaps a single instance of their having been able, after the age of manhood, to articulate any language so as to be understood with facility.

But we sometimes meet with less favourable circumstances to an

acquisition of proper articulate sounds, and this too in a state of childhood, which is the immediate age of imitation. For, firstly, we sometimes see children brought up under the care of those who have a vitious articulation themselves, from whom they will be sure to catch it; and hence those pronunciations and rude dialects that are so frequently found in the remoter or less polished districts of almost every extensive people. Secondly, we occasionally meet with some natural disability or want of harmonious power in the organs of speech themselves; one or two of them evincing a greater mobility than the rest, and consequently taking the lead of them, and interfering with their office. And thirdly, there is not unfrequently a defect of structure in the organs of articulation, as a want or loss of the fore-teeth, or a fissure in the palate or the lips.

Many of the articulate sounds, moreover, in most, perhaps in all, languages, though called simple, are produced by the joint exertion of two or more distinct organs; and unless these organs precisely accord in flexibility and power, and are equally under the command of the will, the sound will be imperfectly imitated. The Arabic and the Saxon sound, in English expressed by *th*, is an articulation of this kind, being compounded of a dental and an aspirate or guttural sound. From early habit the natives of both countries are able to enunciate it perfectly, and they enunciate it alike. But there is scarcely an individual in any other country, who can ever be taught to sound it accurately, unless he should have an opportunity of trying it in early life; for the motive powers concerned in the sound will not move in sufficient unison. For the same reason it is as difficult for a foreigner to catch the German *ch* in the pronoun *ich*, the *sch* in *schätzen*, or both in *schädlich*, or *schmächtigkeit*. But even these combined sounds have sometimes shades of distinction which constitute other sounds, and are expressly intended to do so; and in such cases the difficulty of an accurate enunciation is greatly enhanced. Thus the English *th* in *thing*, and in *thou*, is a different articulation; and the Arabians, who have both, express them by different marks or letters; which if expressed by our own letters, would perhaps be best written *dth*. And it is on this account that where a common language spreads over different countries, as the Arabian, or different parts of a country, which formerly made use of a diversity of tongues, as the English, varieties will necessarily take place in the utterance; and the dialectic may be more in favour than even the original or normal enunciation. There are some persons who prefer the English of Edinburgh to that of London; and the Arabic of Delhi, Ispahan, and Constantinople has modifications of sounds as well as of inflexions, which, though regarded as barbarisms by a native of Cairo, are contemplated as excellencies by those who make use of them.

The organ chiefly employed in the articulation of sounds is the glottis; and subordinate to this are fauces, the nostrils, the tongue, the lips, and the teeth. And hence the division of articulate sounds into vowel or VOCAL, which are formed by the glottis alone,

and are the simplest of all sounds; GUTTURAL, or those which are formed in the fauces more or less acting conjointly with the glottis, of which the fauces are only a continuation, as *h*, *ch*, *ph*, *g h*; NASAL, as *m*, *n*, and the compound *ng*; LINGUAL, as *l* and *r*; LABIAL, as *b*, *p*, *f*, *v*, *w*; and DENTAL, as *c*, *d*, *t*, *z*.

If we were to be more particular than we have time to be, or than is necessary, it would not be difficult to derive very numerous examples of vicious enunciation, and consequently varieties of the species of morbid utterance before us, from every one of these divisions; but the following are the chief which occur in our own tongue, and those that are cognate with it:—

α Ringens.	Vitious pronunciation of the letter R.
ϐ Lallans.	Vitious pronunciation of the letter L.
γ Emolliens.	Vitious substitution of soft for harsher letters.
δ Balbutiens.	Vitious multiplication of labials.
ε Mogilalia.	Vitious omission of labials or exchange for other letters.
ζ Dentiloquens.	Vitious employment of dentals.
η Gutturalis.	Vitious pronunciation of gutturals.

The vitious pronunciation of the letter *r* is produced by a harsh or aspirated vibration or redoubling of it. Examples of this inelegance are common to several of the northern provinces of our own country, as it is to the ruder provinces of France. Among the Greeks from the letter ϱ (*ro*) it was denominated rotacismus, and was common to the Eretrienses in the island of Eubœa. It is generally ascribed to the possession of too large and tardy a tongue. But it is rather produced by pressing the point of the tongue downward towards the root of the teeth of the lower jaw, instead of upwards, with a slight vibration towards the palate.

In the second variety of vitious enunciation, the letter *l* is rendered unduly liquid, or substituted for an *r*. As when delusive is pronounced del*i*usive, as though the *l* possessed the powor of the Spanish *ll*, or the Italian *gl*; or as when parable is pronounced pa*l*able. Alcibiades is said to have laboured under this defect. The Greeks, from the letter λ (*lamda*.) denominated this *lamdacismus*; the Romans with more severity, *lallatio*, or *lullaby-speech*. This is often the result of affectation; sometimes perhaps from not having the tongue sufficiently free, as where there is too great a length of the frænum which ties it to the base of the mouth, or too large and oppressive a flow of saliva. As the articulation of *r* does not enter into some languages, as those of Mexico and China, the *l* is often substituted for it; hence the Jews of the former country, who, from long disuse, have lost the power of pronouncing the *r*, employ the *l* in its stead; and for אשרי האיש אשר in the opening of the first psalm read אשלי תאיש אשל.

In the next variety, the harsh letters are vitiously dropped for softer; as in the substitution of an*g*el for an*g*el; capi*t*ol for capi*t*ol;

*d*at for *th*at. This may be the result of a debilitated articulation in children who have been brought up too daintily; but it is more usually the result of affectation: or is founded upon a general principle of softening the rougher or harsher sounds of language into a smoother and more limpid flow: as is the case with most of the modern dialects of the south of Europe, and particularly those of Italy and Spain, which are well known to be derived from the Latin. Thus in the former we have p*i*ano for p*l*ano; p*i*angere, and still further p*iagn*ere, for p*l*angere, and e*gl*i for i*ll*e: and in the latter *l*lamar for clamare; *l*laga for *pl*aga, *h*ermosa for *f*ormosa.

It is curious to observe how, in this respect, the most barbarous and the most polished languages agree. It is generally, but erroneously conceived, that the former are peculiarly harsh and dissonant; for savages, in speaking, as in any other exertion, take no more pains than are absolutely necessary, and hence content themselves with the soft and simple vowel sounds or those of the glottis, drawled out indeed at too great length; and when they are driven to the use of consonants, select those that give them least trouble to enunciate. On this account Lord Monboddo is correct in observing that "the words of barbarous languages are long and full of vowels; not short and full of consonants, as has been imagined."* And the following remark of my excellent and distinguished friend Dr. Perceval of Dublin, in the manuscript commentary with which he favoured me on the volume of Nosology already spoken of in the Introduction, is peculiarly in unison with this statement:—"In a paralytic affection of the organs of articulation, the patient pronounced the word cocoa, *toto*. The Otaheitans call Cooke, Toote. Their language is beautifully soft and vocal. A sentence reported in Cooke's second voyage is distinguished by the harmonious and expressive collocation of its words: "Tootaha, taio Toote—mutte Tootaha."—"Tootaha, the friend of Cooke—dead is Tootaha." Man in savage life is fond of ease, and would not move a muscle if he could help it; in the voluptuousness of polished life he loves it equally, and is, if possible, still less disposed to exertion; and hence this extraordinary accordance in the character of their articulations.

In the balbutient variety, we have the labial letters too frequently repeated, or enunciated too harshly, or used instead of other letters The Welch are proverbially addicted to this inelegance, by confounding the *v* with the *f*, and the *b* with the *p*; of which Sir Hugh Evans, in the Merry Wives of Windsor, affords a correct and amusing example, "*F*erry goot," says he, "I will make a *p*rief of it in my note-book!" So im*p*ringe is often used for in*f*ringe, and i*b*ory for i*v*ory. And thus *V*eda is pronounced *B*eda, and *V*enares, *B*enares, in Bengal, the Bengalee having no such letter or articulation as *v*.

Infants before they cut their teeth are constantly using labials too freely, as the lips press together without resistance; and hence they delight in iterating the same labial sound; and it is from a

* Origin and Progress of Language; second edit. Vol. I. b. iii. p. 496.

copy of such infantile iteration that we derive the names of pa-pa and ma-ma which they first learn to utter: for the original Hebrew terms, from which these names have descended to Europe and indeed to most other parts of the world, savage as well as civilized, are without any iteration whatever, being simply *ab*, *am*, the first importing *love*, and the second *sustenance*, in Syriac rendered *aba* or *abha* and *ama*; and the same in Chaldee: whence the Greek terms and their correlatives παππα or παππας and μαμμα (*pappa* or *pappas* and *mamma*) produced by a mere infantine balbutiation, or substitution of *p* for *b*, in the first term, and a reduplication of the consonant in each.

Persons in a state of intoxication, from the tremulous debility of their lips, often exhibit the same reduplication of the labial sounds; and thus make an approach towards one of the varieties of the last species. It is also often to be found in persons whose lips are unduly thick and broad, a deformity distinguished vernacularly by the name of blobber-lipped: to which cause Quintilian, who notices this variety of vitious expresssion, chiefly ascribes it, and hence distinguishes it by the name of plateiasma, probably from Theocritus:

> Τρυγονες εκκυαισευντι πλατυασδοισαι απαντα.*
> Cooing, like pigeons, with your blobber-lips.

A verse designed to ridicule the Doric dialect, and consequently intimating that this kind of vitious enunciation was common to a considerable part of Achaia.

The erroneous articulation constituting the next variety, is of a character precisely opposite to the preceding; and consists in omitting the harsher labials altogether, or exchanging them for others that are softer and more easily uttered.

Thus *m*antle is broken down into *a*ntle, *f*ish into *v*ish, and *p*ilfer into *f*ilfer. So in the Spanish the Latin *f*arina becomes *h*arina, and *fa*b*a*, *h*a*v*a, and in French the Latin si*b*ilo, si*ff*er. This blemish is especially common to those who are hare-lipped, or have any other kind of defect in either lip, so that the two will not play in harmony; and more particularly still, if any of their front teeth be wanting.

In the dentiloquent variety, the dental sounds, as of *c*, *s*, *t*, *z*, are too frequently employed, producing the effect of what is called lisping, or, in common language, speaking through the teeth. This, also, is often an affected blemish, as though it were an elegance, instead of a fault in enunciation. It is produced by having a tongue naturally too long, and hence perpetually thrust against the front teeth from necessity, and from a habit of pressing it in this direction too frequently.

The guttural or palatine letters, as *g*, *h*, *j*, *c*, *x*, are sometimes uttered imperfectly, by being introduced where they ought not, or

* Idyl. XV. 88.

withheld where they should be distinctly enunciated; and in this consist the last variety it may be necessary to notice.

One of the most common examples is in the superfluous use of the aspirate, or *h*, by means of which exalt and exasperate are pronounced ex*h*alt and ex*h*asperate; so collar is called k*h*ollar, and custom k*h*ustom. And not unfrequently among men of unfinished education, the aspirate is just as uniformly omitted when it ought to be employed, as employed where it ought to be omitted; whence for this sentence "the upper part of the house is to be let unfurnished," we have "the *h*upper part of the ouse *h*is to be let *h*unfurnished." And if the palate be fissured, or in any other way imperfect, "ghost," is pronounced "host," "jolly," "iolly," or "yolly," "coffee," "dhoffee," "Xerxes," "Zherzes."

Where these defects depend on organic misformation, they will mostly be found without a remedy, though they may be palliated by a laborious discipline. Where they are the result of debility or vitious habit, the remarks with which we closed the preceding species will be equally applicable here.

CLASS II.

PNEUMATICA.

ORDER II.

PNEUMONICA.

Affecting the Lungs, their Membranes or motive power.

THE RESPIRATION IRREGULAR, IMPEDED, OR PAINFUL.

The idiopathic diseases that appertain to this order differ very widely in their respective degrees of severity and danger; and upon the whole are but few; though the number is very considerable in which the lungs and their auxiliary powers are deeply implicated, by sympathy or continuity, in disorders that originate in other organs, and primarily affect other functions.

The genera are as follow:

I. Bex.	COUGH
II. Dyspnœa.	ANHELATION.
III. Asthma.	ASTHMA.
IV. Ephialtes.	DAY-MARE. NIGHT-MARE.
V. Sternalgia.	SUFFOCATIVE BREAST-PANG.
VI. Pleuralgia.	STITCH.

GENUS I.

BEX.

Cough.

SONOROUS AND VIOLENT EXPULSION OF AIR FROM THE LUNGS.

This genus of diseases was by the Latins named Tussis, a term that has been more generally employed by nosologists than any other.

I have ventured, however, to restore the Greek name BEX (B'HΞ) for the sake of uniformity; so that the generic terms may all be derived from a single tongue.

Cough, defined as above, is well known to accompany, as a symptom, a great multiplicity of other affections, some of which are very remote from the seat of couching. Thus it occurs to us in pleurisy, in pneumonitis, hepatitis, paristhmitis, empyema, asthma, catarrh, phthisis, hæmoptysis, hysteria, helminthia, and dropsies of various species. Hence Dr. Cullen has omitted cough as an idiopathic affection, and has only introduced it as a symptom or synonym of catarrh; although it belongs at least as much to phthisis and perhaps to every one of the diseases just enumerated: but Dr. Cullen's system did not allow a place for cough as a primary disease; and in this, as in various other cases, he was obliged to bend to the force of necessity.

Cough, undoubtedly, occurs in its most frequent appearance as a symptom of some other complaint; but it is at times as truly idiopathic as any complaint whatever, and ought to be treated of as such. Under this form its seat is in the chest; and the parts principally affected are the trachea, bronchiæ, the membranes, and substance of the lungs. In the act of coughing, the lungs, like the stomach in vomiting, continue inert; and the active or convulsive part by which the lungs are emptied, is performed by the muscles of respiration.

"It is not necessary," observes Mr, John Hunter, "that the stomach should act violently to produce the evacuation of its contents; nor is it even necessary that it should act at all; for the lungs themselves do not act in the least when any extraneous matter is to be thrown up: and coughing is to the lungs what vomiting is to the stomach. The muscles of respiration are the active parts in emptying the lungs, and can act naturally and preternaturally. The action of vomiting is performed entirely by the diaphragm and abdominial muscles; and we know by the same action that the contents of the rectum can be expelled."* In the Physiological Proem to the present class I have endeavoured to establish this remark in respect to the lungs; and under the species EMESIA in the preceding class, I have noticed experiments of Mr. Magendie that confirm Mr. Hunter's opinion in respect to the stomach.

Generally speaking, idiopathic cough is not dangerous in itself, or while running its regular course; but it has often proved highly dangerous in its results, by super-inducing peripneumony, hæmoptysis, hectic fever, or phthisis.

The whole of these remarks apply not more to common coughs than to pertussis or hooping-cough: which unquestionably, therefore, ought to be arranged as a species under the present genus. In truth, the commencement of both is in most cases so much alike, that it is often impossible, and always difficult, to distinguish them:

* Anim. Economy, p. 199.

both are, in many cases, accompanied with a slight degree of fever; the most obvious and assignable cause of both is cold, I mean where the hooping-cough is original; and, in both, the sonorous fits how much soever they may differ in violence and a few other circumstances, are produced by a spasmodic action of the same muscles.

Thus explained, the genus bex or tussis may be divided into the three following species:

1. BEX HUMIDA.	COMMON OR HUMID COUGH.
2. —— SICCA.	DRY COUGH.
3. —— CONVULSIVA.	HOOPING-COUGH.

SPECIES I.

BEX HUMIDA.

Common Cough. Humid Cough.

THE COUGH ACCOMPANIED WITH AN EXPECTORATION OF A MUCOUS OR SEROUS FLUID.

To this species the Greeks gave the name of anaptysis, and anacatharsis: which last has been copied by Sauvages, and appropriated to the present purpose. The species affords us four varieties; one entonic, or accompanied with an excess of power, and three atonic, or distinguished by enfeebled action.

α Mucosa.	Common mucous cough.
β Anhelans.	Chronic cough of old age.
γ Acrida.	Frothy saline cough.
δ Periodica.	Nervous cough.

In the first variety, the discharge is chiefly mucous, and excreted freely. The exhalents of the bronchiæ are stimulated by an irritation of some kind or other, frequently by a reverse sympathy, in consequence of cold and torpid feet, to act more powerfully than in a state of ordinary health, whence the bronchial vessels become overloaded, and relieve themselves by an expectoration, that takes place freely and without the hoarseness which usually accompanies catarrh, or any other very troublesome disturbance of the respiratory organs.

There is another variety, commonly called the CHRONIC COUGH OF OLD AGE, in which the cough occurs in long paroxysms, with a viscid and mucous discharge, excreted with difficulty, and laborious breathing. Here the bronchial secretion of mucus is perhaps less copious than in ordinary health; but the action of the absorbents being as

weak and sluggish as that of the excretories, the thinner part of the mucus alone is imbibed and carried off; and hence what remains is necessarily small in quantity, peculiarly tenacious, and thrown up with great labour and repeated efforts. This kind of cough is peculiarly common to persons in advanced life: or whose lungs or bronchial vessels are rendered weak and irritable from a neglect of common mucous coughs; which have at length run into the present variety, and become almost habitual; showing themselves on every change of the atmosphere; and particularly during the inclemency of winter.

In the third, or acrid variety, the fluid coughed up is thin, frothy, and saline; and for the most part excreted with difficulty. It is evidently, like the last, an atonic affection of the lungs; though often produced by diseased action in some remote organ with which the lungs associate. It is hence, sometimes, found in transferred gout, and still more frequently in cases of diseased liver; especially where the liver has been affected from a habit of ebriety; and in these cases it is peculiarly troublesome on first rising from bed in the morning. There is, as I suspect, in this form of humid cough, not only great torpor and imbecile action in the membrane of the lungs, but a depraved secretion, small in quantity, and thinner and more acrid in quality than it ought to be.

This cough is sometimes peculiarly pertinacious. Dr. Darwin tells us that he has met with it twice in the same person, at a distance of some years, during a fit of gout, so intractable as to resist venesection, opiates, bark, blisters, mucilages, and all the usual methods. It was, for a time, supposed to be the hooping-cough, from the violence of the spasmodic fits of coughing: it continued two or three weeks, the patient never being able to sleep more than a few minutes at once during the whole time; and never for a moment unless propped up in bed with pillows.*

There is another variety of the present species to be met with, which develops a striking tendency to recur at stated periods. The cough, instead of being violent, is here partly restrainable, and the discharge, though thin, is not acrid. It is the NERVOUS COUGH of Dr. Whytt, who, in his Treatise on Nervous Diseases, has described it with great accuracy and judgment. It is a frequent attendant upon persons of a nervous or irritable temperament, and hence common to the hysteric, dyspeptic, and choleric. Like the last variety, it is also occasionally found in repelled gout. There seems here, also, to be some depravation in the nature of the secretion dependant on the debility of the secreting organs. And hence we sometimes find that the morbid phlegm forms a nidus, as in various cases of phthisis, for the eggs of minute insects floating in the atmosphere, which are conveyed with the inspired air to the bronchial vessels; where they are hatched in the secreted fluid, and often thrown up in the shape of larves or maggots. In like manner

* Zoonom. Class IV. ii. 1. 9.

we sometimes meet with hydatids formed and thrown up in the same way; of which we have a singular example in the Medical Transactions, in a lady, thirty-seven years of age, of a delicate constitution, and nervous or hypochondriacal habit. For half a year she expectorated more or less of these in the midst of thick viscid phlegm, sometimes to the amount of twelve, fifteen, or twenty-four in a day, of various sizes, from that of a pea that of a pullet's egg.

From the difference of causes and symptoms which these varieties evince, a very different mode of treatment is evidently required.

The first variety, produced by excess of action in the mucous membrane of the lungs, and mostly by sympathy with a remote organ, as in the case of cold and torpid feet, will be best relieved by diaphoretics and the warmer sedatives; and especially Dover's powder, which will restore to the system its harmonious balance of power. The warm bath, or bathing the feet in warm water; warm and copious apozems, and oily or mucilaginous demulcents, are also peculiarly adapted to this species of cough. At the same time the bowels should be kept open by any gentle laxative, as the neutral salts, or the confections of cassia or senna.

Here also, we have reason to expect benefit from many of the expectorants, properly so called: those medicines which rather promote the separation of the viscid phlegm with which the bronchiæ are loaded, than simply inviscate or dilute it, though these are also treated of as expectorants by many writers.

The list of the proper expectorants employed formerly was very voluminous; in the present day they are comparatively but few, and the proscription has, perhaps, been carried too far. The principle upon which they act is, in some degree, doubtful. The simplest way of accounting for it is by means of a specific determination to the lungs. For as we have pretty clear proofs of medicines operating specifically upon other organs, as that of mercury upon the salivary glands, and cinchona upon the irritable fibre, there is no reason why we should not expect a like operation upon the viscera of the chest. Dr. Cullen is quite at a loss upon this subject, from not admitting of specific medicines, or a specific action upon any organ. As a general rule, he supposes expectorants to operate on the bronchiæ merely by a diaphoretic power, or that of increasing the flow of the superficial exhalants at large, and consequently of the exhalants of the lungs, by which the mucus present in the follicles may be poured out in a less viscid form, and hence in a state to be more easily thrown up by the trachea.

But this is a very unsatisfactory view of the question. For, first, admitting there are medicines that act directly upon the exhalants of the skin, a specific power is hereby immediately conceded to one set of organs; and if such a power exist in respect to one set, there is no reason why it may not in respect to fifty. Next we see evident proofs of an expectorant power in many medicines, as in gum-ammoniac, where we have no proof whatever of increased exhala-

tion from the surface of the body. And, further, the general explanation gives us no clue to the different operations of particular expectorants.

It is possible that in all these there is a peculiar stimulus; but whether this depends upon any sensible quality they possess, we cannot easily determine: for though many of them are more pungent to the taste than others, their degree of expectorant power does not in every instance keep pace with their degree of pungency.

In the variety, however, of a common mucous cough from cold, it is obvious that, where expectorants are employed, they should be of a mild rather than of an acrimonious nature, as we have already an excess of action to encounter. And hence honey, the rob or jelly of the sub-acid fruits, as currants or raspberries, liquorice-root, and perhaps hyssop, butterbur, and inula, may be used with advantage, though the virtues of the last two or three are but doubtful, notwithstanding the high repute in which they were held formerly. The officinal inula of our own day, however, does not appear to be that of the Latins; for among them its farina is represented as having been particularly sapid; so much so indeed, as to have formed a favourite ingredient in the most celebrated sauces of their public feasts. Horace speaks of it in one place as possessing a bitter taste; for he thus makes an epicure boast of having invented the sauce:—

—INULAS ego primus AMARAS
Monstravi incoquere.*

And in another he describes it as acrid, or stimulating; for it is probably in this sense that the term ACIDAS should be understood:—

ACIDAS mavult inulas.†

While Lucretius makes it rather a mild general stimulant, or aromatic:

——quæ
TITILLARE magis sensus, quam lædere possint,
Fæcula jam quo de genere est, INULÆQUE sapores.‡

But let the quality of the Roman inula be what it may, we do not seem to possess the plant, in the almost tasteless and inert root employed under this name in our own day.

In the second variety, or chronic cough of old age, where the mucous discharge is peculiarly viscid, much smaller in quantity, and excreted with great difficulty and laborious breathing, and the general symptoms evince great torpor of the extreme vessels of the lungs, the warmer and more pungent expectorants can alone be of any service, as the alliacea; and stimulant gum-resins, especially ammoniac, benzoin, styrax, and, perhaps, all the turpentine modifications.

* Sat. II. viii. 51. † Lib. II. 430. ‡ De Rer. Nat. II. 430.

Tar-water was at one time a famous remedy; but has long fallen into great disesteem. From its warm terebinthinate impregnation, and the approach it makes to camphor and the gum-resins just enumerated, it may doubtless prove serviceable in many cases. It is for the same reason that the vapour of tar exhaled from a tin-pan with an oil or spirit-lamp beneath, as recommended by Dr. Crichton in phthisis, is, in the present cough, frequently employed with advantage. The acidum *abietis*, another old preparation of the same kind, seems, however, to be the most deserving of trial of all the terebinthinate forms; and has sunk into disrepute without reason: it is the peculiar acid liquor, yielded along with the essential oil, in distillation of the fresh branches or fruit of the pinus *silvestris* and p. *alba* of Linnéus. It is too acrid to be drunk alone. And is usually diluted with water: and combines in itself some portion of the terebinthinate oil with an acid very nearly resembling the acetous.

The same tribe of medicines will generally be found useful in the third variety, or that in which the cough is followed by a thin frothy and saline excretion: for here we meet with as much local atony and torpor of the excretories as in the preceding. We may here also with advantage employ several of the narcotic bitters, and especially the hop, in the form of pills or tincture; and occasionally the narcotics themselves, as opium, or hyoscyamus, or the extract of the common potatoe, solanum *tuberosum*, as recommended by Dr. Latham.* But where the cough is dependent upon morbid affection of some remote organ, and the lungs are only influenced by sympathy, it is obvious that our chief attention should be directed to the primary disease. I was lately called in to a young gentleman who was severely afflicted with a cough of the present kind, which allowed him no rest, and induced an apprehension of serious mischief in the lungs and considerable danger. On minutely examining the case, I found him labouring under a chronic hepatitis, which, in the more prominent symptoms of pulmonic disorder, had been overlooked. I directed my attention to the former disease alone, with the exception of giving opiates pretty freely as a palliative. The liver had all the external and internal tokens of inflammatory action; and from one or two most violent fits of shivering and horripilation, which made the teeth clatter, I have no doubt that suppuration took place to a certain extent. From this time the inflammatory symptoms ceased, and the cough was heard of no more: yet the tenderness and defined tumour in the right hypochondrium remained for weeks before they entirely disappeared.

In the nervous, or periodic cough, narcotics should be employed very cautiously, and only when the irritation is perpetual or otherwise unconquerable; demulcents will also be of no service. Though the warmer expectorants may be useful, our chief dependence must be on general tonics, as the columba, cusparia, and cinchona, with

* Med. Trans. Vol. VI. Art. VI.

which may be combined several of the metallic oxydes, especially those of bismuth and zinc. When the flowers of zinc were in the height of their popularity, they were supposed to be an unfailing remedy; and Dr. Percival, of Manchester, has given numerous examples of their complete success. By having been too highly advocated, this medicine has now fallen into an undue degree of disesteem. Camphor and volatile alkali will often prove palliatives for the cough, and may be occasionally had resort to; but moderate exercise and change of air should uniformly make a part of the tonic plan wherever the patient's means will allow.

SPECIES II.

BEX SICCA.

Dry Cough.

COUGH UNACCOMPANIED WITH EXPECTORATION.

The symptom in the definition sufficiently shows that the seat of the disease is here, either in a remote organ or in the parenchyma, or general substance of the lungs; rather than in the mucous membrane of the bronchiæ. The disease is commonly, indeed, produced by some irritable substance generated within the lungs, as in the case of a scirrhous or calcareous affection of these organs; or conveyed into them from without, as is common to glass-cutters, hewers of free-stone or sand-stone, workers of metals, and similar mechanics, in consequence of the finer particles of the materials on which they operate being occasionally inhaled with the inspired air, and afterwards worming their way through the delicate tunics of the air-cells.

The dry cough is also at times to be traced to a remote irritation, as that of worms or an inflammatory action in the intestines, liver, or other abdominal organs: in most of which it is probable that the lungs themselves are entirely passive, and do nothing more than yield to the propulsive action of the diaphragm, and its auxiliary muscles, to which the remote stimulus seems to confine its sympathetic power.

The minute and invisible eggs of various insects floating in the atmosphere, are also sometimes swallowed in like manner, and in a few instances hatched into larves, which have been thrown up by coughing.* Minute pieces of bone,† and the kernels of cherries

* Bartholin. Act. Hasn. IV. Obs. 46.

† Schwencke, in Verhandlingen van Haarlem. VIII. ii. p. 203.—Percival, Philos. Essays, I. p. 272.

and other fruits, have, moreover, occasionally slipped into the trachea accidentally; and after exciting great irritation and a hard dry cough for a considerable period of time, have ultimately been thrown up.* A bean, in this manner dropped into the trachea, was rejected on the fifth day in a violent fit of coughing.† It is more extraordinary that materials introduced into or engendered in wounds in the thorax, should at times be found to work their way into the bronchial vessels, and in like manner be thrown up by coughing. Yet in this way have been discharged surgical tents that have slipped beyond the lips of the wound;‡ and the splinter of a fractured rib.§

The varieties chiefly worthy of notice are the three following:—

α Ingenerata. From ingenerate irritants.	From irritation produced locally, as a scrophulous, scirrhous, or calculous affection of the lungs.
β Extranea. From extraneous irritants.	From irritating materials inhaled from without, as in various operations on glass, metals, sand-stone, and marble.‖
γ Verminosa. From remote worms or vermicules.	From some remote irritation, chiefly that of worms burrowing in the intestines, liver, or other abdominal organ.

Of these, the last is only to be removed by removing the primary disease. It is most common to children, and has the associate signs of a tumid belly, and pale emaciated countenance. For the medical treatment we must therefore refer to the genus HELMINTHIA, in the preceding class.

When the irritation proceeds from a scrophulous or calculous affection of the lungs themselves, our attention must be directed to the peculiar diathesis on which the disease is dependent. In the former case small doses of the milder mercurial preparations combined with the usual narcotics of the lurid and umbellate orders, as conium, oenanthe (dropwort,) hyoscyamus, and solanum, may afford local relief by their narcotic and alterative power: while the general state of the system should be subjected to the regulations which will be found laid down under the diseases STRUMA and MARASMUS *phthisis* in the ensuing class.

The deposit of calcareous matter in the substance or air-cells of the lungs may be the result of a morbid affection confined to the lungs themselves: for we often find them loaded with a deposit of this kind, while all the other viscera are in a state of health; or it

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* Eph. Nat. Cur. passim.

† Beaussier de la Bonchardiere, Journ, de Med. XLV. p. 267.

‡ Tulpius, Lib. II. c. 15.—Frbric. Hildanus, Cent. I. Obs. 46. Cent. VI. Obs. 22.

§ Hildan. ex Pigray. Ep. 51.

‖ Diemenbroeck, Anat. Lib. III. Cap. 13.—Rammazzini, &c. Morb. Artificum, Cap. 26.

may proceed from a calcareous diathesis, of which we shall have to treat more at large under the genus OSTHEXIA, in Class VI. Order I. of the Nosological Arrangement. In the former case acid inhalations, or fumigating the chamber with the vapour of tar, which always contains a portion of acid, after the manner proposed under the preceding species, will afford a prospect, not merely of temporary relief by their tendency to dissolve the calcareous deposit, but probably of more permanent benefit by changing the nature of the morbid action, and giving tone to the debilitated excernents.

Where the formation of calcareous matter appears to depend upon an osthectic diathesis, or a constitution prone to generate lime, whatever may tend to increase the action of the superficial exhalants will be most likely to prove beneficial; for we cannot increase the action of these generally without increasing that of the secernents of the lungs, and consequently throwing off the secerned fluid in its most attenuate form. And hence diluting apozems drunk freely will be serviceable; and particularly a very free beverage of aerated mineral waters, which, while they dilute, will tend to invigorate the system generally, and produce a beneficial change upon the habit. Where calculi are disposed to form in the kidneys or bladder, Dr. Russell has recommended a very liberal use of sea-water; De Haen, of lime-water, of which he tells us, that in one case not less than fifteen hundred pints were drunk with very essential advantage. Many foreign Physicians advise the continental mineral springs, as those of Pyrmont, Carolina, and Bareges: while other pathologists have found large quantities of pure water, hot or cold, prove as good a palliative or remedy: in all which we trace out one common principle, which is that of dilution, and we can trace out nothing else. A warm climate, which proves a perpetual diaphoretic, and urges perpetually to the surface, will also in all probability be found serviceable; and, above all things, pure air and as brisk exercise as the patient can bear without fatigue, so as to strengthen the system, and at the same time keep the skin soft and moist.

Mechanics engaged in working on metals, glass, free-stone, or any other material, minute particles of which are apt to fly about and impregnate the atmosphere, and pass by inhalation into the lungs, should be peculiarly careful to keep their mouths and nostrils covered with a handkerchief. And if the lungs be hereby loaded and irritated with sharp spiculæ, and a distressing and chronic cough be excited, all similar labour must be abstained from; the diet be peculiarly light; emetics be frequently administered; and, in the interval diluting apozems be used copiously, with bland demulcents. And if by these means we can check the irritation for some weeks or months, the lungs will often, by a growing habit of exposure to its cause, cease to be materially affected by it; and the patient may pass through life without much inconvenience. But if hereby we should not be able to succeed, inflammation, hemorrhage, or phthisis, will probably be the result.

In this variety we have also great reason to expect benefit from the use of mild expectorants and demulcents.

Of the nature and operation of expectorants I have spoken already: and as there is no complaint in which demulcents can be employed to more advantage, and few in which they will prove so pleasant and tranquillizing, let us digress for one moment to examine into their nature and operation.

Demulcents are medicines that obtund the action of acrid or spicular materials, not by changing their acrimony, but by covering them with a viscid and inirritant fluid. They are of two sorts, mucilaginous and oily: and of the manner in which they act when applied to the surface of the body, there is no doubt whatever. But by what means they are able to retain their inviscating power when passing through the stomach to a remote organ, is far less clear, and has been a source of considerable controversy. Where the irritation is in the lungs, as in the case before us, it has been supposed by many writers, and especially by Dr. Cullen, that by swallowing these substances leisurely, as we necessarily besmear the fauces and upper part of the glottis, we directly take off all irritation from these organs; and that the quietism hereby produced in the upper extremity of the trachea, is propagated by sympathy through the whole of the bronchial ramifications and the air-cells of the lungs; and that it is in this manner demulcents prove remedial in all pulmonic irritations.

But this is no explanation of their obtunding power in remote quarters, as for instance in the kidneys and bladder, where these organs have been stimulated by a blistering plaster: and as Dr. Cullen is not willing to allow of any specific power in medicines of any kind, nothing has remained to him but to cut the Gordian knot abruptly, and to contend, that "the operation of demulcents in covering acrimony in the mass of blood, must be very inconsiderable."*

But is thisto uphold an hypothesis by an assertion opposed to the experienced train of events, and to which he himself submits on other occasions; for Dr. Cullen has no hesitation in recommending the use of demulcents, when we follow him into his practice, almost as freely as any other physician whatever. I pretend not to determine whether they act in every instance when employed internally by their sensible quality of viscosity, or by some insensible specific power; but that by some means or other they are capable of allaying irritation in organs remote from the stomach, is a fact so generally known that it would be a waste of words to bring examples of it. And notwithstanding the difficulty of conceiving how a few drachms of bland oil or a few ounces of gum arabic can be intermixed with many pounds of serosity, and still retain their sensible quality of inviscating sedatives, it is by no means more difficult to conceive this than that moderate doses of sulphuric acid introduc-

* Mat. Med. Part II. cap. XII. p. 412.

ed into the stomach should pass copiously by the skin in its acid state, as Dr. Cullen allows it to do, and cure the itch; or that the muriate of soda, employed as an ingredient n the manufacture of glass, should, in the melting of the material, impregnate the atmosphere of the glass-house, be inhaled by the lungs of the workmen, and passing with the matter of perspiration through the pores of the skin, once more concrete in crystals on the foreheads.

As several of the vegetable oils are obtained from narcotic plants, it is well worth inquiring, though a different question, whether, in any of these, there is a combination of any portion of the narcotic principle; as such oils would in many cases possess a high advantage over the rest. The oils of this description which have been most tried are those obtained from the seeds of the lactuca *virosa*, and the papaver *somniferum:* and both these kinds of seeds, while they make pleasant emulsions, are said, by many writers, to communicate a slight degree of narcotic power at the same time; an assertion, however, which Dr. Cullen does not give credit to. But as I have not tried them sufficiently to speak with decision on the subject, I merely throw out the hint, that it may be followed up by others. The seeds of both plants give forth oil pretty freely: those of the poppy often in the proportion of six or seven ounces of the oil to every two pounds of the seeds.

In hot weather, sultry climates, or long voyages where rancidity may be apprehended, the best as well as the pleasantest of all the vegetable oils is the expressed oil of the cocoa-nut, commonly known by the name of BUTTER OF CHOCOLATE. It is of a brownish hue when first obtained, but may be whitened by ablution in hot water, and still more so by an alkaline ley, quick-lime, or spirit of wine. It will keep for years without becoming rancid, and may even be left for a month in a copper vessel without undergoing this change.

Of the vegetable mucilages, the best fitted for keeping is that obtained from the Iceland moss. If infused in water before it is boiled, it will lose much of its rougher bitterness and colouring material, and its taste will be pleasant. Its viscidity is more than double that of gum arabic; and emulsions thus formed have been kept fourteen weeks without the slightest marks of putrescency.

SPECIES III.

BEX CONVULSIVA.

Hooping-Cough. Kin-Cough.

THE COUGH CONVULSIVE AND SUFFOCATIVE: ACCOMPANIED WITH A SHRILL REITERATED HOOP; AND FREQUENTLY WITH VOMITING: CONTAGIOUS.

THE Greeks denominated this disease BEX *Theriodes* (θηριώδης,) which the Latins translated literally TUSSIS *ferina*, "wild or untameable cough," from its violence. The name of Pertussis, by which it has often been called in later times, is of doubtful origin and meaning; and I have hence followed M. de Sauvages, and exchanged it for TUSSIS *convulsiva*, the specific epithet being far more expressive than that of the Greek writers. Our own name of Hooping-cough is evidently derived from the convulsive clangor which accompanies the fit. The name of *Kin-cough*, by which it is distinguished in the north, and which should rather be written *Kind-cough*, is derived from the Saxon or German term *kind*, "a child," as being peculiarly common to this age. This cough is unquestionably contagious, though not in a very high degree; whence Stoll and other writers have fallen into the error of asserting that it is not so at all.*

The remote cause of hooping-cough it is often difficult to trace. Frequently, indeed, like common or humid cough, it seems to proceed from cold, from some irritability of the stomach,† or some peculiar affection of the lungs.‡ I have already observed that the dry cough (tussis *sicca*) has occasionally been produced by larves of insects, whose minute eggs, being inhaled with the air of respiration, have found a convenient nidus in the bronchial vessels; and hence Linnéus, who at one period of his life endeavoured to resolve almost all diseases whatever into an animalcular or insect origin, taught that the hooping-cough was also produced in the same way by an insect of a peculiar kind.§ This opinion has not been adopted beyond the precincts of the Lennéan school. But we are, nevertheless, very considerably in the dark upon the subject; for there are numerous cases of the disease occuring daily, in which it originates from a source that eludes our research altogether. It is most common to children, though sometimes to be met with in adults; is often epidemic, but rarely, if ever, attacks more than once in a man's life. And from all these circumstances there can be

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* Nat. Med. P. II. p. 184.
† Allgem. Deutsche Bibl. LVII. p. 434.
‡ Stoll, Prælect. p. 289.
§ Diss. Exanth. viva. Vide Amœn. Acad. Vol. v. 82.

little doubt that it proceeds in most instances, from a miasm of a specific nature and peculiar quality; which, like those of the influenza or epidemic catarrh, and the measles, has a direct determination to the lungs; though it is not, like these contagions, essentially linked with fever.

The excretion is at first small in quantity, but afterwards more copious, though always viscid. The hoop, or sonorous spasm, is often accompanied with a rejection of the contents of the stomach; and the whole system during the paroxysm suffers great violence. The face is turgid and purple from suffusion, and the eye-balls swollen and prominent. The little patient, with a fore-warning of the attack, falls on his knees at the time, or clings closely to any thing near him. Yet the violence is instantly forgotten; and, after deeply panting for breath, he returns with as much eagerness as ever to his play, or other pursuit: while the vomiting, which is commonly a good sign, is succeeded by a craving for fresh food. The disease lasts irregularly from three weeks to as many months.

The hooping-cough, when in the height of its career, is usually accompanied with a very copious secretion of mucus, a free discharge of which mitigates the general symptoms. From this circumstance Dr. Butter concludes, and with great correctness, that a morbid irritability of the mucous glands is the primary affection, to which the spasms are only secondary.* It is somewhat singular that with this view of the disease he should place its seat, not in the larynx, or any part of the trachea, but in the alimentary canal. It is true that worms or depraved humours in the stomach or bowels may be a predisposing cause of the complaint, but so likewise may dentition, cold, an irritable habit, measles, or acute diseases in general. It is not always, however, that it is united with any of these; and, where it is, the disease is apt to assume a more dangerous aspect; to be more violent in its progress, and not unfrequently of longer duration in its career. In infants, it is mostly alarming from its tendency to produce convulsions, suffocation, apoplexy, inflammation of the brain, ruptures, and incurvation of the spine. In adults, it excites pneumonitis more frequently than in children; and in pregnant women has often led to abortion. A moist skin, warm extremities, open bowels, plentiful expectoration, and free vomiting, are favourable symptoms. Frequent hemorrhage protracts the disease; and if it proceed from the lungs, a foundation will often be laid for phthisis.

In a few rare instances it assumes a periodic character, and is then sure to become peculiarly intractable. Dr. Perceval, in his Comments on the Nosology, has favoured me with a singular case of this kind, which occurred daily at a certain hour, attended with a tremor of the whole body: the fit terminating by a shriek rather than a hoop. The complaint was obstinate for several months, and returned at the same season for two years. It yielded to no medi-

* Treatise on the Kin-cough, with an Appendix, &c. 8vo.

cine, and was supposed to depend on some morbid condition of the liver.

In treating the disease, our attention ought, in the first place, to be directed to an expulsion of the morbific matter or miasm which produces it, if we were better acquainted with its nature, and had a direct specific for this purpose. But as we are not thus fortunate, and perhaps never shall be, we must pursue another plan.

Dr. Cullen, in laying down his own mode of treatment, indulges in an ingenious, and I believe correct, hypothesis, and divides the disease into two stages. The first consists of that part of it during which he supposes the contagion to be present and operative, which possibly may include the first three weeks; the second, embraces the remainder of its duration. Throughout the former stage, our attention should be directed to whatever will moderate the influence of the contagious stimulus, retard the return of the convulsive paroxysms, and mitigate their violence. Bleeding, in severe cases, will usually be found necessary for this purpose; but it should be avoided except in severe cases, as spasmodic affections are often rather increased than diminished by the use of the lancet; and it will generally be found better to employ blisters as a substitute. The most effectual remedy is emetics; whose action tends equally to interrupt the return of the paroxysms, and to keep the lungs unloaded, by producing a determination towards the surface. The food must be light, and costiveness carefully prevented; but no benefit seems to be derived from purging.

In this manner, upon Dr. Cullen's mode of treatment, we are to guide the patient through that part of the disease which we may rationally suppose to be kept up by the stimulus of contagion. In its latter part, or second stage, in which a morbid habit alone is, in all probability, the irritative power, a different course is demanded. For we have now nothing more to do than to oppose the spasmodic habit by an antispasmodic process. A sudden and violent emotion of the mind, as overwhelming terror, is well known to have had this effect; but such a remedy is not to be recommended; and hence different tribes of medicines have been resorted to, which may be arranged under the three divisions—of SEDATIVES, for the purpose of taking off the morbid irritability of the affected muscles; STIMULANTS, for the purpose of local or general revulsion; and TONICS, for that of both local and general re-invigoration.

The sedatives chiefly made use of or recommended have been opium, hyoscyamus, belladonna, conium, ledum *palustre*, the moschate antispasmodics, and lead. Of the first four a general preference has been given to the conium; for though the opium has the authority of many distinguished practitioners,* it has often been found of no avail, even where it has been given in large and frequent doses; and, still more generally, to have been productive of

* Hufeland, N. Annalen, I. p. 367.—Demachy, Manuel de Pharmacie. Paris, 1788.—Rüling, Beobachtung der Stat. Northeim. p. 107.

greater mischief than good, where it has unquestionably proved of temporary benefit. The conium has hence acquired a far higher degree of public favour, for which it is chiefly indebted to the writings of Dr. Butter: who represents it as having the double virtue of retarding the returns of the convulsive paroxysms, and of mitigating their violence: and on this account he prescribed it through every stage of the disease, and however complicated with other affections. He employed it moreover in every form, whether of powder, extract, plaster, or cataplasm; but, for internal use, he gave the powder, allotting a grain a-day to infants under six months, and ten grains to adults, with a gradual increase as they persevered. In Dr. Butter's hands it seems to have been of some use, as it has been also occasionally in the hands of other practitioners; but it has so often failed in general employment, as to have sunk into a disrespect below its proper standard in the present day; and chiefly, perhaps, because it was too highly extolled in the day of its popularity.

The ledum *palustre*, or marsh cistus, stands chiefly on the authority of Linnéus,* who tells us that it is very generally employed in Westrogotha as a sedative in hooping-cough, and accompanied with great success. And the assertion of Linnéus is supported by Dr. Wählin,† and other continental writers; but it has not been introduced into the practice of our own country.

Musk has been tried in all proportions and with all possible effects, both abroad and at home, from six grains to half a drachm at a time; but the effects it is stated to produce are so various, and indeed contradictory in different individuals, as to prevent confidence in its use. The accounts can only be reconciled by supposing, that in some habits it operates far more beneficially than in others. The artificial musk, a spongy mass, obtained by mixing nitrous acid with oil of amber, appears in every instance to have been as successful as the best and most genuine musk from Thibet; and is hence well entitled to attention from its comparative cheapness.

The boldest sedative practice has been the internal employment of lead. It was first recommended, so far as I know, by Dr. Forbes of Edinburgh,‡ who used the liquor subacetatis, or Goulard's well-known extract, and speaks highly of its success: and it has been occasionally used by practitioners to the present day; but it has never acquired any standard reputation, and in my own practice I have never found it necessary to have recourse to it. Nothing but an extremity of symptoms can justify its use among children.

The stimulant plan, if it have not been more successful than the sedative, has at least been as powerfully supported. Its intention I have already stated to be that of taking off the propensity to spasmodic action in the trachea, by exciting a general or remote local

* Diss. Led. Palustr. in Amœnit. Acad. VIII. p. 156.
† Fortstättning of Provincial Docternas Berättelser, p. 180.
‡ De Tussi convulsiva. Edin. 1743.

revulsion. And the medicines chiefly employed for this purpose have been cantharides, ammonia, ether, camphor, the herb paris, and rhus vernix.

When blisters were formerly employed with great freedom in the hooping cough, it was thought to be ascertained that they always answered best when they irritated the bladder and occasioned strangury. And on this account, some practitioners have endeavoured to produce the latter effect without the pain of the former, and have for this purpose employed the lyssa powder in its tincture, in the proportion of twenty minims to a dose.* Dr. Lettsom combined it with bark and the camphorated tincture of opium. But whether given alone or in combination, I have never found any decided benefit from its use, and cannot contemplate it as a medicine to be recommended.

Where the intention is to divert the tendency to convulsive action by local revellents, it is far better to employ them externally, and particularly on the chest and down the chain of the spine. The most common stimulants for this purpose are garlic, camphor, ammonia, ether, and the essential oils of amber and turpentine, which, in different combinations, have been long used and still preserve their reputation. The practice seems to have been first tried in Poland; and the oil of amber formed, perhaps, the first embrocation; which, however, was soon afterwards united with the water of ammonia. It is a chief ingredient in several of the empiric medicines still in vogue for this purpose, which are rubbed down the spine several times a-day.

I have reason to believe that embrocations of this kind have often proved highly beneficial; and it is not difficult to account for such an effect: since the cervical and dorsal nerves are so generally distributed over the muscles of the chest, the diaphragm, and the scapulæ; and some of them, as the accessory nerves of Willis, form an integral part of the par vagum, and assist in giving rise to the cardiac and pulmonic plexus.

Many stimulants have also been occasionally employed internally for the purpose of producing an excitement generally, and thus of acting as universal revellents, as camphor, ammonia, and various preparations of both the sulphuric and nitric ethers. These have often been found useful, and, where narcotics are given, they rather assist than oppose their good effect.

In Russia and Finland, the berries of the spurge-laurel, Daphne *mezereum*, are employed for the same purpose. To the taste these are extremely pungent, and, in the countries where they are used, are said to be a specific: but I do not know that they have been tried in England.

The rhus *vernix* comes also strongly recommended by many foreign writers of distinguished character, as a stimulant spasmodic of considerable power, and highly useful in the hooping cough. Dr.

* Forbes, loc. citat.

Fresnoi, to whom we are chiefly indebted for our acquaintance with it, employed its leaves in the form of an extract. Of this he dissolved four grains in four ounces of syrup, and gave a table-spoonful every three hours to a child. He adds, that, by the time the whole of this mixture was taken, the cough generally abated, and, in most instances, ceased altogether. In this manner, he tells us he cured forty-two children at Valenciennes in 1786. It is certainly a very active and pungent plant, and, when given in an over-dose, is a severe poison. The vapour or aroma, that issues from its juice, will often excite inflammation in the eyes when held for a short time over it.

After all, perhaps the best antispasmodics are tonic medicines, and a tonic regimen. Dr. Cullen trusts almost exclusively to the cinchona: "I consider," says he, "the use of this medicine as the most certain means of curing the disease in its second stage; and when there has been little fever present, and a sufficient quantity of the bark has been given, it has seldom failed of soon putting an end to the disease.

Floyer strongly recommends the same medicine; and it meets with an almost universal approbation among the German physicians: some of whom, however, unite it with sulphur of antimony,* and others, as already observed, with the tincture of cantharides.†

It is not often, however, that we can get children to take the bark in what may prove a sufficient quantity; and I have therefore more frequently employed the mineral tonics, as the oxyde of zinc, from half a grain to a grain two or three times a-day; or the nitrate of silver, from the twelfth to the eighth part of a grain, repeated in the same manner.

The former has, I believe, fallen into a very undeserved degree of disfavour in the present day, and chiefly from its having formerly been extolled for qualities which it by no means possesses. Dr. Gaubius, who was a man of sound judgment, was peculiarly attached to it; not only in the present disease, but in all clonic irregularities of the muscles: and it was upon his recommendation that it first became popular. Of the solution of arsenic I cannot speak from my own knowledge. It has, however, been tried by several respectable practitioners of late, and is said to have proved highly serviceable.

As an important part of our tonic plan, may be mentioned change of air, and especially where the difference of temperament, or even temperature, can be rendered very considerable, as from a low to a high atmosphere, or from the interior of a country to the sea coast; but cold-bathing, so far as my own experience extends, has proved more certainly and rapidly remedial than any other prescription whatever: and particularly where it has never been made use of before, and hence introduces a new action into the system.

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* Hannes, Brief über den Friesel, &c.

† Schaeffer, Ortbeschreibung von Regenspurg, &c.

GENUS II.

LARYNGYSMUS.

Laryngic Suffocation.

SENSE OF SPASMODIC SUFFOCATION IN THE LARYNX, COMMENCING SUDDENLY, AND RELAXING, OR INTERMITTING; COUGH TROUBLESOME; SCANTY DISCHARGE OF VISCID MUCUS.

THERE is a disease which often attacks the larynx, and especially of infants and children, which has so near a resemblance to croup, as to be very generally confounded with it, and which is hence commonly known by the name of *spasmodic croup*: but which, notwithstanding the resemblance of many of its symptoms, is essentially different from it, and ought to be arranged in a different place. It is for this purpose the present genus has been formed, and the present name invented, with a termination that sufficiently distinguishes it from laryngitis, or *inflammation* of the larynx, yet a termination that has the sanction of the best medical writers in every age.* The distinctive characters of bronchitis or croup are, inflammation of the mucous membrane of the trachea and bronchial vessels, and the secretion of a peculiar concrete and membrane-like material that lines the tracheal tubes, and threatens suffocation by obstructing them. In the disease before us, we have neither inflammation nor membrane-like secretion; while the sense of suffocation is produced, not by obstruction, but by spasm. The only known species belonging to this genus is the following.

SPECIES.

LARYNGISMUS STRIDULUS.

Stridulous Constriction of the Larynx.

COMMENCING USUALLY IN THE NIGHT; VOICE SHRILL AND CROAKING; COUNTENANCE FLUSHED AND SWOLLEN; DISTRESSING STRUGGLE FOR BREATH.

THIS species forms the spasmodic asthma of Millar, Parr, and various other writers. Yet it is not strictly an asthma, though it

* See Prelim. Diss. to the Author's System of Nosology.

makes an approach to it; and the name under which it has been thus described, shows sufficiently that the present is the proper place for its reception. In asthma the constriction commences in the chest, and chiefly exerts itself there, though the spasm may extend to the upper part of the trachea. In spasmodic laryngismus the constriction commences in the larynx, and is chiefly confined to that organ, though it may extend to the chest. In the former, the respiration is wheezy, but the voice is not stridulous; in the latter, the voice is stridulous, but the respiration is rarely wheezy, or rather rarely so in an equal degree; evidently showing a difference in the seat of the two diseases. And hence I have found it necessary to separate it from asthma, and arrange it under a different head.

As already observed, the general symptoms make a nearer approach to croup: "The inconvenience," observes Dr. Parr, "is the greater, since, from the resemblance of the symptoms, remedies have been celebrated as successful in croup, which were never used in the disease; and the less experinced practitioner, trusting to them, has felt the severest disappointment."

The suddenness with which this complaint commences its attack, forms another mark of distinction between itself and croup, almost as pathognomic as the absence of inflammation, and the peculiar secretion in the latter. There are instances, indeed, in which genuine croup has also commenced abruptly, but these are very rare; for it has usually the precursive symptoms of a slight cough and hoarseness for a day, and sometimes two days, as though the patient were labouring under a catarrh. In croup also, the inflammation, when it has once taken effect, becomes a permanent cause of excitement, and the anxiety and struggle for breath continue with little if any abatement, till the inflammation is subdued. In the disease before us, the spasm suddenly subsides in a short time, though it may perhaps return in an hour, or half an hour, or even a few minutes; and in the interval the patient enjoys perfect ease, though the voice is rendered hoarse from the previous straining. Croup is, moreover, an exclusive disease of children; stridulous spasms of the larynx is sometimes found in adults. Those who have been dissatisfied with the name of spasmodic asthma, have, however, treated of it under the name of spasmodic croup, but merely because they have not known how else to distinguish it; for almost every one who has thus noticed it, has acknowledged that it is a different disease, and demands a different plan of cure.

The exciting causes are not always clear; cold and teething are the most common. It appears most frequently in relaxed and irritable habits, where, in truth, we should soonest expect a display of spasmodic action. As there is mostly some degree of cough, and always a secretion of a small portion of viscid mucus, and a croaking voice, there is indeed great reason for supposing some degree of local irritation; and it is on this account that I have preferred entering the disease here, to an arrangement of it under the fourth class, consisting of diseases that are purely and idiopathically

nervous. It is possible, however, that some of these symptoms may be the result of the spasmodic struggle itself.

An active and speedy plan of treatment is imperiously demanded. Yet an antimonial emetic generally effects a cure as soon as it begins to operate, if employed early; but the diaphoresis which it excites should be maintained for some hours, by keeping the child in bed, and the use of diluents; which will be the most effectual means of preventing a return of the spasm. The bowels should also be excited by a purgative of calomel. And if the emetic do not prove sufficient, or the stricture should be renewed, laudanum should be exhibited according to the age of the patient, and a blister be applied to the throat. But bleeding, which is indispensable in croup, should here be avoided, as it will only add to the irritability. Those who regard this affection as an asthma, have strongly recommended the fetid antispasmodics, as assafetida, both by the mouth and injections; but I have not found them successful.

Generally speaking, after the action of the emetic, the child falls into a deep and quiet sleep, and awakes with few remains of the complaint. Yet if the spasm be not attacked at once, suffocation may soon follow. Those who have once laboured under it are more susceptible of it than before; and the younger branches of some families seem much more predisposed to it than those of others.

GENUS III.

DYSPNŒA.

Anhelation.

PERMANENT DIFFICULTY OF BREATHING; WITH A SENSE OF WEIGHT ON THE CHEST.

There has been no small perplexity felt by nosologists in arranging the various diseases which are chiefly characterised by irksome or distressful breathing. The lungs, like the stomach, maintain a close connexion with most of the functions of the body and the organs which are instrumental to them; while the complaints affecting respiration, that originate in the chest, run so frequently into each other as to require the utmost nicety in drawing the line between what ought to be regarded as genera, and what as species. There are three thoracic disorders that are peculiarly obnoxious to this remark; I mean, those which among recent writers have been described under the names of dyspnœa, orthopnœa, and asthma. Celsus, following the Greek physicians, regards them as only modifications of the same malady, merely differing from each other in degree.

"Each," says he, "consists in difficulty of breathing. When this difficulty is moderate and unsuffocative, it is called dyspnœa; when it is more vehement, so that the breathing is sonorous and wheezing, it constitutes asthma; and when it can only take place in an erect position, it is denominated orthopnœa. The first is usually a chronic affection, the latter two acute."* Galen, on the contrary, treats of these diseases as distinct genera, and discusses them in remote positions.

The same diversity of view has occurred in modern times. Sir John Floyer and Dr. Bree have reduced the three divisions of Celsus to two, and have used the term ASTHMA as a generic name under which to arrange them. These two divisions are CONTINUED ASTHMA, and CONVULSIVE or PERIODIC ASTHMA;† the former being the DYSPNŒA of the Greek writers and of Celsus, and the latter uniting their ASTHMA and ORTHOPNŒA. I call these, divisions rather than species, because Dr. Bree makes four subdivisions of the latter, derived from their supposed causes, and assigns the name of species to them when thus subdivided: though if asthma be employed generically, it would perhaps be more consistent with the rules of classification to name the primary ramifications, species; and the secondary, subspecies or varieties.

Almost all the continental writers, make each affection a separate genus, as does Macbride among those of our own country. Cullen makes a genus of dyspnœa, as well as of asthma, but merges orthopnœa in the former; Dr. Parr and Dr. Young take as little notice of orthopnœa, and, with Celsus, reduce dyspnœa and asthma to the rank of species under a genus which they denominate anhelatio or pneusis; which are a Latin and a Greek synonym; the former of which is applied by Sauvages to an entire order.

Yet Dr. Cullen himself, in his First Lines, is untrue to his Nosology; for having in his earlier work arranged and defined dyspnœa as a distinct genus, in his later he expresses doubts whether, under almost every modification, it is to be regarded otherwise than as a vicarious or symptomatic affection. On which account, probably, Dr. Crichton, though for the most part very scrupulous in adopting Dr. Cullen's views, has banished dyspnœa as well as othopnœa from his catalogue, and has only retained asthma, of the whole three.

There is, nevertheless, a distinctive character, which, if steadily adhered to, may easily settle the question, and designate the proper place to which each respectively belongs. The difficulty of breathing is sometimes permanent, and sometimes recurrent, with considerable intervals of perfect ease; and where it is permanent it is occasionally distinguished by sudden and irregular exacerbations. These characters are clear, and cannot well be mistaken; and it is upon these pathognomic marks that the arrangement we are now

* Medicinæ, Lib. IV. iv. 2.

† Inquiry into Disordered Respiration. 5th Edit. p. 231.

about to pursue has been founded. Dyspnœa distinguishes the cases of permanent difficulty of breathing: asthma, those of the recurrent; and orthopnœa, the cases of permanent difficulty of breathing with irregular exacerbations. The first two, therefore, form distinct genera; the last is necessarily a peculiar species of dyspnœa, linking it very closely with asthma.

Thus bounded and distinguished, dyspnœa, as a genus, offers us the two following species:—

1. DYSPNŒA CHRONICA.	SHORT BREATH.
2. ——— EXACERBANS.	EXACERBATING ANHELATION.

SPECIES I.

DYSPNŒA CHRONICA.

Short Breath.

THE BREATHING UNIFORMLY SHORT AND HEAVY: MOSTLY ACCOMPANIED WITH A COUGH.

THE causes of this complaint exist in the chest locally, or in the habit or constitution generally: they are inbred, or the result of accident; and hence the disease exhibits the following varieties:

α Organica. Organic dyspnœa.	From organic deformity, oppression, or accidental injury.
β Extranea. Extraneous dyspnœa.	From calcareous or other spicular materials inhaled while working on stone or metals.
γ Vaporosa. Mephitic dyspnœa.	From the mischievous action of metallic or other poisonous exhalations.
δ Phlegmatica. Phlegmatic dyspnœa.	From a phlegmatic or cachectic habit.
ε Pinguedinosa. Corpulent dyspnœa. Pursiness.	Accompanied with oppressive fatness.

When the chest labours under an organic deformity, or oppression, or the effects of an accidental injury, its cavity is contracted, and its motive powers are usually enfeebled, or curtailed in their action. This is by far the most frequent variety under which the disease makes its appearance. In some instances the lungs have been found peculiarly small,* and shrivelled or dried up,† in per-

* Sandifort, Observat. Anat. Pathol.
† Bonet. Sepulch. Lib. x. Sect. I. Obs. 45.

sons who have died of this complaint; in others, peculiarly hard, and cartilaginous in the duplicature of the pleura, which surrounds them.* There has been adhesion between the folds of their membrane; or adhesion, sometimes ossification† between the pleura and the ribs, sufficient to lay a foundation for difficulty of breathing. The lungs have been found loaded with hydatids, which have diminished their elasticity;‡ and sometimes these animalcules have been thrown up by coughing;§ and still more frequently the lungs have been indurated by scirrhous, or oppressed with steatomatous or other tumours.

In Bonet, and other writers, we have also examples of internal oppression, and a diminution of cavity, produced by an excessive magnitude in the substance of lungs, offering a sort of parabysma of this organ, so as to leave little room, and allow little elasticity for their proper play.‖ And still more generally the oppressive cause lies without, and the capacity of the chest is diminished by rickets, or a softness of the bones (parostia *flexilis*,) or some accidental injury by which the ribs or sternum have lost their proper form and are become incurvated, and without a power of elevation.

In all these cases the healing art can do little more than look on. It may, perhaps, occasionally palliate some of the distress to which the patient is irrevocably doomed; but it cannot go beyond. Perfect tranquillity of body and mind, gentle exercise, a light diet, with a total abstinence from flatulent vegetable and fermented liquors, and an undeviating habit of regular hours, comprises, perhaps, the whole that can be recommended by the physician, or attempted by the patient.

Sawyers and hewers of free-stone or other fossil masses; glass-cutters, lapidaries, and workers upon metals, are often subject to dyspnœa, from having the lungs loaded with fine pulverulent particles detached from the materials on which they are employed, and floating in the atmosphere that surrounds them. This affection is so nearly similar to the variety β of *dry cough*, on which we have treated already, that it is only necessary to refer the reader to the remarks there laid down. The cause and mode of treatment are the same; and the symptoms chiefly differ from a difference of constitution. Where the lungs are peculiarly irritable, a troublesome cough will ensue from the first, before any considerable quantity of buoyant particles can have entered into the bronchiæ; but where there is little irritability, no cough demanding particular attention has shown itself for years; and the lungs, from a habit of expo-

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* Schreiber, Nov. Comment. Petropol. III. p. 395.
† Schacher, Diss. de Ossificatione Præternaturali, Lips. 1726.
‡ Bonet. Sepulch. Lib. II. Sect. I. Obs. 33.
§ Ephem. Nat. Cur. Dec. II. Ann. I. Obs. 80.
‖ Sepulchr. Lib. II. Sect. I. Obs. 57, 58.—Ruysch, Obs. 19, 21.—Eph. Nat. Cur. Dec. I. Ann. I. Obs. 6.—Id. Dec. II. Ann. X. Obs. 175.

sure to the same influence, have betrayed no uneasiness till they have gradually been transformed into almost a mine or quarry of the material worked upon.*

Exposure to the vapour of mineral acids, or of metallic or other mischievous exhalations, is also frequently found to produce a permanent difficulty of breathing. This affection is peculiarly common to those wretched beings who are condemned by the laws of their country to work in metallic mines as an expiation of crimes proved against them; a melancholy and interesting picture of whom is given by Diodorus Siculus, in his description of the mines of Arabia and Ethiopia. The air-cells of the lungs are often found constringed to half their proper capacity; whilst, in many mines, the vapours are so irritable as to excite a perpetual cough. They are loaded, according to the nature of the mine, with oxydes, sulphurets, or comminuted reguline particles of lead, or copper, antimony, silver, arsenic. Metallurgists and the labourers in chemical laboratories are often severe sufferers from a like cause. Gold-refiners become dyspnetic from inhaling the vapour of acquafortis. Etmuller gives an account of his having been seriously injured in his breathing, while carefully superintending an antimonial preparation.† And Heurnius saw the lungs of a printer so changed by inhaling an atmosphere impregnated with lead as to resemble a shrivelled apple.

The treatment of this variety must be regulated by the variety of the cause; but a free inhalation of oxygen gas will be serviceable in perhaps all cases. An inhalation of moderately stimulant vapours, as of an infusion of lavender, marjoram, and indeed most of the verticellate plants, or of diluted wine-vinegar, has also proved frequently of use; to which may be added a current of voltaic electricity passed two or three times a-day from the upper part of the spine to the diaphragm. An atmosphere impregnated with tar heated over an oil or spirit-lamp, has also in many instances been found essentially to invigorate the respiratory powers; and to these, where there is much cough, should be added expectorants and the warmer demulcents. After pursuing this plan for some weeks, pure air and the aerated mineral waters, where the case is not inveterate, will add a healthy degree of tone, and restore the respiratory organs to their natural action.

We sometimes find a permanent difficulty of breathing in persons labouring under great torpor or sluggishness of vascular action. The pulse is slow and unresisting; the muscles are soon fatigued; the mind has little energy; the face is pallid; the skin cold and soft; the urine scanty, and the extremities edematous, without any pathognomic symptoms of dropsy in the chest, or at least any sensible fluctuation in the thorax. It is the dyspnœa *aquosa* of Cullen, and the dyspnœa *pituitosa* of Sauvages. Whatever has a tendency

* Hecquet, Maladies des Artisans, tom. II.
† Ramazzüni, de Morbis Artificum.—Ephem. Vratisl.

to depress the living power, and particularly in flaccid and atonic habits, will readily lay a foundation for this variety of dyspnœa; and hence it is a frequent result of catching cold in the feet, and still more frequently of suppressed perspiration. It also occasionally follows upon chronic catarrhs, and pneumonitis.

A tonic and gentle stimulant plan, consisting of the warm gums, camphor and other terebinthinates, the warmer bitters, the oxydes of zinc and iron, the compound squill pills, the warm bath, moderate exercise, and a generous diet, will be the most successful mode of treatment: occasionally interposing antimonial emetics; which will relieve the lungs far more effectually than those of ipecacuan, as operating longer on the moving powers of the chest. Of the terebinthinate tribe, the best, perhaps, is the balsam of copaiva given in doses of a drachm or a drachm and a half three or four times a-day. Nothing succeeds so well in restoring the secretion of mucus where it has ceased or become deficient; or in producing a healthy discharge where its nature has been changed by morbid action. On which account this medicine may almost be regarded as a specific in morbid secretions of mucous membranes, whether of the lungs, the intestinal canal, or the urethra; as it has often proved highly serviceable in croup. The chief difficulty is in devising a convenient form for its exhibition, as it sometimes excites nausea.

The variety of least moment, perhaps, to the dyspnetic patient, is that which proceeds from, or is accompanied with a short, stunted figure, and considerable corpulence, or at least obesity of the chest. We see persons of this description, significantly described by the colloquial term *pursy*, pant, and perspire, and grow fatigued, day after day upon very little exercise, and yet press on without any serious inconvenience to a late period of life; or, if they sink suddenly and sooner, they yield rather to apoplexy as a result of their general habit than to the idiopathic affection before us. Abstinence from spirits, wines, and fermented beverages, a meagre allowance of animal food, a soluble state of the bowels, and exercise, rather persevering than violent, will form the best plan for present ease, and the best guard against threatened mischief. Bleeding has often been tried, but it affords only temporary relief, which is obtained by gaining space in consequence of emptying the vessels. Sauvages gives us the history of a female, who for two years had been so far suffocated, that it had often been judged necessary to bleed her three times a-day at least, so that she had undergone not fewer than two thousand venesections when she applied to him at Montpelier. She was plunged into a warm bath, the bath was frequently repeated, and friction at the same time made use of, so as to excite violent perspiration: by this mean she was convalescent in ten days. Obstructed perspiration, however, was the cause in this case.

Dyspnœa has also sometimes been produced by causes somewhat more singular, as common respirable air obtaining an entry into cavities in the chest, to which it does not naturally belong. Stoll

gives a singular case of dyspnœa, brought on by air-bladders, or vesicles, seated on the surface of the lungs;* and Gooch and various others tell of the same effect occasioned by air let loose between the lungs and the pleura, the action of which is far more obvious. In Timæus we have an example of a very extraordinary idiosyncrasy giving rise to a difficulty of breathing upon an inhalation of the smell of roses.† The morbid influence of metallic action is not always confined to vapour locally applied; for in Schenck we have a case of dyspnœa produced by mercurial inunction;‡ and, in other books, of a like effect on peculiar constitutions by a solution of the oxydes of lead taken internally, or even applied externally.§

Chronic dyspnœa appears also as a symptom or sequel in various other diseases, or affections of various other organs: as aneurism, ossification, or other mischief in the heart, or aorta; any morbid change in the diaphragm, ribs, or pleura, by which the cavity of the thorax is diminished, or the moving powers restrained in their action; parabysmic enlargements of the liver, spleen, or omentum; whence it is obvious that it must, in a greater or less degree, be an attendant on the latter period of pregnancy. It has also followed occasionally, not only upon suppressed perspiration, but on the suppression of various cutaneous eruptions, and, in a few instances, upon suddenly closing an issue or seton of long standing.‖

SPECIES II.

DYSPNŒA EXACERBANS.

Exacerbating Anhelation.

THE DISEASE SUBJECT TO SUDDEN AND IRREGULAR EXACERBATIONS; BREATHING DEEP, STERTOROUS, ACUTE, AND SUFFOCATIVE: RELIEVED BY AN ERECT POSITION.

This species admits of most of the varieties of the preceding, which it is hence unnecessary to repeat; and, like it, is often found as a symptom in aneurism, polypous concretions, and other affections of the heart and large vessels; in parabysma, and other affections of the abdominal viscera; in empyema, dropsy of the chest, worms, peripneumony, bastard peripneumony, small-pox, and occasionally

* Nat. Med. P. VII. p. 135.
† Case, p. 216.
‡ Observat. Rav. Lib. II. p. 63.
§ Eph. Nat. Cur. Dec. III. Ann. IV. Obs. 30.
‖ Riedlin. Lin. Med. 1695. p. 91.

in severe accessions of intermitting fevers. I have already, indeed, stated that there is scarcely a function with which the action of the lungs is not connected, and consequently scarcely a disease of any importance in which it does not occasionally participate. Whatever be the cause that produces anhelation, or permanent difficulty of breathing, in a patient, any accidental augmentation of it, or any sudden excitement of body or mind, or any diseased action of any kind capable of uniting with the primary cause directly or remotely, will increase its power, and not unfrequently induce a spasmodic constriction in the muscles of respiration. And it is this accidental exacerbation, produced irregularly by casual and often occult causes, and especially in irritable or nervous temperaments, that peculiarly distinguishes this species from the preceding. In asthma the returns are for the most part strictly periodical, and the intervals perfectly free from difficulty of breathing. In exacerbating dyspnœa the constriction occurs with the utmost irregularity, in the day time, at night, in hot or cold weather, in a moist or dry atmosphere; and it is hence sufficiently distinguished from asthma. A catarrhal cough will sometimes prove an occasional cause; several of the varieties of heart-burn, and especially cardialgia *syncopalis*, still more frequently: other causes are, indigestible food, a fit of hysterics, or any violent commotion or agitation. While, as already observed, the occasional cause is often beyond the power of detection.

When the constrictive paroxysm makes its attack, it must be immediately opposed by an erect position, without which suffocation would often instantly ensue, and by the most powerful antispasmodics. Tincture of opium, ether, and volatile alkali, is what I have chiefly trusted to, and have uniformly found far more to be depended upon than castor, or any other odorous antispasmodics in whatever quantity given. A large blister to the chest should also be immediately applied; and, if the paroxysm do not yield soon, sinapisms to the feet. Upon its cessation, the gum ammoniac mixture, or a solution of asafœtida with camphorated tincture of opium, will be found a convenient guard against fresh attacks, provided due attention be paid to the state of the bowels, which ought indeed to form an early consideration. Issues have been recommended as a preventive of the paroxysm, where its approach has been expected, and I have sometimes thought them of efficacy. For this species, however, perhaps the most effectual means of relief are to be derived from the application of the voltaic battery, as already proposed for anhelation from poisonous vapours; and as has been successfully tried in numerous instances of the present species by Dr. Philip, who was first induced to apply this remedy from observing that animals, whose eighth pair of nerves had been divided, exhibited the oppressed breathing and accumulation of phlegm that characterises both species of dyspnœa, and were relieved by having a stream of voltaic aura sent through the lungs.

The accompanying cough, instead of being increased by the use of the voltaic power, is hereby diminished in consequence of its di-

minishing the accumulation of phlegm in the lungs. In proper asthma, which is characterised by intervals of free and healthy breathing, little or no benefit has been derived from this process; and hence Dr. Philip very ingeniously reasons, that although in both diseases the nerves of the respirable organ are alone in a morbid condition, and not the brain or spinal marrow; yet in the former, they are still capable of being recalled to a state of healthy activity, or of becoming sufficiently cleared to form a passage for the supply of nervous influence to the lungs, which effect he supposes to be obtained by the use of the voltaic machine.

GENUS IV.

ASTHMA.

Asthma.

DIFFICULTY OF BREATHING TEMPORARY, RECURRENT; ACCOMPANIED WITH A WHEEZING SOUND AND SENSE OF CONSTRICTION IN THE CHEST; WITH COUGH AND EXPECTORATION.

Asthma, as already observed under dyspnœa, is closely connected with the latter, and particularly with its second species, characterised by what might be strictly called asthmatic exacerbations, and which I have hence denominated dyspnœa *exacerbans*.

The definition of the disease now offered, while it shows the proximity of the one to the other, is sufficient, if I mistake not, to form a marked and accurate distinction. The vulgar term for the complaint in our own language is *broken-wind*; which, as scientific precision is seldom an object of popular language, is often, also, applied to some of the varieties noticed under dyspnœa, or *short-breath*.

Asthma is more commonly a disease of the later than the earlier period of life; for it does not often appear in infancy or youth, although occasional instances of this have occurred, particularly in infancy, that have been mistaken for cases of croup, which the asthma of infancy very much resembles, though admitting of a more easy cure. It soon becomes habitual, and seems sometimes to be hereditary. It invades all temperaments, but more particularly the melancholic, or that which is a compound of the melancholic with the sanguineous.

The paroxysms of asthma are universally preceded by languor, flatulency, head-ache, heaviness over the eyes, sickness, pale urine, disturbed rest, and a sense of straitness, fulness, and anxiety about the præcordia. "When the evening approaches," says Dr. Bree,

who unhappily describes from his own history, "the weight over the eyes becomes more oppressive, and the patient is very sleepy. Frequently at this period there is a tingling and heat in the ears, neck, and breast; and a motion to expel the contents of the bowels is attempted, with some violence, and with great uneasiness of the abdominal muscles. When an asthmatic feels these warnings, he may be convinced that his enemy is at hand."*

The accession is usually about the middle of the night and during the first and deepest sleep: the cause of which has not been rendered very manifest, though I do not think it beyond the reach of explanation, and especially in constitutions predisposed to the disease by habit or hereditary affection. Respiration always takes place most easily in a raised or erect position, but in the night the body is recumbent. Respiration is also so much of a voluntary action, that although it continues during sleep, and when the will is not exerted, it is considerably aided by the concurrence of the will. Now during sleep this concurrence is wanting; and hence the most favourable period for the attack of this insidious complaint is that in which we actually find it make its appearance—during a recumbent position of the body, when the muscles of respiration are destitute of the stimulus of volition. When the disease indeed has once established itself and become habitual, it will recur at other times also, but less frequently.

For the most part the patient wakes suddenly, and feels a most distressing tightness about the chest, as if he were bound with cords: his anxiety is inexpressible, and he labours for breath as though every moment would be his last. He is obliged to sit erect, breathes distressfully with a wheezing sound, and cannot bear the weight of the bed-clothes. Cool fresh air is the object of his intense desire. At the same time the extremities are cold; the heart palpitates; the pulse is sometimes quickened, but usually weak irregular, and often intermitting; the abdomen is distended with flatulence; the stomach is faint, and often rejects with great violence a slimy and frothy material of a greenish or yellowish hue. The eyes stare prominently, and the face is sometimes pale, but more commonly bloated and livid; and the alvine canal, though costive before, will now perhaps pass a loose stool.

In many instances there is an ineffectual effort to excrete, with a harsh and dry cough that brings up nothing more than a little clammy or frothy mucus through the whole of the struggle. And in these cases the fit usually subsides, or perhaps altogether leaves the patient in two or three hours. But, in other instances, the cough is far more violent and suffocative; and when it has lasted for an hour or two, an expectoration of tough viscid mucus commences, and gradually becomes copious and affords relief. It is occasionally mixed with blood from the severity of the struggle: but the larger the discharge of either, or of both, the more the

* Inquiry into Disordered Respiration. See IV. p. 46.

bronchial vessels are made easy by being thus unloaded of part of their obstruction.

It is often, however, many hours before a paroxysm of this kind very sensibly subsides; and the patient generally feels some degree of constriction during the whole of the ensuing day; and is fortunate if the next night be passed without the return of a like fit. The tendency to such returns usually continues for several nights; in severe cases, for a week or a fortnight. Sir John Floyer, who, from describing his own sufferings, has given us one of the best historical accounts of the disease that has ever been written, mentions a case in which the fits recurred for seven weeks together; during the whole of which time the patient was obliged to sit erect in a chair.

Yet, notwithstanding the violence of the assault, it is not often that asthma, under either of these forms, proves fatal at the time: for this "morbus maximè terribilis," as it is called by Willis, "may be carried on to old age, if supervening diseases do not destroy the patient, or disturb the operations of nature, by which a recovery from the paroxysm may be obtained."* But it rarely makes a first attack without subjecting the constitution to subsequent returns; and frequently, by the debility which it hereby produces, lays a foundation for tubercular phthisis, dropsies of the chest or abdomen, aneurisms of the heart, and various other fatal diseases. Whilst it occasionally happens, even where none of these take place, that the mucous glands of the bronchiæ become relaxed, an habitual excess of secretion ensues, and a troublesome dyspnœa is the consequence, from the over-loaded state of the air-cells and bronchial vessels; a mischief, which, in such cases, is felt most oppressively on first awaking, and is only relieved by a long labour of severe coughing. This over-loaded state of the bronchiæ and air-cells, from too large a secretion of mucus, is indeed, at the time, an original exciting cause of the disease; and has by some writers, and especially in our own day by Dr. Bree, been supposed to be the chief cause.

The exciting causes, however, are numerous, and it is difficult to say which is the chief; nor always easy, as we shall observe more at large by and by, to follow them up, and ascertain them satisfactorily. Yet they may all be resolved into an irritation of some kind or other, existing within the cavity of the chest, and stimulating its moving powers to a convulsive constriction. I say existing *within* the cavity of the chest, because we are now considering asthma as an idiopathic disease. Yet it happens not unfrequently that it occurs as a mere symptom, or result of some other disease, or of a morbid state of some remote organ, as the stomach, liver, or spleen; in which case it becomes a secondary affection, and is only to be removed by removing the primary disorder on which it is dependant. And hence it is of the utmost im-

* Bree's Inquiry, &c. sect. VI. p. 71.

portance that we should trace out the actual cause, at least so far as to determine whether the asthma be an idiopathic affection originating in the chest, or a subsidiary affection catenated with some other part of the system.

Whether the suffocative tightness of the chest be the result of a spasmodic stricture of the bronchial vessels, spreading thence to the muscles of respiration; or produced by an infarction of these vessels from a superabundant effusion from their exhalants, is a question of a very different kind. Willis first started the former opinion, which has flowed in a regular current, or with little opposition, through Floyer, Hoffman, and Cullen to the present day. Dr. Bree has lately proposed the latter, and supported it with great ingenuity and learning; illustrating and fortifying his views by numerous references to unquestionable facts, and the opinions of earlier writers, and especially of the humoral pathologists, to whose physiology he seems peculiarly to incline.

Admitting the former hypothesis, the thoracic convulsion is a diseased action from the beginning, and under every degree and modification, and is so regarded by its advocates: while Dr. Bree only allows it to be so when the convulsive action is violent; contending, that in its commencement it is altogether a remedial effort, an instinctive attempt to expel the serum or mucus that clogs the bronchial vessels. And he hence accounts for the pathognomic wheezing, which he does not think the idea of a spasmodic stricture of these vessels is sufficient to explain; as also for the general inefficacy of opium and antispasmodics to whatever extent they may be carried.

I have already stated that an excessive secretion from the exhalants of the bronchiæ may be an exciting cause in many cases, and particularly in a relaxed and debilitated condition of the bronchial vessels in consequence of former attacks. But notwithstanding the masterly manner in which Dr. Bree has argued this point, I cannot regard such a secretion as a common cause of asthma, since, in numerous instances, I have observed, in the words of Sir John Floyer, that "the lungs do not appear to be much oppressed with phlegm before the fit; and at the end of the fit the straitness goes off *before* any considerable quantity is spit up:" while in what is commonly called the dry, nervous, or convulsive asthma there is always very little, and sometimes no mucus whatever excreted from the beginning to the end of the paroxysm. It may, indeed, be maintained that the secretion is absorbed, but this is to beg the question, for we have no proofs of such an absorption. The existence of accumulated mucus in the bronchial vessels of those who have died of asthma, and whose bodies have been opened, does nothing more than establish the fact in those particular cases. And even here we are left in total darkness whether the serum or mucus anticipated the suffocative convulsion and was the cause of it, or whether the latter anticipated the serum or mucus effusion, and forced it into the vessels in which it has been found on dissection. How far the suf-

focative convulsion may originate in a spasm of the bronchiæ, as contended for by Dr. Cullen, we have no means of determining manifestly. That it may exist, however, as well as a spasm of the alimentary canal, no one has been bold enough to deny; that it must produce that strangling constriction or straitness which is a pathognomic sign of asthma, where it does exist, can be as little doubted; and I find it extremely difficult to ascribe the disease to any other state of the bronchiæ, in all cases of dry or nervous asthma, in which, as there is little or no discharge from the lungs, we have full ground for inferring that there is little or no accumulation within them.

"It is not, however, intended," says Dr. Bree, "to deny the possible existence of this spasm, but to object to it as a proximate cause; and to state the imprudence of depending upon it as an important indication in practice."* Yet it does not appear to me that the practice suggested by the one opinion needs to be so much at variance with that suggested by the other, as this passage would seem to intimate. For if acids prove a beneficial mode of treatment, and that benefit be ascribed by the upholder of the muculent hypothesis to the astringent power of the acid, by which the flow of mucus is restrained; it may be ascribed by the upholder of the spasmodic hypothesis to the very same power, by which, as a tonic, it takes off irritability, and allays all muscular irregularities.

Dr. Bree's division of the disease is founded upon causes rather than upon symptoms; and he has hence divided it into the four following species:—Firstly, those cases, being most numerous and common, which are produced by the irritation of effused serum in the lungs.—Secondly, those produced by the irritation of aerial acrimony in the lungs.—Thirdly, those dependant on irritation in the stomach, or some of the abdominal viscera.—And, fourthly, those dependant upon habit.

In treating further of this disease, I shall also have further to express my deep sense of the value of Dr. Bree's learned and elaborate investigation: but, as the definitions under the present classification are founded upon a principle of symptomatology rather than of etiology, it will not be in my power to adopt his divisions in the exact terms and order in which he has given them; though it will be found that his first two species run nearly parallel with the only two to which I propose to limit the genus; and which will be wide enough to embrace his fourth, or those cases of the disease, which, whatever be their symptoms, depend on an established habit: while the third species of Dr. Bree, comprising cases in which asthma is not an idiopathic affection, but a sign or result of morbid action in some organ remote from the lungs, cannot be correctly treated of in the present place; the affections included under it being alone to be remedied by remedying the primary disease on which it is dependant.

* Inquiry, &c. sect. VII. p. 106.

From the view then thus offered, and from other symptoms that we shall have presently to take notice of, it will, I think, be found convenient to contemplate the genus ASTHMA, as comprising, and limited to, the two following species —

1. ASTHMA SICCUM. DRY ASTHMA. NERVOUS ASTHMA.
2. ——— HUMIDUM. HUMID ASTHMA. COMMON ASTHMA.

SPECIES I.

ASTHMA SICCUM.

Dry Asthma. Nervous Asthma.

PAROXYSM SUDDEN, VIOLENT, AND OF SHORT DURATION, CONSTRICTION HARD, DRY, SPASMODIC; COUCH SLIGHT; EXPECTORATION SCANTY, AND ONLY APPEARING TOWARDS THE CLOSE OF THE FIT.

THIS is the proper convulsive or nervous asthma of Willis, Hoffman, Floyer, and Akenside. Its predisposing cause we are sometimes capable of developing: for we can trace the disease to a morbid structure of the chest, to an irritable condition of the bronchial vessels, or parenchyma of the lungs, produced by a pleuritis, or a succession of severe and protracted winter coughs; or to an hereditary taint. Of the occasional causes, however, we are often in great ignorance; and mostly so where the disease appears in its simplest character, and totally unconnected with any other affection. In some instances it evidently follows upon a sudden repulsion of cutaneous eruptions; in others, on a sudden cessation of edematous swellings in the extremities of cachectic patients; and not unfrequently on inhaling deleterious exhalations: most of which we have already noticed as occasional causes of dyspnœa, and dry or humid cough. So that it is probably a mere difference in the constitution or habit that renders these causes capable of producing one of these diseases rather than another. And hence dry asthma, like the preceding, as thus diversified by its occasional causes, may be contemplated under the following varieties:—

α Simplex. Simple nervous asthma.	Without any obvious cause or connection with any other affection.
β Metastaticum. Repelled humours.	From retropulsion of some acrid humour from the surface of the body.
γ Phlegmaticum. A cachectic frame.	From repelled edema of the extremities in phlegmatic or cachectic habits, with a scanty secretion of urine.

℥ Vaporosum. Deleterious exhalations.	From inhaled fumes of metals, especially of lead and arsenic; of sulphur, charcoal, nitric acid, and other deleterious or poisonous substances.
℥ Organicum. Organic misformation.	From organic derangement of the walls or contents of chest.

The first of these varieties constitutes the second species of Dr. Bree, who supposes the unknown and exciting cause to reside in some "subtile acrimony *always* present in the atmosphere in a greater or less degree, and ready to be inspired."* It is at least difficult to disprove this opinion; but admitting the fact, we can make little use of it, and are nearly as much in the dark as ever; since we have no information of the nature of this acrimony, and have no means of determining whether it really exist in the atmosphere, in some proportion or other, at all times, as Dr. Bree affirms; or of measuring its occasional excesses, and consequently of guarding against it when it becomes mischievous.

It is a position of far more general assent, that this modification of asthma is more likely to occur "in proportion as the habit is disposed to the condition called nervous."† The paroxysm, indeed, frequently makes its attack under those circumstances which are most apt to try the strings of a nervous temperament. A sudden emotion of the mind will give rise to it, an alteration of the wind, a change of residence, or a meal that disagrees with the stomach; and often there is a considerable evacuation of pale urine. While on the contrary, as already observed, it more usually makes its attack without any one of these harbingers, or any other that can be traced out. The small quantity of viscid mucus that is excreted through the whole of the struggle, proves evidently that the inner membrane of the bronchial vessels is in a state of peculiar dryness; and leads us to conceive that, at the onset, it was nearly or altogether destitute of its lubricating fluid. It is on this account that the cough and wheezing are both slight. And it is very possible that the spasmodic exertion is not without its use as tending to promote an increased action of the exhalants, and to take off that aridity from the mucous tunic of the bronchiæ which may sometimes be a paroximate cause of the disease.

Cases of the species of asthma before us, and even of humid asthma, occurring upon a sudden disappearance of scabid, herpatic, and other cutaneous eruptions, are so common that it is hardly worth while to dwell upon them. They are especially noticed by Sir John Floyer, and have rarely escaped the attention of any pathologist since his day. And that this is an actual cause of the disease, is perfectly manifest from the irrecurrence of the latter as

* Inquiry, &c. p. 192.
† Id. p. 191.

soon as such eruption has been re-excited. A sudden disappearance of gout in the hand or foot, or of an habitual discharge, as that of the hemorrhoidal vessels, has operated in the same manner, while a renewal of these affections has proved an equal remedy.

But those of relaxed and phlegmatic habits are peculiarly affected by such transfers of morbid action, particularly when the feet and ancles are habitually edematous, and accustomed to enlarge towards night. Chronic or exacerbating dyspnœa is a frequent attendant upon such a state of corporeal debility; and hence, we have reason to expect asthma also: for further information upon which subject the reader may turn to what has already been observed under dyspnœa *chronica*.

It is not to be wondered at that asthma should be produced by the inhaled fumes of metals, and other mineral substances, since we see it also frequently occasioned, in constitutions prone to the complaint by clouds of common smoke or dust. And Dr. Perceval informs me that he has met with two cases in which slight apoplexies were concomitants of asthma produced by concentrated fumes of nitrous acid; here again leading to the same train of causes we have already noticed, as laying a foundation for chronic dyspnœa.

To this subdivision, also, belong such cases of asthma as proceed from fogs and mists, especially those of populous and extensive towns, which many asthmatics are obliged to abandon, as soon as November makes its appearance, for a drier and less hazy atmosphere. The debilitated coats of the bronchiæ seem chilled and corrugated, and consequently constringed by the inhaled vapour; and hence the suffocative feeling. Where, however, the internal tunic of the bronchiæ is dry, hot, and irritable habitually, the moisture of such an atmosphere cools and softens the harsh membrane, and the patient longs for such a situation instead of flying from it. And hence the reason why fogs are poisonous to some asthmatics and healthy to others. It is also probable that the altered gravity of the atmosphere, in these cases, and the larger and smaller doses of oxygene inhaled on every inspiration, produce some influence that proves beneficial or injurious according to the habit or actual state of the air-vessels. And hence, again, while some asthmatics can live only in a mountainous situation, others find their only relief in lowlands and valleys.

An impregnation of the atmosphere with odourous essences, has also been found, in a few cases of uncommon idiosyncrasy, or where the air-vessels have been peculiarly sensible, a sufficient cause of the asthmatic paroxysm; which has hence been produced by the smell of musk, and in one instance related by Timæus, by that of roses.* And, in consequence, it is not to be wondered at that more pungent and perhaps acuated corpuscles should produce a like effect. Dr. Scott, of Northumberland, has given cases of the greatest dan-

* Cas. 216.

ger and extremity, occasioned by accidentally inhaling the effluvia of ipecacuan whilst pulverising.*

Another and a very frequent cause of both species of asthma, but more particularly the asthma *siccum*, is some organic derangement of the walls or contents of the chest. Gibbosity is one of the most common of the present group of causes. Lommius asserts, after Hippocrates,† that if a person become gibbous before puberty, in consequence of asthma, he dies.‡ On which Dr. Bree has well observed, that the authors have here substituted cause for effect,§ since it is rather the gibbosity that produces the asthma, than the asthma that produces the gibbosity. An osseous, and consequently rigid condition of the cartilaginous extremities of the ribs and sternum; pressure upon the lungs produced by a dropsy of the chest, or of the pericardium; by an empyema; by vomicus or indurated tumours of whatever kind in the substance of the lungs; an inordinate magnitude of the lungs themselves; have all been found occasional causes of asthma, and are among the most formidable to be attacked. Haller, Bonet, Morgagni, and others, who have been peculiarly attentive to structural diseases and their effects, have recorded numerous instances of this kind.

The general treatment of this distressing affection is still a matter of discussion. A considerable distinction is necessary in the two species under which it makes its appearance; and hence it will be more advantageous to defer the consideration of this subject till we have noticed somewhat more at large the history of humid asthma, so that the plan proper for the one may stand in contrast with that proper for the other.

SPECIES II.

ASTHMA HUMIDUM.

Humid Asthma. Common Asthma.

PAROXYSM GRADUAL, INGRAVESCENT, PROTRACTED; CONSTRICTION HEAVY, HUMID, LABORIOUS; COUGH SEVERE; EXPECTORATION COMMENCING EARLY; AT FIRST SCANTY AND VISCID, AFTERWARDS COPIOUS AND AFFORDING GREAT RELIEF.

This is the ordinary form under which the asthmatic paroxysm shows itself: and the trivial name of humid or humoral was given to it by earlier writers, most of them advocates of the humoral pathology, from an idea that an acrid humour was hereby discharged from the

* Edin. Med. Comment. Vol. IV. p. 75.
† Lomm. Obs. Med. Lib. II. p. 146.
‡ Aph. XLVI. sect. 6.
§ Inquiry, &c. p. 24.

general mass of the blood, consequently that the expiation was to be encouraged as much as possible; the suffocative struggle being regarded as an instinctive or remedial effort of nature to restore the system to a state of health.

Like the preceding species, it very generally appears without any obvious cause or connection with any other affection. In some cases, however, it seems to be the result of a plethora, or, as Dr. Cullen expresses himself, "a turgescence of the blood, or any other cause of any unusual fulness and distention of the vessels of the lungs."* And sometimes, as in old age, or after long continued and repeated catarrhs, it is produced by an excess of serum or mucus flowing inordinately from a weakened and relaxed state of the bronchial exhalants or mucous glands: thus offering us three varieties as follow:—

α Simplex. Simple humid asthma.	Without any manifest cause or combination with any other affection.
β Plethoricum. From plethora.	From plethora, or the suppression of some accustomed sanguineous evacuation.
γ Atonicum. From local atony.	From a debilitated and relaxed condition of the excretories of the air-vessels, as a consequence of chronic and neglected catarrhs, or of old age.

We also meet with examples of the humid as well as of the dry asthma, as a symptom or sequel of many other diaeases; as gout, hypochondrias, hysteria, parabysma, and syphilis.

I have already observed, that the attack of the present species is more severe, as well as of longer duration, than the preceding; as though the patient were contending with two hostile forces instead of with one—a diminished diameter of the vessels, and infarction from a surplus of viscid mucus: and thus both the exciting causes co-operate, which have been contended for singly by the leaders of opposite principles. I am much disposed to think that this is frequently the case; and that, to a certain extent, both hypotheses are correct. That asthma occurs, as in the preceding species, without any increased discharge of mucus, is unquestionable; that it occurs with such increased discharge, is equally incontrovertible; and that this overflow is often the result of a constrictive and irritant struggle, is only analogous to the increased secretion that takes place in the alimentary canal, from the torminal spasms of cholera in various cases in which we are equally incapable of ascertaining its immediate cause. In a relaxed and atonic state of the lungs and their air-vessels, constituting the third variety of the species before us, it is very probable that this overflow of mucus, and especially if it possess

* Pract. of Phys. Part II. Book III. Chap. VI. § MCCCLXXXIV.

any morbid acrimony, may itself be the stimulus, as an overflow of bile in a like state of morbid acrimony may occasionally be an exciting cause of cholera: but as in spasmodic cholera, where we have no such overflow, we are compelled to admit the existence of some other though an unknown cause; so in asthma, where there is no expuition, or the expuition does not appear till the paroxysm is subsiding, we ought, I think, in fair reason, rather to acknowledge our inacquaintance with the actual cause than to place our faith in one that has so little to support it.

But whatever be the source of the aggravated distress endured in humid asthma, after some hours of suffering the patient feels less anxiety, breathes more leisurely and with less labour; and, with a growing freedom of expectoration, acquires general relief and tranquillity. Yet such is the irritable state of the affected organs, that even on the second day "no change of posture is made with impunity, and particular distress affects him if he engage in the fatigue of dressing whilst the stomach is empty. During the day, if no particular hurry occur, the breathing becomes generally more free till the evening: an inexperienced asthmatic even flatters himself that his disease is leaving him; but he finds, at the approach of night, that he must sustain a new attack. The paroxysm recommences with the usual symptoms, and the night is passed nearly as the former, but the sleep is more perfect, and productive of more relief. The third day the remission is more complete; there is some additional expectoration, and bodily motion is performed with less distress, but still with great inconvenience. After the paroxysm has been renewed in this manner for three nights, the expectoration generally becomes free, but there is no certain termination of the fit at a fixed period. However, except in particular cases, it goes off after a few days; and as the daily remissions become more perfect, the urine is higher coloured, and in smaller quantities; the expectorated mucus is more copious and digested; strength of pulse and vigour of action increase; and good humour again enlivens the mind."*

In treating asthma, our attention must be directed to the paroxysm itself, and to the nature of the constition after the paroxysm has ceased; and, even during the paroxysm, to the character of the particular species under which the disease shows itself.

Dr. Cullen, who, as we have already seen, regarded plethora and turgescence of the blood-vessels as the usual cause, recommends blood-letting in the first attack, and especially in young persons; with the use of acids and neutral salts, as employed by Sir John Floyer, for the purpose of taking off the turgency of the blood. Nevertheless bleeding demands a nice discrimination, and is rarely to be recommended in either species. The relief it affords, even in dry or convulsive asthma, is very temporary; and Dr. Cullen al-

* Bree, Inquiry, &c. Sect. IV. p. 48.

lows that it cannot be persevered in without undermining the constitution and laying a foundation for dropsy.

Dr. Bree regards it as a doubtful operation in the first species, or that, to adopt his own language, produced by an aerial irritation, and as always imprudent in the second. In this last, "I have repeatedly," says he, "directed it; but I have never had reason to think that the paroxysm was shortened an hour by the loss of blood: and I have often been convinced that the expectoration was delayed, and that more dyspnœa remained in the intermission than was common after former paroxysms. In old people, who have been long used to the disorder, it is certainly injurious.*

Purging, beyond the intention of keeping the bowels regularly open, has seldom proved beneficial. When, indeed, the disease is secondary, and depends evidently upon an overloaded liver or stomach, or some suppressed evacuation, active cathartics, and especially such as operate simply, will be of great use; and the increased action excited in the alvine canal will often take off the irregular action of the chest; but where the asthma is idiopathic, and especially where the constitution is infirm, as in old age, a powerful alvine irritation will exacerbate the spasm of the chest instead of diminishing it.

In exciting nausea or vomiting, however, we may be less cautious; for each has often been found highly advantageous in both species of idiopathic asthma. The first, by diminishing generally the living power, and hereby relaxing the convulsive action; and the second, by changing the seat of the convulsive action, and at the same time determining to the surface. Riverius employed full vomiting.† Dr. Akenside was much attached to the practice of both; he vomited freely on the accession of the paroxysm, and often continued the same plan for a fortnight or three weeks, by giving from five to ten grains, or even a scruple of ipecacuan every other morning.‡ Sir John Floyer extended the time beyond this, though he did not repeat the dose so frequently. He advises the operation of vomiting once a-month.

Blistering may also be made use of, but, like setons or issues, can only be of ulterior advantage, for the fit must be of far more than ordinary length if it continue till the blister has produced vesication. It may, however, go far to prevent or shorten a relapse on the ensuing night; and especially when the disease is connected with an asthmatic habit.

Sir John Floyer is said, during his residence at Lichfield, to have found great benefit in his own case by the use of very strong coffee. And the practice was afterwards followed up by Sir John Pringle, as he informs us, with equal success. "On reading the section on coffee, in the second volume of your Essays," says he in a letter to Dr.

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* Inquiry. &c. p. 245.

† Prax. Med. Lib. VII. cap. 1.

‡ Transact. of the College of Phys. of Lond. Vol. I. Art. VII.

Percival, "one quality occurred to me which I had observed of that liquor confirming what you had said of its sedative powers. It is the best abater of the periodic asthma that I have seen. The coffee ought to be of the best Mocha, newly burnt, and made very strong immediately after grinding it. I have commonly ordered an ounce for one dish, which is to be repeated fresh after the interval of a quarter or half an hour, and which I direct to be taken without milk or sugar."*

Sedatives and antispasmodics, given alone, have rarely been attended with any decisive advantage. They have occasionally afforded relief in the first species, but have had little effect in the second; and, by heating the system unnecessarily, have often augmented and prolonged the paroxysm. Dr. Bree, in relating his own case, which was that of humoral asthma, tells us, that in the access of a paroxysm he took four grains of solid opium, which produced nearly an apoplectic stupor for two days. A few hours after trying the opium, a most debilitating sickness supervened with incessant efforts to puke. The labour of the respiratory muscles abated, but the wheezing evidently increased, accompanied with an intense head-ache and a countenance more turgid than usual; the pulse being at first strong and quick, and afterwards sinking into great weakness. The paroxysm showed itself four hours earlier than usual the next day. He tried it in smaller doses during several subsequent fits, but in no instance without great general mischief, and with little or no local benefit.

Much of this deleterious effect may have depended on idiosyncrasy. But in every instance sedatives and narcotics, if employed at all, should be combined with diaphoretics. In this form they often prove a very powerful remedy: and one of the best preparations of this kind is the compound powder of ipecacuan. An universal glow and diapnoe, as it has been called, or breathing moisture on the surface, are among the most favourable symptoms of the disease, under whatever form it makes its appearance. Antispasmodics and narcotics, as musk, castor, valerian, cardamine, camphor, and the fetid gums, may perhaps be employed successfully when the disease is chiefly dependant upon a morbid habit; but even here they will derive a great advantage from an union with diaphoretics, as the neutral salts, and small doses of ipecacuan, or antimonial powder.

The hyoscyamus has often succeeded as a narcotic where opium has failed: but, like the latter, it should not be trusted to by itself in either species of the complaint.

Where the urine is small in quantity, and of a pale hue, and particularly where the disease is connected with a pituitous or phlegmatic habit, diuretics have been found unquestionably serviceable. And it is apparently in reference to this variety of the disease, that

* Philosophical, Medical, and Experimental Essays; by Thomas Percival, M. D. Vol. III.

Sir John Floyer asserts, that swelled legs and copious urine are beneficial changes in asthma. Dr. Percival indeed thought them of service generally: but if so, it can only be as co-operating with diaphoretics, or other medicines that prove revellent by exciting increased action in the excretories of remote organs. Dr. Ferriar combined them with opium, and thus unquestionably increases the power of both.

But as there is no discharge that promises such direct benefit as that from the excretories of the bronchial vessels themselves, so is there no tribe of medicines on which we can place so much dependance as on expectorants when judiciously selected and administered. In every kind of idiopathic affection these may be employed with advantage: for if there be a turgescence in the blood-vessels, they will have a tendency to emulge them; if the bronchiæ themselves be surcharged with serum or mucus, they will facilitate their exhaustion; or if their interior tunic be dry and irritable, by taking off the obstruction and restoring the deficient secretion, they will soften and lubricate the irritable membrane.

Among the fetid gums which have been employed for this purpose, ammoniac has acquired the greatest degree of popularity: but its power is inferior to that of assafœtida, the virtue of which is to be judged of by the degree of its offensive odour. Both these, however, are apt to be too heating, except in very flaccid and phlegmatic habits; and it will hence be often necessary to soften their pungency by a saline medium, taking care not to irritate the bowels unduly. And where there is a considerable degree of irritability and much quickness of pulse, we may prefer several of the oleraceous, and especially the mucilaginous demulcents: but oily demulcents are always to be avoided. Dr. Paulet of Paris has lately employed the chenapodium *Botrys*, and speaks of its good effects in very high terms, especially in humoral asthma: but I am not aware that it has hitherto been introduced into our own country. He gives it in the form of an electuary, mixing the powder of the plant with honey.

Of all the medicines, however, which act on the excernents of the lungs, the squill is by far the most to be depended upon. It is indeed a stimulant of the excernent system generally; for there is no part of this system capable of resisting its power; and it is hence necessary to watch its effects upon the kidneys and intestinal canal, and to attemper it with opium or some other guard, if it produce much influence in either of these ways; except, indeed, in the case of asthma connected with the phlegmatic habit, which is the only modification of the disease in which this collateral influence is found to be of advantage. Squills have also a peculiar tendency to stimulate the stomach and produce nausea or vomiting; and it rarely shows much of an expectorating power till it has occasioned the former. But as these are advantageous to the disease in both species, and especially in humoral asthma, we are not to discontinue it on this account, but only to moderate its use. There are many

practitioners, indeed, who employ it directly as an emetic medicine, and prefer it to ipecacuan. In asthma it may, in some habits, be allowed to supersede it; but in no other disease that I recollect; for it is rougher in its action and more offensive in its taste.

Where, however, the lungs seem to be affected only secondarily, and the source of the disease lies in an infarcted and torpid state of the liver or some other abdominal organ, squills, and indeed expectorants in general, will be found less serviceable than in idiopathic cases. And hence, we should prefer the seneka root, which has often been found of great success, after calomel, or whatever other cathartic may be judged most proper, has been previously made use of. Seneka root, indeed, is in itself a sort of general evacuant; for while it increases very largely the discharge of mucus, it increases also the flow of perspiration and urine, and sometimes acts as an emetic and purgative.

There is a tribe of medicines which are also found of essential benefit in many cases of both species of asthma, but whose mode of action we are so little acquainted with that it has been explained on very different principles by different pathologists; I mean, the acids both mineral and vegetable. These principles we have not room to examine; nor is it necessary; since if they be really beneficial, it is of little moment whether they act as sedatives in allaying irritation, or as tonics in invigorating the absorbents and restraining the loose and relaxed mouths of the bronchial exhalants. It may be sufficient to observe, that the vegetable seem more efficacious than the mineral acids, probably because, in consequence of their being less corrosive, the patient can take them in larger quantity; and that, of the vegetable acids, those obtained by fermentation seem more useful than the native.

Yet it is rarely, that these have been given alone; for it has been found that by uniting them with diaphoretics, as small doses of ipecacuan, or with narcotics, the remedial power of each has been augmented; and that the latter are not only rendered more efficacious, but are borne with less mischief afterwards. Sir John Floyer was in the habit of uniting the acetous acid with squills, and hence, indeed, the popularity which the vinegar of squills has preserved to the present day. Dr. Bree has employed both the vegetable and the mineral acids, but always in union with some other preparation. Thus in humoral asthma, after puking, he advises a draught composed of an ounce of distilled vinegar, and from one to three grains of ipecacuan in a sufficient quantity of pure water, to be taken every four hours, as a mean of determining to the surface of the body, and of promoting absorption and exhalation. And as a mean of taking off irritation and exciting the secernents of the bronchiæ, it may be also employed in nervous or dry asthma, and often with as good effect.

In like manner, Dr. Bree has made use of the nitric acid in union with squills and extract of henbane; giving three grains of the henbane with six minims of the acid and ten of tincture of squills in the

form of a draught, and repeating it every three or four hours during the paroxysm. And he tells us, that "Many patients, who had taken the most powerful antispasmodics, have assured me that none had been so useful; and two gentlemen now under my direction inform me, that it is the only medicine that has ever given them relief in the paroxysms."* I cannot say, that I have found it thus pre-eminently serviceable; but it has often been of decided benefit. And I know of no medicine that succeeds so well in preventing the mischievous effects of opium, and even in adding to its sedative power; or that is so valuable an adjunct in almost all anti-spasmodic preparations, and especially where ether, camphor, and other terebinthinates are employed; or that tends so effectually to take off excess of pungency from the more heating expectorants.

As simple relaxants are always hurtful in this disease, and only add to the debility, it is not to be wondered at that warm bathing should be also injurious. Cold bathing, as a tonic between the intervals, has much more to be said in its favour. Dr. Bree tried it in his own person, but did not obtain success. His was a case of humoral asthma. But in the first species, and particularly where habit has given inveteracy to the recurrence of the paroxysms, and where the general constitution is vigorous, there is no single remedy likely to be of more value.

We thus enter upon the prophylaxis of the disease, upon which it will not be necessary to dwell at any great length, after what has been observed under the two preceding genera.

Wherever asthma may be supposed to be dependent upon a turgescent state of the blood, tonics can have no claim to be employed, till after such a condition has been removed; and then, perhaps, the best medicine will be the mineral acids. But in all other cases of the idiopathic disease, tonics may be adverted to with great advantage during the interval of the fits: and if one do not seem to succeed, it should only lead to exercise our ingenuity in the choice of another, and not to abandon the principle; for we should never forget that the fundamental evil we have to oppose, whether general or local, is a lax, mobile, and irritable state of the muscular fibres. Peruvian bark is often found to overload the stomach, and especially in dyspeptic patients; and with these I have found columbo agree better, occasionally combined with carbonate of soda. But the best tonics are the metallic oxydes, and of these that of iron, where it is not found too heating.

Inhalations cannot well be tried during the paroxysms, but they have been very generally had recourse to in the intervals, and have consisted of very different vapours. When pneumatic medicine was at the height of its popularity, much benefit was supposed to be derived from the use of oxygene and hydrogene gasses. Dr. Beddoes was peculiarly attached to the former and thus describes its effects with his constitutional warmth of expression:—No soon-

* Inquiry, &c. p. 285.

er does it touch the lungs, than the livid colour of the countenance disappears, the laborious respiration ceases, and the functions of all the thoracic organs go on easily and pleasantly again." Yet, with all this high recommendation, few patients chuse to be cured in this manner in the present day; oxygene gas is now rarely adverted to by asthmatics or their medical attendants; and the remedy, from having been extolled beyond its proper level, has fallen back into an unmerited disesteem. Dr. Ferriar has spoken in sober terms of the undoubted benefit of hydrogene in the first species; and I am induced to believe that a long perseverance in the use of this gas may often produce the effects he has ascribed to it; but it is rarely that I have seen it so decidedly useful as to ascribe the patient's recovery to this remedy, rather than to other means he had been in the course of employing at the same time.

Warm aromatic fumes have been also tried; as prophylactics, obtained from various substances. The smoking of tobacco has very extensively been recommended; the leaves of the scandix *odorata* were at one time in still higher repute; but both have of late years given way to those of the datura *strammonium* or thorn-apple. Most of these contain a narcotic power, and whatever benefit they produce is hence, perhaps, chiefly derived: but either this narcotic power, or the stimulating power with which it is united so intimately, for all stimulants exhaust and induce a tendency to paresis or paralysis, has at times been found to injure deglutition, and induce a difficulty of swallowing. Tobacco is justly chargeable with this effect, and the strammonium still more generally; and hence if they produce any influence whatever upon the bronchiæ, it must be ultimately of the same kind, and therefore highly injurious.

There is another process, which has lately been adopted in France, but of the issue of which we have not yet received any satisfactory information. It consists in a revival of the impregnated aqueous injections of Stephen Hales,* with a view of determining how far such impregnated materials may reach the lungs and be thrown off by the bronchial exhalants. M.M. Magendie and Nysten have been chiefly engaged in these researches, and they have ascertained that alcohol, ether, camphor, and most of the other volatile antispasmodics, together with the gasses, are in this manner conveyed to the lungs, and transpire from the surface of their air cells.†

Issues, setons, and even cauteries, have been long in repute as useful drains or revellents; and, under this character, as highly successful in the cure of asthma. And where the disease has appeared upon a sudden check of a cutaneous eruption, or a sudden cessation of any habitual evacuation, I can unite in this recommen-

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* Hœmostatics, II. 74, 75,

† Précis Elementaire de Physiologie, Tom. II. p. 291.

dation of Macbride* and Riedlin.† Issues to this end, and indeed for all others, are most conveniently kept open, and produce the most salutary irritations by small pieces of the bark of spurge-laurel or mezereon, both of which contain a very acrid matter; and the latter of which, more especially, has for this purpose been very generally employed in France, under the name of *ecorce du Garou*.‡ A lady, between fifty and sixty years of age, whom I have long been in the habit of attending, had several very severe fits of asthma, about three years ago, at the distance of ten days or a fortnight from each other. I discovered that she had been formerly subject, though at irregular periods, to slight bleedings from the hemorrhoidal vessels, which for some months had ceased to be renewed. With a view of exciting a vicarious action, I opened an issue in one of the arms, and irritated the rectum by small doses of aloetic cathartics. The issue discharged copiously for six weeks, during which time the patient continued free from all attack: I then suffered it to heal slowly, still continuing the aloes; and about a month afterwards was informed that the habitual discharge had returned. She had no paroxysm after this for upwards of two years. She has since had one attack, but far slighter, and of shorter duration.

M. Bonifex, in like manner, relates a case in which a corpulent asthmatic patient, who suffered severely from frequent fits of this disease, was accidentally infected with the itch. As the eruption extended, his breathing became every day more easy; and from the time that the contagion took place he had no return of a paroxysm whatever. He was then desirous of being cured of the itch, and for this purpose went for several days successively into a cold bath. The eruption was hereby repelled; but he was immediately attacked with an asthmatic fit, which returned twice within the space of a month. M. Bonifex advised him to have recourse to his former cure, by using the bed-clothes of one infected with the itch. This advice he followed; a few days after which the scabid eruption made its appearance, when he was again perfectly liberated from his asthma.§

It is only necessary to add, that the diet should be light and cordial without being stimulant, the food of a solid rather than of a liquid kind; and the meal never be suffered to overload the stomach; all flatulent fruits and other vegetables should be avoided; but oranges, the alliaceous esculents, and the aromata may be allowed in moderation. Hot liquors should be sedulously abstained from; and the beverage consist chiefly of coffee, ginger-tea, and acidulated waters.

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* Med. Observ. and Inquir. Vol. VI. Art. II.

† Lin. Med. 1695. p. 91.

‡ Essai sur l'Usage et les Effets de l'Ecorce de Garou, M. Archange le Noi. Paris, 1767.

§ Recueil d'Observations de Medicine des Hôpitaux Militaires par M. Richard de Hautesierck, &c. Tom. II. 4to. Paris, 1774.

Where asthma is dependant upon some primary affection of another kind, it can only be effectually attended to by removing or palliating the original disorder.

GENUS V.

EPHIALTES.

Day-Mare. Night-Mare.

SIGHING, SUFFOCATIVE ANHELATION, WITH INTERCEPTED UTTERANCE, AND A SENSE OF SOME EXTERNAL WEIGHT PRESSING HEAVILY ON THE CHEST; TRANSITORY.

Ephialtes, incubus, night-mare, which are the common names in Greek, Latin, and English, for the present genus of diseases, though not exactly of the same meaning, import a sudden sense of an oppressive and suffocative weight on the chest, threatening strangulation, and rendering the person attacked incapable of changing his position. Ephialtes, from ἐφάλλομαι, signifies "to leap upon;" incubus, from incubo, "to lie upon;" and the term *mare*, in our compound night-mare, embodies the looser idea contained in the Greek and Latin denominations, and signifies a hag, goblin, demon, or spectre; as though the oppressive weight were occasioned by some such hideous monster's abruptly leaping or lying on the chest; whence our old Anglo-Saxon name for the disease *Elf-sidenne*, or elf-squatting; which is as significant as any of them.

The character of the genus will be found sufficiently expressed in the following definition.

If the generic definition be correct, as I trust it is, there can be no doubt that ephialtes belongs to, or should be ranged in close connexion with the family of anhelations, under which it was usually classsd by the earlier writers; and indeed continued to be so till the time of Dr. Cullen, who has strangely removed it to that of *vesaniæ*, or mental derangements, putting it immediately after mania: reducing it from a generic to a specific station; and as singularly uniting it with *sleep-walking*, with which it has little or no connexion in cause or symptoms, as will be sufficiently obvious from comparing the account about to be given of the one disease with that of the other.

The history of the affection will easily lead us to the nature of its production. It appears most frequently in persons of an irritable or nervous temperament, and of a weakly constitution; particularly amongst those who are predisposed to hypochondrias or low spirits. Others, indeed, are occasionally affected by it, but more

rarely, and perhaps in a less degree. It usually, though not always, occurs in the night, during a reclined position, and after great fatigue of body or mind, or a stomach disordered by indigestible food, or food taken in excess.

Although, therefore, the symptoms of this complaint are to be taken from the actual state of the muscles and other organs of respiration, the exciting cause is to be ascribed, for the most part, to the actual state of the stomach, or the sensorium, or both:—more generally indeed to both, as the brain and the stomach are so much in the habit of associating in the same action.

Yet how comes it that the organs of respiration should be thus singularly affected by the state of the stomach and the sensorium, and chiefly so in the night rather than in the day? The solution of the question may be found in the reasons we have already offered why the paroxysms of asthma, or of exacerbating dyspnœa, should mostly recur under similar circumstances, and at the same period.

Respiration is a semi-voluntary action. In firm health, the will, indeed, is seldom applied to for its aid: but the moment the moving powers of the chest labour under any degree of debility, the will instantly interferes, and by its stimulus compensates for the deficient energy.

Something like this applies to the state of the stomach during the process of digestion. In a period of what may be called eupepsy, or firm and healthful digestion, the ordinary action of the stomach is equal to its own demand: but the moment it labours under any degree of debility, or, in consequence of its being overloaded, or loaded with indigestible materials, its ordinary action is not sufficient, it becomes necessary that it should be supplied, not indeed by the will, but instinctively, or by the remedial aid of the living principle, with an additional flow of nervous energy to enable it to meet the excess of duty hereby imposed upon it.

Now it would be easy to prove, if we had time, that the surplus of sensorial power, under such circumstances bestowed upon the stomach, is taken from the general supply to the system at large, as from a common stock; and that every organ contributes its proportion: the chill that during digestion in a weakly stomach takes place in the extremities, the tendency to sleep, or in other words the torpitude of the brain that occurs at the same time, and the stertorous sound that so often accompanies or follows such tendency, are sufficient proofs that all the organs which are implicated in these phenomena are simultaneously exhausted by the proportion of sensorial power they have conjointly contributed to assist the enfeebled stomach in the discharge of its duty.

On such occasions, therefore, the lungs are as much called upon for their contribution as any other organ, or in other words they make as large an advance as any other organ to the proportion of sensorial power which is thus deducted from the general stock, and sent, as a temporary accommodation, to the stomach. And if this

demand, on the part of a feeble or overloaded stomach, should occur in a system in which the general weakness of the respiratory organs is so considerable as to render it necessary for them to be perpetually drawing upon the will for its collateral stimulus; if it should take place in a recumbent position, in which they have, at all times, less power of action than in an upright posture; and if, moreover, it should be exhibited during sleep, in which the will itself, and most, sometimes indeed all, the faculties of the mind are in a state of suspension, from a cause I shall hereafter have occasion to explain; almost every fact will co-operate that can tend to impede respiration, to lower the tone of the respiratory muscles, and consequently to excite in them irregular and spasmodic action; in one word, that can lay a foundation for all the symptoms which characterise ephialtes: the mind sympathetically disturbed and hurried in the midst of sleep, imaging to itself, at the moment, from the terrible sensation induced, as terrible a cause for production, and giving full credulity to the presence of a huge and hideous spectre, tyrannically squatted upon the chest, and striving to take away the breath.

In ephialtes, however, the respiratory organs, though thus suddenly and violently affected, have seldom any other disease than that of debility, and may not perhaps in every instance even have this, but be affected by sympathy alone; and hence, as soon as the mind is thoroughly roused, and the will recalled by the emergency of the case to the exercise of its duty, the respiratory organs are re-invigorated, and all the distressful symptoms fly away as a dream.

Now in revery, the will, as indeed all the faculties of the mind, may be as abstracted during the day as they are suspended in sleep during the night: and from the peculiar strength and vivacity of the train of ideas or mental emotions that constitute the revery, the same sudden exhaustion may take place, and the same inordinate demand upon the common stock of sensorial power, distributed throughout the system at large, may be made upon every organ acting under a common bond of sympathy, as we have just contemplated during the influence of sleep. And the respiratory organs being thus, in the same manner, mulcted of a part of their ordinary influx of nervous power, the same complaint may take place in the one period as in the other: though, the body not being recumbent in the day, the lungs will not sustain so violent a struggle; and the intellect, from its being less passive than in sleep, not so strongly imposed upon. And hence we may expect to meet, and do in fact meet, with the two following distinct species of the affection:—

1. EPHIALTES VIGILANTIUM.	DAY-MARE.
2. ——— NOCTURNUS.	NIGHT-MARE.

SPECIES I.

EPHIALTES VIGILANTIUM.

Day-Mare.

PRODUCED DURING WAKEFULNESS: THE PRESSURE SEVERE, AND EXTENDING OVER THE ABDOMEN: RESPIRATION FREQUENT, LABORIOUS, CONSTRICTED: EYES FIXED: SIGHING DEEP AND VIOLENT: INTELLECT UNDISTURBED.

This species is less frequently described by pathological writers, than the ephialtes of the night season. Rhodius,* however, Forestus,† and Sauvages,‡ have distinctly marked it; and a striking example of it occurred some years ago in my own practice.

Forestus gives a case that returned periodically every third day like an intermittent fever. The patient was a girl nine years of age, and at these times was suddenly attacked with great terror, a constriction of both the upper and lower belly, with urgent difficulty of breathing. Her eyes continued open, and were permanently turned to one spot; with her hands she forcibly grasped hold of things that she might breathe the more easily. When spoken to, she returned no answer. In the mean time the mind seemed to be collected; she was without sleep; sighed repeatedly; the abdomen was elevated, the thorax still violently constricted and oppressed with laborious respiration and heavy panting: she was incapable of utterance.

This case seems to be founded on a highly irritable or spastic diathesis, and makes some approach towards ecstasis and catalepsy; but with that intolerable weight on the chest which peculiarly marks ephialtes. No exciting cause is stated. A predisposed cause I have already hinted at; and shall briefly advert to the treatment under the ensuing species.

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* Cent. I. Observ. 54.
† Lib. X. Obs. 52.
‡ Class V. Ord. I. Anhelationes Spasmodicæ. Gen I.

SPECIES II.

EPHIALTES NOCTURNUS.

Night-Mare.

PRODUCED DURING SLEEP AND INTERRUPTING IT WITH VIOLENT STRUGGLE AND TREMOR: THE PRESSURE ON THE CHEST SEEMING TO BE THAT OF SOME HIDEOUS MONSTER OR PHANTOM.

The sensation is said to be frequently preceded by some fearful dream, as that of an implacable enemy, known or unknown, in close pursuit of the dreamer, from whose grasp he feels incapable of escaping; or of exposure to some overwhelming danger by sea or land, as that of falling from a steep precipice; or struggling, amidst the ruins of a shipwreck, with rocks and breakers that threaten to dash him to pieces every moment. This I believe is often the case; and particularly when the state of the brain rather than that of the stomach forms the exciting cause.

The attack, however, appears to be sometimes slighter and unaccompanied with such fearful scenes of desperate adventure, or the machinery of hideous and appalling demons or monsters: for Fortis gives the case of a young woman, who, during the paroxysm, supposed herself to be pressed upon by a man who was very far from being disagreeable to her; yet, who awoke from this imaginary concubinage with the usual sense of oppression, the voice and breath interrupted, great anxiety, and the face covered with sweat.* And similar cases according to Craanen, Heurnius, and Forestus have occurred to men as well as to women. While we are told by Pliny that the oppression in his day was ascribed to the sports of fauns, an idea rather pleasing than hateful to the imagination; and that the disease was hence denominated faun-gambols, *ludibria fauni.*

The treatment may be stated in a few words. The mind and body should be kept free from all undue fatigue and commotion; the diet be light, and especially towards the evening: the alvine evacuations should be regular: and perhaps, as Dr. Darwin recommends, a mattrass or harder bed than usual should be used, and an alarum clock be hung up in the room, so that the sleep may be interrupted at short intervals. This will supercede the use of the feeble medicines which were formerly in vogue for the cure of night-mare, as saffron and peony; and will render superfluous all further inquiry into a subject which once exercised the pen of the learned, whether the latter was or was not a specific in the form of an amulet; Manardus contending for the affirmative of its occult

* Sauv. Nosol. Meth. I. 631.

powers;* and a writer of distinguished talents in the Ephemerides of Natural Curiosities, for the negative.† With far better reason, Zacutus Lucitanus recommends the use of aloes:‡ and when the cause is seated in the stomach, there are few medicines that will be found more valuable.

GENUS VI.

STERNALGIA.

Suffocative Breast-pang.

VIOLENT PAIN ABOUT THE STERNUM, EXTENDING TOWARDS THE ARMS: ANXIETY, DIFFICULTY OF BREATHING, AND SENSE OF SUFFOCATION.

This disease is described by modern writers under the names of angina *pectoris*, syncope *anginosa*, asthma *dolorificum*, or *arthriticum*, orthopnœa *cardiaca*, and various others of a similar import, that clearly discover its relationship to the genera which have just passed in review before us. It has characters, however, sufficiently marked to separate it from all of them, and particularly from those under which it has hitherto been ranked as a species or subdivision. And I have in consequence been under the necessity of giving it a new denomination, as well as of assigning it a new place: and hence the above name of STERNALGIA (ΣΤΕΡΝΑΛΓΙΑ); a compound, importing "pain about the sternum," which is a striking pathognomic symptom, if not the leading feature of the affection. It is here it differs essentially from syncope and asthma, neither of which terms, therefore, ought to have been appropriated to it; while it has still less connexion with angina in its common sense of quinsy, although this is the name by which, from the time of Dr. Heberden, it has been most frequently denominated.

The genus offers us two species, possessing characters that sufficiently distinguish them from each other.

1. STERNALGIA AMBULANTIUM. ACUTE BREAST-PANG.
2. ——— CHRONICA. CHRONIC BREAST-PANG.

* Epist. Lib. III. N. 2.
† Dec. III. Ann. I. Obs. 26.
‡ Prax. Hist. Lib. VII. Obs. 19.

SPECIES I.

STERNALGIA AMBULANTIUM.

Acute Breast-pang.

SUPERVENING SUDDENLY DURING EXERCISE; WITH TENDENCY TO SYNCOPE: RELIEVED BY REST.

It is singular that there is no description which will fairly apply to this genus under either of its species in any of the writings of the Greek, Roman, or Arabian authors that have descended to us. Some few passages have been quoted as possibly referring to it; but on examination they will be found too general for the purpose, or evidently intended for some other affection. And hence, considering the minuteness with which many of these writers have followed up all the morbid affections of the human frame, and the accuracy with which they have described them, the most reasonable conclusion is, that, like rickets and several other diseases, it was not known to them, or, in other words, was not in existence.

The first glances at it which we are any where capable of tracing, are to be met with occasionally in the works of Morgagni,* and somewhat more distinctly in the *Consultationes Medicæ* of Hoffman. Dr. Letherland has followed up the inquiry with a curious spirit of research in the Edinburgh Medical Commentaries,† and has quoted a passage from the works of Poter, which renders it highly probable that this writer was well acquainted with, at least, the first species of the genus, and was aware of its being often fatal. Poter's description of the disease is as follows: "Respirandi difficultas quæ per intervalla deambulantibus incidit;—sic ut plurimum derepentè moriuntur."‡ But it is to the late Dr. Heberden that we are indebted for the first, full, and perspicuous account of sternalgia, or, as he calls it, angina *pectoris*, and for having fixed the public eye of the profession upon its peculiar nature. His observations are given at considerable length in the second and third volumes of the Medical Transactions of the College.

It is, however, very singular, that, after having paid so much attention to the subject as in these remarks he appears to have done, in his very elegant and valuable *Commentarii de Morborum Historiâ*, written many years subsequently, and at the advanced age of seventy-two, he should have suppressed all account of this disease; and restored the term angina, in his use of it, to the common but more literal meaning of quinsy or sore throat.

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* See especially Epist. XXIII. Art. 8

† Vol. III. p. 180.

‡ Poterii Op. Cent. 3. N. 22.

Dr. Cullen has not noticed the complaint either in his Nosology or in his First Lines; but he has entered it, with the unsatisfactory name of angina *pectoris* in his "Catalogue of Omitted Diseases."*

It has, however, been minutely described and well illustrated, both historically and practically, by many modern writers of established reputation, as Dr. Fothergill, Dr. Duncan, Dr. Percival, Dr. Darwin, Dr. Macbride, Dr. Hamilton, Dr. Haygarth, and Dr. Parry, most of whom have accompanied their descriptions with a speculative inquiry into the causes of the complaint.

Sternalgia rarely attacks the young, or those who are under five-and-forty or fifty years of age. Persons with short necks, inclined to corpulency, or of a gouty temperament, and especially when indulging a sedative life, are peculiarly predisposed to it. The form it first assumes is commonly that of the present species, by far the most severe, and, as Poter correctly observes, the most frequently fatal: for when the constitution has been for some time habituated to the paroxysms, though it often becomes greatly debilitated by them, and the paroxysms themselves increase in duration, it passes through the attack with less violence and immediate danger.

The first assault is usually felt while the patient is walking, and especially if he happen to be walking soon after eating, or during the process of digestion. He complains of a new and painful sensation in his breast, spreading up to his arms. At first, perhaps, this extends no farther than to the insertion of the deltoid muscle, and more commonly on the left side than on the right; but it soon winds its way to the elbow, wrist, and fingers' ends. In this incipient state he sometimes loses the pain suddenly and entirely by merely standing still. Yet it rarely continues more than from half an hour to an hour, even under its most severe assault, and where it proves fatal.

Whatever exercise the patient is engaged in when the paroxysm attacks him, he feels that a perseverance in it would produce a total suspension of living power: and hence if he be walking, and especially against the wind, he turns from the wind and stands still; when, if the complaint be slight, and in its infancy, it soon vanishes.

In one instance, a patient thus attacked, and who was distinguished for great firmness of mind, had the resolution to continue walking, and found the pain go off after it had affected him from five to ten minutes.† If by a like degree of courageous effort, the patient, in struggling for breath, is able to overcome the constriction, he will continue able through the remainder of the fit to make a deep inspiration, though accompanied perhaps with sighing and some difficulty of expiring his breath. In other instances, however, an equal degree of firmness has been exerted in vain. In most cases,

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* "Catalogus morborum à nobis omissorum, quos omississe fortassis non oportebat."

† Parry, Treatise on Angina Pectoris.

the pulse, during this contest, varies but little, yet it is sometimes quickened, and sometimes intermits; while, in a few instances, the heart palpitates considerably, though less so than in the chronic species.

A habit of return is soon induced after a few fits have paved the way; and when this is effected, the action of walking is not necessary for its production, for it will sometimes be brought on by the most trivial circumstances, as coughing, swallowing, going to stool, or a slight disturbance of the mind. And, in this case, the first species becomes converted into the second. "One," says Dr. Heberden, "has told me that this complaint was greatest in winter; another, that it was aggravated by warm weather; in the rest the seasons were not suspected of making any difference."* The pulse is not often affected in any considerable degree; being, for the most part, only a little quickened, and seldom exceeding eighty strokes in a minute; in one instance, even where the semilunar valves of the heart were afterwards found ossified, and the ossification had extended to the aorta itself, the pulse, though small, never exhibited irregularity.† Yet, in a few instances, I have found it not only irregular but intermittent; and intermittent for some weeks after the paroxysm had ceased to return.

The cause is very obscure, and the more so as the disease has often been found in persons labouring under different sorts of structural derangement about the heart, or in one or more of the organs of respiration, to which it has been ascribed, as soon as such derangements have been discovered; while, in other cases, nothing of the kind seems to have existed. Thus the cartilaginous portions of the ribs have sometimes appeared ossified on examination after death; sometimes the semilunar valves of the heart; and sometimes the coronary arteries; and hence Dr. Wall has ascribed the disease to the first or second of these morbid changes,‡ and Dr. Parry to the third.§ Dr. Haygarth, on one occasion, found the mediastinum in a state of suppurative inflammation, and has hence regarded this as the cause;‖ while, as the pericardium has sometimes evinced concretions of blood, Dr. Hooper, and others, have referred the disease to this affection.¶ Dr. Hosack conceives it to be an effect of plethora;** Dr. Darwin, of asthma, producing a cramp of a peculiar kind in the diaphragm, or the other muscles of respiration; while a very large number of pathologists, among whom may be mention-

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* Medical Transactions, Vol. II. p. 61.

† Id. Letter from Dr. Wall, Vol. III. p. 16.

‡ Medical Transactions, Vol. III. Art. II.

§ Treatise on the Syncope Anginosa, commonly called Angina Pectoris.

‖ Medical Transactions, Vol. III. Art. VI.

¶ Mem. of the Med. Soc. of Lond. Vol. I. 19, 21.

** Americ. Med. and Phil. Regist. Vol. II. p. 366.

ed Elsner,* Benger,† Dr. Butter,‡ and Dr. Macqueen,§ have endeavoured to account for it as a particular species of gout: and hence Dr. Berger attacked it with gum guiacum, which, in his paper upon this subject in the Copenhagen Transactions, he asserts to have been particularly serviceable. Dr. Latham, has, in various instances, found it in persons, who, possessed of sound chests, and apparently untainted constitutions,‖ were affected with enlargements of the abdominal viscera, or other diseases seated in these organs.

That there is a violent and painful constriction of some of the muscles about the sternum during the existence of the paroxysm, and that respiration is hence greatly impeded, is unquestionable; and that many of the above misformations of structure, or constitutional habits, may occasion a predisposition to sternalgia, is highly probable; but they give us little or no information concerning the cause that immediately produces it; while it is by no means unlikely that several of these morbid changes, thus brought forward as causes, are themselves only effects of so laborious and perilous a struggle. And hence we cannot, I am afraid, in our present defective knowledge of the physiology of the disease, do more than adopt the modest opinion of Dr. Bergius and Dr. Heberden, and regard it as dependant upon a cause that has not yet been traced out, but which does not seem to originate necessarily in any structural derangement of the organs affected. Dr. Heberden, in a letter to his friend Dr. Percival, with whom he differed upon this subject, gives a very instructive and interesting account of the dissection of a patient who had fallen a victim to the disease, though it was complicated with other affections. "The dissection," says he, "of this sufferer by the agina *pectoris*, as well as that of a few others which I have heard of, teaches us that the disease is neither owing to inflammation, nor to any malconformation of the parts. We must not, therefore, seek for the cure amongst the means which lower the vis vitæ; and we need not despair of finding it elsewhere. But we should not expect to find it very soon when we consider how little success has attended all our searches after a remedy for the gout, and for some other distempers with whose nature we have had, for a thousand years, such abundant means of being acquainted."¶

The variable state of the pulse, and the occasional palpitation of the heart, is best accounted for by supposing some such structural disease as we have just seen occasionally exists there. Yet, even these symptoms may depend upon the habit or idiosyncrasy, and ap-

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* Abhandlung üeber die Brustbränne. Königsburg.
† See Algem. Dentsche, Bibl. XXXVI. 125.
‡ Treatise on the disease commonly called Angina Pectoris. Lond. 1791.
§ Lond. Med. Journ. Vol. V.
‖ Medical Transactions, Vol. IV. Art. XVI.
¶ Edin. Med. Comm. Vol. III. p. 180.

pear to have occurred, in a few instances, in which dissection has discovered no such manifest local cause. So far as I have witnessed the disease, it has commenced in the respiratory muscles with a suffocative struggle, and tense constrictive pain: and it has not been till a minute or two afterwards, and where the spastic action has extended in different directions, that the pulse has varied, or palpitation ensued: as though the primary seat of disease was in these muscles, and the heart was only affected secondarily.

Where the real nature of a disease is thus doubtful, and its causes thus obscure or variable, its best mode of treatment must be equally uncertain; though I willingly join with Dr. Heberden in thinking that we ought not to despair of finding a cure, I am afraid we have not found it yet.

Where the temperament is plethoric, or the heart is evidently implicated in the affection, bleeding will often afford some relief. But in the simplest cases of the complaint, where the pulse is little disturbed, and the heart without palpitation, the use of the lancet has proved injurious rather than beneficial: and purging has been of as little avail. Antispasmodics and cordials, and especially wine, palliate the symptoms for a few minutes, but afterwards lose their virtue.

The mode of treatment which I have found most successful consists in putting the patient immediately in an inclined, rather than a recumbent position, with his head raised high. He should instantly take an emetic of whatever may be given most expeditiously, though the antimonial preparations form the best medicine for this purpose, as producing a longer action. As soon as the patient rejects, he may be allowed a little warm water, though this should be administered to him sparingly. The diaphoresis hereby usually induced should be assisted by a moderate warmth of bed-clothes, and particularly by placing the patient between the blankets; and if the constrictive pain or difficulty of respiration still outlast the sickness, opium intermixed with ether, camphor, or other diffusible antispasmodics, should be employed pretty freely. And I may here observe as a general rule, that, where the common forms of opium, as the extract, wine, or tincture, are found to affect the head, the Lancashire or Cheshire preparation of it, known by the name of *Black Drop*, which is a solution of this drug in verjuice, with, apparently, some portion of rectified spirit, and, certainly, a liberal combination of aromatics, seems to have less tendency to excite nausea and head-ache afterwards; and, from its being nearly doule the strength of the ordinary laudanum, may be used in a much smaller quantity.

But it is in the intervals of the fits that medical skill and ingenuity are likely to be most efficacious. If we find the complaint connected, as it often is, with a morbid diathesis of any kind, as that of gout, with the sudden suppression of any habitual discharge, as that of the hemorrhoidal vessels, or a chronic affection of any other organ, as the heart, the stomach, or the liver, our attention must be

immediately directed to what may thus prove a predisposing cause, which we must endeavour to palliate or remove, according to the nature of the cause we may be fortunate enough to detect. The bowels, in the mean time, must be kept gently open, and a freedom from relapse be secured at night for a week or a fortnight by an opiate pill, or the extract of henbane, which last, in one or two instances, I have found of important service.

As the disease is greatly dependant upon a morbid mobility and weakness of the muscular fibres, either general or local, a tonic course of medicine and regimen should be instantly commenced, and unswervingly persevered in. The diet should be light; all flatulent foods and drinks be cautiously avoided; the hours be early, and the exercise indulged in be of the gentlest kind.

Arsenic, in small doses, is said to have been tried with advantage;* but I know nothing of its effects from my own practice; and should prefer the oxides of many other metals, and particularly those of bismuth, copper, and iron, as more likely to afford a permanent and radical cure. Sir Gilbert Blane has briefly noted a case, in which the disease yielded to arsenic in combination with digitalis and mercury.†

When the complaint is strictly idiopathic and uncombined, it has often been found to give way to some local irritation or vicarious drain. A sudden flow of blood from the anus has completely removed it. An ichorous or serous discharge from the same organ has proved equally successful: as has also an obstinate gleet. And it is hence not to be wondered at, that setons or issues should have been productive of equal service. The latter are to be preferred as the least troublesome; one should be opened in each thigh, and each incision should be large enough to contain two peas; which it would be better at first to make of the mezereon bark, as already recommended for the same purpose in asthma.

I have been informed that some preparation of the prunus *Laurocerasus*, given during the paroxysm, has proved rapidly successful; and from its power of augmenting action while it diminishes irritability, it is possible the information is correct: yet without a high degree of skill and circumspection, so potent and rapid a poison must inevitably become a remedy far worse than the disease itself. The remedial or poisonous property is probably the prussic acid which this plant is now well known to contain; as well as the blossom of peach-trees, the oil of bitter almonds, and other vegetables of the same smell. And hence, for the sake of greater accuracy, it would be better to employ the prussic acid of the chemist in its simpler and more concentrated state.

* Alexander, Med. Com. Edinb. Vol. V. p. 99.
† Medico Chir. Trans. Vol. IV. p. 136.

SPECIES II.

STERNALGIA CHRONICA.

Chronic Breast-pang.

THE PAROXYSMS LESS VIOLENT BUT OF LONGER CONTINUANCE: RECURRING FREQUENTLY WITH GREAT PALPITATION ON THE HEART, EXCITED BY SLIGHT, AND OFTEN UNKNOWN CAUSES, AND NOT RELIEVED BY REST.

From the observations which have been thrown out at some length in treating of ephialtes and asthma, it is not to be wondered at, that sternalgia should in many habits where it has once taken a hold, be peculiarly disposed to recur when the body is recumbent, and particularly during sleep: nor even that, in some idyosyncrasies, it should, like the two complaints just alluded to, often originate in such a state of body.

If, however, the first attacks do not prove fatal, the disease is often apt to become chronic; and to exhibit the symptoms that characterise the present species. The attack is now not only more easily brought on, but requires a longer period of time for its removal. Rest, even if it commence during exercise, has little or no effect, and the paroxysm has at times been protracted not only for some hours, but even for several days, without remission, and occasionally with a considerable degree of danger through the whole period. Yet it has occasionally continued to harass and weaken the constitution, without actually destroying it, for twenty years; and, in a few instances, has been known to cease spontaneously. In this species of the disease, we meet with far more instances of palpitation of the heart and irregular pulse than in the preceding: and not unfrequently these catenating symptoms become more manifestand distressing as the disease becomes more inveterate: as though the morbid state of the heart or its appendages were a result of sternalgia, instead of sternalgia being a result of the former. In Sir Gilbert Blane's valuable Tables of Medical Cases occurring in his private practice, as contradistinguished from the diary of his public duty as physician to St. Thomas's Hospital, under the head of "Palpitation of the heart and Angina Pectoris," we have the following remark: "in one of these cases there was an extreme distress of breathing for five years, and the pulse fluctuated from twenty to thirty-two, never falling below the former, nor exceeding the latter. Nothing gave material relief. Leave was not obtained to open the body after death."* Dr. Fothergill in like manner asserts, not only that the pulse in his practice has been irregular and intermitting during the exacerbations, but that it has continued irregular and even intermittent when the patient has been free from pain and at rest.

* Med. Chir. Trans. Vol. IV. p. 136.

Of the medical treatment and regimen I have already spoken under the preceding species.

GENUS VII.

PLEURALGIA.

Pain in the Side.

PUNGENT PAIN IN THE SIDE; DIFFICULTY OF BREATHING; WITHOUT FEVER OR INFLAMMATION.

The last genus of diseases which occurs under the present order, is that which has been usually denominated pleurodyne, for which pleuralgia is here adopted in its stead for the sake of simplicity. Both terms import pain or ache in the side; but as *algia* is a more common medical termination than *odyne*, and one alone is sufficient, a preference has been given to the former. On a nice and critical examination it would not be difficult to point out a shade of difference between αλγος and οδυνη, but no such critical distinction has been ever attended to by professional writers, and, as terminations to medical compounds, they are used convertibly, or as direct synonyms.*

The difficulty of breathing noticed in the generic definition depends altogether upon the acute ache produced by every attempt to inflate the lungs; and though negative characters ought to be avoided as much as possible, both in generic and specific definitions, it is necessary in the present instance to add, "without fever or inflammation;" since this is the chief feature by which pleuralgia, or "stitch in the pleura," is distinguished from "pleuritis, or inflammation of the pleura."

Pleuralgia, or pleurodyne, is no more to be found in Dr. Cullen's Nosology than sternalgia. Pain in the side is, in his opinion, never any thing more than a mere symptom of some other complaint, most commonly rheumatism; and the example which Dr. Cullen has thus set has been followed by most of the later writers of our own country. There are two species, however, that have a fair claim to be regarded as strictly idiopathic. They do not often constitute alarming diseases, but, so long as they continue, are peculiarly distressing; while the latter is often of long duration, and demands a considerable range of medical treatment.

Sauvages, therefore, is fully justified in forming a distinct genus of the complaints before us; and Macbride is more to be commend-

* See the Author's Preliminary Dissertation to his Nosology.

ed in following his example than Cullen in departing from it. The two species are as follow:

1. PLEURALGIA ACUTA. STITCH.
2. ——————— CHRONICA. CHRONIC PAIN IN THE SIDE.

SPECIES I.

PLEURALGIA ACUTA.

Stitch.

PAIN SUDDEN AND TEMPORARY: SUPERVENING ON MUSCULAR EXERCISE: RELIEVED BY PRESSURE.

This species is found most frequent among boys who are engaged in any violent exertion, and particularly in hard running. It is produced by too great and sudden a distention of the fine blood-vessels of the pleura from undue propulsion of the blood, at an age in which these delicate vessels readily give way, and become overloaded.

It is hence relieved by a handkerchief, or any other tight bandage, which has the double advantage of supporting the vessels, and of diminishing the current of blood by its pressure. In like manner it gradually subsides on rest or even slackening the pace; for the overstretched vessels, no longer urged by an inordinate propulsion, soon return to their proper diameter by their proper elasticity. Where this is not the case, bleeding and other evacuants are instantly necessary; together with warm relaxing liniments and anodyne fomentations.

It is from this forcible distention of the minute vessels of the pleura that Van Swieten, Sauvages, and Macbride distinguish this species by the name of pleurodyne à spasmate; thus making a distinction between spasma and spasmus; and understanding, by the former, that voluntary stretching or straining which takes place in any vehement exertion, contraction, or extension of a muscle, as in striving, bearing heavy burdens, or running. In the language of M. de Sauvages "Spasma non est spasmus, sed distractio, divulsio, qualis accidere solet à vehementi musculi nisû, contractione, extensione; ut inter luctandum, onera gestanda, currendum."*

This species is occasionally met with as a symptom in flatulence, hysteria, and hypochondrias: in all these cases, however, though the disease or symptoms are the same, the exciting cause is very different. There is here, evidently, a nervous or irritable temperament, and a tendency to spastic action; and the pleura, and consequently the delicate vessels of the pleura, are spastically and in-

* Nosol. Method. Cl. V. Ord. II. Gen. XI.

voluntarily contracted; so that the blood-vessels are forcibly diminished instead of being forcibly enlarged in their diameter; and the acute pain proceeds from an urgent pressure of the ordinary current of blood through a contracted channel, instead of from an urgent pressure of an accumulated current of blood through a channel distended to its utmost stretch.

SPECIES II.

PLEURALGIA CHRONICA.

Chronic pain in the Side.

PAIN PERMANENT: AUGMENTED BY PRESSURE: INABILITY OF LYING ON THE SIDE AFFECTED.

This species is more diffused than the first, and accompanied with a considerable degree of irritation; whence pressure, instead of diminishing, augments the pain. The cause is therefore of a different kind from any of those already noticed, and is, perhaps, most frequently to be found in adhesions of the folds of the pleura to each other, or to the intercostal muscles, or, a thickening in some part of its extent, whereby the play of the spiratory organs is impeded, and a state of perpetual irritation, or a perpetual tendency to irritation, is kept up.

This species has also often been produced by a fractured rib, or some other lesion of the chest; or by some internal malformation, or other structural disease in the organs of the same cavity. Dr. Perceval, in a note upon this species appended to the volume of Nosology, refers to a case which once occurred to him, of pain in the left side acute and obstinate, that baffled all remedies, local and general; and which was at length found to have originated from an aneurism of the aorta.

Chronic pleuralgia may also follow from an inflammation of the pleura; or from transferred gout or rheumatism. It is peculiarly apt to take place under every disease, which, by lowering the tone of the system, renders it generally irritable and subject to irregularity of action; as is the case in worms, syphilis, and phthisis. The opposite extreme of plethora has, moreover, not unfrequently been found to produce it by the permanent stimulus of an excess in the circulating fluid; in consequence of which the minute blood-vessels of the pleura are kept constantly upon the stretch, in the same manner as we have already seen they are transiently distended under the former species.

Most of these, however, may be regarded as mere symptomatic affections. Among the genuine idiopathic cases may be mentioned, in the first place, those produced by external pressure, as habitually forcing the chest, in writing, against the hard edge of a desk; or,

which still more frequently occurs, and is productive of far severer effects, by the absurd though fashionable use of tight stays, which, while they undermine the health, generally coop up and distort the chest into a shape equally ungraceful and unnatural. This barbarous custom cannot be too strongly inveighed against: for though the imprisoned young female may, by dint of habit, and where little exercise or exertion is required, be able to obtain a sort of triumph over the primary mischief of adhesions hereby produced; yet may she pave the way for an obstinate cough and phthisis; and should she escape these, she will still have other inconveniences to suffer as soon as she reaches a state of pregnancy.

That adhesions may take place without inflammation, and consequently the cause we are now contemplating occur without pleuritis, is clear from what is every day occurring in other organs.

If a boy, subject to an inguinal rupture, wear a truss that sits with tolerable force and precision, a radical cure, the result of adhesion, is often obtained in a few years. And hence pressure, in the present day, has become a powerful and extensive engine in the hands of the surgeon: and bids fair, like many other powers in nature which are highly mischievous when misdirected or left to themselves, to be of great value and importance under a skilful control.

In attempting either to cure or to palliate the present species of pleuralgia, we must direct our eye as nearly as possible to its cause. If the affection be symptomatic, we must combat the original disease. If idiopathic, bleeding from the arm will generally be found requisite, and freely, if we suspect plethora; but locally by cupping or leeches, if it be from the mischievous habit of dress we have just reprobated, and the constitution, as is mostly the case, be relaxed and delicate. Here also dry cupping has been frequently found serviceable. Under all circumstances, a loose dress should be insisted upon. Blistering will often afford relief, and the discharge should be rendered permanent; but a seton or an issue will generally succeed better than a blister. Electricity by drawing sparks has also proved frequently of use. Quiet rather than exercise is demanded, and the ablest course of internal medicines will be that which is best calculated to take off irritating and irregular action, as bark, valerian, snake root, conium, and the various preparations of the hop. The pain has occasionally yielded to the sudden appearance of some cutaneous eruption,* a remote abscess,† a critical evacuation from the bowels, the skin,‡ or the sanguiferous system,§ or a smart fit of the gout.‖

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* Huxham, I. p. 200.
† De Haen, Rat. Med. Contin. II.
‡ Krebs, Medic. Beobachtungen, Band. II. p. 32.
§ Horst. Opp. Vol. III. p. 51.—Schenck, Obs. Lib. II. N. 100.
‖ Eph. Nat. Cur. Dec. III. Ann. III. Obs. 16.

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