A manual for students who are preparing for examination at Apothecaries' Hall / John Steggall.

A

MANUAL FOR STUDENTS

WHO ARE

PREPARING FOR EXAMINATION

AT

APOTHECARIES' HALL.

BY JOHN STEGGALL, M.D., &c.

FIFTH EDITION,

WITH ADDITIONS AND CONSIDERABLE IMPROVEMENTS.

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TO

JONATHAN PEREIRA, ESQ. F.L.S.

&c. &c.

LECTURER ON CHEMISTRY, MATERIA MEDICA,
AND MEDICAL BOTANY,

THIS PUBLICATION,

FOR THE USE OF STUDENTS PREPARING FOR EXAMINATION
AT APOTHECARIES' HALL,

IS DEDICATED,

BY HIS TRULY OBLIGED FRIEND,

JOHN STEGGALL.

~~5, Smithfield Bars.~~ 9, Ely Place, Holborn.

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APOTHECARIES' HALL.

Regulations to be observed by Students whose Attendance on Lectures commenced before January 1, 1829.

The Court of Examiners chosen and appointed by the master, wardens, and assistants, of the Society of Apothecaries, of the city of London, in pursuance of a certain Act of Parliament, "For better Regulating the Practice of Apothecaries throughout England and Wales," passed in the 55th year of the reign of his Majesty King George the Third, apprise all persons whom it may concern:

That every candidate for a certificate to practise as an apothecary will be required to possess a competent knowledge of the Latin language; and, in compliance with the 14th and 15th sections of the said Act, to produce testimonials of having served an apprenticeship of not less than five years to an apothecary, of having attained the full age of twenty-one years, and of good moral conduct.

Candidates will also be required to produce testimonials of attendance on lectures and medical practice, agreeably to regulations at different times published by the Court.

Those whose attendance on lectures commenced prior to the 1st of February, 1828, will be admitted to examination after an attendance on

One course of lectures on chemistry:
One course of lectures on materia medica:
Two courses of lectures on anatomy and physiology:
Two courses of lectures on the theory and practice of medicine:
And six months' physician's practice at a hospital, or nine months at a dispensary.

Those who began to attend lectures subsequently to the 1st of February, 1828, and previously to the 1st of October in the same year, will only be admitted to examination after the following course of study, viz. an attendance on

One course of lectures on chemistry:
One course of lectures on materia medica and botany:
Two courses of lectures on anatomy and physiology:
Two courses of lectures on the theory and practice of medicine:
to be attended subsequently to the lectures on chemistry and materia medica, and to one course at least of anatomy:

And six months, at least, physician's practice at a hospital, or nine months at a dispensary; such attendance to commence subsequently to the termination of the first course of lectures on the principles and practice of medicine.

Those whose attendance on lectures commenced on or after the 1st of October, 1828, and previously to the 1st of January, 1829, will be required to produce testimonials of having attended

Two courses of lectures on chemistry:

Two courses of lectures on materia medica and botany:

Two courses of lectures on anatomy and physiology:

Two courses of anatomical demonstrations:

Two courses of lectures on the theory and practice of medicine: to be attended subsequently to one course of lectures on chemistry, materia medica, and anatomy:

And six months, at least, the physician's practice at a hospital (containing not less than sixty beds,) or nine months at a dispensary: such attendance to commence subsequently to the termination of the first course of lectures on the principles and practice of medicine.

Students are earnestly recommended in addition to the above-mentioned lectures to attend clinical lectures, and also lectures on midwifery and the diseases of women and children, on the latter of which subjects, as an important part of medical practice, they will be examined.

The examination of the candidate will be as follows:

1. In translating grammatically parts of the Pharmacopœia Londinensis, and physicians' prescriptions; and after the 1st of January, 1831, candidates will be required to translate portions of the following medical Latin authors, viz. Celsus de Medicinâ, or Gregory Conspectus Medicinæ Theoreticæ.
2. In chemistry.
3. In materia medica.
4. In botany.
5. In anatomy and physiology.
6. In the practice of medicine.

Regulations to be observed by Students whose Attendance on Lectures commenced since January 1, 1829.

That every candidate for a certificate to practise as an apothecary, will be required to possess a competent knowledge of the Latin language, and in compliance with the 14th and 15th sections of the said Act, to produce testimonials of having served an ap-

prenticeship of not less than five years to an apothecary, of having attained the full age of twenty-one years, and of good moral conduct: and also testimonials of having attended

Two courses of lectures on chemistry.

Two courses of lectures on materia medica, therapeutics, and botany:

Two courses of lectures on anatomy and physiology:

Two courses of anatomical demonstrations:

Two courses of lectures on the theory and practice of medicine: to be attended subsequently to one course of lectures on chemistry, materia medica, and anatomy:

Two courses of lectures on midwifery and the diseases of women and children:

And nine months, at least, the physician's practice at a hospital (containing not less than sixty beds,) or twelve months at a dispensary: such attendance to commence subsequently to the termination of the first course of lectures on the principles and practice of medicine.

Students are, moreover, earnestly recommended to attend clinical lectures, and diligently to avail themselves of instruction in morbid anatomy and forensic medicine.

The examination of the candidate will be as follows:

1. In translating grammatically parts of the Pharmacopœia Londinensis, and physicians' prescriptions; and, after the 1st of January, 1831, candidates will be required to translate portions of the following medical Latin authors, viz. Celsus de Medicinâ, or Gregory Conspectus Medicinæ Theoreticæ.*

2. In chemistry.

3. In materia medica and therapeutics.

4. In botany.

5. In anatomy and physiology.

6. In the practice of medicine.

N.B. Physicians' pupils, who intend to present themselves for examination, must appear personally at the beadle's office, in this Hall, and bring with them the tickets, authorizing their attendance on such practice, as the commencement thereof will be dated from the time of such personal appearance.

No testimonial of attendance on lectures on the principles and practice of medicine, delivered in London, or within seven miles thereof, will render a candidate eligible for examination, unless such lectures were given, and the testimonial is signed by, a fellow,

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* For the first twelve months the translations from these authors will be confined to the first and third books of the former, and to the first ten chapters of the latter.

candidate, or licentiate, of the Royal College of Physicians of London.

NOTICE.

Every person intending to qualify himself under these regulations, to practise as an apothecary, may obtain at the beadle's office at this Hall, (where attendance is given every day except Sunday, from nine until two o'clock,) a printed form of certificate of all the lectures candidates are required to attend, and also of the physician's practice. The court request the blanks may be filled up when signed by the respective lecturers and physicians, whose lectures or practice the student has attended.

Students are enjoined to observe, that in future, these certificates so filled up will be required from candidates for examination, and that no other form of testimonials of attendance on lectures and medical practice will be admitted; except such certificates as have heretofore been received, if the same were obtained prior to the 1st of February, 1828: or such as bear the seal of a university or college, and the signature of the officer attached to such university or college, whose duty it is to sign certificates of attendance on the lectures given therein.

Every person offering himself for examination must give notice in writing, to the clerk of the society, on or before the Monday previously to the day of examination; and must also at the same time deposit all the required testimonials at the office of the beadle.

The Court will meet in the Hall every Thursday, where candidates are required to attend at half-past four o'clock.

By order of the Court,

JOHN WATSON, Secretary.

London; September 1, 1829.

For information relative to these regulations, medical students are referrred to Mr. Watson, who may be seen at his residence, 43, Berners' street, between the hours of nine and ten o'clock every morning (Sunday excepted); and for information on all other subjects connected with the "Act for better regulating the Practice of Apothecaries," application is to be made to Mr. Edmund Bacot, clerk of the society, who attends at the Hall every Tuesday and Thursday from one to three o'clock.

It is expressly ordered by the Court of Examiners, that no gratuity be received by any officer from any person applying for information relative to the business of this Court.

Regulations to be observed by Students, whose attendance on Lectures shall commence on or after the 1st of January, 1831.*

EVERY candidate for a certificate to practise as an Apothecary, will be required to produce testimonials of having served an apprenticeship† of not less than five years to an Apothecary:

Of having attained the full age‡ of twenty-one years:

Of good moral conduct:§ and,

Of having devoted at least two years to an attendance on lectures and Hospital practice.

The candidate must have attended the following courses of lectures:‖

CHEMISTRY:	Two courses—each course consisting of not less than forty-five lectures.
MATERIA MEDICA and THERAPEUTICS:	Two courses—each course consisting of not less than forty-five lectures.
ANATOMY and PHYSIOLOGY:	Two courses: Of the same extent as required by the Royal College of Surgeons, of London.
ANATOMICAL DEMONSTRATIONS:	Two courses: Of the same extent as required by the Royal College of Surgeons, of London.
PRINCIPLES and PRACTICE of MEDICINE:	Two courses—each course consisting of not less than forty-five lectures, to be attended subsequently to the termination of the first course of lectures on chemistry, materia medica, and anatomy and physiology.

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* Students who are at present pursuing their medical studies, and those who may begin to attend lectures at the commencement of the next medical session, (viz. October,) will be received as candidates for examination by complying with the regulations heretofore published.

† The apprenticeship must have been served with a person legally qualified to practise as an Apothecary, either by having been in practice prior to, or on the 1st of August, 1815, or by having received a certificate of his qualification from the Court of Examiners.

‡ As evidence of age, a copy of the baptismal register will be required in every case where it can possibly be procured.

§ A testimonial of moral character from the gentleman to whom the candidate has been an apprentice, will always be more satisfactory than from any other person.

‖ The lectures required in each course respectively, must be given on separate days.

BOTANY:	One course.	
MIDWIFERY: and the DISEASES of WOMEN and CHILDREN:	Two Courses:	To be attended during the second year.
FORENSIC MEDICINE:	One Course:	

Students are moreover recommended diligently to avail themselves of instruction in morbid anatomy.

The candidate must also have attended for twelve months, at least, the physician's practice at an hospital containing not less than sixty beds, and where a course of clinical lectures is given; or for fifteen months at an hospital wherein clinical lectures are not given; or for fifteen months at a dispensary* connected with some medical school recognized by the court. The whole of such attendance to be subsequent to the first year of attendance on lectures.

The testimonials of attendance on lectures, and hospital practice, must be given on a printed form, with which students may be supplied, on application, at the under-mentioned places.

In London, at the Beadle's office, at this Hall.

In Edinburgh, at Messrs. Mac Lachlan and Stewart's, booksellers.

In Dublin, at Messrs. Hodges and Smith's, booksellers.

In the provincial towns, where there are medical schools, at the hospital, or from the teacher who keeps the register of the school.

Students are enjoined to observe that no other form of testimonial will be received; and that no attendance on lectures will qualify a candidate for examination, unless the teacher is recognized by the Court.

The teachers in Dublin, Edinburgh, Glasgow, and Aberdeen, recognized by the constituted medical authorities in those places respectively, are recognized by the Court.

REGISTRATION.

A book† is kept at the Hall of the Society for the registration, at stated times, of the names of students, and the lectures, hospitals, or dispensaries they attend.

All students, in London, are required to appear personally, and

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* Certificates of attendance on the physician's practice at dispensaries will continue to be received, until the 1st of January, 1833, from all such as have heretofore been admitted, but after that time the present regulation will be strictly adhered to.

† The book will be opened for the registration of those students whom these regulations affect, on the 1st of February, 1831.

to register the several classes for which they have taken tickets; and those only will be considered to have complied with the regulations of the Court whose names and classes in the register correspond with the testimonials of the teachers.

The book will be open for the registration during the first twenty-one days of the months of February, June, and October, from nine o'clock until two.

The Court also require students at the provincial medical schools to register their names in their own handwriting, and the classes they attend, with one of the teachers* in each respective school, within fourteen days from the commencement of each course of lectures, and those students only will be deemed to have complied with the regulations whose names are so registered.

Each student, at his first registration, will receive the printed form on which he is to obtain the certificates of his teachers.

The examination of the candidate will be as follows:

1. In translating parts of Celsus de Medicinâ, or Gregory Conspectus Medicinæ Theoreticæ, Pharmacopœia Londinensis, and physicians' prescriptions.
2. In chemistry.
3. In materia medica and therapeutics.
4. In botany.
5. In anatomy and physiology.
6. In the practice of medicine.

NOTICE.

Every person offering himself for examination must give notice in writing to the clerk of the Society, on or before the Monday previously to the day of examination, and must also at the same time deposit all the required testimonials at the office of the beadle, where attendance is given every day, except Sunday, from nine until two o'clock.

Candidates will be admitted to examination in the order in which their names stand on the notice paper; and those neglecting to attend agreeably to their notice, will, upon a subsequent application, be placed at the bottom of the list.

By the 22d section of the act of parliament no rejected candidate can be re-admitted to be examined until the expiration of six months from his former examination.

The Court meet in the Hall every Thursday, where candidates are required to attend at half-past four o'clock.

By order of the Court,

JOHN WATSON, Secretary.

Apothecaries' Hall; September 9, 1830.

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* The students will be informed at each school, respectively, of the name of the teacher to whose care the register will be confided.

The Act directs the following sums to be paid for certificates:

For London, and within ten miles thereof, ten guineas.

For all other parts of England and Wales, six guineas.

Persons having paid the latter sum become entitled to practise in London, and within ten miles thereof, by paying four guineas in addition.

For an assistant's certificate, two guineas.

MANUAL

FOR

APOTHECARIES' HALL.

CHEMICAL DECOMPOSITIONS,

&c.

PREPARATIONS.

ACIDUM ACETICUM DILUTUM.

1. Composition of the dry acid:

4 prop. carbon	$4 \times 6 = 24$	50.
3 prop. oxygen	$3 \times 8 = 24$	
2 prop. hydrogen	$2 \times 1 = 2$	

2. Vinegar is generally obtained, in this country, by exciting the acetous fermentation in malt liquors. The theory of the formation of acetic acid is very obscure, but the most satisfactory explanation is the following: Alcohol being composed of a greater proportion of hydrogen and carbon than acetic acid, the oxygen of the atmosphere abstracts from the alcohol sufficient carbon and hydrogen to form carbonic acid and water, so as to leave carbon, oxygen, and hydrogen, in the exact proportion for forming acetic acid. During fermentation, carbon is given out, which, by combining with the oxygen of the atmosphere, forms carbonic acid.

3. Common vinegar contains, besides acetic acid, *water, alcohol, colouring matter, mucilage, aroma, supertartrate of potash,* and, occasionally, some other impurities.

4. In distilling this acid, the first pint is rejected, because it contains alcohol, and the last, containing the impurities, is left in the retort, to prevent empyreuma.

ACIDUM BENZOICUM.

5. Composition:

15 carbon	$15 \times 6 = 90$	120.
3 oxygen	$3 \times 8 = 24$	
6 hydrogen	$6 \times 1 = 6$	

6. Benzoin is composed of *benzoic acid* and *resin.* By the application of a gentle heat, the benzoic acid is sublimed, together with some empyreumatic oil, produced by the decomposition of a portion of the resin. It is then pressed between folds of bibulous paper, to separate the oil, which discolours it, and is again sublimed.

7. The term *balsam* is generally applied to those substances which contain benzoic acid, and resinous matter.

ACIDUM CITRICUM.

8. Composition of the crystallized acid:

4 oxygen	$4 \times 8 = 32$	76.
4 carbon	$4 \times 6 = 24$	
2 hydrogen	$2 \times 1 = 2$	
2 water	$2 \times 9 = 18$	

9. Lemon juice is composed of *citric* acid, *water* and *mucilage;* Chalk of *carbonic acid* and *lime.* On the admixture of these, the citric acid combines with the lime, forming an insoluble

citrate, whilst carbonic acid escapes. The citrate is then washed, to free it from the mucilage. When sulphuric acid is added, a sulphate of lime is formed, and precipitated, whilst the citric acid remains dissolved in the water. An excess of sulphuric acid is used to decompose any mucilage which may remain after washing the citrate.

ACIDUM MURIATICUM.

10. Composition of the dry acid:

1 chlorine	36	37.
1 hydrogen	1	

11. Dried common salt is composed of *chlorine** and *sodium*, water of *oxygen* and *hydrogen*. On admixture, the oxygen of the water of the sulphuric acid combines with the sodium, forming soda, and this, uniting with sulphuric acid, constitutes a sulphate of soda. The chlorine of the salt unites with the hydrogen of the water, forming muriatic acid, in vapour, which is dissolved by the water in the receiver. It is requisite to use Woulfe's apparatus in this process.

ACIDUM NITRICUM.

12. Composition:

1 nitrogen	14	72.
5 oxygen	$8 \times 5 = 40$	
2 water	$2 \times 9 = 18$	

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* *Chlorine* is a gaseous simple elementary body of a greenish yellow colour, capable of supporting combustion. It destroys colours, combines directly with metals, and, with hydrogen, forming muriatic acid gas. It unites with oxygen in four proportions, which are, a *protoxide* of chlorine, containing 1 proportion of oxygen; the *peroxide*, containing 4 oxygen; the *chloric acid*, composed of 1 chlorine and 5 oxygen; and *perchloric acid*, composed of 1 chlorine and 7 oxygen.

13. During this process, sulphuric acid combines with the potash, forming bisulphate of potash, which remains in the retort, whilst the nitric acid rises, and is condensed in the receiver.

14. In making nitric acid, the great proportion of sulphuric acid is added, for three reasons: 1st, To prevent the formation of nitrous acid. 2d, To form a bisulphate of potash, which is more soluble, and easily removed from the retort. 3d, To furnish the quantity of water necessary for producing liquid nitric acid.

15. *Nitrogen* combines with oxygen in 5 proportions, which are, *nitrous oxide* composed of 1 nitrogen and 1 oxygen; this is commonly known as the laughing gas; it supports combustion, and is respirable for a short time, creating great excitement of the system; *nitric oxide* or *nitrous gas*, contains 1 nitrogen and 2 oxygen; *hyponitrous acid* is composed of 1 nitrogen and 3 oxygen; *nitrous acid* contains 1 nitrogen and 4 oxygen; *nitric acid* is composed of 1 nitrogen and 5 oxygen.

ACIDUM SULPHURICUM DILUTUM.

16. Composition of dry sulphuric acid:

1 sulphur	16	40.
3 oxygen	$3 \times 8 = 24$	

Composition of the liquid acid:

Sp. gr. 1·850, 1 water, 49.

17. Sulphuric acid is obtained by burning a mixture of nitrate of potash and sulphur, in large chambers lined with lead. One atom of the sulphur combines with two atoms of oxygen of the air, forming sulphurous acid, which is disengaged; another atom of the sulphur decomposes the nitric acid of the potash, and, uniting with three atoms of its oxygen, forms sulphuric acid; this combining with the potash of the nitrate, forms sulphate of potash, which is left

in the earthen pot. The nitrogen, and two atoms of the oxygen of the acid, form the nitric oxide, or nitrous gas, which, escaping into the air, abstracts from it two atoms of oxygen, and then becomes nitrous acid. Both the sulphurous and nitrous acids are absorbed by the water at the bottom of the chamber. One atom of nitrous acid gives two atoms of oxygen to two atoms of sulphurous acid, converting it into sulphuric acid, becoming itself nitric oxide, which, abstracting oxygen from the air, again forms nitrous acid. When the water is sufficiently acidulated, it is evaporated and boiled, and the sulphuric acid is left. The evolution of heat that takes place in mixing the acid with water, arises from their condensation.

ACIDUM TARTARICUM.

18. Composition of the crystallized acid :

5 oxygen	5 × 8 = 40	75.
2 hydrogen	2 × 1 = 2	
4 carbon	4 × 6 = 24	
1 water	9 = 9	

19. By adding the carbonate of lime to the supertartrate of potash, an insoluble tartrate of lime is formed and precipitated, carbonic acid escapes, and a neutral tartrate of potash is left dissolved in the water. On the addition of sulphuric acid to the precipitate, a sulphate of lime is deposited, and tartaric acid remains in solution.

AMMONIÆ SUBCARBONAS.

20. Composition :

1 ammonia	17	59.
1½ carbonic acid	33	
1 water	9	

21. When muriate of ammonia and chalk are mixed together, a double decomposition takes place: the chlorine of the muriatic acid unites with the calcium, forming chloride of calcium; its hydrogen combines with the oxygen of the lime to form water, which uniting with the disengaged ammonia and carbonic acid, form hydrated sesquicarbonate of ammonia.

22. A portion of the ammonia escaping during the process, leaves a preponderance of the acid.

LIQUOR AMMONIÆ.

23. Composition:

Ammonia and water.

24. The muriatic acid, from its greater affinity, combines with the lime; ammonia is set at liberty, and passes over, held in solution by the water.

25. Ammoniacal gas is evolved during the above process, and is absorbed by the water, making the liquor ammoniæ. This gas is alkaline, extinguishes flame, and destroys animal life. It is rapidly absorbed by water.

26. Its composition is

1 nitrogen		14	17.
3 hydrogen	3 × 1 =	3	

LIQUOR AMMONIÆ ACETATIS.

27. Composition of the dry acetate:

1 acetic acid	50	67.
1 ammonia	17	

28. In this process, the acetic acid unites with the ammonia, forming acetate of ammonia, and carbonic acid escapes.

POTASSA CUM CALCE.

29. Composition:

Potash and lime.

30. It is merely a mechanical mixture.

LIQUOR POTASSÆ.

31. Composition:

Potash and water.

32. Potash is a compound of *oxygen* and the metal *potassium*.

33. In making Liquor Potassæ, the lime attracts the carbonic acid of the subcarbonate, and is precipitated, whilst the pure potash remains in solution.

34. *Potassium* is a metal of a silvery appearance, soft at the ordinary atmospheric temperature, but hard and brittle if cooled down to 32° F. It was discovered by Sir Humphrey Davy, by means of the galvanic battery, and may be obtained in several ways: Gay Lussac and Thenard procured it by heating potash, in a gun-barrel, with iron filings, in which case the oxygen unites with the iron, potassium is sublimed, and collected in a cool part of the apparatus. It has a most powerful affinity for oxygen, and must be kept in a bottle hermetically sealed, or in substances which contain no oxygen, such as naphtha. It decomposes water so rapidly, that combustion takes place, pure potash is formed, and the hydrogen and a portion of potassium take fire. It combines with oxygen in two proportions, forming the protoxide and peroxide. The atomic number of potassium is 40.

POTASSA FUSA.

35. Composition:

1 potassium	40	57.
1 oxygen	8	
1 water	9	

36. In this process, water is expelled by evaporation, and the potash is reduced, by fusion, to a convenient shape.

POTASSÆ ACETAS.

37. Composition of the dry acetate:

1 acetic acid	50	98.
1 potash	48	

38. The acetic acid unites with the potash, forming an acetate of potash, and the carbonic acid escapes.

POTASSÆ CARBONAS.

39. Composition:

2 carbonic acid	2 × 22 = 44	101.
1 potash	= 48	
1 water	= 9	

40. By transmitting carbonic acid through a solution of subcarbonate of potash, the latter becomes fully saturated with the acid, forming a bicarbonate, but known in the pharmacopœia as carbonate of potash. This process must be conducted in Woulfe's apparatus.

POTASSÆ SUBCARBONAS.

41. Composition of the dry salt:

1 potash	48	70.
1 carbonic acid	22	

42. The process in this preparation is intended to separate the greater part of foreign bodies, with which the impure potash may be mixed, and to reduce it to a state of dryness.

POTASSÆ SULPHAS.

43. Composition of the dry salt:

1 potash	48	88.
1 sulphuric acid	40	

44. The salt which remains after the distillation of nitric acid, is a bisulphate of potash. The excess of acid is saturated by the subcarbonate, carbonic acid is evolved, and the result is a neutral sulphate of potash.

POTASSÆ TARTRAS.

45. Composition of the dry salt:

1 potash	48	114.
1 tartaric acid	66	

46. The potash of the subcarbonate saturates the excess of acid in the supertartrate, carbonic acid escapes, and a neutral tartrate of potash is formed.

SODÆ CARBONAS.

47. Composition of the dry salt:

1 soda	32	76.
2 carbonic acid	$22 \times 2 = 44$	

48. Soda is composed of *oxygen* and the metal *sodium*.

49. Sodium is obtained in a similar manner to potassium; it is less fusible, and is heavier. When thrown into water, it oxidizes very rapidly, but no flame is evolved. Its atomic number is 24.

50. The subcarbonate, by this process, is fully saturated with carbonic acid, forming what is denominated carbonate of soda. This salt loses part of its carbonic acid by exposure to the air, and is usually found composed of 1 proportion of bicarbonate and 1 of carbonate, thus making it a sesquicarbonate of soda.

SODÆ SUBCARBONAS.

51. In this process, the foreign bodies contained in the common soda are removed, by filtration, evaporation, and crystallization.

SODÆ SUBCARBONAS EXSICCATA.

52. Composition:

1 carbonic acid	22	54.
1 soda	32	

53. This process is only intended to expel a portion of the water of crystallization.

SODÆ SULPHAS.

54. Composition of the dry salt:

1 sulphuric acid	40	72.
1 soda	32	

It is usually combined with 10 proportions of water.

55. The excess of acid in the sulphate is saturated by the soda of the subcarbonate, a neutral sulphate is formed, and carbonic acid escapes.

SODA TARTARIZATA.

56. Composition:

1 tartrate of potash	114	212.
1 tartrate of soda	98	

57. The soda of the subcarbonate saturates the excess of acid in the supertartrate of potash, and a triple salt is formed of tartrate of potash and soda.

ALUMEN EXSICCATUM.

58. Crystallized alum is composed of

3 sulphate of alumina	$3 \times 58 = 174$	487.
1 ——— potash	88	
25 water	$9 \times 25 = 225$	

59. In making alumen exsiccatum, the water of crystallization is driven off.

CALX.

60. Composition:

1 oxygen	8	28.
1 calcium	20	

61. The heat expels carbonic acid and water from the chalk.

MAGNESIA.

62. Composition:

1 oxygen	8	20.
1 magnesium	12	

63. The heat drives off the carbonic acid, and leaves the magnesia pure.

MAGNESIÆ SUBCARBONAS.

64. Composition:

Magnesia, carbonic acid, and water, or carbonate and hydrate of magnesia.

65. In this process, there is a double decomposition: the sulphuric acid unites with the potash, forming sulphate of potash in solution, and the carbonic combines with the magnesia, which is precipitated.

In this, as in many preparations, it may be observed, that different quantities of water are ordered to dissolve the different salts, and this is rendered necessary by the different degrees of solubility of the substances employed.

ANTIMONII SULPHURETUM PRÆCIPITATUM.

66. Composition:

Oxide of Antimony, sulphur, and sulphuretted hydrogen.

Sulphuret of Antimony is a compound of sulphur and metallic antimony.

67. Antimony combines with oxygen in three proportions, which are the protoxide, deutoxide, and peroxide. The first is the most active, the last two combine with alkalies, forming compounds, called antimonites and antimoniates. The atomic number of antimony is 44.

68. When sulphuret of antimony, potash, and water, are boiled together, the sulphuret is dissolved by the potash, and water is decomposed; the oxygen of the water unites with the antimony, forming protoxide of antimony; its hydrogen combines with the sulphur, forming sulphuretted hydrogen. When sulphuric acid is added, it seizes upon the potash, making sulphate of potash; the protoxide of antimony is then precipitated, together with sulphur and sulphuretted hydrogen, and, at the same time, some sulphuretted hydrogen flies off.

Dr. Turner considers that when sulphuric acid is added, it seizes upon the potash, forming sulphate of potash, and the protoxide and sulphuretted hydrogen are again resolved, by a mutual reaction of their elements, into proto-sulphuret of antimony and water.

ANTIMONIUM TARTARIZATUM.

69. Composition:

1 tartrate of potash		114	284.
1 tartaric acid		66	
2 protoxide of antimony	$52 \times 2 =$	104	

70. Glass of antimony is made by roasting the native sulphuret, by which an oxide of antimony and sulphurous acid are formed; the oxide is then vitrified with undecomposed ore, by exposure to a great heat. It generally contains a little silex.

71. When glass of antimony is boiled with supertartrate of potash, the excess of acid combines with the oxide of antimony, and the resulting salt is a tartrate of potash and antimony, in

solution, which is subsequently evaporated, and the salt is obtained in crystals.

PULVIS ANTIMONIALIS.

72. Composition:

Protoxide of antimony and phosphate of lime.

73. The heat applied drives off the sulphur from the antimony, which attracts oxygen from the atmosphere, and is converted into a protoxide of antimony. The hartshorn becomes a phosphate of lime, in consequence of the destruction of its gelatine.

74. The result is either a mechanical mixture of phosphate of lime and protoxide of antimony, or a subphosphate of lime and antimony. The antimony, however, sometimes becomes a peroxide, which accounts for the uncertainty in the activity of this preparation; the protoxide being very powerful, whilst the peroxide is comparatively inert.

ARGENTI NITRAS.

75. Composition:

1 nitric acid	54	172.
1 oxide of silver	118	

76. The nitric acid first oxidizes and then dissolves the silver, nitrous gas escaping. By fusion, part of the acid, together with the water, is expelled.

There is but one oxide of silver containing one atom of oxygen.

ARSENICUM ALBUM SUBLIMATUM.

77. Composition:

Oxygen and arsenicum.

78. By this process, the arsenious acid is separated from its impurities, which are occasionally chalk, gypsum, &c.

LIQUOR ARSENICALIS.

79. Composition of the arsenical preparation:

Arsenious acid and potash, dissolved in water and coloured by Sp. Lav. c.

80. The metal arsenicum combines with oxygen, in two proportions; arsenious acid contains 2 oxygen, the arsenic acid 3.

81. The oxide of arsenic combining with the potash, forms an arsenite of potash, which is dissolved by the water.

BISMUTHI SUBNITRAS.

82. Composition:

Oxide of bismuth and nitric acid.

83. The nitric acid oxidizes, and then combines with the bismuth, forming a nitrate of bismuth; nitrous gas being given out. On the addition of water, the subnitrate is precipitated.

CUPRUM AMMONIATUM.

84. Composition:

Peroxide of copper, ammonia, and sulphuric acid.

85. During trituration, part of the sulphuric acid contained in the sulphate of copper, unites with the ammonia, and thus sets free the carbonic acid. The result is either a triple compound of sulphate of copper and ammonia, or a mechanical mixture of subsulphate of copper, with sulphate of ammonia.

86. Copper combines with oxygen in two proportions:

The protoxide is composed of

1 copper	64	72.
1 oxygen	8	

The peroxide is composed of

1 copper	64	80.
2 oxygen	2 × 8 = 16	

FERRUM AMMONIATUM.

87. Composition:

Bichloride of iron and muriate of ammonia, or muriatic acid peroxide of iron and ammonia.

88. The muriatic acid unites with the iron, forming a muriate of iron, while the carbonic acid escapes. The muriate of iron volatilizes by heat, and more readily with the muriate of ammonia, with which it unites. The result is either a triple compound of muriate of iron and ammonia, or a mixture of bichloride of iron with muriate of ammonia.

FERRI SUBCARBONAS.

89. Composition:

Peroxide of iron and carbonate of iron.

90. Here there is a double decomposition; the sulphuric acid unites with the soda, forming sulphate of soda, which remains in solution, while the carbonic acid unites with the protoxide of iron, forming with it carbonate of iron. Exposed to the air, the protoxide of iron contained in the carbonate attracts oxygen, forming peroxide of iron, and the carbonic acid is in great part evolved.

FERRI SULPHAS.

91. Composition of the crystallized salt:

1 protoxide of iron	= 36	139.
1 sulphuric acid	= 40	
7 water	9 × 7 = 63	

92. The iron becomes oxidized by the oxygen of the water, and is then dissolved by the acid; during the process, hydrogen gas escapes. Iron combines with two proportions of oxygen, forming the protoxide and peroxide.

FERRUM TARTARIZATUM.

93. Composition:

Tartaric acid, peroxide of iron, and potash.

94. The excess of acid in the supertartrate dissolves the iron which has been oxidized by the air and water, thus forming a tartrate of iron and potash.

LIQUOR FERRI ALKALINI.

95. Composition:

Peroxide of iron and carbonate of potash.

96. The iron is oxidized and dissolved by the nitric acid, forming pernitrate of iron; on adding the subcarbonate of potash, a double decomposition takes place: the peroxide of iron is first precipitated, but subsequently dissolved by the carbonate of potash, part of the nitric acid is evolved, and part combines with a portion of the potash, forming nitrate of potash, in crystals, from which the liquor ferri alkalini is poured off.

TINCTURA FERRI MURIATIS.

97. Composition :

Peroxide of iron, muriatic acid, and spirit.

98. The muriatic acid forms with the iron, muriate of iron, which is dissolved in the spirit.

VINUM FERRI.

99. Composition :

Tartrate of iron and potash, with supertartrate of potash dissolved in spirit.

100. The excess of acid unites with the iron, and a tartrate of iron and potash is formed ; the compound is dissolved by the spirit.

HYDRARGYRUM CUM CRETA.

101. Composition :

Suboxide of mercury and chalk.

102. Part of the mercury is slightly oxidized by the trituration, and mechanically mixed with the chalk.

HYDRARGYRI NITRICO-OXYDUM.

103. Composition :

Peroxide of mercury and nitric acid.

104. The nitric acid first oxidizes, and then dissolves the mercury, forming nitrate of mercury, nitrous gas being given off. By heating it, part of the acid is expelled, and the result is a deutoxide of mercury, mixed with a little subnitrate.

105. Mercury is fluid at the ordinary temperature, and boils at 680° ; it becomes solid at about 40° below zero. It combines with oxygen in two proportions: the protoxide contains 1 oxygen, its atomic number is 208 ; the peroxide has 2 oxygen, and its atomic number is 216.

HYDRARGYRI OXYDUM CINEREUM.

106. The chlorine of the calomel decomposes the water, and unites with its hydrogen to form muriatic acid, which, with the lime, forms muriate of lime. The oxygen of the water oxidizes the mercury, which is precipitated.

HYDRARGYRI OXYDUM RUBRUM.

107. Composition:

1 mercury		200	216.
2 oxygen	$8 \times 2 =$	16	

108. The mercury is oxidized by the oxygen of the atmosphere, assisted by heat.

HYDRARGYRI OXYMURIAS.

109. Composition:

2 chlorine	$36 \times 2 =$	72	272.
1 mercury	$200 =$	200	

110. The sulphuric acid first oxidizes, and then unites with the mercury, forming a bipersulphate of mercury, sulphurous acid gas being given out; upon adding the common salt to the bipersulphate, the oxygen of the latter unites with the sodium, and forms soda, which combines again with the sulphuric acid, and forms sulphate of soda; the chlorine of the salt unites with the mercury, and forms bichloride, or oxymuriate of mercury.

LIQUOR HYDRARGYRI OXYMURIATIS.

111. Composition:

Muriatic acid, peroxide of mercury, and water.

112. It is generally considered that a decomposition takes place in making this solution. Some water is decomposed: its oxygen uniting with the mercury forms peroxide of mercury; its hydrogen combining with the chlorine, forms muriatic acid, which holds the peroxide in solution.

HYDRARGYRUM PRECIPITATUM ALBUM.

113. Composition:

1 peroxide of mercury	= 216	270.
1 muriate of ammonia	= 54	

114. When the muriate of ammonia and corrosive sublimate are dissolved together in water, a portion of the water is decomposed: its oxygen combines with the mercury, forming peroxide of mercury, and its hydrogen forms with the chlorine muriatic acid, which holds in solution the peroxide of mercury; therefore there is a solution of muriate of ammonia, and muriate of mercury. When potash is added, a portion of muriate of potash is formed, carbonic acid escapes, and a submuriate of mercury and ammonia is precipitated.

HYDRARGYRUM PURIFICATUM.

115. By this process, mercury is separated from any foreign substances, being more easily volatilized than any metals with which it may be adulterated.

HYDRARGYRI SUBMURIAS.

116. Composition:

1 chlorine	= 36	236.
1 mercury	= 200	

117. The sulphuric acid first oxidizes, and then unites with the mercury, forming a bipersulphate of mercury; the remaining portion of mercury is then added, and the result is a protosulphate of mercury; when this is rubbed with common salt, the oxygen of the protosulphate unites with the sodium, and forms soda; this uniting with the sulphuric acid, forms sulphate of soda; the chlorine of the salt unites with the mercury, and forms chloride of mercury, or calomel. The calomel is passed through a solution of muriate of ammonia, that any corrosive sublimate, if present, may be dissolved and washed away: it is then digested in boiling distilled water, to dissolve any corrosive sublimate, which is discovered by liq. ammoniæ throwing down a white precipitate, the same as the hydrargyri præcipitatum album.

HYDRARGYRI SULPHURETUM NIGRUM.

118. Composition:

Protosulphuret of mercury and sulphur.

Mr. Brande considers it to be a bisulphuret with sulphur.

119. The mercury combines chemically with a portion of the sulphur, forming sulphuret of mercury, which is mechanically mixed with the remaining sulphur.

HYDRARGYRI SULPHURETUM RUBRUM.

120. Composition:

1 mercury	= 200	}	232,
2 sulphur	2 × 16 = 32	}	

121. The mercury combines with the sulphur, forming a deuto-sulphuret of mercury.

PLUMBI ACETAS.

122. Composition:

1 protoxide of lead		= 112	189.
1 acetic acid		= 50	
3 water	3 × 9	= 27	

123. The acetic acid combines with the oxide of lead, and the carbonic escapes.

LIQUOR PLUMBI SUBACETATIS.

124. The acetic acid combines with the oxide of lead, and forms with it an uncrystallizable subacetate, composed of 2 atoms protoxide of lead, and 1 of acetic acid.

125. Lead combines with oxygen in three proportions: the protoxide, named massicot and litharge, contained in all the salts of lead, is composed of

1 lead		= 104	112.
1 oxygen		= 8	

The deutoxide, or red lead,

1 lead		= 104	116.
1½ oxygen		= 12	

The peroxide,

1 lead		= 104	120.
2 oxygen	2 × 8	= 16	

ZINCI OXYDUM.

126. Composition:

1 zinc		= 34	42.
1 oxygen		= 8	

127. On adding the ammonia to the sulphate of zinc, the ammonia unites with the sulphuric

acid, and oxide of zinc is precipitated. This is the only oxide of zinc.

ZINCI SULPHAS.

128. Composition:

1 oxide of zinc	42	136.
1 sulphuric acid	40	
6 water	$6 \times 9 = 54$	

129. In this process part of the water is decomposed: its oxygen unites with the zinc, forming an oxide, which is dissolved by the sulphuric acid, making sulphate of zinc, and the hydrogen of the water escapes.

POTASSÆ SULPHURETUM.

130. Composition:

Sulphuret of Potassium and Sulphate of Potash.

131. When sulphur and subcarbonate of potash are heated together, the carbonic acid is expelled, and three fourths of the potash are decomposed, the oxygen of which, uniting with a portion of the sulphur, forms sulphuric acid, and this combining with the undecomposed fourth of the potash, forms sulphate of potash. The potassium of the decomposed potash unites with the sulphur, making sulphuret of potassium, thus leaving a residue of sulphate of potash, and sulphuret of potassium.

SULPHUR PRÆCIPITATUM.

132. Composition:

Sulphur and water.

133. When sulphur, lime, and water, are boiled together, decomposition of the latter takes place. One proportion of the sulphur combines with the hydrogen of the water, forming bisulphuretted hydrogen, and this uniting with a portion of the lime, forms hydroguretted sulphuret of lime in solution; another portion of the sulphur combines with oxygen, forming hyposulphurous acid, and this uniting with a second portion of lime, forms hyposulphite of lime in solution; a third portion of sulphur combining likewise with oxygen, forms sulphurous acid, and this, with a third portion of lime, forms sulphite of lime, which is precipitated. When muriatic acid is dropt into the solution, it combines with the lime, forming muriate of lime, the oxygen of the hyposulphite unites with a portion of the hydrogen forming water, sulphuretted hydrogen is evolved, and the sulphur is precipitated.

134. Sulphur combines with oxygen in four proportions. 1st. *Hyposulphurous acid contains* 2 *sulphur and* 1 *oxygen.* 2d. *Sulphurous acid* contains 1 sulphur and 2 oxygen. This acid uniting with bases, forms the class of salts called sulphites. 3d. *Hyposulphuric acid* is composed of 2 sulphur and 5 oxygen. 4th. *Sulphuric acid* contains 1 sulphur and 3 oxygen. It combines with various bases, forming the salts named sulphates.

MISTURA FERRI COMPOSITA.

135. In preparing this mixture, the sulphuric acid unites with the potash, forming sulphate of potash, and the carbonic acid with the iron, making a carbonate of iron, which is suspended in the mixture by the myrrh. By exposure to the air, the iron attracts more oxygen, becoming a peroxide, and a portion of its carbonic acid escapes.

ALCOHOL.

136. Composition:

2 carbon	$6 \times 2 = 12$	23.
1 oxygen	$= 8$	
3 hydrogen	$3 \times 1 = 3$	

137. Alcohol is obtained from sugar by the vinous fermentation. By this process the sugar loses carbon and oxygen in the proportions for forming carbonic acid, and is resolved into alcohol, as may be seen by the following diagram:

	hydrogen.	oxygen.	carbon.
Sugar contains	3	3	3
Subtract 1 atom of carbonic acid,		2	1
The result will be, 1 atom of alcohol,	3	1	2

138. In purifying rectified spirit, the subcarbonate of potash attracts the water, and prevents its rising during distillation.

SPIRITUS AMMONIÆ.

139. There is a double decomposition in this preparation. Muriate of ammonia and subcarbonate of potash are decomposed. The muriatic acid unites with the potash, and the carbonic acid with the ammonia, forming carbonate of ammonia, which rises in combination with the spirit.

ÆTHER SULPHURICUS.

140. Composition:

Hydrogen, oxygen, and carbon, with a little sulphuric acid.

141. In this process the æther which passes over, depends upon a new arrangement of the elements of alcohol, occasioned by the presence of sulphuric acid, and a certain temperature. The formation of æther may be explained by the following diagram:

	hydrogen.	oxygen.	carbon.
Two atoms of alcohol consist of	6	2	4
The sulphuric acid separates 1 atom of water resulting from decomposition of the alcohol	1	1	
Leaving 1 atom of æther composed of . .	5	1	4
Subtract from æther 1 atom of water . . .	1	1	
The result will be 2 atoms of olefiant gas	4	0	4

ÆTHER RECTIFICATUS.

142. Sulphuric æther contains some sulphuric acid and ætherial oil; the potash saturates the acid and forms a soap with the oil; on the addition of a gentle heat, the æther is separated from these impurities and condenses in the receiver.

WATER.

143. Composition:

1 oxygen = 8
1 hydrogen = 1
} 9,

or two parts of hydrogen and one of oxygen by volume.

ATMOSPHERIC AIR.

144. Composition:

Oxygen twenty-one parts, azote seventy-nine parts by weight.

It contains also a variable proportion of aqueous vapour and carbonic acid.

ANIMAL CHEMISTRY.

1. The component principles of animal matter, are oxygen, hydrogen, carbon, and nitrogen; besides these four elementary bodies, other substances are combined in various proportions; they are, sulphur, phosphorus, iron, lime, soda, and potash. The compounds formed of these principles, which enter in different proportions into the various parts, are the following:

Gelatine.
Albumen.
Mucus.
Fibrin.
Urea.
Resin.
Sugar.
Oil.
Acids.

COMPLEX ANIMAL PRODUCTS.

2. Blood, when first drawn from an animal, appears to be an homogeneous fluid, but if allowed to rest a short time, a separation of its component parts takes place.

3. The serum or thin transparent part is composed, according to Berzelius, of

Water.
Albumen.
Muriate of potash and soda.
Lactate of soda and animal matter.
Carbonate and phosphate of soda.

4. The coagulum or crassamentum, is composed of

Fibrin.
Albumen.
Colouring matter, containing salt, combined with iron.

5. Human bile is composed of

Water.
Albumen.
Resin.
Picromel.
Yellow matter.
Several neutral salts of soda.
Phosphate of lime and oxide of iron.

6. Biliary calculi consists chiefly of *adipocire*, with a quantity of colouring matter, or, according to Chevreul, of yellow colouring matter, and a peculiar principle, denominated cholesterine.

7. The chief component parts of bone, are

Animal matter.
Phosphate and carbonate of lime.
Phosphate of magnesia.
Fluate of lime and water.

8. The brain is composed of

Water.
White fatty matter.
Red fatty matter.
Albumen.
Osmazome.
Phosphorus.
Acids, salts, and sulphur.

9. Chyle is composed of

Water. Fibrin.
Albumen, and some salts.

10. Concretions found in the pineal, salivary, pulmonary, and prostate glands, consist chiefly of

Phosphate and carbonate of lime.

11. Chalk stones, or gouty concretions, are composed of

Uric acid, and soda.

12. Gastric juice has not been accurately analysed, from the impossibility of obtaining it unmixed with other fluids.

13. Humours of the eye consist of

Water.
Albumen.
Gelatine.
Several neutral salts.

14. Ligaments and membranes are composed chiefly of

Coagulated albumen and gelatine.

15. Milk is composed of

Water.
Cheese.
Sugar of milk.
Muriate, phosphate, and
Lactate of potash.
Lactate of iron.
Earthy phosphates.

16. Mucus of the nose is composed of

Water.
Mucous matter.
Salts of potash aud soda.
Albumen and animal matter.

17. Muscle consists principally of

Fibrin.
Some gelatine.
Osmazome.
Albumen, and neutral salts.
Soda.
Lime, and ammonia.

18. The nails are composed of

Coagulated albumen, and a quantity of gelatine, and a small quantity of earthy matter.

19. Pancreatic juice is considered analogous in its component parts to the saliva.

20. Saliva is composed of

Water.
Albumen.
Mucus.
Saline substances.
And a small quantity of animal matter.

21. Synovia is composed of

Fibrous matter.
Albumen.
Salts of soda, and lime.
Water.

22. Tears are composed of

Water.
Albumen.
Mucus.
Various neutral salts.

23. The substance of the teeth is composed of

Phosphate of lime.
Carbonate of lime.
Cartilage.
The enamel is free from cartilage, and contains gelatine.

24. Tendons contain no fibrin, and are composed principally of

Gelatine and membranes.

25. Urine is composed of

Water.
Urea, or nephrin.
Sulphate of potash and soda.
Phosphate of soda and ammonia.
Muriate of soda and ammonia.
Lactic acid.
Uric acid, or lithic acid.
Lactate of ammonia.
Animal matter, soluble in alcohol.
Earthy phosphates.
Mucus of the bladder.
Silica.

26. Urinary calculi are arranged under six heads, by Mr. Henry; but Dr. Wollaston limits them to four; they are,

1. Uric calculi, which consist principally of uric acid.
2. Fusible calculi, composed principally of phosphate of lime, and phosphate of lime and ammonia.
3. Mulberry calculi, composed of
Oxalate of lime, or of oxalate and phosphate of lime.
4. Bone earth calculi, consisting principally of phosphate of lime.

To these might be added a distinct variety,

The cystic oxide.

TOXICOLOGY.

1. Toxicology treats of the nature, antidotes, action, and tests of poisons.

2. Poisons are those substances which, when introduced in some way into the body, are capable of destroying the vital functions, or of placing the fluids and solids in such a situation as to prevent the continuance of life.

3. They are generally described as of five kinds, viz. corrosive, acrid, narcotic, narcotico-acrid, and septic; but, for all practical purposes, may better be restricted to three: *irritant*, *narcotic*, and *narcotico-acrid*.

4. *Symptoms produced by corrosive irritant poisons.* There is heat, irritation, and dryness about the mouth, fauces, and œsophagus, with a sensation of constriction; vomiting, sometimes of blood; great pain in the stomach and bowels; thirst; copious evacuations by stool, with tenesmus; a sensation of constriction about the diaphragm, with difficulty of breathing; pain in the kidneys and strangury; convulsions; cramps in the hands; trembling of the lips; syncope; small, corded, and irregular pulse; and cold clammy perspirations; there is also sometimes a miliary eruption, or purple spots about the body.

5. Under the head corrosive irritants may be arranged the preparations of *arsenic*, *mercury*,

silver, antimony, copper, barytes, tin, zinc, mineral acids and *alkalies, caustic alkaline earths,* and *phosphorus.*

6. *Morbid appearances produced by irritant poisons.* The alteration in the different parts will vary considerably, according to the greater or less chemical influence of the poison. Corrosive poisons, in addition to the common appearances produced by irritants, corrode and destroy by their chemical action the mucous membrane of the mouth, fauces, œsophagus, and stomach; whilst irritants not corrosive produce increased vascularity and redness of the lining mucous membrane of the stomach and intestines, occasionally ulceration and perforation, a copious secretion of thick mucous, coagulable lymph or extravasation of blood, and, in some cases, excoriation about the anus.

In describing the symptoms of any class of poisons, they must be understood to comprise all the varieties which may proceed from them collectively, and not as applied to each poison, which may give rise to only a portion of them.

7. *Corrosive sublimate* is said to be distinguished by the profuse salivation, the mercurial fœtor, swelling of the salivary glands, and diminished secretion of urine; however, these diagnostic characters cannot be much depended on.

8. *Copper* has been distinguished by the coppery taste in the mouth, the severe gripings. and occurrence of jaundice.

9. *Mineral acids* are known by the destruction of the soft parts of the mouth; the matter vomited is black, and effervesces, if dropt upon the hearth. The intellect is generally but little impaired.

Nitric acid is known by giving out fumes of nitrous gas, and the yellow stains on the lips.

10. *Potash, soda,* and *ammonia* are distinguished by the urinous acrid taste; the vomited matter feels soapy, and commonly effervesces with acids.

Ammonia is known by the pungent smell it evolves.

11. *Treatment for corrosive irritant poisons.* The general treatment consists in evacuating the stomach as quickly as possible; but as the action of the mineral acids, and some others, is so rapid, it is first necessary to administer antidotes to render the poison inert, and give tepid mucilaginous drinks, to make the vomiting as easy as possible. Castor oil may afterwards be administered, and the inflammatory consequences treated on general principles. Amongst the antidotes most efficacious may be enumerated the following:

12. *Lime water* is considered the best for arsenic in solution.

13. *White of eggs* for corrosive sublimate and preparations of copper.

14. *Decoctions of yellow cinchona, bark, galls,* or *tea,* for tartar emetic.

15. *Sulphates of magnesia,* or *soda,* for barytes.

16. *Muriate of soda,* or table salt, for lunar caustic.

17. *Magnesia, chalk,* or *soap-suds,* for acids. If strong sulphuric acid has been swallowed, as little water as possible should be given.

18. *Oxalic acid* requires the administration of *lime* or *magnesia,* suspended in water.

19. *Acids* may be given for *alkalies;* the best are acetic acid and lemon juice. *Oil,* in large

quantities, is particularly recommended, as it modifies the effect of the poison, by combining with it and forming a soap.

VEGETABLE IRRITANT POISONS.

20. Amongst them are the *helleborus niger* and *fœtidus, elaterium, colocynth, euphorbium, ricinus, ranunculi, delphinium, mezereon, juniperus sabina, jalapa,* and *convolvulus scammonea.*

The *symptoms* are very similar to those produced by corrosive poisons. There is generally vomiting and purging, pain in the stomach and intestines, quick breathing and vertigo, syncope, labouring pulse, cold sweats, convulsions, and sometimes paralysis.

22. *Treatment.* Assist the vomiting, if commenced, by mucilaginous drinks: if not excited, give from five to ten grains of sulphate of copper, or a scruple of sulphate of zinc. After the poison is evacuated, give coffee, acids, and camphor, according to circumstances, and combat the inflammation in the usual manner.

NARCOTIC POISONS.

23. The principal narcotic poisons are, *opium, lactuca, hyoscyamus niger, solanum dulcamara, laurel water, stramonium,* &c.

24. *Symptoms.* The symptoms of narcotic poisons, and of opium in particular, are—stupor, drowsiness, insensibility, and immobility, respiration scarcely perceptible, pulse small and feeble, but sometimes full and slow; as the effects increase, the lethargic state becomes more pro-

found; swallowing is suspended; the breathing sometimes is stertorous; the pupil is frequently contracted by opium, but dilated by other narcotics; countenance pale and cadaverous: the muscles of the limbs and trunk are relaxed; sometimes there is vomiting, but the coma soon returns, and death, which is occasionally preceded by convulsions, soon follows.

25. *Treatment.* Administer a powerful emetic, such as half a drachm or two scruples of sulphate of zinc, assisted by copious mucilaginous drinks, and at the same time dash cold water over the head and chest. If the stomach pump be at hand, inject plenty of gruel into the stomach, and endeavour to draw off the poison. After the poison has been satisfactorily evacuated, give coffee, vinegar and water, brandy, or cordials. The patient should be sedulously kept awake till the symptoms have subsided. Coffee and brandy are better for opium, and brandy and ammonia are the best remedies for digitalis. Orfila considers the best antidotes to prussic acid to be, inhalation of the vapour of ammonia, or of a weak solution of chlorine, and cold affusion over the head and along the back.

CANTHARIDES.

26. The principal symptoms produced by cantharides are, the burning heat in the œsophagus and stomach, vomiting of blood, priapism, suppression of urine, attended with discharge of blood from the urethra. The appearances after death are those of inflammation of the lining mucous membranes.

27. The *treatment* consists principally in ad-

ministering demulcents and antiphlogistics. No real antidote is yet known.

POISONOUS FISH.

28. *Symptoms* occasioned by them: Sensation of weight at the stomach, nausea, vertigo, heat about the head and eyes, and occasionally tumefaction of those parts; colicky pains; thirst, and often urticaria.

29. The treatment necessary consists in administering an emetic, with copious draughts of warm water, then a purgative and anodynes. If excessive vomiting or spasms supervene, æther and ammonia should be given.

POISONOUS SERPENTS AND INSECTS.

30. The *Viper, Rattle Snake, Scorpion,* &c.

Symptoms. A sharp pain in the wounded part, which soon extends over the limbs or body; great swelling at first, hard, and pale; then reddish, livid, and gangrenous in appearance; faintings, vomitings, convulsions, and sometimes jaundice; pulse small, frequent, and irregular; breathing difficult; cold perspiration; the sight fails, and the intellectual faculties become deranged; inflammation and gangrene often supervene, and death soon follows.

30. *Treatment.* Apply a ligature moderately tightened above the bitten part; allow the wound to bleed; after bathing and fomenting it well with warm water, apply freely to the wound the actual cautery, lunar caustic, or the butter of antimony;

afterwards cover it with lint, dipped in olive oil and hartshorn. Give warm diluting drinks, with ammonia, occasionally a little wine, and let the patient be well covered in bed, to induce perspiration. Should gangrene threaten, *wine* and *bark* may be given more liberally.

A dry cupping-glass applied over the part has been found eminently successful in these cases, immediately after the infliction of the wound. It acts by preventing the absorption of the poison.

NARCO-ACRID POISONS.

32. In this class are included those vegetable poisons which act locally, producing irritation and inflammation, and remotely giving rise to the effects of narcotism. In sufficient doses they usually prove fatal within twelve hours.

33. The *Symptoms* occasioned by them closely resemble those produced by narcotics and irritants, and require no separate consideration.

34. These poisons are principally derived from the natural orders, solaneæ, umbellatæ, ranunculaceæ, and fungi. The most powerful are the *atropa belladonna, solanum dulcamara, nicotiana tabacum, conium maculatum, cicuta virosa, æthusa cynapium, œnanthe crocata, aconitum napellus, helleborus niger, scilla maritima, digitalis purpurea, veratrum album, colchicum autumnale, nux vomica, camphor, and cocculus indicus.*

Nux vomica is especially distinguished by the violent tetanic symptoms it produces.

35. The treatment to be adopted is the same as is generally necessary in poisoning by the narcotics.

TOXICOLOGICAL CHEMISTRY;

OR, TESTS FOR THE PRINCIPAL POISONS.

ARSENIC.

1. The following are the tests for arsenic:

Ammoniacal sulphate of copper, added to a solution of arsenic, produces a green precipitate of arsenite of copper, called Scheele's green.

Ammoniacal nitrate of silver, added to a solution of arsenic, produces a lemon yellow precipitate of the arsenite of silver, leaving nitrate of ammonia in solution.

Sulphuretted hydrogen, added to a solution of arsenic, produces a lemon yellow or sulphur precipitate of sulphuret of arsenicum, or orpiment. This precipitate may then be heated with fresh burnt charcoal or black flux, and the metallic arsenic will be sublimed. This is one of the most certain tests for arsenic.

Mixed with potash and charcoal, and heated in a glass tube, it sublimes and forms a brilliant metallic coating on the sides of the tube.

When arsenic in substance is thrown on burning coal, it evaporates with a white smoke, and a smell resembling garlic.

CORROSIVE SUBLIMATE.

2. The following are the best tests for corrosive sublimate:

Sulphuretted hydrogen throws down a black precipitate.

Hydriodate of potash throws down a precipitate of a pale scarlet colour, which is the iodide of mercury.

Protochloride of tin affords a greyish black precipitate of the bichloride of tin. This is one of the most valuable tests for corrosive sublimate.

Solution of potash, added to corrosive sublimate, produces a yellow precipitate.

Lime water, added to corrosive sublimate, produces an orange precipitate.

Ammonia, added to corrosive sublimate, produces a white precipitate.

Albumen, added to corrosive sublimate, produces a white precipitate of calomel and albumen.

Heated in a glass tube with carbonate of potash, globules of mercury are obtained.

Galvanism. Drop a small quantity of the solution on a piece of gold, and bring into contact a key, or some piece of iron, so as to form a galvanic circle. If sublimate be present the gold will be whitened.

PREPARATIONS OF COPPER.

3. The tests for the preparations of copper are the following:

Ammonia produces a blue precipitate of ammoniated copper.

Ferro-prussiate of potash, produces a reddish brown precipitate.

Sulphuretted hydrogen gives a black precipitate of sulphuret of copper.

A clean plate of iron, plunged into a solution of sulphate of copper, will in a few hours have a coating of copper.

Heated in a crucible with charcoal, metallic copper will be obtained.

TARTAR EMETIC,

4. The tests for tartar emetic are the following:

Sulphuretted hydrogen, or hydrosulphuret of potash, throw down orange-red precipitates.

Gallic acid or infusion of galls, produces a whitish yellow precipitate.

Sulphuric acid, produces a white precipitate, soluble in an excess of the acid.

THE ACIDS.

5. The acids may be distinguished from other substances, by the following tests: they convert most vegetable blues into red; they have a sour taste; the addition of an alkali destroys these properties.

6. The following are the acids most commonly used for poisoning: sulphuric, muriatic, nitric, oxalic, and prussic acids.

7. The tests for sulphuric acid are:

Muriate of barytes, which produces a white precipitate of sulphate of baryta, which is insoluble in nitric acid.

Nitrate of lead, which produces a white precipitate.

8. Tests for muriatic acid:

Nitrate of silver, produces a copious white precipitate, soluble in ammonia, but insoluble in nitric acid.

Bring the fumes of the concentrated acid in contact with ammoniacal gas, and white fumes will be formed.

9. Nitric acid may be known by the escape of nitrous gas when boiled upon copper, lead, or tin.

10. The tests for oxalic acid are:

Muriate of lime, which causes a white precipitate, soluble in nitric acid, and insoluble in small quantities of muriatic acid.

Sulphate of copper, throws down a bluish white precipitate of the oxalate of copper, which is insoluble in a few drops of muriatic acid.

Nitrate of silver, throws down a white precipitate of the oxalate of silver, which, when dried and heated, fulminates and is lost.

11. The tests for the prussic acid are:

Its odour, that of bitter almonds.

If potash be added, and then a solution of sulphate of iron, a precipitate is produced. If to this, dilute sulphuric acid is added, a precipitate of a bluish green colour is produced.

Nitrate of silver forms a cyanuret of silver, insoluble in cold nitric acid, which, when dried and heated, gives out cyanogen gas.

LEAD.

12. The tests for lead are:

Sulphuretted hydrogen, which produces a black precipitate.

Chromate of potash produces a gamboge yellow precipitate.

Infusion of galls produces a white precipitate of gallate of lead.

Sulphuric acid, or any soluble sulphate, produces a white precipitate.

A piece of zinc put into the solution of acetate of lead, causes the lead to be deposited in an arborescent manner.

SULPHATE OF ZINC.

13. The tests for the sulphate of zinc are:

Ferro-prussiate of potash, which produces a white precipitate.
The hydro-sulphurets, which produce a white precipitate.
Alkalies, which produce a white precipitate.
Infusion of galls, producing no precipitate.

NITRATE OF SILVER.

14. The tests for nitrate of silver are the following:

Muriatic acid, and the soluble muriates, produce a white precipitate, which becomes brown by exposure to light.

Ammonia and arsenious acid, added to a solution of nitrate of silver, throw down a bright yellow precipitate, which, by exposure to the light, soon becomes of a brown colour.

Arsenite of potash produces a yellow precipitate of arsenite of silver.

The solution stains the skin black.

IODINE.

15. The tests for iodine are the following:

It stains the skin brown.
It destroys vegetable colours like chlorine.
Heated in a tube it is converted into a violet coloured gas.
A solution of starch added to it produces a blue colour.

The tests for the hydriodate of potash are:

Sulphuric acid, corrosive sublimate, acetate of lead, and proto-nitrate of mercury. The first throws down a white precipitate, the second a carmine red of the iodide of mercury, the third a yellow, the iodide of lead, and the fourth a carmine red of the iodide of mercury.

THE ALKALIES.

16. The solutions of alkalies feel soapy to the touch; they change most vegetable reds and blues

to green, and yellows to brown, and remain transparent when carbonic acid is added to them, which distinguishes them from the alkaline earths.

17. Potash may be distinguished from soda by the following tests:

Tartaric acid, or muriate of platinum, added to potash, produce precipitates of supertartrate of potash, and chloride of platinum and potash; but, with soda, they produce no precipitate.

18. Ammonia is readily known by its pungent odour.

THE ALKALINE EARTHS.

19. Lime may be detected by,

Oxalate of ammonia, which causes a white precipitate, insoluble in an excess of oxalic acid.

Carbonic acid, which causes a white precipitate.

20. Barytes may be known by,

The sulphuric acid and all the sulphates producing a white precipitate insoluble in nitric acid.

NITRATE OF POTASH.

21. The nitrate of potash may be distinguished by its crackling and producing a white flame when thrown on burning coals. Heated with sulphuric acid it produces nitrous fumes, and with the chloride of platinum it throws down a yellow precipitate.

MURIATE OF AMMONIA.

22. The tests for muriate of ammonia are:

Quicklime rubbed with it, which causes an ammoniacal odour.

Nitrate of silver added to a solution of this salt causes a white precipitate.

MATERIA MEDICA.

ALTERATIVES,

1. Are medicines, which change the functions of the body, and restore them to a healthy state, without producing any sensible evacuation.

2. The principal alteratives are *mercurial* and *antimonial* preparations, in small doses; *sarsaparilla, guaiacum,* and *mezereon.*

ANTACIDS OR ABSORBENTS,

3. Counteract and neutralize acidity in the stomach and intestinal canal, by their chemical action.

4. The principal antacids are *chalk, magnesia, potash, soda,* and *ammonia.*

ANTHELMINTICS OR VERMIFUGES,

5. Are medicines, which assist in the expulsion of worms, either by dislodging or destroying them.

6. The anthelmintics, which act by exciting copious evacuations, are *calomel, scammony, gamboge,* and *spirits of turpentine.*

7. Mechanical anthelmintics, are principally *dolichos pruriens, iron filings,* powdered *tin, male fern-root,* and *carbonate of iron.*

ANTISEPTICS,

8. Are remedies supposed to be capable of resisting putrefaction.

9. The principal accredited antiseptics are, vegetable and mineral *acids*, *cinchona*, *camphor*, *myrrh*, and *opium*.

ANTISPASMODICS,

10. Are remedies supposed to have a specific effect in subduing that muscular contraction called spasm.

11. The principal are *assafœtida*, *castor*, *opium*, *musk*, *galbanum*, *valerian*, *camphor*, and *æther*.

APERIENTS,

12. Are mild cathartics.—*Vide Cathartics.*

ASTRINGENTS,

13. Are remedies which produce a constricted or contracted state of the fibres in various parts of the system.

14. The principal astringents are *sulphuric acid*, *alum*, *sulphate of copper*, preparations of *silver*, *iron*, *zinc*, and *lead*; *oak bark*, *galls*, *tormentilla*, *bistort*, *logwood*, *catechu*, *kino*, and *pomegranate*.

CARMINATIVES,

15. Are those stimulant remedies which act, by dispersing and preventing gaseous collections.

16. The principal are *oil of cinnamon, caraway, peppermint, aniseed*, and essential oils in general.

CATHARTICS,

17. Are those medicines which produce an increase of alvine evacuations.

18. The gentle cathartics, called aperients, or laxatives, are *manna, cassia fistula, tamarinds, castor oil*, and *magnesia*.

16. The more powerful cathartics are *senna, rhubarb, aloes, jalap, scammony, gamboge, colocynth, elaterium, calomel*, and *croton oil*.

DEMULCENTS,

20. Are remedies of an oily or mucilaginous nature, which protect the intestines, by their viscidity, from acrid substances.

DIAPHORETICS,

21. Increase the determination of perspiratory fluid to the skin.

22. The principal are: *acetate* of *ammonia, opium, camphor, guaiacum, mezereon, sassafras*, and *sulphur*.

DILUENTS,

23. Are those bland fluids, which tend to increase the proportion of fluid in the blood.

DIURETICS,

24. Are medicines which excite an increased discharge of urine.

25. The principal are *acetate*, *supertartrate*, and *nitrate* of *potash*, *nitric æther*, *squills*, *spirits* of *turpentine*, *copaiva*, *digitalis*, *tobacco*, *mercury*, *cantharides*, and *colchicum*.

EMETICS,

26. Are those medicines which, being received into the stomach, excite the action of vomiting.

27. The principal are *tartarized antimony*, *sulphate of zinc*, *sulphate of copper*, *ipecacuanha*, *squills*, *tobacco*, *mustard*, and *chamomile*.

EMMENAGOGUES,

28. Are those substances which tend to excite the menstrual discharge. Some act on the system, generally by diminishing undue arterial action; others excite the torpid action of the uterine vessels, by a sympathetic effect, produced by purgatives, which stimulate the rectum.

29. The principal emmenagogues in common use, are *aloes*, *hellebore*, *assafœtida*, *galbanum*, various preparations of *iron*, *mustard*, *savine*, *rue*, and *madder*.

EMOLLIENTS.

30. Are those substances which, applied externally, relax and soften the animal fibre.

31. The principal emollients are, unctuous substances and liniments, with warmth and moisture.

ERRHINES,

32. Are those substances which, being brought

into contact with the pituitary membrane, excite a discharge from the nose.

33. The principal are *tobacco*, *white hellebore*, *asarabacca*, and *euphorbium*.

ESCHAROTICS,

34. Are substances which erode and destroy the parts to which they are applied.

35. The principal are *potash*, *nitrate of silver*, *mineral acids*, *sulphate of copper*, and *muriate of antimony*.

EXPECTORANTS,

36. Are substances which excite a discharge of mucus from the lining membrane of the trachea and lungs.

37. The principal expectorants are *antimonials*, *ipecacuanha*, *squills*, *digitalis*, *tobacco*, *ammoniacum*, and the *balsams*.

LITHONTRIPTICS,

38. Are substances which are considered to dissolve urinary calculi.

39. They are *soda*, *potash*, *lime*, *magnesia*, and some of the acids.

NARCOTICS,

40. Are medicines which induce sleep, and generally alleviate pain, some by a stimulant action, and others by effects directly sedative.

41. The principal are *opium, hemlock, henbane, aconite, stramonium, belladonna, lactuca virosa. tobacco, hops, camphor,* and *nux vomica.*

SIALOGOGUES,

42. Increase the secretion and discharge of saliva.

43. The principal are *tobacco, pellitory,* and *mercury.*

STIMULANTS,

44. Are those substances which merely increase the power of the circulation.

45. They are principally *ammonia, æther, cantharides, mustard,* and the *aromatics* in general.

TONICS,

46. Are those substances which restore the healthy tone of the stomach. They are supposed to act by increasing muscular power; but it is more probable that they are beneficial, by checking the inordinate excitement, or irritability of the stomach and viscera.

47. The principal are *sulphate of zinc* and *iron; acids* in small doses; and the various bitters, such as *cinchona, gentian,* &c.

ABIETIS BESINA.

Thus, of the old Pharmacopœias, is a resinous natural exudation, from the Spruce Fir. This tree also affords Burgundy pitch, which is obtained from incisions made in the bark. These resins are principally brought from Germany.

Use.—Rubefacient in form of plaster.

Off: Preparations.—Empl: Opii: Empl: Galb: c:

ABSINTHIUM.

The leaves and tops of Common Wormwood. Artemisia Absinthium. Cl. 19, ord. 2, *Syngenesia Superfiua*. Indigenous.

Use.—This bitter is given as a tonic and stimulant in dyspepsia and intermittent fevers and as a vermifuge.

Dose.—℈i. to ℈ij. of the powder, or in infusion.

ACACIA GUMMI.

The natural exudation from the Acacia Vera, which grows in Egypt.

Use.—As a demulcent, in catarrh and ardor urinæ.

Dose.—℈i. to ℈ij.

Prep.—Muc: Acaciæ, Mist: Cornu usti, Mistura Cretæ, Mist: Moschi, Confectio Amygdalarum, P: Cretæ compositus, Pulv: Trag: compositus.

ACETOSÆ FOLIA.

The leaves of Common Sorrel. Rumex Acetosa. Cl. 6. ord. 2, *Hexandria Digynia*. Indigenous.

Use.—This plant is given as a refrigerant and diuretic, in inflammations.

Dose.—Of the leaves, ad libitum, of the juice, ʒi. to ʒij.

ACETOSELLA.

The leaves of Oxalis Acetosella. Wood Sorrel. Cl. 10, ord. 5, *Decandria Pentagynia*. Indigenous.

Use.—This plant may be administered as the former. They both owe their virtues to the superoxalate of potash, which is sold under the name of salts of lemons.

ACETUM.

Vinegar is obtained by various processes. The most common are the following: on the continent, it is obtained from wine exposed to a necessary temperature; and, in this country, from an infusion of malt. It is also obtained by subjecting wood to destructive distillation.

Use.—Refrigerant, diaphoretic, and diuretic, in fevers; externally, stimulant and rubefacient.

Dose.—ʒi. to ʒiv.

ACIDUM HYDROCYANICUM.

Prussic acid is prepared in the following manner at Apothecaries'Hall: a pound of cyanide of mercury is put into a retort, with a pound of muriatic acid, and six pints of water; heat is applied, and six pints are distilled over into a capacious receiver. The composition of the dry acid is

1 cyanogen	26	27.
1 hydrogen	1	

This acid combines with salifiable bases, forming that class of bodies called hydrocyanates.

Cyanogen may be obtained by heating dry prussiate of mercury, and collecting the gas over mercury. It burns with a bluish flame, and has a strong disagreeable smell. It forms with bases, the salts named cyanides.

Cyanogen is composed of

2 carbon	$6 \times 2 = 12$	26.
1 nitrogen	14	

Use.—Sedative in coughs and asthma, and has been given in dyspepsia, depending upon irritability of the stomach.

This acid is found in laurel leaves, in the leaves and flowers of the peach, in bitter almonds, and in the kernels of the cherry and plum.

ACONITI FOLIA.

The leaves of Monkshood, or Wolfs-bane. Aconitum Napellus. Cl. 13, ord. 3, *Polyandria Trigynia*. This plant grows native in Germany, the Alps, and Pyrennees.

Use.—It has been given in syphilis, chronic rheumatism, and as a diuretic in dropsies.

Dose.—Gr. i. to gr. iij. of the extract, of the powdered leaves iv. or v. grains.

Prep.—*Extr. Aconiti.*

ADEPS.

The fat of the Sus Scrofa, Hog. Used only in making ointments.

ÆRUGO.

The impure subacetate of copper or verdigris is obtained in France by immersing plates of copper in the husks and refuse of expressed grapes, and by exciting in them the acetous fermentation.

Use.—It has been given as a tonic in epilepsy, and acts as an emetic. It is also applied to ulcers externally.

Dose.—As a tonic gr. $\frac{1}{8}$ to gr. $\frac{1}{2}$, as an emetic gr. ij. to gr. v.

Prep.—Linimentum Æruginis.

ALLII RADIX.

The bulbs of the Allium Sativum, Garlic.

Use.—This plant is principally used as an anthelmintic, and has been given as a stimulant, expectorant, and diuretic in catarrh, asthma, and dropsy. Externally applied, it acts as a stimulant and rubefacient.

Dose.—3ss. to 3ij. of the juice, or two or three of the cloves.

ALÖES SPICATÆ EXTRACTUM.

The extract of Spiked or Socotrine Aloes is obtained by boiling the leaves, and evaporating the decoction. It is brought principally from the Cape of Good Hope and Bombay.

Use.—It is a warm, stimulant purgative, acting chiefly on the large intestines; hence its administration would be improper in hæmorrhoids. It is also considered to be emmenagogue, stomachic, and anthelmintic. Administered as an enema, with subcarbonate of potash, it removes ascarides.

Dose. Gr. ij. to iv. as a tonic, as a purgative gr. v. to gr. viii.

Preparations.—Decoctum Aloes comp:, Extr: Aloes, Extr: Coloc: comp:, Pil: Aloes c Myrrhâ, Pilula Cambogiæ comp:, Pulv: Aloes comp., Tinctura Aloes, Tinctura Aloes comp:, Tinctura Benzoini comp:, Vinum Aloes.

ALTHÆÆ FOLIA ET RADIX.

The leaves and root of Marsh Mallow, Althæa Officinalis. Cl. 16, ord. 8, Monadelphia Polyandria. Indigenous.

Use.—The decoction is given as a demulcent, in visceral inflammations and calculous disorders.

Prep.—Syr: Althææ.

ALUMEN.

The supersulphate of alumina and potash. Alum is usually obtained by burning schistose pyritic clays, or alum ores; in which case the oxygen of the atmosphere forms sulphuric acid with the sulphur of the iron; and the sulphuric acid, combining with the alumina, forms supersulphate of alumina, which is afterwards mixed with potash.

Use.—This salt is astringent and styptic. It is given internally in hemorrhage and gleet; and used externally in ophthalmia; as a gargle for relaxed uvula; and also as an injection in gleet.

Dose.—Gr. x. to ℈i.

Prep.—*Alumen exsiccatum, Liquor Aluminis comp:*

AMMONIACUM.

A Gum resin supposed to be produced from the Heracleum Gummiferum; brought from Africa and the East Indies. It exudes from the stem, which is cut off just above the ground.

Use.—It is a stimulating expectorant, and may be given in asthma, or in the chronic catarrh of old persons. It is also given as an emmenagogue, and acts as a stimulant applied externally.

Dose.—Gr. x. to 3ss.

Prep.—*Mist. Ammoniaci, Pilula Scillæ comp: Empl: Ammoniaci, Empl: Ammoniaci cum Hydrargyro.*

AMMONIÆ MURIAS.

Muriate of Ammonia is obtained by the destructive distillation of bones and refuse animal matter, such as wool, horn, &c. and likewise from gas liquors. The ammoniacal liquor thus obtained is saturated by sulphuric acid, and again decomposed by muriate of soda: sulphate of soda remains in the retort, and muriate of ammonia is sublimed.

Use.—This salt is diuretic and aperient, but seldom given internally. It is more used externally, in solution, as a cold discutient lotion.

Prep.—*Subc: Ammoniæ, Liquor Ammoniæ, Ferrum Ammoniatum, Spiritus Ammoniæ.*

AMYGDALÆ AMARÆ. }
———— DULCES. }

They are both varieties of the Amygdalus Communis, growing in Spain and Italy. The bitter almond contains hydrocyanic acid.

Use.—Almonds are given as demulcent and sedative, in coughs, in the form of emulsion, which is readily made by triturating them with water.

Prep.—*Ol: Amygdalarum, Mistura: Amygdalarum, Conf: Amygdalarum.*

AMYLUM.

The Starch of Wheat, Triticum Hybernum. Cl. 3, ord. 1, *Triandria Monogynia;* nat. ord. *Gramina.* The starch is obtained by steeping wheat in water, and then expressing the juice, which is diffused through water and falls down an impalpable powder.

Use.—It acts as a demulcent in dysentery and diarr-

hœa, but is principally used in decoction, as a vehicle for opiate and other injections.

Prep.—*Mucilago Amyli, Pulvis Tragacanthæ comp:*

ANETHI SEMINA.

Seed of the Anethum Graveolens. Native of the south of Europe.

Use.—It is given as a carminative to infants, in the form of dill water, or in powder.

Prep.—*Aqua Anethi.*

ANISI SEMINA.

The seeds of the Pimpinella Anisum; a native of Spain and Egypt.

Use.—The same as dill.

Prep—*Ol: Anisi, Spiritus Anisi.*

ANTHEMIDIS FLORES.

Flowers of the Anthemis Nobilis. Cl. 19, ord. 2, *Syngenesia Superflua*. Indigenous.

Use.—Chamomile flowers are tonic and carminative, and are useful in dyspepsia, gout, and colic. The warm infusion is emetic.

Dose.—Gr. x. to ℈j. in powder or in infusion.

Prep.—*Infusum Anthemidis, Extractum Anthemidis.*

ANTIMONII SULPHURETUM.

Sulphuret of Antimony; a natural ore, used only to prepare the Antimonii Sulphuretum Præcipitatum, and Pulvis Antimonialis.

ANTIMONII VITRUM.

The glass is obtained from the sulphuret. By fusion the antimony becomes oxidized, and greater portion of the sulphur is driven off, leaving a protoxide of antimony with a little sulphur and silex.

Use.—It is now never given internally, but used to prepare the Antimonium Tartarizatum.

ARGENTUM.

Purified Silver, used to make the Argenti Nitras.

ARMORACIÆ RADIX.

The root of Horseradish, Cochlearia Armoracia. Cl. 15, ord. 1, *Tetradynamia Siliculosa*. Indigenous.

Use.—It is stimulant and diuretic, and may be given in chronic rheumatism and dropsy.

Dose.—℈j. to ʒj.

Prep.—*Inf: Armoraciæ comp: Spiritus Armoraciæ comp.*

ARSENICUM ALBUM.

Arsenious acid, or white oxide of arsenic. Metallic Arsenic is found in many different states, viz. native, in masses or combined with oxygen, sulphur, metals, as cobalt, copper, and nickel, or with salts, forming arseniates. It is generally obtained in Germany by roasting the cobalt ores, from which Arsenic sublimes. If at a high temperature, it quickly attracts oxygen.

Use.—It is given as a tonic in intermittent fevers, epilepsy, chorea, and for lepra; and has been externally applied to foul ulcers.

Dose.—Gr. $\frac{1}{16}$ to gr. $\frac{1}{4}$, of the white arsenic, of the solution, *m.* v. to *m.* xv.

Prep.—Liquor Arsenicalis.

ASARI FOLIA.

The leaves of the Asarum Europæum. Asarabacca. Indigenous. Cl. 11, ord. 1, *Dodecandria Monogynia.*

Use.—The powdered leaves are irritating, and used as a snuff in ophthalmia and headach. Taken internally they are emetic and cathartic.

ASSAFŒTIDÆ GUMMI RESINA.

Assafœtida is obtained in Persia by cutting off the stem of the Ferula Assafœtida, and allowing the juice to exude. It is then exposed to the sun and hardened.

Use.—It is given as a stimulant, antispasmodic, emmenagogue, expectorant, and athelmintic, in hysteria and nervous diseases, spasmodic coughs, amenorrhœa, cough, and worm cases.

Dose.—Gr. v. to gr. xx.

Prep.—*Tinct: Assafœtidæ, Mist: Assafœtidæ, Sp: Ammoniæ Fœtidus, Pilula Galbani comp:*

AVENÆ SEMINA.

The decorticated seeds of the Avena Sativa, common Oat. Indigenous. Cl. 3, ord. 2, *Triandria Digynia;* nat. ord. *Gramina.*

Use.—Demulcent and nutrient, in visceral inflammations, and as a vehicle for injections.

AURANTII BACCÆ ET CORTEX.

The berries and rind of the fruit of the Citrus Aurantium, a native of Spain and Italy.

Use.—The peel is a tonic and stomachic. The berries are used in issues, in place of peas.

Prep.—*Syr: Aurantii, Inf: Aurantii, Inf: Gent: comp:, Tinct: Aurantii, Tinct: Cinch: c:, Tinct. Gent: comp:, Sp: Armoraciæ comp:*

BALSAMUM PERUVIANUM.

Peruvian Balsam is obtained by boiling in water the twigs of the Myroxylon Peruiferum, which grows in South America.

Use.—It is given as a tonic and expectorant in asthma, catarrh, leucorrhœa, and chronic rheumatism.

Dose.—*M.* x. to *m.* xxx.

BALSAMUM TOLUTANUM

Was considered to be produced from the Toluifera Balsanum, but is now said to exude from incisions made in the bark of the Myroxylon Peruiferum.

Use.—The same as the balsam of Peru.

Prep. — *Tinct: Tolutani, Syr: Tolutanus, Tinct. Benzoini comp:*

BELLADONNÆ FOLIA.

The leaves of the Atropa Belladonna, or Deadly Nightshade. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia*; nat. ord. *Luridæ*.

Use.—It is narcotic, but seldom given internally; externally it may be applied as a plaster to allay pain, and to the eye to produce dilatation of the pupil, in iritis and cataract.

Dose.—Gr. ¼ to gr. i. of the extract or powdered leaves.

Prep.—*Extractum Belladonnæ.*

BENZOINUM.

The Benzoin is produced from incisions made in the bark of the Styrax Benzoin, which grows in Sumatra and Java.

Use.—The same as tolu or balsam of Peru.

Prep.—*Acidum Benzoicum, Tinct. Benzoini comp.*

BISMUTHUM.

Bismuth is a simple metallic body, found native, or oxidized, or combined with sulphur and several metals. It melts at a low temperature; is brittle, lamellated, and of a yellowish white colour. It is not used medicinally in its pure state.

BISTORTÆ RADIX.

The root of Polygonum Bistorta, Bistort. Indigenous. Cl. 8, ord. 3, *Octandria Trigynia.*

Use.—It is tonic and astringent, given in hæmorrhage and diarrhœa, and may be used as an injection in discharges from the urethra and vagina.

Dose.—Gr. x. to 3ss.

CAJUPUTI OLEUM.

Cajuput oil is obtained in Amboyna and Borneo by distilling the leaves of the Melaleuca Cajuputi.

Use.—It is stimulant, antispasmodic, and diaphoretic, given in chronic rheumatism and spasmodic colic.

Dose.—*M.* v. to *m.* x.

CALAMINA.

Calamine, or the impure Carbonate of Zinc, is a natural ore, generally mixed with other ores and stony substances. It is used externally as an application to ulcers.

CALAMI RADIX.

The root of the Acorus Calamus, Sweetflag. Indigenous. Cl. 6, ord. 1, *Hexandria Monogynia.*

Use.—Tonic and aromatic, and may be given in anorexia, dyspepsia, &c.

Dose.—Gr. x. to ℥i. or in infusion.

CALUMBA.

The root of a plant growing in Southern Africa, supposed to be the Cocculus Palmatus.

Use.—Calumba root is given as a tonic in diarrhœa, vomitings attendant on pregnancy, and in cholera.

Dose.—Gr. x. to ℈i. of the powder; of the infusion ℥iss.

Prep.—*Inf: Calumbæ, Tinct: Calumbæ.*

CAMBOGIA.

Gamboge exudes from the broken twigs of the Stalagmitis Cambogioides, and is brought from Ceylon.

Use.—It is a drastic purgative, and hydragogue, and is administered in dropsies, obstinate costiveness, and worm cases.

Dose.—Gr. ij. to gr. v.

Prep.—*Pil: Cambogiæ comp.*

CAMPHORA.

Camphor is obtained by distillation from the branches and leaves of the Laurus Camphora, a native of the East Indies.

Use.—It is a stimulant and diaphoretic, and may be given in typhus, hysteria, convulsions, and mania.

Dose.—Gr. v. to gr. x.

Prep.—*Mist: Camphoræ, Spir: Camphoræ, Tinct: Camphoræ comp:, Linimentum Camphoræ, Lin: Saponis, Linimentum Hydrargyri.*

CANELLÆ CORTEX.

Canella Bark brought from the West Indies, considered by some to be produced by the Canella Alba, by others

from the Vinterania Canella. The bark is obtained from the younger branches of the tree.

Use.—Stimulant and aromatic; used as an adjunct to other bitters.

Dose.—Gr. x. to ʒss.

CANTHARIS.

Cantharis Vesicatoria, Geoffroy and Latreille. Lytta vesicatoria, Fabricius, of the order Coleopteræ, section Heteromères, and family Trachelides, of Cuvier. This insect is principally brought from Spain.

Use.—Blistering flies, given internally, act as stimulant and diuretic, and have been prescribed in gleets, dropsies, and paralysis of the sphincter vesicæ; they are injurious in inflammation of the kidney. Externally they are used to blister the skin.

Dose.—Gr. i. to gr. iij. of the powder, of the tincture *m.* x. to ʒss.

Prep.—*Tinctura Lyttæ, Empl. Lyttæ, Ceratum Lyttæ.*

CAPSICI BACCÆ.

The berries of the Capsicum Annuum, a native of India.

Use.—They are stimulant, and may be given in dyspepsia, chronic gout, and rheumatism.

Dose.—Gr. v. to gr. x.

Prep.—*Tinctura Capsici.*

CARDAMINES FLORES.

The flowers of Cardamine Pratensis, or Cuckow Flower. Indigenous. Cl. 15, ord. 2, *Tetradynamia Siliquosæ.*

Use.—They are said to be stimulant and diaphoretic, and recommended in convulsions and spasmodic diseases.

Dose.—℈i. to ʒi.

CARDAMOMI SEMINA.

The seeds of the Matonia Cardamomum, brought from Bengal.

Use.—They are stimulant and carminative, generally given to prevent the griping occasioned by purgatives.

Dose.—Gr. v. to ℈i.

Prep.—*Extr. Colocynthidis comp:, Tinct: Card: Tinct: Cinnam: comp: Tinct: Gent: comp:, Tinct: Rhei, Tinct: Sennæ, Spiritus Ætheris aromat:, conf: Aromatica, Pulv: Cinnam: comp:*

CARICÆ FRUCTUS.

Figs, the fruit of the Ficus Carica, are brought from Spain, Italy, India, &c.

Use.—They are demulcent, and gently purgative.
Dose.—Ad libitum.
Prep.—*Decoctum Hordei comp: Confectio Sennæ.*

CARUI SEMINA.

The seeds of the Carum Carui. Indigenous. Cl. 5, ord. 2, *Pentandria Digynia*; nat. ord. *Umbellatæ.*
Use.—They are carminative, but generally prescribed as an adjunct to other medicines.
Dose.—Gr. x. to ℈i.
Prep.—*Oleum et Aqua Carui, Spiritus Carui, Sp: Juniperi comp:, Tinct: Sennæ, Tinctura Cardamomi comp: Confectio Opii, Conf: Rutæ, Empl: Cumini.*

CARYOPHYLLI.

CARYOPHYLLARUM OLEUM.

Cloves are the dried unexpanded flower buds of the Eugenia Caryophyllata, which grows in the Moluccas. The oil is expressed from them.
Use.—Stimulant and aromatic, given in gout and dyspepsia.
Dose.—gr. x. to ℈i.
Prep.—*Inf: Caryophyllorum, Inf: Aurant: comp:, Vinum opii, Conf: aromatica, Confectio Scammoneæ.*

CASCARILLÆ CORTEX.

The bark of Croton Cascarilla, a native of the Bahama islands.
Use.—Tonic and stomachic, given in dyspepsia and intermittents.
Dose.—℈i to ʒi.
Prep.—*Tinct. Cascarillæ, Inf: Cascarillæ.*

CASSIÆ PULPA.

The pulp of the pods of the Cassia Fistula, brought from the East and West Indies.
Use.—Laxative, given to children.
Dose.—ʒij. to ℥i.
Prep.—*Confectio Sennæ, Conf: Cassiæ.*

CASTOREUM.

Castor is found in follicles situated between the anus and genitals of the Castor Fiber, a native of North Europe, Asia, and America.
Use.—Antispasmodic given in Hysteria and nervous diseases.
Dose.—Gr. v. to ℈i.
Prep.—*Tinct. Castorei.*

CATECHU EXTRACTUM.

The extract made from the inner wood of the Acacia Catechu, a native of Hindostan.

Use.—It is astringent and is given in hæmorrhage and diarrhœa.

Dose.—Gr. x. to ℈ij.

Prep:—Inf: Catechu, Tinct. Catechu.

CENTAURII CACUMINA.

The tops of the Chironea Centaurium, common Centaury. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia.*

Use.—Tonic and diaphoretic, given in dyspepsia, and might be well substituted for gentian.

Dose.—Gr. xv. to 3i.

CERA ALBA.
CERA FLAVA.

Animal substances formed by the bee, used in making ointments.

CEREVISIÆ FERMENTUM.

Yeast is said to be antispetic, and has been recommended in typhoid fever. It is more used as a cataplasm to foul ulcerated surfaces.

CETACEUM.

Spermaceti is found in spongy masses within the cranium of the Physter Macrocephalus of the Southern Ocean.

Use.—It is demulcent and emollient; given internally in dysentery and catarrh, but principally used in making ointment.

Prep.—Cerat: Cetacei. Ung: Cetacei.

CINCHONÆ CORDIFOLIÆ CORTEX.
CINCHONÆ LANCIFOLIÆ CORTEX.
CINCHONÆ OBLONGIFOLIÆ CORTEX.

The varieties of Cinchona are very numerous: they are found most abundant in the districts of Peru. The different species are not yet all accurately and precisely defined, but they are divided, on account of their colour, into four kinds: the grey, the yellow, the red, and the white. Amongst the grey Cinchonas, is the Cinchona Lancifolia of the Pharmacopœia, now known to be Cinchona Condaminea; of the yellow kind, the Cinchona Cordifolia, correctly named Lancifolia; and of the red, the Cinchona Oblongifolia or Magnifolia. The grey or quilled Bark affords the most Cinchonine, the Cordifolia the most quinine, and the Oblongifolia contains both quinine and Cinchonine combined with kinic acid.

Sulphate of quinine is obtained by boiling yellow Cinchona bark in very dilute sulphuric acid, then lime

is added, the precipitated powder is dried and macerated in alcohol until the quinine is dissolved, and sulphuric acid is added to saturate it.

Use.—Tonic and astringent, principally administered in intermittent fevers, in chorea, after long fevers and inflammations, such as erysipelas, and most diseases assuming an intermittent type.

Dose.—Of the powder 3ss. to 3ij., of the sulphate of quinine gr. ij. to gr. v.

Prep.—Decoctum Cinchonæ, Infus: Cinchonæ, Extractum Cinchonæ, Extr: Cinchonæ resinosum, Tinct, Cinchonæ, Tinct: Cinch: comp.

CINNAMOMI CORTEX ET OLEUM.

The bark of the Laurus Cinnamomum, a native of Ceylon. It affords a small portion of oil.

Use.—Stimulant and carminative in colic, &c.

Dose.—Gr. v. to ℈i.

Prep.—Aq: Cinnamomi, Spir: Cinnamomi, Tinct: Cinnamomi, Tinct: Cinnam: comp:, Pulv: Cinnamomi comp.

COCCUS.

The body of the dried female Coccus Cacti, brought from Mexico, Georgia, and South Carolina.

Use.—Only as a colouring matter.

Prep.—Tinct: Cinchonæ comp: Tinct: Cardamomi comp.

COLCHICI RADIX ET SEMINA.

The root and seeds of the Colchicum Autumnale or Meadow Saffron. Indigenous. Cl. 6, ord. 3, *Hexandria Trigynia;* Nat. Ord. *Spathaceæ.* The bulb should be dug up in May and June. The active principle is veratrine. An alcoholic solution of guiacum with vinegar, rubbed upon the dried bulb, produces a blue colour when it is good and properly dried.

Use.—It is diuretic and cathartic, and acts nearly as a specific in gout and rheumatism.

Dose.—Gr. v. to gr. x. of the powder, 3i. to 3ij. of the acetum, and *m.* v. to 3ss. of the Vinum Colchici.

Prep.—Acetum Colchici, Vinum Colchici, Spiritus Colchici Ammoniatus.

COLOCYNTHIDIS PULPA.

The Pulp of the Capsule of the Cucumis Colocynthis or Bitter Cucumber, which grows in Turkey.

Use.—Violently carthartic, seldom given alone.

Dose.—Gr. i. to gr. v.

Prep.—*Extractum Colocynthidis, Extr: Colocynthidis comp.*

CONII FOLIA ET SEMINA.

Leaves and seeds of the Conium Maculatum or common Hemlock. Indigenous. Cl. 5, ord. 2, *Pentandria Digynia;* Nat. Ord. *Umbellatæ.*

Use.—Narcotic and palliative; given in schirrhus, hooping-cough, and rheumatism.

Dose.—Gr. ij. to gr. x. of the powder or extract.

Prep.—*Extr: Conii.*

CONTRAJERVÆ RADIX.

The root of Dorstenia Contrajerva, brought from Peru and Mexico.

Use.—Tonic and astringent, given in typhoid fevers and diarrhœa.

Dose.—Gr. x. to 3ss.

Prep.—*Pulv: Contrajervæ comp.*

COPAIBA.

The exudation from holes bored in the trunk of the Copaifera Officinalis of South America.

Use.—Diuretic and stimulant, given in gleet, leucorrhœa, &c.

Dose. M. x. to 3i.

CORIANDRI SEMINA.

Seeds of the Coriandrum Sativum. Indigenous. Cl. 5, ord. 2, *Pentandria Digynia;* Nat. Ord. *Umbellatæ.*

Use.—Carminative and stomachic.

Dose.—℈i. to 3i.

Prep.—*Confectio Sennæ.*

CORNUA.

Hartshorn Shavings are nutrient and demulcent when reduced to the state of jelly.

Dose.—Ad libitum.

Prep.—*Cornu Ustum, Pulv: Antimonialis.*

CROCI STIGMATA.

The pistils of the Crocus Sativus or Common Saffron. Indigenous. Cl. 3, ord. 1, *Triandria Monogynia;* Nat. Ord. *Ensatæ.*

Use.—Antispasmodic, recommended in chlorosis and nervous affections, most used as a colouring matter.

Dose.—Gr. x. to 3ss.

Prep.—*Conf: Aromatica, Pil: Aloes c. Myrrha, Syr: Croci, Tinct: Aloes comp:, Tinct: Cinchonæ comp:, Tinct: Rhei, Tinct: Rhei comp:, Decoctum Aloes comp.*

CUBEBA.

The berry of the Piper Cubeba, a native of Java.
Use.—Stimulant in gonorrhœa, gleet, &c.
Dose.—3ss. to 3ij.

CUMINI SEMINA.

The seeds of the Cuminum Cyminum.
Use.—Carminative, taken internally; applied externally, they are stimulant and discutient.
Dose.—℈i. to 3i.
Prep.—*Emplastrum Cumini.*

CUPRI SULPHAS.

Sulphate of Copper is made either by roasting copper pyritic ores, or by heating copper with sulphur, then calcining it, and afterwards digesting it in weak sulphuric acid.
Use.—Given as a tonic in epilepsy and intermittents; emetic and escharotic.
Dose.—Gr. ¼ to gr. i. as a tonic, gr. v. to gr. x. as an emetic.
Prep.—*Cuprum Ammoniatum.*

CUSPARIÆ CORTEX.

The bark of Cusparia Febrifuga, which grows in South America.
Use.—Tonic and stimulant, given in intermittents and dyspepsia.
Dose.—Gr. x. to ℈i.

CYDONIÆ SEMINA.

The seeds of Pyrus Cydonia, a native of Crete.
Use.—Emollient and demulcent in coughs.
Dose.—Ad libitum.
Prep.—*Decoctum Cydoniæ.*

DAUCI RADIX ET SEMINA.

The seeds and root of the Daucus Carota. Indigenous Cl. 5, ord. 2, *Pentandria Digynia.*
Use.—The seeds are carminative; the root is used in form of poultice.
Dose.—Gr. x. to ℈i. of the bruised seed.

DIGITALIS FOLIA ET SEMINA.

The leaves and seeds of common Foxglove, Digitalis Purpurea. Indigenous. Cl. 14, ord. 2, *Didynamia Angiospermia;* Nat. Ord. *Luridæ.*
Use.—Diuretic and sedative, given in inflammations, hæmorrhages, and in all cases when it is necessary to diminish the too frequent action of the heart.

Dose.—Gr. i. to gr. iij. of the powder, *m.* x. to 3ss. of the tincture, 3i. to ℥ss. of the infusion.

Prep.—*Infusum Digitalis, Tinct: Digitalis.*

DOLICHI PUBES.

Cowhage, the hairs scraped off the pods of the Dolichos Pruriens, brought from America.

Use.—A mechanical anthelmintic, given to expel lumbrici and ascarides.

Dose.—Gr. v. to gr. x. mixed with treacle.

DULCAMARÆ CAULIS.

The stalks of the Solanum Dulcamara, Bittersweet or Woody Nightshade. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia;* Nat. Ord. *Solaneæ.*

Use.—Narcotic and diuretic, given in dropsies and chronic rheumatism.

Dose.—℈i. to 3i.

Prep.—*Decoctum Dulcamaræ.*

ELATERII PEPONES.

Squirting Cucumbers, the fruit of the Momordica Elaterium, a native of the South of Europe. The extract is obtained by slicing the cucumbers and gently expressing the juice, which deposits a fæcula, and this is subsequently dried for use.

Use.—A powerful hydragogue cathartic, given principally in dropsies.

Dose.—Gr. $\frac{1}{8}$ to gr. i.

Prep.—*Extractum Elaterii.*

ELEMI.

Gum Elemi, which is brought from Brazil and Carolina, exudes from incisions made in the bark of the Amyris Elemifera.

Use.—Stimulant, but principally applied externally.

Dose.—gr. x. to ℈i.

Prep.—*Unguentum Elemi comp.*

EUPHORBIÆ GUMMI RESINA.

Euphorbium is an exudation from the cut stem of the Euphorbia Officinarum, a native of Africa.

Use.—Chiefly as an errhine, in lethargic cases and amaurosis.

Dose.—A grain or two snuffed up the nose.

FERRUM.

Iron Filings are introduced into the Pharmacopœia principally as being used in several preparations.

Use.—By some considered as tonic and anthelmintic.

Dose.—Gr. v. to 3i.

Prep. — *Ferri Sulphas, Ferrum Tartarizatum, Vinum Ferri, Liquor Ferri Alkalini, Ferrum Ammoniatum.*

FILICIS RADIX.

The root of the Male Fern, Aspidium Filix Mas. Indigenous. Cl. 24, ord. 1, *Cryptogamia Filices.*

Use.—It is given as an anthelmintic, in Tænia.

Dose.—3i. to 3iv.

FŒNICULI SEMINA.

The seeds of the Anethum Fæniculum, Common Fennel. Cl. 5, ord. 2, *Pentandria Digynia.* Indigenous.

Use.—Carminative and diuretic.

Dose.—℈i to 3i of the bruised seeds.

FUCUS.

Bladder wrack, Fucus Vesiculosus. Indigenous. Cl. 24, ord. 3, *Cryptogamia Algæ.*

Use.—Deobstruent, given in scrofula.

Dose.—Gr. x. to ℈ij.

GALBANI GUMMI RESINA.

The natural exudation of the Bubon Galbanum, a native of Africa.

Use.—Stimulant and antispasmodic; given in hysteria and chlorosis; externally rubefacient.

Dose.—Gr. v. to ℈i.

Prep.—*Pil: Galbani comp:, Empl: Galb: comp:*

GALLÆ.

Gall nuts are round excrescences found on the Quercus Infectoria, of Syria and Asia Minor. The cynips, or little insect, punctures the leaves, and deposits its eggs, which, acting as a foreign body, causes a substance to be thrown out around it, which forms the nut. They are principally brought from Aleppo. The best are of a greyish blue colour, and not perforated.

Use.—Astringent, given in diarrhœa, and used as an injection, and as an external application in case of piles.

Dose.—Gr. ij to gr. x.

GENTIANÆ RADIX.

The root of the Gentiana Lutea, a native of Switzerland.

Use.—Tonic and stomachic, given in dyspeptic cases

Dose.—Gr. x. to 3i.

Prep.—*Tr: Gentianæ comp:, Infusum Gentianæ, Extr: Gentianæ.*

GLYCYRRHIZÆ RADIX.

The root of the Glycyrrhiza Glabra, a native of the south of Europe, but now abundantly cultivated in this country.

Use. Demulcent, given in coughs.

Dose.—Gr. x. to 3i.

Prep.—*Decoctum Sarsaparillæ comp*: *Infusum Lini*, *Extractum Glycyrrhizæ*, *Conf*: *Sennæ*.

GRANATI CORTEX.

The bark of the fruit and root of the Punica Granatum, a native of the south of Europe.

Use.—Astringent and anthelmintic; given in dysentery and tænia; it may be used as a gargle, and as an injection in leucorrhœa. It is requisite to use the bark of the fresh root to ensure the expulsion of the tape worm.

Dose.—ʒi to 3i.

GUAIACI RESINA ET LIGNUM.

This resin exudes from incisions made in the bark of the Guiacum Officinale, which grows in Jamaica. Its green colour is owing to the absorption of oxygen.

Use.—Alterative, diaphoretic, and slightly purgative, given in chronic rheumatism, and some cutaneous affections.

Dose.—Gr. x. to ʒss.

Prep.—*Decoctum Sarsaparillæ comp*:, *Mistura Guaiaci*, *Tinct*: *Gauaci Ammoniata*, *Pilula Hydrargyri Submuriatis comp*:

HAMATOXYLI LIGNUM.

The wood of the Hæmatoxylon Campechianum, a tree growing in South America.

Use.—The extract obtained from the wood is astringent, and may be given in diarrhœa and dysentery.

Dose.—ʒi. to 3i.

Prep.—*Extractum Hæmatoxyli*.

HELLEBORI FŒTIDI FOLIA.

The leaves of the Helleborus Fœtidus. Indigenous. Cl. 13, ord. 6, *Polyandria Polygynia*.

Use.—Cathartic and anthelmintic, principally administered for the lumbricus teres.

Dose.—gr. v. to gr. x.

HELLEBORI NIGRI RADIX.

The root of the Helleborus Niger, or Black Hellebore, a native of Austria and Italy.

Use.—Cathartic and emmenagogue, and recommended in mania and melancholy.

Dose.—Gr. v. to ℈i.

Prep.—*Tinctura Hellebori Nigri.*

HORDEI SEMINA.

The decorticated seeds of the Hordeum Ditichon. Cl. 3, ord. 2, *Triandria Digynia*, nat. ord. *Gramina*.

Use.—Demulcent, given as a decoction.

Dose.—Ad libitum.

Prep.—*Decoctum Hordei comp:*

HUMULI STROBILI.

The strobiles of the Humulus Lupulus, or Common Hop. Indigenous. Cl. 22, ord. 5, *Diœcia Pentandria.*

Use.—Tonic, narcotic, and diuretic.

Dose.—Gr. v. to ℈i. of the extract.

Prep.—*Extractum Humuli, Tinctura Humuli.*

HYDRARGYRUM.

Mercury or Quicksilver is found in various forms in Spain, Friuli, the Palatinate, and in America. It is found either in the metallic state, or combined with sulphur, sulphuretted hydrogen, silver, copper, chlorine, or with sulphuric acid. The greatest portion of the Mercury of commerce, is obtained from the sulphuret or cinnabar, which is subjected to an intense heat with lime, when the pure mercury is volatilized and condensed in a receiver. Mercury is frequently adulterated, and is known to be impure by the following characters. It blackens the fingers, has less weight than mercury, has a peculiar odour, and, when poured upon a plate or paper, instead of presenting round globules and flowing about briskly, it leaves the globules elongated as if adherent. It is purified by distillation, in which case the mercury is volatilized, and the impurities remain in the retort.

Use.—Metallic Mercury has been recommended in ileus and hernia, but its internal use is at present abandoned.

Prep.—*Hydrargyri Nitrico Oxydum.*
———— *Oxydum Cinereum.*
———— *Rubrum.*
———— *Oxymurias.*
———— *Submurias.*
———— *Sulphuretum Rubrum.*
———— *Nigrum.*
———— *Præcipitatum Album.*
Hydrargyrus cum Cretâ.
Ung. Hydrarg: fortius.
———— *mitius.*
Linimentum Hydrargyri.
Pilula Hydrargyri.

HYOSCYAMI FOLIA ET SEMINA.

The leaves and seeds of the Hyoscyamus Niger, or Common Henbane. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia.*

Use.—Anodyne and narcotic, given in spasms, gout, and asthma, and in inflammatory diseases where opium would be injurious.

Dose.—Gr. x. to gr. xv.

Prep.—*Extractum Hyoscyami, Tinct: Hyoscyami.*

JALAPÆ RADIX.

The root of the Convolvulus Jalapæ, a native of South America.

Use.—Carthartic and hydragogue.

Dose.—Gr. x. to 3ss.

Prep.—*Extractum Jalapæ, Tinct: Jalapæ.*

IPECACUANHÆ RADIX.

The root of the Cephaelis Ipecacuanha, or Calicocca Ipecacuanha of the Pharmacopœia, a native of Brazil. There are three varieties, differing in their colour, but the preference is given to the greyish brown kind.

Use.—Diaphoretic, expectorant, and emetic: particularly useful in pertussis, catarrh, pneumonia of children, and asthma; and may be given as a nauseant in most inflammatory fevers. It aids the action of purgatives, and in small doses is recommended in diarrhœa and dysentery.

Dose.—Gr. ss. to gr. ij. as an expectorant, gr. x. to 3ss. as an emetic.

Prep.—*Pulv: Ipecacuanhæ comp:, Vinum Ipecacuanhæ.*

JUNIPERI BACCÆ ET CACUMINA.

The tops and berries of the Juniperus Communis. Indigenous. Cl. 22, ord. 13, *Diœcia Monadelphia.*

Use.—Diuretic in dropsies.

Dose.—3ss. to 3i.

Prep.—*Oleum Juniperi, Spiritus Juniperi comp:*

KINO.

The extract from the wood of the Pterocarpus Erinacea, which grows in Africa.

Use.—Astringent, given in diarrhœa, dysentery, hæmorrhages, and fluor albus.

Dose.—Gr. x. to 3ss.

Prep.—*Tinctura Kino, Pulv: Kino comp:*

KRAMERIÆ RADIX.

The root of the Krameria Triandria, brought from Peru.

Use.--Astringent and tonic.
Dose.—Gr. xx. to ʒss.

LACTUCA.

The inspissated juice of the Garden Lettuce, Lactuca Sativa. Cl. 19, ord. 1, *Syngenesia Polygamia Æqualis*. This juice is named Lactucarium.
Use.—Narcotic and anodyne, recommended in pthisis.
Dose.—Gr. i. to gr. vi.

LAVANDULÆ FLORES.

The tops of the Lavendula Spica, a native of the south of Europe. Cl. 14, ord. 1, *Didynamia Gymnospermia*.
Use.—Stimulant and tonic, given in dyspepsia.
Dose.—Gr. v. to ℈i.
Prep.—*Ol: Lavendulæ, Spiritus Lavendulæ comp:*

LAURI BACCÆ ET FOLIA.

The leaves and berries of the Laurus Nobilis, or Bay Tree, a native of Italy. Their active principle is prussic acid.
Use.—Stimulant and narcotic.
Dose.—Gr. v. to ℈i.
Prep.—*Empl: Cumini, Confectio Rutæ.*

LICHEN ISLANDICUS.

Iceland Moss.
Use.—Tonic and nutrient, given in coughs and dyspepsia.
Dose.—ʒi. to ℥ss. in decoction.
Prep.- *Decoctum Lichenis.*

LIMONES.
LIMONUM CORTEX.
LIMONUM OLEUM.

The fruit of the Citrus Medica, a native of Spain, Italy, &c.
Use.—The juice is refrigerant in fevers, and useful in scorbutus. The peel is tonic, and may be given in dyspepsia. The oil is merely used on account of its fragrance, as an adjunct to other medicines.
Dose.—Of the juice ad libitum, of the pul. gr. x. to ʒss.
Prep.—*Acidum Citricum, Syrupus Limonum, Infusum Aurantii comp: Inf: Gentianæ comp:*

LINUM CATHARTICUM.

Purging Flax, the seeds of the Linum Catharticum. Indigenous. Cl. 5, ord 5, *Pentandria Pentagynia.*

Use.—Purgative.
Dose.—3ss. to 3i. in substance or in infusion.

LINI USITATISSIMI SEMINA.

The seeds of the Linum Usitatissimum, or Common Flax.

Use.—Demulcent, given in infusion, in catarrh, gonorrhœa, &c. The powder is externally used in the form of poultice.
Dose.—Ad libitum.
Prep.—*Oleum Lini.*

MAGNESIÆ SUBCARBONAS.

Subcarbonate of Magnesia.
Use. Antacid and laxative.
Dose.—3ss. to 3ii.
Prep.—*Magnesia.*

MAGNESIÆ SULPHAS.

Sulphate of Magnesia is obtained in several ways: First, by evaporating waters, which hold it in solution; as those of epsom, sea water, &c. Second, in Italy it is obtained from magnesian schists, which contain magnesia and sulpuret of iron. Third, it is prepared in England by calcining lime stones, which contains magnesia, by which a hydrate of lime and magnesia is formed; muriatic acid is then added in sufficient quantity to combine with the lime only, and the residue is washed and treated with sulphuric acid, which converts it into a sulphate. Fourth, it may also be obtained by pouring sulphuric acid on the carbonate of magnesia, which would be a very expensive process. The salts, which may be mistaken for sulphate of magnesia, are crystallized sulphate of zinc, oxalic acid, and super-acetate of lead.
Use.—Purgative and diuretic.
Dose.—℥ss. to ℥iss.

MALVA.

The entire plant of the Malva Sylvestris, or Common Mallow. Indigenous. Cl. 16, ord. 8, *Monodelphia Polyandria.*
Use.—Demulcent in strangury and dysentery.
Dose.—Ad libitum.

MANNA.

An exudation from the branches of the Fraxinus Ornus, or Flowery Ash, a native of Sicily.
Use.—Gently laxative for children.
Dose.—℥ss. to ℥i.
Prep.—*Conf: Cassiæ.*

MARRUBIUM.

Marrubium Vulgare, or White Horehound. Cl. 14, ord. 1, *Didynamia Gymospermia*. Indigenous.

Use.—Tonic and diuretic, given in coughs, asthma, &c.

Dose.—℈j. to 3ss.

MASTICHE.

Mastich is the exudation from the trunk and branches of the Pistachia Lentiscus, a native of Spain and the Grecian Islands.

Use.—Astringent and diuretic, given in gleets and leucorrhœa.

Dose.—Gr. x. to 3ss.

MENTHA PIPERITA.

Peppermint, Mentha Piperita. Indigenous. Cl. 14, ord. 1, *Didynamia Gymnospermia*.

Use.—Carminative.

Dose.—Gr. x. to ℈j.

Prep.—*Aqua Menthæ pip:*, *Oleum Menthæ pip:*, *Spiritus Menthæ pip*.

MENTHA VIRIDIS.

Spearmint.

Dose.—Doses and preparations as peppermint.

MENYANTHES.

The leaves of the Menyanthes Trifoliata, or Buckbean. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia*.

Use.—Tonic and purgative, given in gout, rheumatism, and intermittents.

Dose.—3ss. to 3j., or in infusion.

MEZEREI CORTEX.

The bark of the Daphne Mezereum, a native of North Europe. Cl. 8, ord. 1, *Octandria Monogynia*.

Use.—Diaphoretic and stimulant, given in chronic rheumatism and cutaneous diseases.

Dose.—Gr. ij. to gr. x.

Prep.—*Decoctum Mezerei*, *Decoctum Sarsaparillæ comp*.

MORI BACCÆ.

The fruit of the Morus Nigra, a native of Persia and Italy.

Use.—Refrigerant and laxative.

Prep.—*Syrupus Mori*.

MOSCHUS.

Musk is found in a bag situated between the navel

and prepuce of the Moschus Moschiferus, or Musk Deer, a native of Thibet.

Use.—Stimulant and antispasmodic, given in tetanus, hysteria, and epilepsy.

Dose.—Gr. v. to 3ss.

Prep.—*Mistura Moschi.*

MYRISTICÆ NUCLEI.

The berry of the Myristica Moschata, a native of the Moluccas.

Use.—Aromatic, stimulant, and narcotic; generally given as an adjunct to other medicines.

Dose.—Gr. v. to ℈j.; *m.* ij. to *m.* v. of the oil.

Prep.—*Spiritus Myristicæ, Spiritus Lavendulæ comp:, Confectio Aromatica, Emplastrum Picis comp:*

MYRRHA.

Myrrh is the Gum Resin of a plant growing in Arabia, which has hitherto not been accurately described.

Use.—Expectorant and tonic, given in catarrh and dyspepsia.

Dose.—Gr. x. to 3ss.

Prep.—*Tinctura Myrrhæ, Pil: Aloes cum Myrrhâ, Pil: Ferri cum Myrrha, Pil: Galb: comp:, Decoctum Aloes comp:, Mist: Ferri comp.*

OLIBANUM.

The concrete gum of the Juniperus Lycia, a native of India.

Use.—Stimulant, seldom used but to scent sick rooms.

Dose.—Gr. v. to ℈j.

OLIVÆ OLEUM.

The expressed oil of the fruit of the Olea Europea, native of the south of Europe.

Use.—Demulcent in the form of emulsion, in coughs.

Dose.—3j. to 3ii.

Prep.—*Linimentum Ammoniæ fortius.*

OPIUM.

The concrete juice of the Papaver Somniferum, generally obtained by making incisions in the unripe capsules. Cl. 13, ord. 1, *Polyandria Monogynia.* There are three kinds of opium now to be met with, the Turkey, East Indian, and English. The first has long had the preference.

The active principles are an alkaline base, named morphia, combined with meconic acid and narcotine. Morphia is readily obtained by triturating powdered opium with acetic acid. Ammonia is then added to the

filtered liquors, and by combining with the acetic acid, precipitates the impure morphia, which is purified by digesting it in cold alcohol, and crystallized by evaporation, after being dissolved in boiling alcohol.

Narcotine is obtained by digesting opium in ether, and gently evaporating the filtered solution.

Use.—Narcotic, stimulant, and anodyne.

Dose.—gr. ss. to gr. ij.

Prep.—*Conf: Opii, Emplast: Opii, Extract Opii, Pil: Saponis cum Opio, Pulv: cornu Usti cum Opio, Pulv: Cretæ comp: cum Opio, Pulv. Ipecacuan: comp:, Pulv: Kino comp:, Tinctura Opii, Tinctura Camphoræ comp:, Vinum Opii.*

OPOPONACIS GUMMI RESINA.

The Inspissated Juice, obtained by incisions in the roots of the Pastinaca Opoponax, or Rough Parsnip, found in the south of Europe and the Levant.

Use.—Antispasmodic and emenagogue, given in hysteria and amenorrhœa.

Dose.—Gr. x. to ʒss.

ORIGANUM.

The leaves of the Origanum Vulgare, or Common Marjoram. Indigenous. Cl. 14, ord. 1, *Didynamia Gymnospermia.*

Use.—Tonic and stomachic, given in debility of the stomach.

Dose.—Gr. v. to ʒi.

Prep.—*Ol: Origani.*

PAPAVERIS CAPSULÆ.

Dried capsules of the Papaver Somniferum.

Use.—Anodyne in fomentations.

Prep.—*Decoctum Papaveris, Syr: Papaveris, Extr: Papaveris.*

PETROLEUM.

Barbadoes Tar, a natural product.

Use.—Antispasmodic, given in asthma and as a vermifuge.

Dose.—Gr. x. to ʒss.

PIMENTÆ BACCÆ.

Allspice, the berries of the Myrtus Pimenta of south America and the West Indies.

Use.—Tonic and stimulant.

Dose.—Gr. v. to ʒi.

Prep.—*Aqua Pimentæ, Oleum Pimentæ, Spiritus Pimentæ, Syr: Rhamni.*

PIPERIS LONGI FRUCTUS.

The fruit of the Piper Longum of Bengal.

Use.—Tonic and stimulant.

Dose.—Gr. v. to gr. x.

Prep.—*Confectio Opii, Pulv: Cinnamomi comp:, Pulv: Cretæ comp:, Tinct: Cinnamomi comp.*

PIPERIS NIGRI BACCÆ.

The berries of the Piper Nigrum of the East Indies.

Use and Dose.—As the Piper Longum.

Prep.—*Confectio Piperis Nigri.*

PIX ABIETINA.

Burgundy Pitch, the resinous exudation from incisions made in the bark of the Pinus Abies, or Norway Spruce Fir.

Use.—Externally stimulant and rubefacient.

Prep.—*Emplastrum Picis comp:*

PIX LIQUIDA.
PIX NIGRA.

Both obtained from the Pinus Sylvestris, or Scotch Fir, by the application of heat. Pix Nigra is merely inspissated Pix Liquida.

Prep.—*Unguent um Picis Liquidæ, Unguentum Picis Nigræ.*

PLUMBI SUBCARBONAS.

Subcarbonate of Lead, or Cerusse, is only used in making the Acetate of Lead.

PLUMBI OXYDUM SEMIVITREUM.

Litharge, a Protoxide of Lead, used in making the Liquor Plumbi Subacetatis, Emplastrum Plumbi, and Ceratum Saponis.

PORRI RADIX.

The bulbous root of the Allium Porrum or Leek.

Use.—Expectorant and anthelmintic, given in asthma, catarrh, and worm cases.

Dose.—℥i. to ℥ss. of the juice.

POTASSÆ NITRAS.

Purified Nitrate of Potash. Nitre is found native in some parts of the world, and in considerable quantity on the surface of the ground in India, in South America, Egypt, and Spain. In France and Germany it is made in nitre beds, which are formed by layers of animal and vegetable substances, mixed with lime.

Nitric acid is formed by decomposition of the animal and vegetable substances, and combines with the lime, forming a nitrate of lime, which is decomposed by

subcarbonate of potash, thus producing nitrate of potash, and carbonate of lime.

Use.—Refrigerant and diuretic, given in inflammations in general, but contraindicated in inflammation of the kidney.

Dose.—Gr. x. to 3ss.

POTASSA IMPURA.

Potash is obtained by burning wood and different land vegetables to ashes, which are then digested in water, the solution is evaporated, and the residue is calcined. Potash is prepared in very large quantities in Russia, America, and Tuscany.

POTASSÆ SUPERTARTRAS.

Purified supertartrate of potash, Cream of Tartar, exists abundantly in grape juice, and is more soluble in water than in spirit. It is deposited in wine casks, in proportion as the vinous fermentation proceeds.

Use.—Diuretic and purgative, given in dropsies.

Dose.—3ss. to 3i.

Prep.—*Ferrum Tartarizatum, Potassæ Tartras, Acidum Tartaricum, Antimonium Tartarizatum.*

PRUNA.

The dried fruit of the Prunus Domestica, a native of Asia and Europe.

Use.—Laxative and nutrient.

Dose.—Ad libitum.

Prep.—*Confectio Sennæ.*

PTEROCARPI LIGNUM.

The wood of the Pterocarpus Santalinus, a native of India.

Use.—Only as a colouring matter.

Prep.—*Sp: Lavendulæ comp.*

PULEGIUM.

Mentha Pulegium, or Pennyroyal. Indigenous. Cl. 14, ord. 1, *Didynamia Gymnospermia.*

Use.—Expectorant and emmenagogue, given in asthma and hysteria.

Dose.—Gr. x. to 3i.

Prep.—*Aqua Pulegii, Oleum Pulegii.*

PYRETHRI RADIX.

The root of the Anthemis Pyrethrum, a native of the Levant, Barbary, and Spain.

Use.—Stimulant and sialogogue, used in apoplexy and toothach.

Dose.—Gr. iv. to gr. x., to be chewed to excite the flow of saliva.

QUASSIÆ LIGNUM.

The wood of the Quassia Excelsa, which grows in Jamaica.

Use.—Tonic, given in intermittents and dyspepsia.

Dose.—Gr. v. to 3ss.

Prep.—*Inf: Quassiæ.*

QUERCÛS CORTEX.

The bark of the Quercus Pedunculata. Indigenous. Cl. 21, ord. 6, *Monoecia Polyandria.*

Use.—Astringent and tonic, given in diarrhœa and intermittents.

Dose.—Gr. x. to 3ss.

Prep.—*Decoctum Quercûs.*

RESINA FLAVA.

Yellow Resin, the residue of the distillation of the Oleum Terebinthinæ, obtained from the Pinus Sylvestris, or Scotch Fir.

Use.—Externally stimulant, used in ointments and plasters.

Prep.—*Empl: Ceræ, Ceratum Resinæ, Empl: Picis comp:, Empl: Resinæ, Unguentum Picis Aridæ.*

RHAMNI BACCÆ.

The berries of the Rhamnus Catharticus, or Purging Buckthorn. Indigenous. Cl. 5, ord. 1, *Pentandria Monogynia.*

Use.—Purgative, given in dropsies.

Dose.—3i. to 3ij.

Prep.—*Syr: Rhamni.*

RHEI RADIX.

The root of the Rheum Palmatum, a native of China and Tartary. An inferior kind is brought from the East Indies. That which is generally known as English rhubarb is produced by the Rheum Undulatum.

Use.—Purgative, but in small doses stomachic and astringent.

Dose.—As a purgative gr. x. to 3ss.

Prep.—*Inf: Rhei, Tinct: Rhei, Tinct: Rhei comp:, Extr: Rhei.*

RHÆADOS PETALA.

The petals of the Papaver Rhæas, or Red Poppy. Indigenous. Cl. 13, ord. 1, *Polyandria Monogynia.*

Use.—As a colouring matter.

Prep.—*Syr: Rhœados.*

RICINI OLEUM.

The expressed oil of the seeds of the Ricinus

Communis, or Palma Christi, a native of the East and West Indies.

Use.—Mildly cathartic.

Dose.—3iv. to ʒiss.

ROSÆ CANINÆ PULPA.

The pulp of the fruit of the Rosa Canina, or Dog Rose. Indigenous. Cl. 12, ord. 5, *Icosandria Polygynia.*

Use.—Cooling and laxative for children.

Dose.—Ad libitum.

Prep.—*Conf: Rosæ Caninæ.*

ROSÆ CENTIFOLIÆ PETALA.

The petals of the Rosa Centifolia, or Hundred-leaved Rose, an European shrub.

Use.—Said to be laxative.

Prep.—*Aqua Rosæ, Syr: Rosæ.*

ROSÆ GALLICÆ PETALA.

The petals of the Rosa Gallica, or Red Rose.

Use.—Astringent.

Prep.—*Conf: Rosæ Gallicæ, Inf: Rosæ comp:, Mel: Rosæ.*

RUBIÆ RADIX.

The root of the Rubia Tinctorum, or Dyers' Madder. Indigenous. Cl. 4, ord. 1, *Tetrandria Monogynia.*

Use.—Emmenagogue and astringent.

Dose. 3ss. to 3i.

RUTÆ FOLIA.

The leaves of the Ruta Graveolens, or Common Rue, a native of the south of Europe.

Use.—Tonic, emmenagogue, and stimulant, given in hysteria and colic.

Dose.—Gr. x. to 3ss.

Prep.—*Oleum Rutæ, Conf: Rutæ.*

SABINÆ FOLIA.

The leaves of the Juniperus Sabina, or Common Savine, a native of the south of Europe.

Use.—Emmenagogue, given in amenorrhœa and chlorosis; principally used as an irritant to blistered surfaces.

Dose.—Gr. v. to gr. x.

rep.—*Ceratum Sabinæ.*

SACCHARUM.

Sugar, obtained from the Sugar Cane, Saccharum Officinarum, a native of the East and West Indies.

Use.—To sweeten other medicines.

Prep. -Syr: Omnes.

SAGAPENUM.

Gum Sagapenum, the produce of an unknown plant, brought from Smyrna and Aleppo.

Use.—Antispasmodic and emmenagogue.

Dose.—Gr. x. to 3ss.

Prep.—Pil: Galbani comp:

SALICIS CORTEX.

The bark of the Salix Caprea, or round-leaved Willow. Indigenous. Cl. 22, ord. 2, *Diœcia Diandria.*

Use.—Tonic and astringent, given in intermittents. This bark is sometimes mixed up with Cusparia bark.

Dose.—Gr. x. to 3ss.

SAMBUCI FLORES.

Flowers of the Sambucus Nigra, or Common Elder. Indigenous. Cl. 5, ord. 3, *Pentandria Trigynia.*

Use.—Diaphoretic.

Prep.—Unguentum Sambuci.

SAPO DURUS.

Spanish Soap is made with olive oil and soda.

Use.—Laxative and lithontriptic.

Dose.—Gr. v. to 3ss.

Prep.- Ceratum Saponis, Emplastrum Saponis, Linimentum Saponis comp:

SAPO MOLLIS.

Soft Soap is made with olive oil and potash.

SARSAPARILLÆ RADIX.

The root of the Smilax Sarsaparilla, a native of South America.

Use.—Demulcent and diuretic, given in secondary syphilis and cutaneous diseases.

Dose.—℈i. to 3i.

Prep.—Decoctum Sarsaparillæ comp:, Extractum Sarsaparillæ.

SASSAFRAS LIGNUM ET RADIX.

The chips and bark of the root of the Laurus Sassafras, a native of China and North America.

Use.—Stimulant and sudorific.

Dose.—℈i. to 3i.

Prep.—Oleum Sassafras, Decoctum Sarsaparillæ comp:, Decoctum Guaiaci.

SCAMMONEÆ GUMMI RESINA.

Scammony; the concrete juice is obtained by making incisions in the root of the Convolvulus Scammonea of Aleppo and Smyrna.

Use.—Drastic, purgative, and anthelmintic.

Dose.—Gr. v. to ℈i.

Prep.—*Conf*: *Scamm*:, *Pulv*: *Scamm: comp*:, *Extr*: *Colocynth*: *comp*:, *Pulv*: *Sennæ comp*:

SCILLÆ RADIX.

The bulb of the Scilla Maritima, brought from Spain.

Use.—Expectorant and diuretic, given in dropsies, catarrh without much inflammation, and asthma.

Dose.—Gr. i. to gr. v.

Prep.—*Acet*: *Scillæ*, *Oxym*: *Scillæ*, *Pil*: *Scillæ comp*: *Tinct*: *Scillæ*.

SECALE CORNUTUM.

Ergot of Rye, is a parasitical fungus growing on the Secale Cereale. Indigenous. Cl. 3, ord. 2, *Triandria Digynia*.

Use.—A stimulant to the uterus, given in protracted labours depending on debility or atony of the uterus.

Dose.—Of the powder, gr. x. to gr. xx. every quarter of an hour, until the effect be produced.

SENEGÆ RADIX.

The root of the Polygala Senega, a native of North America.

Use.—Tonic and expectorant, useful in typhus.

Dose.—℈i. to ℈ij. or ℥iss. of the decoction.

Prep.—*Decoc*: *Senegæ*.

SENNÆ FOLIA.

The leaves of the Cassia Senna, brought from Alexandria.

An inferior kind is brought from the East Indies, distinguished by the large size of the leaves.

Use.—Purgative, in most cases requiring evacuations.

Dose.—℈i. to ʒi.

Prep.—*Conf*:, *Inf*:, *Tinct*:, *et Syr*: *Sennæ*, *Conf*: *Cassiæ*.

SERPENTARIÆ RADIX.

The root of the Aristolochia Serpentaria, or Virginian Snakeroot.

Use.—Stimulant and diaphoretic, given chiefly in typhoid fevers.

Dose.—Gr. x. to ʒss.

Prep:—*Tinct*: *Serpent*:

SIMAROUBÆ CORTEX.

The bark of the Quassia Simarouba of South America.

Use.—Tonic, given in intermittents, chronic diarrhœa, and dyspepsia.

Dose.—Gr. x. to ʒss.

Prep.—*Inf: Simaroubæ.*

SINAPIS SEMINA.

The seeds of the Sinapis Nigra. Indigenous. Cl. 15, ord. 2, *Tetradynamia Siliquosa.*

Use.—Stimulant, rubefacient, and emetic: given in dyspepsia and apoplexy, and often applied as a cataplasm.

Dose.—℈i. to ʒss.

Prep.—*Catap: Sinap:*, *Inf: Armoraciæ comp:*

SODÆ MURIAS.

Common Salt is obtained either from salt mines, sea water, or saline springs, by evaporation.

Use.—Tonic and laxative.

Dose.—℈i. to ʒi.

SODÆ SUBBORAS.

Borax is found native in some parts of India and Thibet.

Use.—As a detergent in apthæ of children.

Dose.—Gr. x. to ʒss.

Prep.—*Mel Boracis.*

SODA IMPURA.

Soda is obtained by the combustion of marine plants, such as the Salsola Soda, and the residue is dissolved, and subjected to several chemical processes, in order to separate the impurities. It is made in great abundance in Spain.

SPARTII CACUMINA.

The tops of the Spartium Scoparium, Common Broom. Indigenous. Cl. 17, ord. 4, *Diadelphia Decandria.*

Use.—Diuretic, in dropies.

Dose.—℈i. to ʒi.

SPIGELIÆ RADIX.

The root of the Spigelia Marilandica of North America.

Use.—Anthelmintic, given in cases of lumbrici.

Dose.—Gr. x. to ʒi.

SPONGIA USTA.

Burnt Sponge. Sponge is found in the Mediterranean and Red Sea. Its active principle is iodine.

Iodine is usually obtained from sea-weeds. It is

supposed to be an elementary body, solid at the ordinary temperature of the atmosphere, possessing a metallic appearance. If heated to about eighty degrees, it gives out a violet vapour, from which its name has been derived. It supports combustion, renders vegetable colours yellow, and forms a blue compound with starch.

Iodine unites with hydrogen, forming a colourless gaseous acid, the hydriodic acid, which, uniting with different bases, forms the salts called hydriodates.

Use.—Deobstruent, in bronchocele and scrofula.

Dose.—3i. to 3ij.

STANNUM.

Stanni Limatura: Tin Filings.

Use.—A mechanical anthelmintic, given for lumbrici and ascarides.

Dose.—Gr. iij. to gr. x.

STAPHISAGRIÆ SEMINA.

The seeds of the Delphinium Staphisagria, a native of the South of Europe.

Use.—Cathartic; very rarely used; chiefly applied as a powder to destroy pediculi.

Dose.—Gr. iij. to gr. x.

STRAMONII, SEMINA ET FOLIA.

The seeds and leaves of the Datura Stramonium, brought from America. Cl. 5, ord. 1, *Pentandria Monogynia.*

Use.—Narcotic; given in mania, epilepsy, and asthma.

Dose.—Gr. ss. to gr. ij. of the extract.

Prep.—*Ext: Stramonii.*

STYRACIS BALSAMUM.

The balsam of the Styrax Officinale, brought from the South of Europe and the Levant.

Use.—Stimulant and expectorant; given in asthma.

Dose.—Gr. x. to 3ss.

Prep.—*Tinct: Benzoini comp:*

SULPHUR.

Sulphur is found native in many parts of the world, particularly in the neighbourhood of volcanoes. It is also found combined with many metals, from which it may be obtained by exposure to heat.

TABACI FOLIA.

Leaves of the Nicotiana Tabacum, a native of North America.

Use.—Narcotic, emetic, sedative, and cathartic; rarely given internally; principally used as an enema in hernia.

Dose.—Gr. ss. to gr. ij.

Prep.—*Inf: Tabaci.*

TAMARINDI PULPA.

The fruit of the Tamarindus Indicus, from the East and West Indies.

Use.—Gently laxative.

Dose.—Ad libitum.

TARAXACI RADIX.

The root of the Leontodon Taraxacum, or Dandelion. Indigenous. Cl. 19, ord. 1, *Syngenesia Polygamia Æqualis.*

Use.—Diuretic; useful in dropsy and jaundice.

Dose.—3ss. to 3ij.

Prep.—*Ext: Taraxaci.*

TEREBINTHINA CANADENSIS.

Canada Turpentine or Balsam, obtained from the Pinus Balsamea.

TEREBINTHINA CHIA.

The resin of the Pistachia Terebinthus.

TEREBINTHINA VULGARIS.

The resin of the Pinus Sylvestris, or Scotch Fir.

Use.—Stimulant and diuretic; in gleets and leucorrhœa.

Dose.—℈i. to 3i.

TEREBINTHINÆ OLEUM.

Oil of Turpentine, obtained by distillation from the raw turpentine of the Pinus Sylvestris.

Use.—Purgative and anthelmintic, given in tænia.

Dose.—3i. to ℥ss.

Prep.—*Linim: Terebinthinæ.*

TESTÆ.

The shell of the Ostrea Edulis, or Oyster. Used as an antacid.

TIGLII OLEUM.

The expressed oil of the seeds of the Croton Tiglium, a native of the East Indies.

Use.—Drastic purgative, useful in mania, apoplexy, and tetanus.

Dose.—*M.* i. to *m.* iij.

TORMENTILLA RADIX.

The root of the Tormentilla Erecta, or Septfoil. Indigenous. Cl. 12, ord. 5, *Icosandria Polygynia.*

Use.—Astringent, in diarrhœa.
Dose.—Gr. x. to 3ss.
Prep.—*Pulv: Cretæ comp.*

TOXICODENDRI FOLIA.

The leaves of the Rhus Toxicodendron, or Sumach of North America.
Use.—Stimulant and narcotic.
Dose.—Gr. ij. to gr. vi.

TRAGACANTHA.

Tragacanth, a natural exudation from the Astragalus Verus, a native of North Persia.
Use.—Demulcent, given in coughs.
Dose.—Gr. x. to 3ss.
Prep.—*Pulv: Tragacanthæ comp:*

TUSSILAGO.

The leaves of the Tussilago Farfara. Indigenous. Cl. 19, ord. 2, *Syngenesia Superflua.*
Use. — Demulcent and expectorant; useful in coughs, asthma, and phthisis.
Dose.—3ss. to 3i.

VALERIANÆ RADIX.

The root of the Valeriana Officinalis, or Wild Valerian. Indigenous. Cl. 3, ord. 1, *Triandria Monogynia.*
Use.—Antispasmodic and tonic, recommended in hysteria and epilepsy.
Dose.—℈i. to ℈ij.
Prep.—*Tinct: Valerianæ Ammoniata.*

VERATRI RADIX.

Root of the Veratrum Album, or White Hellebore, a native of Greece and Italy.
Use.—Errhine in amaurosis, emetic and purgative.
Dose.—Gr. ij. to gr. v. snuffed up the nose.
Prep.—*Decoctum Veratri, Unguentum Veratri, Unguentum Sulphuris compositum.*

ULMI CORTEX.

The bark of the Ulmus Campestris, or Common Elm. Indigenous. Cl. 5, ord. 2, *Pentandria Digynia.*
Use.—Tonic and alterative, in intermittents and cutaneous diseases.
Dose.—℈i. to 3i.
Prep.—*Decoctum Ulmi.*

UVÆ PASSÆ.

Raisins; the fruit of the Vitis Vinifera, a native of the South of Europe.

Use.—Demulcent, nutrient and aperient.
Dose.—Ad libitum.
Prep.— *Tinctura Sennæ.*

UVÆ URSI FOLIA.

The leaves of the Arbutus Uva Ursi, or Bearberry. Indigenous. Cl. 10, ord. 1, *Decandria Monogynia.*
Use.—Tonic and astringent, principally given in diseases of the kidney or bladder.
Dose.—Gr. x. to 3i.
Prep.—*Decoctum Uvæ Ursi.*

ZINCUM.

Zinc; only used to make the sulphate.

ZINGIBERIS RADIX.

The root of the Zingiber Officinale of Jamaica.
Use.—Stomachic and stimulant.
Dose.—Gr. v. to 3ss.
Prep. *Syr. Zingiberis, Tinctura Zingiberis.*

TABLE,

Showing the proportion in which Opium, and certain preparations of Antimony, Arsenic, and Mercury, are contained in some compounds.

OPIUM.

Confectio Opii.—36 grains contain one grain of opium.

Pil. Saponis cum Opio.—Five grains contain one grain of opium.

Pulvis Cornu Usti cum Opio.—Ten grains contain one grain of opium.

Pulvis Cretæ compositus cum Opio.—Two scruples contain one grain of opium.

Pulvis Ipecacuanhæ compositus.—Ten grains contain one grain of opium.

Pulvis Kino compositus.—One scruple contains one grain of opium.

Tinctura Opii.—Nineteen minims contain about one grain of opium.

Tinctura Camphoræ composita. — Four fluid drachms contain nearly one grain of opium.

ANTIMONY.

Liq. Antimonii Tartarizati.—One fluid ounce contains two grains of tartarized antimony.

MERCURY.

Hydrargyrum cum Cretâ.—Three grains contain one grain of mercury.

Liquor Hydrargyri Oxymuriatis.—An ounce contains half a grain of the oxymuriate of mercury.

Linimentum Hydrargyri.—Six drachms contain one drachm of mercury.

Pilula Hydrargyri.—Three grains contain one grain of mercury.

Pilula Hydrargyri submuriatis composita.—Four grains contain about one grain of the submuriate of mercury.

Unguentum Hydrargyri Fortius.—Two drachms contain one drachm of mercury.

Unguentum Hydrargyri mitius.—Six drachms contain one drachm of mercury.

ARSENIC.

Liquor Arsenicalis.—Two fluid drachms contain one grain of the oxide of arsenic.

ANATOMY.

BRIEF DESCRIPTION OF THE VISCERA, &c.

1. The viscera of the body are parts circumscribed within cavities, highly vascular, and destined to the support of animal life.

2. They are the contents of the *cranium*, *thorax*, *abdomen*, and *pelvis*.

3. The cranium is formed by eight bones, six proper, and two common to it and the face. The six proper are the *os frontis*, *os occipitis*, *two ossa parietalia*, and *two ossa temporum;* the two common are, the *os ethmoides*, and *os sphenoides*.

4. The contents of the cranial cavity are, the *brain*, with its *vessels*, *membranes*, and *nerves*.

5. The membranes are three in number: the *dura mater*, *tunica arachnoidea*, and *pia mater*.

6. The *dura mater* is a tough fibro-serous membrane of white pearly appearance, composed of two layers: the outer one has a villous appearance, and forms the internal periosteum; the inner layer is smooth, and immediately covers the tunica arachnoidea.

7. On the outer surface of the dura mater are seen some little granular fleshy-looking bodies, called *Glandulæ Pacchioniæ*.

8. The two layers of the dura mater are separated in some parts, leaving spaces, partly triangular, called sinuses, the principal of which are the

superior and *inferior longitudinal*, the *two lateral*, the *torcular Herophili*, or *fourth sinus*, and the *sphenoidal sinuses*.

Little fibrous cords are stretched across the superior longitudinal sinus, called the *chordæ Willisii*.

9. The inner layer of the dura mater forms folds or processes, which dip down and separate the different parts of the brain; they are the *falx cerebri*, *tentorium*, and *falx cerebelli*.

10. The *falx cerebri* extends from the crista galli, following the course of the sagittal suture, to the internal occipital protuberance at the back part of the skull, where it unites with the tentorium. It divides the cerebrum into two portions, called hemispheres. The separation of its folds superiorly forms the superior longitudinal sinus.

11. The *tentorium* extends across the back part of the cranium, between the cerebrum and cerebellum; its folds form, by their separation, the lateral sinuses.

12. The *falx cerebelli* extends from the tentorium to the foramen magnum, along the spine of the occipital bone, to the margin of the foramen magnum.

13. The arteries of the dura mater are the *anterior*, *middle*, and *posterior meningeal*. The first are branches of the ophthalmic, the middle are given off from the internal maxillary artery, and the posterior from the occipital arteries.

14. The *pia mater* is a thin delicate membrane, extremely vascular, composed of lamellæ of cellular tissue. It immediately invests the brain, dips down into the convolutions, and sends elongated portions into the ventricles, called *choroid plexuses*.

15. Two choroid plexuses enter the lateral ventricles, behind the crura cerebri; another penetrates under the velum, fornix, and corpus callosum, called tela choroidea; whilst another gets into the fourth ventricle near the calamus scriptorius.

16. The *tunica arachnoidea* is a delicate serous membrane, investing the brain, and lining the dura mater, in a similar manner to the pleura investing the lungs and lining the ribs, forming a shut sac.

17. The tunica arachnoidea is adherent to the pia mater in every part except between the tuber annulare and conjoint optic nerves, and also between the medulla oblongata and cerebellum. Under the velum it surrounds the vena galeni, and then passes into the third, and thence into the other ventricles, forming the lining membrane.

CEREBRO-SPINAL SYSTEM.

18. The cerebro-spinal system is composed of four substances, differing in their colour.

1. The white or *medullary substance*, constitutes the inner part of the cerebrum and cerebellum, but is placed externally in the pons varolii, crura cerebri and cerebelli, medulla oblongata, and medulla spinalis. It has a fibrous structure, and appears to consist of minute globules united together in a linear manner.

2. The grey or *cineritious substance*, forms the outer layer of the cerebrum and cerebellum, and is found in the centre in the pons varolii, crura cerebri et cerebelli, and medulla oblongata et spinalis. Its colour is owing to its numerous minute bloodvessels; its globules are not arranged in lines so as to give the appearance of fibres.

3. The yellow substance is a modification of the grey, and may be seen between the grey and the white in the lower part of the posterior cerebral lobes, and in the cerebellum.

4. The black substance is seen in the crura cerebri, of a semilunar form, called ocus niger.

THE BRAIN.

19. The Brain is divided into *cerebrum*, *cerebellum*, and *medulla oblongata*.

20. The *cerebrum* occupies the upper and larger portion of the cranium. It is divided by the falx major into two *hemispheres;* and each hemisphere is divided into three lobes, the anterior, middle, and posterior, the two former being separated, inferiorly, by a depression, named *fissura Sylvii.*

21. Its surface is divided by deep fissures, producing convex ridges, called *convolutions*, which are connected to the pia mater by small filaments and vessels, and to these Ruysch has applied the term *tomentum cerebri.*

22. On separating the hemispheres of the cerebrum, the *corpus callosum* is brought into view. It is a portion of medullary substance, extending transversely and horizontally from the inside of each hemisphere. Its upper surface is convex; a furrow, called raphè, runs along its centre, on the side of which are transverse lines, named *lineæ transversæ.* The anterior cerebral arteries pass between the raphè and lineæ transversæ.

23. After slicing away the substance of either hemisphere, to a level with the corpus callosum, a medullary portion is left, of an oval form, called *centrum ovale.*

24. Beneath the corpus callosum and centrum ovale is situated a *lateral ventricle*, on each side.

25. The proper ventricles are four in number, communicating with each other; they are lined by tunica arachnoidea, and are moistened by a fluid secreted in them.

26. The lateral ventricles are said to resemble a ram's horn in their form; they extend from the anterior lobes, in a parallel direction, to the posterior part, where they bend downwards, forwards, and inwards.

27. The anterior part forms the *anterior cornu*, an elongated part extending into the posterior lobe forms the *posterior cornu*, or *digital cavity;* the inferior descending portion is called the *inferior* or *descending cornu.*

28. The parts first seen in the lateral ventricles, forming the floor, are the *corpora striata, tænia semicircularis*, and *thalamus opticus.*

29. The *corpora striata* are greyish pyriform bodies, situated at the anterior part of the ventricle; they are rounded and largest in front.

30. The *thalami optici* are white convex bodies situated behind them, connected together by a small portion of medullary matter, called *commissura mollis.*

31. The thin flattened band of white substance seen between the thalamus opticus and corpus striatum is named *tænia semicircularis.*

32. The ventricles are separated from each other by a thin membrane, named *septum lucidum*, attached above to the corpus callosum, and below to the fornix; it is composed of two medullary layers, the space between which is the *fifth ventricle.*

33. The *fornix* is continued from the septum lucidum, commencing, in front, by two rounded cords, called anteriar pillars, or crura, which terminate in the corpora albicantia. The union of these crura forms the body of the fornix, which is

divided, posteriorly, into two crura, and they terminate in the *hippocampi majores.*

34. The under surface of the body of the fornix is marked with longitudinal lines, forming what is called *psalterium*, or *lyra.*

35. The anterior thin edge of the posterior crura extends into the descending cornu of the lateral ventricles, and is named *corpus fimbriatum*, or *tænia hippocampi.*

36. The posterior edge is connected with the floor of the posterior cornu, or digital cavity.

37. The floor of the digital cavity is formed by the *hippocampus minor.*

38. The floor of the inferior cornu is formed by the hippocampus major, a projection of medullary substance, terminating in four or five prominences, resembling the foot of an animal, and hence called *pes hippocampi.*

39. There is a little opening at each side of the edge of the anterior extremity of the fornix, called the *foramen of Monro.* Each foramen leads down to the third ventricle, communicating through the *foramen commune anterius.*

40. Lying on the thalamus opticus of each side is seen a choroid plexus.

41. The *choroid plexuses* of the lateral ventricle are vascular, plexiform, membranous bodies, extending from the foramina of Monro, over the thalami optici, to the termination of the ventricles. The veins of each plexus unite and form the *vena Galeni*, which empties itself into the torcular herophili.

42. Beneath the fornix is situated the *velum interpositum*, or tela choroidea, forming the roof of the third ventricle.

43. Behind the thalami and third ventricle, and

beneath the velum, is situated the *pineal gland*, connected to the thalami by two peduncles; and inferiorly to it, the *corpora quadrigemina*.

44. The two highest eminences of the corpora quadrigemina are called *nates;* the posterior inferior are named *testes*.

45. There is a little fissure between their upper surface and the corpus callosum, called the *fissure of Bichat*, which admits the passage of the arachnoid membrane into the ventricles.

46. The *third ventricle* is a deep fissure, bounded laterally by the thalami optici; superiorly, by the velum; inferiorly, by the pons tarini and tuber cinereum; anteriorly, by the anterior commissure and anterior crura of the fornix; and posteriorly, by the pineal gland and posterior commissure.

47. The *anterior commissure* is a medullary band, uniting the corpora striata, in front of the anterior crura of the fornix.

48. The posterior commissure is situated at the back part, and at the base of the pineal gland.

49. The *third ventricle* terminates anteriorly in the *foramen commune anterius*.

50. The posterior termination is called *foramen commune posterius*.

51. There is an opening, leading downwards and forwards, from the foramen commune anterius to the infundibulum, called *iter ad infundibulum*.

52. The *infundibulum* is a conical body of cineritious and medullary substance, extending from the anterior and inferior part of the third ventricle to the pituitary gland.

53. The pituitary gland is of an oval form, and of a brownish colour, externally. It is situated in the sella turcica of the sphenoid bone.

54. There is a passage below the posterior commissure of the third ventricle, leading down to the fourth ventricle, named *Iter a tertio ad quartum ventriculum, canalis medius,* or *aquæductus Sylvii.*

Parts seen at the Base of the Brain, proceeding from the front to the back part.

a. Looking down the separation of the anterior cerebral lobes, in the mesian line, we first see the anterior extremity of the corpus callosum.

b. Two whitish cords are seen lying in a groove of the anterior lobe on each side of the mesian line; these are the olfactory nerves, with their anterior extremity enlarged, and of a greyish colour.

c. The middle cerebral lobes are observed making an evident projection above the anterior lobes, from which they are separated by the fissure of Sylvius.

d. Behind the olfactory nerves are seen the optic nerves, separated in front, then united in the mesian line, and again diverging. They may be traced over the crura cerebri to their origin in the thalami optici and tubercula quadrigemina.

e. Immediately behind the conjoint optic nerves is a small grey appendage, called infundibulum, which is hollow, and is continuous with the third ventricle.

f. The base of the infundibulum is emplanted on a grey eminence, called tuber cinereum, which forms part of the floor of the third ventricle.

g. Behind this are two little white bodies, called corpora albicantia, in which the anterior pillars of the fornix terminate.

h. Behind the corpora albicantia are two large bands of medullary substance, the crura cerebri. They have a black spot in their centre called locus niger.

i. Between the crura cerebri and the corpora albicantia there is a triangular space (continuous with the tuber cinereum) called pons tarini or locus perforatus, which also assists in forming the floor of the third ventricle.

k. On the inner edge of the crura cerebri and locus perforatus the fibres of the third pair of nerves are seen given off. They may be traced as far as the locus niger.

l. Behind the crura cerebri, and continuous with them, is seen a quadrilateral white eminence, called the pons varolii, continued behind with the crura cerebelli. Its upper part is formed by the tubercula quadrigemina, which form the upper wall of the aqueduct of Sylvius. Along its centre is seen a depression, occasioned by the passage of the basilar artery.

m. Along the external edge of the pons varolii are seen the fourth pair of nerves, which wind round the pons backwards and upwards towards the cerebellum, and may be traced to the valve of Vieussens.

n. From the middle of the outer edge of the pons varolii, the fifth pair of nerves is seen arising in two bundles; the posterior largest, the anterior smallest. It may be traced to the centre of the pons varolii, where it is found to commence by three roots, the middle one of which is the largest, and arises between the corpora olivaria and restiformia.

o. At the posterior edge of the pons varolii, at about two or three lines from the mesian line, is seen the commencement of the sixth pair of nerves.

p. The posterior angles of the pons are continued obliquely outwards, forming the crura cerebelli; their upper part is continuous with the processus a cerebello ad testes, and their posterior and inner portion with the corpora restiformia.

q. Behind the pons varolii is the medulla oblongata, separated from it by a deep depression, called foramen cœcum. It is thickest in front, smaller behind and downwards, and imperceptibly joins with the medulla spinalis. It is separated in the mesian line into two equal halves, each of which consists of three eminences or cords.

r. The eminences on each side of the mesian line, are the corpora pyramidalia. Their fibres interlace and are blended together behind, and in front are continued across the pons varolii.

s. On the outside of the corpora pyramidalia are the eminences called corpora olivaria. Their fibres take the course of the pons varolii, and their centre is of a greyish colour, which portion is named corpus dentatum olivare.

t. On the posterior and superior surface of the medulla oblongata, and at the sides of the corpora olivaria are two other eminences, called corpora pyramidalia lateralia, or restiformia. They run obliquely upwards and outwards towards the cerebellum, in which they are expanded.

u. At the posterior and upper part of the medulla oblongata, and between the corpora restiformia, is a triangular depression, called sinus of the fourth ventricle, or calamus scriptorius. It is covered by some folds of pia mater, and white transverse fibres are observed in it, which appear to be the roots of the auditory nerve.

v. Lying upon the crura of the cerebellum are two nervous cords, which form the seventh pair. The portio dura or facial nerve, the smallest, anterior, and to the inner side, comes from the posterior edge of the pons varolii, from the groove which separates the corpora olivaria and restiformia. The portio mollis, placed behind and outside the former, commences in the transverse band of the calamus scriptorius, then winds round the corpora restiformia,

from which it also receives fibres, and passes over the crura cerebelli, where it generally forms a little grey ganglion. It is accompanied in part of its course by the facial, to which it generally adheres, and sometimes communicates with it by nervous filaments.

w. Between the corpora olivaria and restiformia a series of nervous filaments are seen, which constitute the eighth pair of nerves. They are subdivided into superior or glosso-pharyngeal and inferior, forming the par vagum.

x. The accessory nerve arises from the sides of the corpora restiformia, and the continuation of these cords in the medulla spinalis, between the corpus dentatum, and the posterior roots of the cervical nerves.

y. The great hypoglossal or lingual nerve arises between the corpora pyramidalia and olivaria, by three bundles of roots.

z. Behind the pons varolii is seen the cerebellum.

CEREBELLUM.

55. The *cerebellum* is situated beneath the posterior part of the cerebrum, and separated from it by the tentorium.

56. It is divided into two lobes, by a fissure principally occupied by the falx minor.

57. The *cerebellum* is composed of cineritious and medullary matter, forming, by their internal arrangement, that appearance termed *arbor vitæ*.

58. An oval nucleus of grey substance is found in the medullary part, and, from its border being notched, is named *corpus dentatum*, or *rhomboideum*.

59. The surface of the cerebellum is not convoluted, as the cerebrum, but formed into *lamellæ*, with *sulci* or grooves between them.

60. There are two *vermiform appendages* observed on it; they have the appearance of rounded central ridges, situated superiorly and inferiorly.

61. Two large cords arise from the cerebellum, named *crura cerebelli*, which, by uniting with the crura cerebri, appear to form the pons varolii.

62. Between the cerebellum and medulla oblon

gata is a cavity running downwards and backwards; it is called the *fourth ventricle.*

63. It is bounded above by the valve of Vieussens; in front, by the medulla oblongata; behind, by the cerebellum; and below, by a process of arachnoid membrane.

64. It has a communication above with the third ventricle, through the *canalis medius.*

65. A fissure is observed at the anterior part of the fourth ventricle, called *calamus scriptorius,* from its pen-like form.

66. The *pons varolii,* formed by the union of the crura cerebri and crura cerebelli, is continuous with the medulla oblongata.

67. The *medulla spinalis* commences at the medulla oblongata; it descends through the foramen magnum, down the spine, and terminates at about the third lumbar vertebra in the cauda equina.

68. It is composed of medullary matter externally, and cineritious matter internally, and is covered by a continuation of the three membranes of the brain.

69. The medulla spinalis is divided into two lateral halves by an anterior and posterior fissure, which do not penetrate to the centre. Each half is subdivided into two cords, by a slight depression, and these are considered to be derived from the corpora pyramidalia and corpora restiformia. The medulla spinalis does not quite fill the vertebral canal, but is kept fixed in its situation by the ligamentum dentatum, which is composed of cellular substance or membrane.

70. The *arteries* of the *brain* are from the *two carotid* and *vertebral arteries.*

71. The internal carotid artery gives off within the cranium, the *ophthalmic* and the posterior *com-*

municating branches, and then is divided into *anterior* and the *middle cerebral* arteries.

72. The vertebral arteries enter the skull through the foramen magnum, and give off the posterior arteries of the cerebellum; they then unite on the basilar process to form the *basilar artery,* which gives off the superior artery of the cerebellum, and divides into the posterior cerebral arteries, called *profundæ cerebri,* which are distributed upon the posterior lobe.

73. There is a communication between the branches of the internal carotids and basilar arteries, forming an arterious circle, called the *circle of Willis,* which surrounds the tractus optici, the union of the optic nerves, the infundibulum, corpora albicantia, and pons tarini.

74. The veins terminate in the various sinuses, which empty themselves into the internal jugular veins.

NERVES.

75. The nerves are white medullary cords, necessary to sensation.

76. They are composed of very fine filaments called *nervous fibres,* and each fibre is composed of an envelope called *neurilema,* and a central pulp of medullary substance.

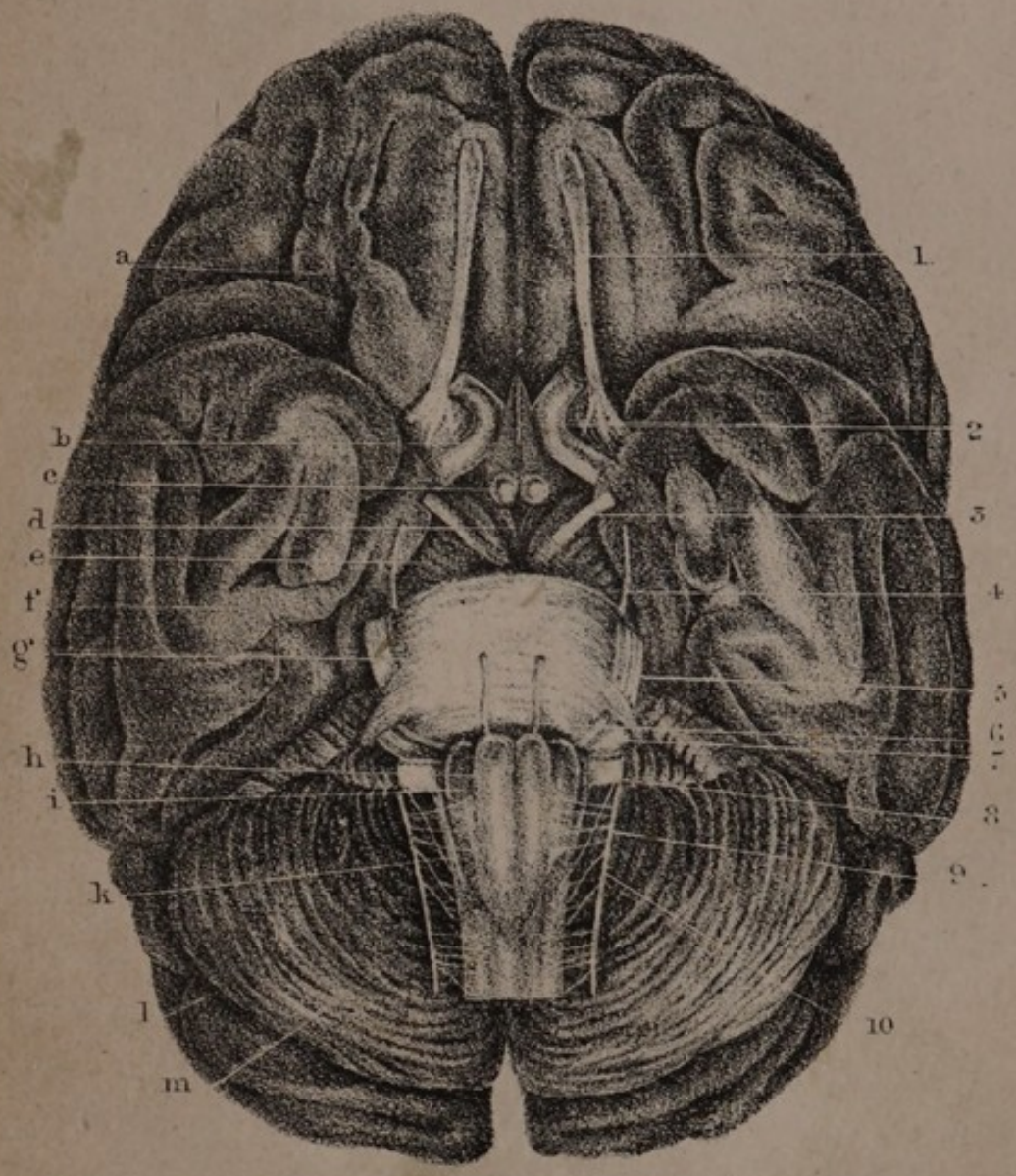
77. Every nerve has two extremities, one communicating with the brain or spinal cord, called its origin; the other, distributed to some of the organs or parts of the body, called the termination.

78. They thus form a communication between objects and the brain, and convey to it the various impressions which constitute the senses.

Base of the Brain & Origin of the Cerebral Nerves.

1. 1st Pair
2. 2nd Pair
3. 3rd Pair
4. 4th Pair
5. 5th Pair
6. 6th Pair.
7. 7th Pair.
8. 8th Pair.
9. 9th Pair.
10. Accessary Nerve.

Vide Page 87.



a. *Anterior Cerebral Lobes.*
b. *Infundibulum.*
c. *Corpora Albicantia.*
d. *Locus perforatus or Pons Tarini.*
e. *Crura Cerebri.*
f. *Middle Cerebral Lobes.*
g. *Pons Varolii.*
h. *Corpora Pyramidalia.*
i. *Olivaria.*
k. *Restiformia.*
l. *Posterior Cerebral Lobes.*
m. *Cerebellum.*

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79. Nerves communicate with each other in various places, forming what are termed plexuses.

80. Some nerves have enlarged parts on them called ganglions, differing in structure from the nerves themselves; their precise use is unknown.

81. The nerves arise either from the brain or spinal marrow, and are, for this reason, divided into *cerebral* and *spinal nerves*.

CEREBRAL NERVES.

82. The cerebral nerves are generally described as nine pairs.

83. The *first pair*, or *olfactory*, arise from the corpora striata and under surface of the anterior lobe of the cerebrum by three roots; they perforate the ethmoid bone, and are distributed upon the pituitary membrane of the nose.

84. The *second pair*, called *optic*, arise from the nates and thalami optici; they first converge and unite in front of the sella turcica, then diverge and separate, passing through the foramina optica, and perforate the sclerotica, to be expanded into the retina.

85. The *third pair*, or *motores oculorum*, arise from the crura cerebri, pass through the foramen lacerum of the sphenoid bone, and are distributed to the muscles of the eye. This pair give off a filament to the ophthalmic ganglion.

86. The *fourth pair*, or *pathetici*, arise from the valve of the fourth ventricle, immediately beneath the tubercula quadrigemina; they pass through the foramen lacerum, and are distributed to the trochlearis or superior oblique muscle of the eye. They are the smallest of the cerebral nerves.

87. The *fifth pair*, or *trigemini*, arise from the crura cerebelli, tuber annulare, and the fissure between the corpora olivaria and restiformia, by numerous filaments, forming two fasciculi, which perforate the dura mater; the small branch, or fasciculus, constitutes the muscular branch of the inferior maxillary nerve. The fasciculus, which arises most posteriorly, forms, at the side of the cavernous sinus, the gasserian plexus, from which three trunks are given off, which are,

88. 1st. The *ophthalmic*, which divides into three branches; the supra-orbitar, the lachrymal, and the nasal branches. The first supplies the forehead and inner corner of the orbit, the lachrymal is distributed to the lachrymal gland and upper eyelid, and the nasal to the nose and inside of the orbit. The nasal branch gives off a filament to the ophthalmic ganglion.

89. 2d. The *superior maxillary* nerve passes out at the foramen rotundum; in the pterygoid fossa it gives off filaments, which form a plexus or ganglion, and this plexus gives out three sets of nerves:

a. Spheno-palatine or nasal, to the pituitary membrane.

b. Palatine, to the membrane of the palate and gums, tonsils, velum palati, and uvula.

c. The vidian divides into two branches; the first is continued into the aqueduct of Fallopius, runs along with the facial nerve, and traverses the tympanum under the name of chorda tympani; it then emerges at the glycerian fissure, and anastomoses with the lingual branch of the infra-maxillary nerve. The carotid branch goes into the carotid canal, and anastomoses with the sympathetic. The superior maxillary nerve then passes along the infra-orbitar canal, and, when it emerges, divides into numerous filaments, distributed to the under eyelid, ala nasi, upper lip, muscles, and integuments, communicating with the portio dura.

90. 3d. The *inferior maxillary* passes through the foramen ovale, and gives off the following branches:

a. The masseteric branch to the masseter muscle.

b. The temporal nerves to the temporal muscle.

c. The buccinator nerve to the buccinator muscle.

d. Pterygoid nerve to the internal pterygoid muscle.

e. Auricular to the ear, communicating with the portio dura and occipital branches of the second cervical.

f. The dental nerve, distributed to the teeth of the lower jaw, and to the chin and face.

g. The gustatory nerve to the membrane and papillæ of the

tongue, destined for the sense of taste. This nerve receives the chorda tympani, and gives off filaments to the sublingual and submaxillary glands, to the lining membrane of the mouth, and to the hypoglossal nerve.

91. The *sixth pair*, or *abducentes*, arise from the junction of the tuber annulare with the medulla oblongata, pass through the foramen lacerum, having given off filaments at the outside of the internal carotid to the sympathetic nerve, and are distributed to the abductor muscles of the eyes.

92. The *seventh pair* consist of two portions, the *portio dura* and *portio mollis*.

93. The *portio dura*, or *facial nerve*, arises from the posterior edge of the pons varolii, and a fissure between the corpora olivaria and restiformia; it passes along the meatus auditorius internus in a depression of the portio mollis, then enters the canal of Fallopius, where it receives the petrous branch of the vidian nerve.

94. The facial nerve emerges from the stylo-mastoid foramen, and enters the parotid gland, where it forms a plexus named *pes anserinus*, from which, branches are given off to the head, neck, cheeks, lips, and chin, and branches communicating with the supra-orbitar, infra-orbitar, buccinator, and upper cervical nerves.

95. The *portio mollis* arises from the anterior part of the fourth ventricle; it enters the meatus auditorius internus, passes into the labyrinth, and divides into minute filaments, which form two fasciculi; the anterior go to the cochlea, the posterior to the vestibule and semicircular canals.

96. The *eighth pair* consist of three nerves:

97. 1st. The *glosso-pharyngeus* arises from the side of the medulla oblongata, passes out at the foramen lacerum basis cranii, where it gives off

filaments anastomosing with the vidian, sympathetic, pneumo-gastric, and accessory nerves, and is distributed to the pharynx, tongue, &c.

98. 2d. The *par vagum*, or *pneumo-gastric* nerve, arises from the side of the medulla oblongata, and emerges with the glosso-pharyngeus, going down the neck at the outside, and rather behind the common carotid artery. It gives off a branch, named pharyngeus, and another, named laryngeus, and then enters the thorax, passing in front of the left subclavian artery and arteria innominata, and gives off a considerable branch, called *recurrent*, or inferior laryngeal. This nerve is reflected upwards, winding round the aorta on the left side, and the arteria innominata on the right side, and is principally distributed to the smaller muscles and mucous membrane of the larynx, and the inferior constrictor of the pharynx. The par vagum then passes behind the roots of the bronchi, along the œsophagus, to the stomach and viscera.

99. 3d. *Nervus accessorius* arises lower down the side of the medulla oblongata; it passes out at the foramen lacerum, behind the internal jugular vein, and is distributed to the trapezius muscle.

100. The *ninth pair*, *hypoglossal* or *lingual*, arise from between the junction of the corpora olivaria and corpora pyramidalia, and are distributed to the muscles of the tongue.

101. The spinal nerves consist of thirty pairs: seven cervical, twelve dorsal, five lumbar, and six sacral nerves.

102. They arise by two fasciculi: those from the front give the power of motion; those from behind give sensation: they pass through the dura mater, then unite and perforate the lateral foramina of the

vertebral canal. A ganglion is formed on the posterior fasciculus, before the union.

103. The *phrenic* nerve is formed by filaments from the fourth and fifth cervical nerves. It enters the thorax with the par vagum, then traverses the anterior mediastinum to terminate in the diaphragm on each side. The right phrenic nerve gives off filaments which pass through the tendinous opening of the diaphragm, and anastomose with the par vagum and solar plexus.

SYMPATHETIC NERVE.

104. The sympathetic nerve extends on each side from the cranium to the pelvis, forming several ganglia, connected together by filaments. Each nerve consists of three *cervical* ganglia, twelve *dorsal*, five *lumbar*, and four *sacral;* and besides these, according to Cloquet, in the cranium the lenticular and spheno-palatine ganglia, and one upon the arteria communicans.

105. It is by some described as commencing by the union of a branch of the sixth, with a reflected branch of the second division of the fifth pair of cerebral nerves.

106. The *superior cervical ganglion* extends from just below the foramen magnum to the third cervical vertebra; it gives off several branches, which anastomose and form plexuses about the neck and face, and one to form the *superficialis cordis.*

107. The *middle cervical ganglion* is found on a level with the fifth cervical vertebra, giving filaments to the recurrent nerve, some to the thyroid gland, and, from its fore part, the *middle cardiac nerves.*

108. The *inferior cervical ganglion* is situated

near the junction of the last cervical vertebra and first rib; it gives off the *inferior cardiac nerve.*

109. The thoracic ganglia lie on the heads of the ribs, connected together by filaments. The first five give out filaments which ramify on the trachea, œsophagus, and aorta, and assist in forming the pulmonary plexus. Anterior branches, from the sixth to the ninth, unite into a trunk, named splanchnicus major, which terminates in the semilunar ganglion. Branches from the tenth and eleventh unite and form the splanchnicus minor, which pierces the diaphragm, gives branches to the larger nerve, and terminates in the renal plexus. The nerves in the abdomen consist of the semilunar ganglia, the fibres of which, together with lumbar branches and filaments from the par vagum and phrenic nerve, form the solar plexus, around the root of the cæliac artery. From this plexus filaments are given off, which anastomose around and accompany the vessels of the neighbouring parts, from which they also receive their names, such as the *right* and *left hepatic, coronary, splenic,* and *mesenteric.*

110. The *renal plexus* is formed by the lesser splanchnic and filaments from the solar plexus; it gives out filaments which descend to the testis and ovarium; other plexuses are formed about the loins and pelvis, which are named according to their distribution.

111. The *lenticular ganglion* is situated on the outside of the optic nerve, in the back part of the orbit. It receives filaments from the third pair, and the ophthalmic division of the fifth. It sends out about ten filaments, which penetrate the sclerotica, and are distributed to the iris, forming the ciliary nerves.

THE EYE.

112. The external parts or appendages of the eye are, the *eyebrows*, *eyelids*, and the *lachrymal organs*.

113. The *eyebrows* are two arches of hairs, which grow over the superciliary ridge of the os frontis. They protect the eye from the moisture of the forehead, from extraneous substances falling from above, and also from rays of light striking down upon the eye.

114. The *eyelids* are superior and inferior. The junction of their extremities forms the external and internal *canthus*. The eyelids are formed of common integuments, and contain in them a thin semilunar cartilage, named *tarsus*, and a row of stiff hairs, named *cilia* or eyelashes.

115. The eyelids cover the eyes during sleep, and are a great protection against bodies floating in the air; they also moderate the quantity of light received into the eye.

116. There are some sebaceous follicles, situated between the conjunctiva and the tarsal cartilages, called the glands of Meibomius.

117. The *lachrymal organs* consist of the *caruncula lachrymalis*, *lachrymal gland*, the *lachrymal ducts*, with the *puncta*, the *lachrymal sac*, and the *nasal duct*.

118. The tears keep the cornea and conjunctiva in a constant state of moisture, and wash away any hard foreign body.

119. The *lachrymal gland* is situated at the upper and outer part of the inside of the orbit; it gives out six or seven little ducts, which terminate near the internal margin of the upper eyelid. The *puncta*

lachrymalia are two little orifices at the internal canthus, surrounded by a cartilaginous ring, which assists in keeping them open; they allow the passage of the tears into the lachrymal sac, from whence they pass down the nasal duct into the nose.

120. The *caruncula lachrymalis* is a small glandular body, situate between the inner angle of the eyelids and the ball of the eye; it has small hairs on its surface, which are of use to entangle bodies that get into the eye. It is likewise perforated for the transmission of the tears into the sac.

121. A little fold of the tunica conjunctiva lies between the caruncula lachrymalis and ball of the eye, which is called *valvula semilunaris.*

122. The lachrymal sac is an elongated reservoir, situated behind the palpebral ligament in a fossa, formed by the os unguis and the nasal process of the superior maxillary bone.

123. The nasal duct or canal is the continuation of the sac, and opens into the inferior meatus of the nose.

124. The *globe* or *ball* of the eye is composed of membranes or *coats, humours, vessels,* and *nerves.*

125. The *coats* of the eye are the *tunica conjunctiva, sclerotica, choroidea, cornea, iris,* and *retina.*

126. The *tunica conjunctiva* is a delicate mucous membrane, investing the entire outer surface of the eye, and internal parts of the eyelids; it is a reflection from the skin.

127. The *sclerotic coat* is fibrous and very strong; it is perforated posteriorly by the optic nerve, and anteriorly terminates in the cornea. It is thickest at the back part.

128. The *cornea* is that transparent covering of

the eye which immediately invests the iris, and is intimately connected with the sclerotica. It is composed of several lamellæ, which may be separated by maceration.

129. The *choroid coat* is a vascular membrane, situated between the sclerotica and retina. Its inner layer forms several folds at its termination, called the ciliary processes. It secretes a black substance on its inner side, called *pigmentum nigrum*. Its inner coat is covered with ramifications of vessels, and has obtained the appellation of *tunica Ruyschiana*.

130. It absorbs the rays of light, which are painful, or two powerful for the retina.

131. The *retina* is formed by the expansion of the optic nerve; it is very vascular, and terminates upon the edge of the capsule of the lens.

132. It is lined by a membrane internally, the tunica vasculosa retinæ, and covered by a delicate membrane named the tunica Jacobi.

133. A yellow spot is seen on the outer side of the entrance of the optic nerve, called the *foramen centrale*, and in its centre is a small opening, which, according to Sir E. Home, gives passage to a lymphatic vessel.

134. The *iris* is a circular membrane, attached at its outer edge to the ciliary ligament. Its internal opening is called the pupil; the posterior coloured surface is called the uvea. It has two sets of fibres, radiated and circular, which are considered by some to be muscular, and to act as a sphincter to the pupil.

135. The iris immediately moderates, by its contraction and collapse, the quantity of rays which impinge upon the retina.

136. The space between the iris anteriorly and the cornea is called the *outer chamber;* that between the iris posteriorly and the crystalline lens is called the *inner chamber.* Each chamber contains fluid, called the *aqueous humour,* and is lined by a membrane.

137. The union of the iris, external layer of the choroid, and sclerotic coats, by cellular membrane, forms the ciliary circle or ligament. The ciliary ligament is described by some as formed by the union of the cornea, choroid, and sclerotic coats.

138. Between the ciliary circle, sclerotica, and cornea, a narrow circular canal is found, called the canal of Fontana.

139. The crystalline lens is a transparent lenticular body, situated behind the iris and in front of the vitreous humour. It is composed of concentric lamellæ, softest on the outside, and contained in a capsule, between which and the lens is the aquala Morgagni. Its edges give insertion to the zone of Zinn.

140. The vitreous humour, or corpus vitreum, is perfectly transparent; its fluid part is contained in a number of cells, formed by processes of the hyaloid membrane, which gives them a general covering. Between the vitreous humour and crystalline lens a triangular canal is found, called the canal of Petit. Its formation is explained in two ways. Some consider the hyaloid membrane to be composed of two layers, which separate at the edge of the lens; one passing behind, the other in front, thus leaving a triangular space. Others consider the hyaloid membrane to be single, and that it passes entirely behind the lens, and that a striated and folded membrane, called zone of Zinn, arising

from the anterior part of the hyaloid, proceeds forwards, and is attached to the anterior part of the lens, near its edge: admitting the latter, the boundaries of this canal would be the zone of Zinn, the crystalline lens, and the hyaloid membrane.

141. The eye receives its blood from the ophthalmic artery, a branch of the internal carotid. The veins of the eye pass into the facial vein and cavernous sinuses.

142. The nerves of the orbit are the *optic*, the *third* and *fourth pair*, the *first branch* of the *fifth*, and the *sixth*.

143. The moving powers of the eye are the *recti muscles*, and the two *oblique*.

OF THE MOUTH, LARYNX, AND PHARYNX.

144. The bony parts of the mouth are, the *superior* and *inferior maxillary* bones, the *palate* bones, and the *teeth*.

145. The *teeth*, in the adult, are thirty-two in number. There are eight *incisores*, four *cuspidati* or *canini*, ten *bicuspidati*, and ten *molares*. The teeth situated farthest backwards are termed *dentes sapientiæ*.

146. The soft parts of the mouth are the *cheeks* and *lips*, the *gums*, the *soft palate* and *uvula*, the *tongue*, the *lining membrane*, and the *salivary glands*.

147. The *cheeks* and *lips* are formed of common integument, and are studded with little glands, called *buccal* and *labial*.

148. The *soft palate* is the upper loose part, which hangs down from the palate bones. It separates the mouth from the fauces.

149. The posterior central portion of the soft palate, which is pendulous, is termed the *uvula*.

150. The *salivary glands* consist of the *parotid*, *sublingual*, and *submaxillary* glands.

151. The *parotid gland* is situated between the angle of the lower jaw and the mastoid process of the temporal bone. It sends out a duct called *stenonian*, which perforates the buccinator muscle, and enters the mouth opposite the posterior molar tooth.

152. The *submaxillary glands* are found at the inner side of the basis of the lower jaw, between the two bellies of the digastric muscle. Each sends out a duct, which opens into the mouth, close to the frænum of the tongue.

153. The term *sublingual* indicates the situation of those glands, which send out ducts, that terminate on the sides of the tongue.

154. The mouth has two openings; the posterior one into the fauces is called *isthmus faucium*.

155. The *isthmus faucium* is formed superiorly by the edge of the soft palate, inferiorly by the tongue, and laterally by the arches of the palate.

156. The *arches* of the *palate* are formed by folds of the lining membrane, enclosing muscular fibres. The anterior or *glosso-palatine* terminates laterally at the base of the tongue. The posterior or *palato pharyngeal* terminates in the sides of the pharynx.

157. The *constrictor isthmi faucium* is contained in the anterior arch.

158. The muscular fibres in the posterior arch are those of the *palato-pharyngeus*.

159. A triangular space is left between the two arches on either side, which contains the *tonsil* or *amygdala*.

160. The pharynx is a large cavity, bounded above by the os occipitis; behind, by the vertebræ; and below, by the œsophagus.

161. It is surrounded by muscular fibres, forming six muscles, called *constrictores pharyngis.*

162. There are *seven* openings into the pharynx: the *isthmus faucium;* the openings of the nose, or *choanæ narium;* the openings from the *Eustachian tubes;* the *glottis;* and the *œsophageal* opening.

163. The *œsophagus* is a cylindrical tube, continued from the pharynx to the stomach, from about the second cervical vertebra to the tenth dorsal. It is first placed behind the trachea, and in the chest it is enclosed in the posterior mediastinum, between the aorta and vena azygos. It does not pass exactly in the mesian line, but its upper half is a little inclined to the left, and its lower half to the right side. It has two series of muscles, circular and longitudinal, and is lined internally by a mucous membrane, continuous from the mouth and pharynx.

164. The *larynx* is a hollow tube, situated at the top of the trachea, in front of the pharynx; it is composed of cartilages, bone, and ligaments; is moved by muscles, and lined with a mucous membrane.

165. The *cartilages* are the *thyroid, cricoid,* the two *arytenoid,* and the *epiglottis.*

166. The *epiglottis* of fibro-cartilaginous structure, is situated above and over the glottis.

167. The *cricoid cartilage* is situated below the thyroid cartilage; it is in the form of a ring. Its superior posterior edge presents two articular surfaces, corresponding to similar surfaces of the arytenoid cartilage; on the sides there are also two

articular surfaces for the inferior cornua of the thyroid cartilage.

168. The *arytenoid cartilages* are very small, and are situated above the superior, posterior, and lateral parts of the cricoid.

169. The *thyroid cartilage* occupies the greater part of the larynx. It has two lateral portions, termed *alæ*. The projection formed by their union in front is called *pomum Adami*. Ligaments connect these cartilages together.

170. The thyroid gland, composed of two lateral lobes, rests upon the sides of the thyroid cartilage, the carotid arteries, and neighbouring muscles of the larynx.

171. The ligaments which form the edges of the glottis are called *chordæ vocales*. They form the principal part in the organ of voice, and extend from the arytenoid to the thyroid cartilage.

172. The upper opening into the pharynx is called *glottis*. The *larynx* is open inferiorly into the trachea.

173. The arteries of the *larynx* are the superior *laryngeal* branches from the external carotids, and *inferior laryngeal* branches from the subclavian.

174. The *nerves* are principally from the eighth pair of cerebral nerves.

175. The *trachea* is a nearly cylindrical tube, commencing at the cricoid cartilage, and terminating in the bronchi, at about the third dorsal vertebra.

176. The *trachea* is composed, besides its membranes, of a number of segments of cartilaginous circles, which are not extended to the posterior part. The canal is formed posteriorly of thick membranous substance and muscular fibres, which

are transverse and longitudinal. It is lined with a mucous membrane studded with numerous glands.

177. The *bronchi* ramify at their entrance into the lungs, and are again subdivided, till they terminate in cells.

VISCERA OF THE THORAX.

178. The boundaries of the *thorax* are the *sternum* and *ribs, anteriorly:* the *ribs, laterally;* and *posteriorly*, the *ribs* and *spine.* The *thorax* extends from the neck to the diaphragm.

179. The contents of the thorax are the *lungs*, and their investing membrane called *pleura*, the *heart* and its *pericardium*, and the contents of the *mediastina.*

180. The *pleura* is a serous membrane, covering the lungs and internal walls of the thorax. The part lining the ribs is called *pleura costalis;* the portion covering the lungs, *pleura pulmonalis.*

181. The space between the two pulmonary cavities of the thorax anteriorly is called the *anterior mediastinum.* A similar triangular space behind is called the posterior mediastinum.

182. The parts contained in the *anterior mediastinum* are *absorbent glands*, and the remains of the *thymus gland.*

183. The *posterior mediastinum* contains the *trachea* and *a portion* of the *bronchi*, the *œsophagus, aorta descendens*, the *thoracic duct*, the *eighth pair of nerves*, the *vena ázygos*, and some *lymphatic glands.*

184. The *lungs* are spongy bodies, occupying the lateral portions of the chest. They are

externally of a light blue or greyish colour, speckled with small black spots.

185. The *right lung* is divided into three lobes or divisions, and the left into only two.

186. The substance of the lungs is composed of the lining mucous membrane, the ramifications of the bronchi, terminating in air cells, veins, nerves, absorbents, arteries, and parenchyma or cellular substance connecting these parts together.

187. There are two sets of arteries distributed to the lungs; one for nutrition, and the other for the general circulation.

188. The nutritious arteries are the *bronchial;* the others are called *pulmonary*, which, unlike all other arteries of the body, convey venous blood.

189. The nerves are from the *great sympathetic* and *eighth pair.*

190. The *pericardium*, which contains the heart, is a fibro-serous membrane; it is composed of two layers, the inner of which is reflected over the heart.

191. The *heart* is a hollow muscle, and is situated in the lower and front part of the chest.

192. Its divisions are into an *apex* or point turned forward and to the left side, and a *base* turned backwards and upwards as high as the fifth rib; a superior and inferior surface; and a right and left margin. The apex of the heart generally points to the cartilage of the fifth or sixth rib.

193. The substance of the heart is composed of its external covering; its muscular part; and, internally, its lining membrane.

194. There are four cavities in the heart; the two at the base are called *auricles*, the two near the apex are called *ventricles.*

195. The two *auricles* are separated from each other by a thin membrane, in which there is a foramen in the *fœtus*, called *foramen ovale*.

196. The *ventricles* are separated by a thick membrane, called *septum ventriculorum*.

197. There are four openings into the *right auricle*, viz. the openings of the *venæ cavæ*, the opening of the *coronary vein*, protected by a valve, and the communication with its corresponding ventricle.

198. The eminences and depressions to be seen in the right auricle are, the *musculi pectinati*, or fleshy fibres; the *Eustachian valve;* the *tuberculum Loweri*, or angle where the venæ cavæ unite, the valve of the coronary vein; and the annulus *fossæ ovalis*.

199. The opening from the right auricle into the ventricle is protected, on the ventricular side, by three valves, or one valve having three points, called the *tricuspid valve*. It prevents the return of blood from the ventricle into the auricle.

200. The other opening of the right ventricle is into the pulmonary artery, and is protected by three valves, called *sigmoid* or *semilunar;* in the central extremity of each of which is a small body, called *corpus sesamoideum*.

201. In this ventricle are observed the fleshy pillars, called *carneæ columnæ*, sending out tendinous threads to the edges of the *tricuspid valve*, called *chordæ tendineæ*.

202. There are five openings into the left auricle, *four* from the pulmonary veins, and the *communication* with its corresponding ventricle.

203. There are two openings into the left ventricle, viz. the *auricular* and the *aortic opening*.

204. Interiorly are seen very strong *carneæ columnæ.*

205. The auricular opening is guarded internally by the *mitral valve,* and the *aortic* is protected by three *sigmoid valves,* each containing a *corpus sesamoideum.*

206. The proper arteries of the heart are *the two coronary arteries.* Its veins terminate in the *coronary vein,* and its *nerves* are from the cardiac plexus, situated behind the aorta, and formed by branches of the sympathetic and the par vagum.

207. The *aorta* arises from the left ventricle, ascends obliquely to the right side, and then makes a curve backward to the left, ascending as high as the second dorsal vertebræ; it then passes downwards in front of the left side of the dorsal vertebræ, as far as the os sacrum, where it bifurcates, dividing into two iliacs. The divisions of the aorta are into the *arch,* the *thoracic* and *abdominal aorta.*

208. The arteries given off from the arch are—

a. The *coronary arteries* to the heart itself.
b. The *arteria innominata,* which divides into right carotid and right subclavian.
c. The *left carotid.*
d. The *left subclavian.*

209. The branches of the external carotid are—

Anterior, *superior thyroid, lingual,* and *labial;* posterior, *muscular, occipital,* and *posterior auris;* ascending, *pharyngeal, transversalis faciei, internal maxillary,* and *temporal.*

210. The branches of the subclavian are—

Vertebral.
Internal mammary.
Thyroid axis. { *Inferior Thyroid.* / *Cervicalis ascendens.* / *Suprascapularis.*
Cervicalis profunda.
Intercostalis superior.

211. The thoracic aorta gives off—

a. *Bronchial* arteries, to nourish the lungs.
b. *Œsophageal.*
c. *Intercostal,* to the pleura, intercostal muscles, and spine.

212. The abdominal aorta gives out the following arteries—

a. The *right* and *left phrenic,* to the diaphragm.
b. The *cœliac,* which divides into the *hepatic,* to the liver, gall-bladder, and stomach; the *splenic,* to the spleen, pancreas, and stomach; the *coronaria ventriculi,* distributed to the stomach, œsophagus, omentum minus, and diaphragm.
c. The *superior mesenteric* supplies the small intestines, and gives to the large intestines, the ilio colica, colica dextra, and colica media.
d. *Capsular,* to the renal capsules.
e. *Renal,* to the kidneys.
f. *Spermatic,* to the testicles.
g. *Inferior mesenteric,* to the large intestines.
h. *Lumbar,* four on each side, to the loins.
i. *Middle sacral,* to the os sacrum, peritoneum, &c.
k. *Common iliacs* divide and supply the entire pelvis and lower extremities.

213. The *hepatic* gives off before it divides, the *pylorica superior* and *gastrica duodenalis,* which gives off the *pylorica inferior, pancreatico duodenalis,* and *gastrica epiploica dextra.* The hepatic then divides into right and left branches, the right one gives off the *cystic branch.*

214. The *coats* of an artery are *three:* an external or cellular coat, a fibrous or muscular coat, which is thick, yellow, elastic, and easily ruptured. It is by means of this coat that the arteries remain open after death. The third or inner coat is thin and transparent, resembling a serous membrane. It is a continuation of the lining membrane of the heart.

215. The coats of the veins are the same in number, but much thinner.

216. The coats of the arteries receive their vessels

(vasa vasorum) from the neighbouring arteries, and are abundantly supplied with nerves from the cerebral, spinal, and sympathetic nerves.

217. The veins in general accompany the arteries, and receive their names accordingly; the principal exceptions are the azygos major and minor.

218. The vena azygos, first formed by two or three lumbar veins, receives the lower left intercostal veins, crosses the spine at about the middle of the thorax, where it receives the right intercostals and right bronchial vein, and then terminates in the vena cava superior, just before it enters the pericardium.

219. The azygos minor receives the upper left intercostals, left bronchial vein, and some œsophageal branches, and then empties itself into the left subclavian vein.

220. The thoracic duct commences at the third lumbar vertebra, by an enlarged extremity termed receptaculum chyli; it passes up through the aortic opening of the diaphragm, between the aorta and vena azygos, and terminates in the angle formed by the left subclavian and internal jugular veins.

221. The *diaphragm* is divided into two parts, called the larger and smaller muscles of the diaphragm. The larger arises from the ensiform cartilage, and from the cartilage of all the ribs below the sixth, and is inserted into the cordiform tendon. The smaller muscle or appendix arises, by its long crura, from the fourth, and adheres to the superior lumbar vertebræ, and, by its short crura, from the second and third lumbar vertebræ, and is inserted into the cordiform tendon.

222. There is an opening in the tendon, for

the vena cava; one between the long crura, for the aorta and thoracic duct; and another between the short crura, for the passage of the œsophagus.

ABDOMINAL VISCERA.

223. The *abdomen* extends from the diaphragm to the pelvis. It is bounded, laterally and in front, by the integuments and muscles, and posteriorly by the spine.

224. The abdomen is divided externally, by anatomists, into three regions: the *epigastric*, *umbilical*, and *hypogastric*.

225. The *epigastric region* occupies the part above a line drawn from the extremity of the last true rib to the other. It is subdivided into three regions; the *scrobiculus cordis* occupies the centre, and the sides are called right and left *hypochondria*.

226. The *umbilical region* extends an equal distance above and below the umbilicus, between the other two. Its centre is called the *umbilical region;* its sides, the *ilia* or *flanks;* and the parts more posteriorly are called *lumbi* or *loins*.

227. The *hypogastric region* extends from the middle region to the *pubis*. Its middle division is called *regio pubis*, and its two sides *inguina* or *groins*.

228. The contents of the abdomen, besides the *peritoneum*, which lines it, are the *alimentary canal* and its *appendages*, and a part of the *urinary organs*.

229. The *alimentary canal* consists of the *stomach* and *small* and *large intestines*. The appendages are the *liver*, *gall-bladder*, the *spleen*, and *pancreas*.

230. The *peritoneum* is a serous membrane, lining the cavity of the abdomen, and investing the various viscera, giving them strength and support. Its reflexions from one viscus to another form duplicatures, which receive different names, according to their situation. The reflexion of the peritoneum, from the diaphragm to the liver, forms the ligaments of the liver; that from the liver to the stomach forms the lesser omentum; from the stomach to the transverse colon forms the great omentum; that portion enclosing the colon forms the meso-colon; that which extends down and over the small intestines is called the mesentery. There are, besides these, the ligaments of the colon, meso-rectum, and appendices epiploicæ, which are formed by it.

231. *Reflexions of the peritoneum.* Tracing the peritoneum upwards from the abdominal muscles, it covers the diaphragm, passes over the liver, (forming its ligaments,) and at its concave part meets a layer coming from the tendon of the diaphragm and under surface of the stomach. The two layers pass to the little curvature of the stomach, forming the lesser omentum, cover it, separate at the great curvature, and hang down in folds over the intestines; they then ascend and enclose the colon, forming the meso-colon, and again separate. The lower layer passes over the small intestines, forming mesentery, goes down over the kidneys, part of the rectum, bladder, and uterus, and mounts up the abdominal parietes. The upper layer goes over the pancreas, duodenum, and crura of the diaphragm, and rises to meet the other portion at the under surface of the liver.

232. The *Stomach* is a membranous bag, of the

A Diagram explanatory of the Reflexions of the Peritonæum.

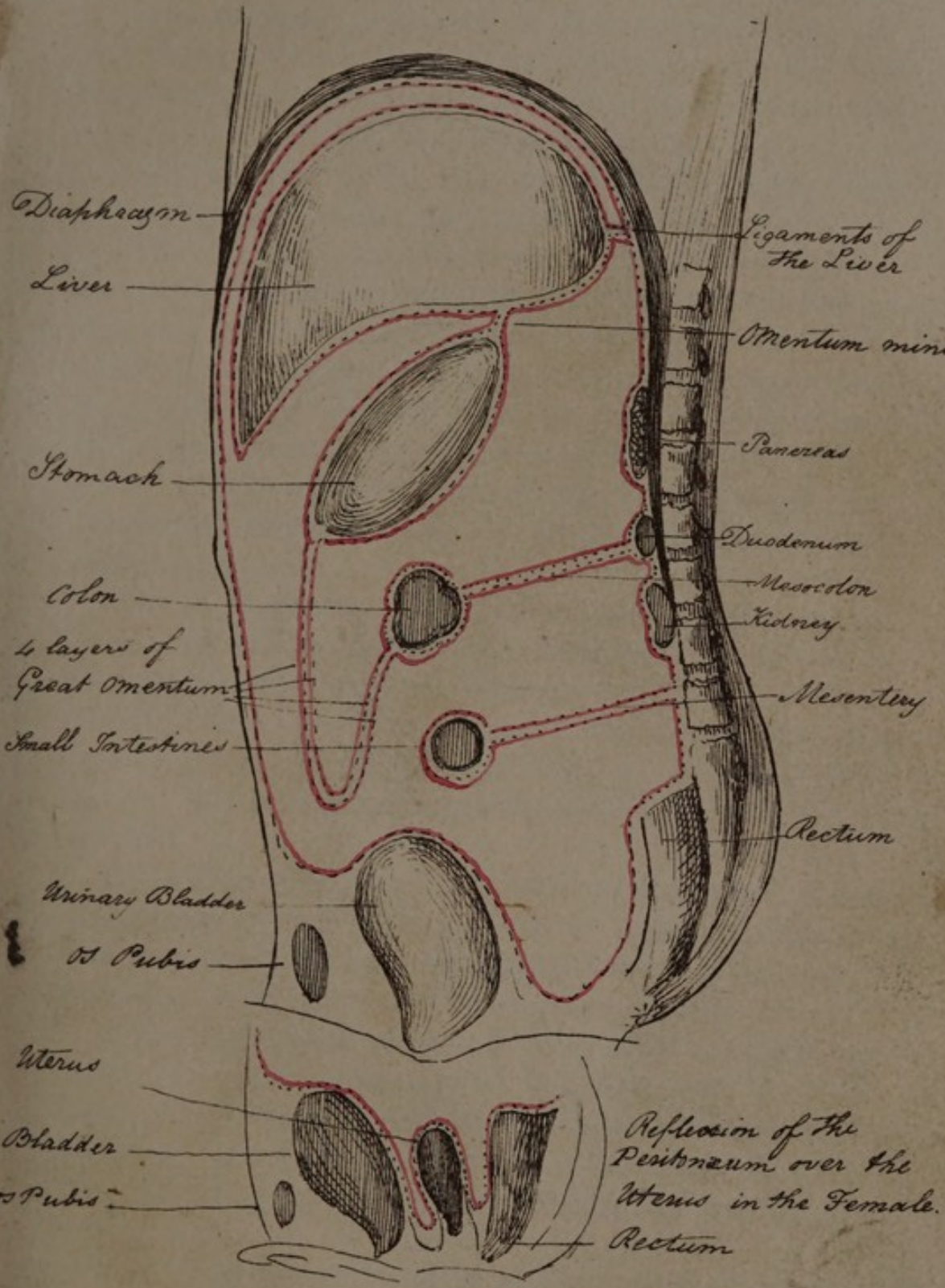

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figure of the bagpipe; it is situated in the left hypochondrium and part of the epigastrium. It has two extremities, the *cardiac* and *pyloric;* two *curvatures,* the *lesser* and *greater;* two *orifices,* the *superior* or *cardiac,* and *inferior* or *pyloric.*

233. The coats of the stomach are three: the *peritoneal, muscular,* and *mucous* or villous.

234. It receives its arteries from the *cœliac.* The branches distributed to it are, the *coronary* or *superior gastric,* supplying the *small curvature,* the *pyloric* and *right inferior gastric* to the *large curvature,* the *left inferior gastric,* and *arteriæ breves* from the splenic, distributed to the cardiac extremity. Its veins terminate in the vena portæ. Its nerves are derived from the great sympathetic and eighth pair.

235. The gastric juice is secreted by the villous coat, and little glands of the stomach. It dissolves the nutritious part of the food.

236. The *small intestines* commence at the pylorus. They are the *duodenum, jejunum,* and *ilium.* They vary in length from thirteen to twenty-six feet.

237. The *duodenum* differs from the other small intestines in being larger; it is more sacculated, has two ducts emptying themselves into it, and is only partially surrounded by peritoneum.

238. The duodenum commences at the pylorus, bends upwards, passing in contact with the gall-bladder, descends perpendicularly over the right kidney, and then crosses over the spine to terminate in the jejunum, at about the second lumbar vertebra.

239. The biliary and pancreatic ducts terminate

in the back part of the duodenum, just where it makes the curve.

240. The *jejunum*, so named from being generally found empty, terminates in the ilium, and closely resembles it in its structure.

241. The upper two fifths of this portion of intestines is called *jejunum*, and the lower three fifths *ilium*.

242. The distinctive characters of the *jejunum* are, its coats are thicker, it has more valvulæ conniventes, and consequently a greater surface for absorption.

243. The large intestines commence at the termination of the ilium; they are the *cæcum*, *colon*, and *rectum*. They have three coats, like the stomach and small intestines. Their length is from three feet and a half to four feet.

244. The large intestines are particularly characterized by their sacculated appearance, formed by ligamentous bands, and differ from the small intestines in being wider, shorter, and straighter, and by having the appendices epiploicæ attached to them.

245. The *cæcum* or *caput coli*, is the first portion; it commences at the ilium, and is situated beneath the right kidney, resting on the right iliac fossa.

246. At the junction of the cœcum with the ilium, the lining membrane forms a fold, called *valvula ilii*.

247. There is a little worm-like appendage attached to the cœcum, called *appendix vermiformis*.

248. The *colon* is divided into four portions; the

ascending, the *transverse*, the *descending*, and its *sigmoid flexure*, which terminates in the rectum.

250. Little folds, containing fat, hang down from the colon, called *appendices epiploicæ*.

251. The *rectum* commences at the sigmoid flexure of the colon, and terminates in the anus.

252. Its distinctive characters are, its covering only anteriorly and superiorly by peritoneum, and its wanting the three longitudinal bands that are seen on the cœcum and colon.

253. The arteries of the duodenum are, the pancreatico-duodenal, pyloric, and some branches from the superior mesenteric; those of the jejunum, ilium, and part of the colon, from the *superior mesenteric;* the left part of the colon and rectum is supplied by the *inferior mesenteric* and *hæmorrhoidal arteries*.

254. The veins of the intestines terminate in the *vena portæ*.

255. The nerves are supplied from the *great sympathetic* and *eighth pair*.

256. The *liver* is a conglomerate gland, the largest of the body; it is situated in the right hypochondrium, epigastrium, and part of the left hypochondrium. It is superiorly convex, and inferiorly concave. It is divided into three lobes; a *right*, *left*, and the *lobulus Spigelii:* and by some into five, which include the *lobulus caudatus* and *lobulus quadratus*.

257. The *liver* is kept in its place by five ligaments, which are named the *broad*, the *round*, the *right* and *left lateral*, and the *coronary* ligament.

258. These ligaments are formed by peritoneum, excepting the round ligament, which consists of the remains of the umbilical vein.

259. The liver has two coverings: the peritoneal and tunica propria, of cellular fibrous structure, which also surrounds the different vessels, and accompanies them to their minutest ramifications. There are five fissures, or depressions of the liver, viz. the *great fissure*, called fossa umbilicalis, for the passage of the umbilical vein in the fœtus, and the ligamentum rotundum in the adult; the *fissure* for the *vena portæ*, named sulcus transversus, vel sinus venæ portarum, through which pass the great vessels, nerves, biliary ducts, and absorbents; that for the *vena cava*, the one for the *ductus venosus* in the fœtus, and the depression for the *gall-bladder*.

260. The substance of the liver is composed of *ramifications of blood-vessels*, *absorbents*, *biliary ducts*, and *nerves*, connected together by cellular substance.

261. The blood-vessels of the liver are: the *hepatic artery*, for its nourishment; the *vena portæ*, which ramifies through it to secrete the bile; and the *vena hepatica*, which returns the blood from the hepatic artery and vena portæ. The *nerves* are from the *great sympathetic* and *eighth pair*.

262. The vena portæ consists of the junction of the *superior* and *inferior mesenteric veins*, with the *splenic veins*, and branches from the stomach, pancreas, and gall-bladder. It carries blood of a dark blackish colour.

263. The excretory ducts of the *liver*, *tubuli bilarii*, arise from the acini, and ultimately unite to form the *hepatic duct*, which joins with the *cystic duct*, and forms the *ductus communis choledochus*.

264. The *gall-bladder* is placed in the concave surface of the right lobe. It consists of a *fundus*, *body*, and *cervix*. It has three coats, an external

or *peritoneal*, a middle one, probably *muscular*, and a *villous* coat. A duct proceeds from the cervix, called *ductus cysticus*, which joins the hepatic duct, and forms the ductus communis choledochus. This duct terminates in the duodenum.

265. Its vessels and nerves are derived from the same as those of the liver.

266. The *pancreas* is a long, flat, glandular body, placed at the back part of the epigastric region, behind the stomach, and in front of the spine. Its greater extremity is connected by cellular substance with the duodenum, its lesser with the spleen. The *pancreatic duct* runs horizontally within the substance of the gland, and terminates in the duodenum.

267. The arteries of the pancreas are branches from the hepatic, splenic, and superior mesenteric. Its veins go to the vena portæ, and its nerves are from the eighth pair and great sympathetic.

268. The *pancreatic juice* is secreted by the acini of the pancreas, and conveyed by the pancreatic duct into the duodenum, to assist in chylification.

269. The *spleen* is a soft substance of a purplish colour, situated in the left hypochondrium, between the large extremity of the stomach and the false ribs; its lower part is behind the colon, and rests upon the upper part of the left kidney; it is externally convex, internally concave, and is covered by peritoneum and its tunica propria.

270. It is formed of a congeries of *blood-vessels*, *lymphatics*, and *nerves*, connected and supported by cellular substance.

271. Its artery, called the *splenic*, arises from the *cœliac*. Its veins assist in forming the vena

portæ, and its nerves are from the eighth pair and great sympathetic.

272. The *kidneys* are two glandular bodies, situated at the back part of the abdomen, on each side of the lumbar vertebræ, resting upon the broad part of the diaphragm, and the quadrati lumborum muscles.

273. The right *kidney* is lower than the left, in consequence of the situation of the great lobe of the liver.

274. They are composed of two kinds of substances, a cortical and medullary, enveloped in a tunica propria of fibrous structure.

275. The urine is secreted by the acini (formed by the minute secerning extremities of the renal artery) into the tubuli uriniferi, which are arranged in conical bundles, and terminate in the mammellæ or papillæ, which are about ten or twelve in number; a membranous tube, called calyx, or infundibulum, arises round the base of each of these mammellæ. These calices, or infundibula, unite into two or three large trunks, which dilate at the sinus of the kidney, into what is termed the pelvis. The urine, following the course of the above parts, then passes into the ureters, and from thence into the bladder.

276. The urine is prevented returning from the bladder by the valvular termination of the ureters.

277. The arteries of the kidneys are the two renal. Its nerves are from the great sympathetic and eighth pair.

278. The right renal artery is longer than the left, in consequence of the vena cava, behind which it passes, being placed on the right side of the aorta.

279. The left renal vein is longer than the

right, having to pass across the fore part of the aorta.

280. The *renal glands* are two small flat bodies situated above the kidneys: the uses of them are unknown.

281. The urine is discharged by the contraction of the bladder, and the action of the diaphragm and abdominal muscles, which force the intestines down upon the bladder.

OF THE PELVIC VISCERA.

282. The male pelvis contains the *bladder*, *rectum*, *prostate gland*, *vesiculæ seminales*, and *vasa deferentia*.

283. The female pelvis contains the *bladder*, *rectum*, and the *uterus* with its appendages.

284. The *urinary bladder* is a large membranous bag, situated in the fore part of the pelvis, behind the symphysis pubis.

285. It rises, when distended, above the ossa pubis into the abdomen.

286. Its divisions are into a *fundus*, turned upwards; a *body;* and a *neck*, turned downwards and forwards.

287. It has three coats: a *peritoneal*, which covers only the fundus, sides, and back part; a *muscular*, and a *villous* coat.

288. There are three openings into it: one *inferior*, which is the beginning of the urethra, surrounded by the neck of the bladder; and *two* posterior and lateral openings, which are the terminations of the ureters. The two latter openings

from the ureters are obliquely placed, and run some way between its coats.

289. The arteries of the bladder are from the internal iliacs. The nerves are from the sacral and great sympathetic.

290. The *testes* are two glandular bodies, situated in the cavity of the scrotum, separated from each other by condensed cellular substance, called the septum.

291. Each testicle has two coats: an outer one, called *tunica vaginalis;* and an inner one, called *tunica albuginea.*

292. The body of the testicle is composed of an immense number of whitish tubes, called *tubuli seminiferi,* which unite in bundles, and form the vasa recta, situated at the posterior border of the testes; these ascend and terminate in the vasa efferentia, which perforate the tunica albuginea at its upper part, and being convoluted, there form the globus major. The vasa efferentia all terminate in the vas deferens, which forms, by its convolutions, the globus minor: it then ascends, and assists in forming the spermatic cord.

293. The arteries of the testes are the two *spermatic arteries,* which arise from the aorta. Frequently the left spermatic artery arises from the left renal artery.

294. The right *spermatic vein* terminates in the inferior cava, and the left in the left renal vein. The nerves of the testicle are principally from the renal and lumbar plexus.

295. The *vas deferens,* passing upwards from the epididymis, through the abdominal ring, crosses over the psoas muscle, and, descending in the pelvis, gets behind the bladder, to which it

closely adheres, and gradually approaches its fellow of the opposite side; it terminates in the vesicula seminalis, of the same side.

296. The *vesiculæ seminales* are two small oblong membranous reservoirs, situated at the lower and under part of the bladder. Each vesicula is formed by the convolutions of one tube, which pierces the prostate gland, and opens into the urethra.

297. The *prostate gland* is a firm glandular body, somewhat of the shape of a horsechesnut, situated at the neck of the bladder; through its substance the urethra passes. Its ducts, ten or twelve in number, open into the urethra.

298. The *spermatic cord* is composed of the spermatic artery and veins, the spermatic nerves, lymphatics, and the vas deferens, which are connected together by cellular substance, and covered by the cremaster muscle.

299. The *uterus* is a hollow viscus, situated in the female pelvis, between the bladder and rectum. It is divided into a *fundus*, *body*, and a *cervix*.

300. It is composed of three coats: an external or *peritoneal* covering, a *muscular*, and a *villous* coat.

301. It has three openings into it: two at the angles of its fundus, leading to the Fallopian tubes; and one at its neck, leading to the vagina.

302. The appendages of the uterus are, the *ligamenta lata*, *ligamenta rotunda*, *ovaria*, *Fallopian tubes*, and *vagina*.

303. The *ligamenta lata* are two doublings of the peritoneum, sent off from the edges of the uterus to be fixed to the sides of the pelvis. They contain and support the *ovaria*, *Fallopian tubes*,

ligamenta rotunda, and the *vessels* and *nerves* of the uterus.

304. The *ligamenta rotunda* are two long roundish cords, arising from the corners of the uterus, in front of and below the Fallopian tubes. They pass through the abdominal rings, and are lost upon the pubes.

305. The *ovaries* are two oblong flat bodies, situated in the ligamenta lata, and connected to the uterus by two ligaments. They are supposed to contain the rudiments of the fœtus.

306. The *Fallopian tubes* are two small tubes, proceeding from the angles of the uterus, towards the lateral part of the pelvis. Their outer extremities are expanded in the form of a membranous fringe, called fimbria. In structure they appear to resemble the uterus.

307. The Fallopian tubes are open at their extremities into the abdomen, which affords the only instance of direct continuation of mucous and serous membranes.

308. The *vagina* is a membranous canal, extending from the neck of the uterus to the pudendum.

309. It is covered, at its upper and back part, by peritoneum. Internally, it is lined by a mucous membrane.

310. The uterus, and its appendages, are supplied with blood by the uterine and spermatic arteries.

311. Its nerves are from the *lumbar*, *sacral*, and *great sympathetic*.

PARTS PECULIAR TO THE FŒTUS.

312. In the fœtus, a membrane, called *membrana pupillaris*, closes up the pupil of the eye; it is attached to the loose edge of the iris, and disappears some time before birth.

313. The *thymus gland*, situated in the anterior mediastinum, is very large; it gradually disappears after birth.

314. The parts peculiar to the fœtal circulation are, the *foramen ovale* of the heart; *canalis arteriosus; ductus venosus;* the *funis*, or *umbilical cord;* the *umbilical vein*, and the two *umbilical arteries.*

315. The *foramen ovale* is an opening of communication between the two auricles.

316. The *canalis arteriosus* forms the medium of communication between the pulmonary artery and aorta.

317. The *ductus venosus* passes from the umbilical vein to the inferior vena cava.

318. The *umbilical vein* passes from the umbilicus to the liver.

319. The *umbilical arteries* arise from the internal iliacs, and pass to the umbilicus.

320. The *umbilical cord* consists of the umbilical vein and two umbilical arteries; it passes from the placenta of the mother, to the umbilicus of the child.

THE SKIN.

321. The skin is a membrane which covers the whole surface of the body, and is reflected inwards by all the natural openings, so as to line by inter-

nal reflexions, the eye, the nasal fossæ, the mouth, the air passages, the alimentary canal, and the urinary passages. These internal portions change their character, becoming soft and moist, and are generally known as mucous membranes.

The colour of the skin differs in the human race, varying in shade from black to white.

It is composed of three layers: the *cutis vera*, the *rete mucosum*, and *cuticle*. It is likewise studded with follicles, and has appendages such as horn, hair, and nails.

322. The *cutis vera* forms nearly the entire thickness of the skin, of which it is the deepest-seated layer. It is composed of dense cellular tissue, mixed up with aponeurotic fibres, crossing each other in every direction. Its inner surface is areolar, and appears to be a continuation of the cellular tissue itself. Its outer surface is studded with numerous papillæ, or little cone-shaped eminences, in which the vessels and nerves terminate. The cutis vera is elastic, but strong. It is thick on the back, on the posterior part of the limbs, in the palms of the hands, and soles of the feet; but exceedingly thin on the eyelids and genitals.

A thin muscular layer is found immediately beneath, and connected with it in animals, called the *panniculus carnosus*.

323. The *rete mucosum* forms a layer of substance nearly liquid, seated between the cutis vera and cuticle. It is very thin, and colourless in the white portion of the human race, but forms in the black a dark covering, quite distinct. The colour of the skin principally depends upon it. It seems to be secreted by the vessels of the cutis vera.

324. The epidermis adheres to the mucous layer,

and to the cutis vera, by a number of filaments, which appear to be only elongations which penetrate the pores and crevices of the skin. Pores are observed in it, which give passage to the perspiratory fluid.

The epidermis is not an organised body, for no nerves or vessels have ever been traced to it. It may rather be considered as a covering resulting from the drying of the external layers of the rete mucosum. It is thickest in the palms of the hands and soles of the feet, where it appears to consist of several layers.

PHYSIOLOGY.

OF THE NUTRITIVE FUNCTIONS.

1. *Mastication* and *insalivation.* The food being taken into the mouth is retained there, and brought under the action of the teeth by the lips, buccinator muscles, and tongue. By the lateral motions of the lower jaw, the inferior molar teeth grind the alimentary substance against the upper ones. During this time, the food becomes mixed with the saliva and mucus of the mouth, which convert it into an easily swallowed bolus, and also fit it for further digestion and assimilation.

2. *Deglutition.* When the food has been sufficiently divided and imbued with saliva, it is placed in a mass upon the dorsum of the tongue, which is rendered concave for its reception. The mouth is then closed, the apex of the tongue applied to the roof of the mouth, and the rest of the organ brought successively in contact with it, from before backwards; the food, having no other way to escape this pressure, slides down on the inclined plane formed by the tongue, through the isthmus faucium, into the pharynx, which is drawn upwards and forwards to receive it. At this time the *velum* palati is elevated, and thus prevents the food getting into the nostrils or Eustachian tubes. The larynx is raised, and rather inclined forwards, at the same

time that the pharynx is elevated, so that the glottis is brought under the epiglottis, which amply covers it, and thereby prevents the food from entering that cavity. As soon as the food has passed the isthmus into the pharynx, the velum is depressed, and thus cuts off the return of food into the mouth, at the same time that it assists in its descent. The moment the food has passed into the pharynx its constrictors begin to act, and gradually force it into the œsophagus. The larynx, pharynx, velum, &c. are now restored to their natural position.

3. *Digestion.* The alimentary matter, being propelled by the contractions of the œsophagus into the cardiac extremity of the stomach, becomes acted upon by the gastric juice, which, assisted by the heat and muscular contraction of the stomach, quickly dissolves the digestible part, and entering into union with it, produces a new fluid, called chyme. The chyme is gradually conveyed, by a kind of peristaltic motion, from the cardiac to the pyloric end of the stomach. When it has been sufficiently operated upon by the stomach, it passes through the pylorus into the duodenum. The pylorus possesses a peculiar sensibility, which may be considered as a kind of sentinel, that prevents any matter from passing through it but such as has been properly converted into chyme.

4. *Chylification.* The chyme having passed through the pylorus into the duodenum, becomes mixed with the *biliary*, *pancreatic*, and *intestinal* secretions. These juices, by their action upon the chyme, separate it into two portions; one a milky fluid called chyle, and another portion called *fæces*. By some, the alkaline and saline ingredients of the bile are supposed to combine with the chyle, while

the albumen and resinous portion combines with the excrementitious portion. The chyle attaches itself to those irregular circular folds of the mucous membrane of the small intestines called valvulæ conniventes, where it is absorbed by the lacteals, and conveyed to the thoracic duct. The large intestines also possess lacteals, so that if any portion of chyle should not have been absorbed in the small intestines, it is taken up in the large ones. The fæces pass from the small to the large intestines, through the valvula coli, and there acquire that peculiar fœtid odour which distinguishes them. They are gradually urged on into the rectum, where they remain for a certain time, and are then discharged.

5. *Excretion of the fæces.* The fæces gradually accumulating in the rectum, stimulate it to discharge its contents; the levator and sphincter ani then relax, and the diaphragm and abdominal muscles expel the fæces. After the excretion, the levator chiefly retracts the intestine, which is again closed by its sphincter.

6. *Absorption and course of the chyle.* Those absorbents which take up the chyle in the intestines are called lacteals. They are most numerous in the jejunum. The lacteals of the small intestines, and part of the large, convey the chyle to the mesenteric glands, where it is supposed to undergo some change. Passing from one gland to another, they form one or two large trunks. These accompany the superior mesenteric artery to the right side of the aorta, and there join the thoracic duct. The thoracic duct is formed by the junction of the lacteals with the lymphatics of the pelvis and ower extremities. It begins on the third lumbar

vertebra, and here swells out into an oval sac called *receptaculum chyli.* Proceeding upwards on the right side of the aorta it passes through the aortic opening of the diaphragm into the posterior mediastinum. On the fourth dorsal vertebra it crosses behind the aorta to reach the left side of the neck, and terminates in the angle of the union of the subclavian and jugular veins.

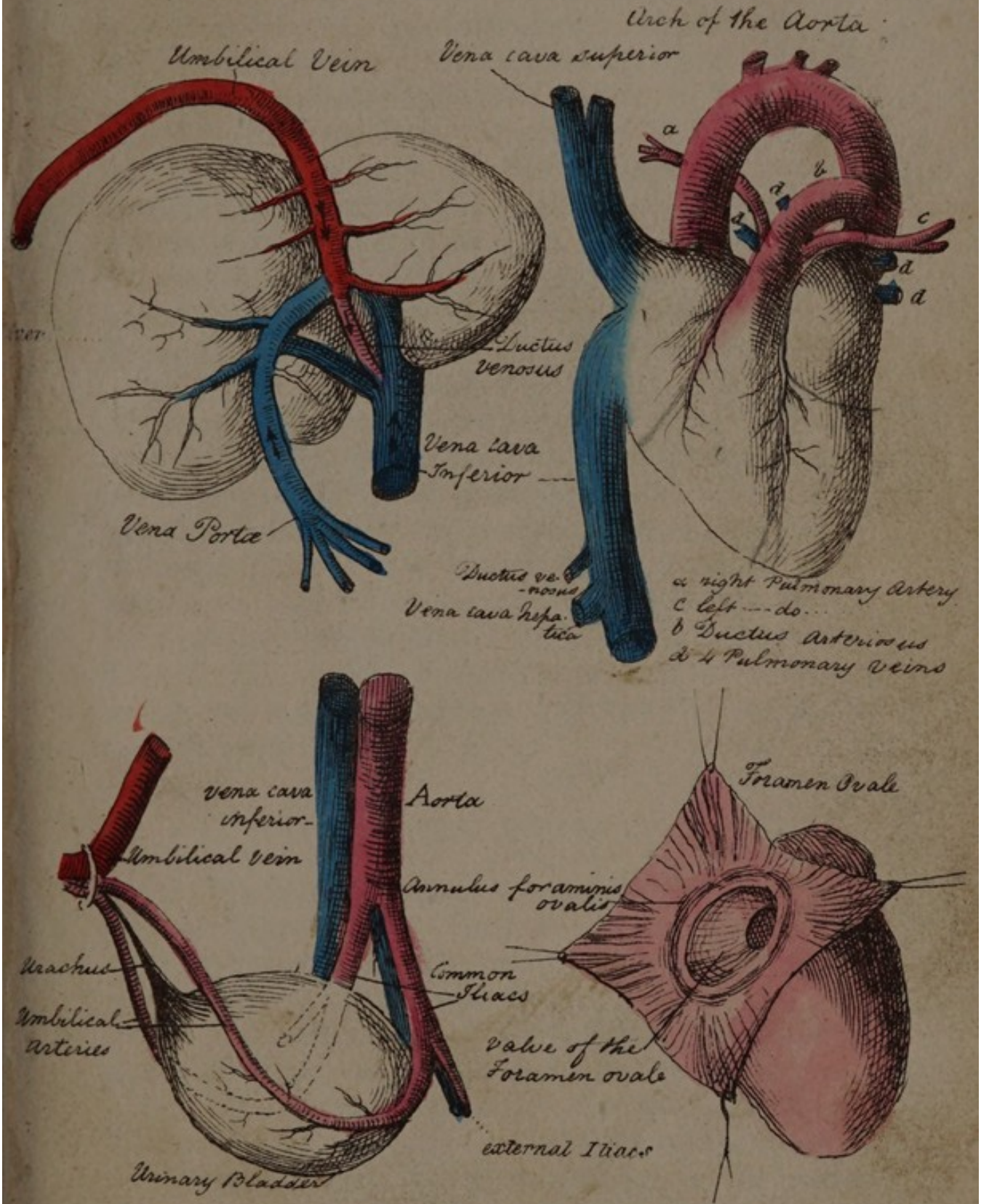
7. *Use of the spleen.* The physiology of the spleen is not understood. By some it has been thought subservient to the function of the liver, by preparing a fluid for the vena portæ. Others consider it subservient to the stomach, and that it receives the surcharge of blood when the stomach is empty.

8. *Circulation of the blood.* The blood is returned from the upper part of the body by the superior vena cava, from the inferior part by the inferior cava, and from the heart itself by the coronary vein to the right auricle. This contracts and discharges its contents into the right ventricle; when completely filled, the right ventricle contracts; by that contraction, its tricuspid valve is shut, and its contents propelled through the pulmonary artery and its ramification to the lungs. From the lungs the blood is returned by the four pulmonary veins to the left auricle, which, being distended, now contracts, and throws the blood into the left ventricle. The left ventricle then contracts, its mitral valve shuts, and all the blood is propelled through the aorta into the capillary system, to be again returned by the veins. The aorta, and pulmonary artery, are each guarded by three semilunar or sigmoid valves, which prevent the blood returning into the ventricles.

9. *Of respiration.* The air is received into the lungs by the enlargement of the cavity of the chest. The power which effects this enlargement, in common, by inspiration, is the diaphragm; but when it is more difficult, the intercostal muscles and pectoralis minor assist. The blood of the pulmonary artery being exposed to the influence of the air in the lungs, is converted from a dark colour into a florid red; it is considered to be decarbonized, that is, carbon is emitted, which, combining with the oxygen of the inspired air, forms carbonic acid: a watery vapour is likewise evolved. Others consider that oxygen is absorbed, and that carbonic acid, already formed in the blood, is evolved. When the blood has been properly acted upon, the inspiratory muscles relax, while the abdominal muscles, pressing the viscera upwards against the diaphragm, diminish the cavity of the chest, and thus expel the air.

10. *Of the fœtal circulation.* The ramifications of the umbilical vein absorb the blood deposited by the uterine arteries in the cells of the placenta, and convey it by the umbilical vein, through the umbilicus, into the abdomen of the fœtus. Here the vein divides into two branches, one of which conveys the greater part of the blood through the liver, whilst the other, called *ductus venosus*, terminates in the inferior vena cava, from which the blood passes into the right auricle. From the right auricle, it passes partly into the right ventricle, and partly through the foramen ovale, into the left auricle. That portion of blood which passes into the the right ventricle is transmitted into the pulmonary artery, which sends part of it to the lungs, but the greater part to the descending aorta, by the canalis

Diagrams to explain the Circulation of Blood in the Fœtus.



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arteriosus. The blood which is sent into the lungs is returned by the four pulmonary veins to the left auricle, there mixes with the blood received through the foramen ovale, and then passes into the left ventricle, whence it is transmitted into the aorta, where it mixes with the blood brought by the canalis arteriosus, and is distributed through the whole system, and is brought back by the veins. To the mother the blood is returned by the two umbilical arteries, which are continuations of the hypogastric arteries, branches of the internal iliacs.

11. The temperature of the blood is about 100°. The cause of it is imperfectly understood. Some attribute it to the caloric evolved in the lungs, arising from the union of oxygen with carbon, and say that it is carried by means of the blood to the different parts of the body; others consider that caloric is evolved in the general capillaries at the time of the conversion of the arterial into venous blood. Mr. Brodie considers the nervous system as having some connexion with the production of animal heat.

OF SECRETION.

12. The term secretion is applied to that process by which part of the blood is separated from the circulatory organs. The manner in which secretion is effected is perfectly unknown.

13. The secretions are divided into *exhalations*, *follicular secretions*, and *glandular secretions*.

14. *Of the secretion and excretion of the tears.* The tears are secreted from the lachrymal gland, from whence they are conveyed by six or seven excretory canals to the upper and outer part of

the eye, where they pass through the conjunctiva, and are carried by a triangular canal, formed in the edges of the tarsi to the inner canthus of the eye, where they are absorbed by the *puncta lachrymalia*, and conveyed from thence by little ducts to the *lachrymal sac*. From the *lachrymal sac*, the tears pass by the *nasal duct* into the inferior meatus of the nose.

15. *Use of the tears.* The tears keep the cornea moist, prevent the friction of the eyelids on the eyes, and wash away any extraneous bodies which may have fallen into the eye.

16. *Secretion of milk.* The milk is secreted in the glandular substance of the mammæ. The *tubuli lactiferi* arise in numerous small portions of the gland, called *granules*. As they approach the nipple, the ducts unite into twelve or fifteen, of considerable size, which terminate on the surface of the nipple by open mouths. The milk is for the purpose of nourishing the infant.

17. *Secretion of saliva.* The saliva is secreted by the parotid, submaxillary, and sublingual glands, and conveyed by their ducts into the mouth. Its use seems to be to assist the mastication and deglutition of the food, and its digestion in the stomach.

18. *Secretion of gastric juice.* The gastric juice, a fluid analogous to saliva, is supposed to be secreted partly by the extreme arteries of the villous coat of the stomach, and partly by the glands. It dissolves those substances which are nutritious to the animal.

19. *Secretion of the pancreatic juice.* The pancreatic juice is secreted in the acini of the pancreas, and conveyed by numerous small ducts into the

great pancreatic duct, which opens along with the biliary duct in the duodenum. It is supposed to assist in chylification, by diluting the acrimony of the bile.

20. *Secretion of bile.* The bile is secreted in the liver by the minute branches of the vena portæ into the *acini* or *penicilli;* from thence it passes through the excretory ducts, called the *pori biliarii,* into the *hepatic duct;* this, with the cystic duct, forms the *ductus communis choledochus,* which terminates in the duodenum. It is said by some that the blood of the vena portæ, having more carbon and hydrogen than that of the hepatic artery, is more proper for furnishing the elements of the bile.

21. *Excretion of bile.* When digestion is not going on, the opening of the *ductus choledochus* is closed by the contraction of the duodenum; and the bile not therefore finding access into it, regurgitates into the gall-bladder, where it acquires greater consistence. When the duodenum is distended with chyme, the irritation it produces is propagated to the gall-bladder, the parietes of which contract, and force the bile along the cystic duct into the ductus choledochus, and from thence into the duodenum.

22. *Use of the bile.* The bile precipitates the fæces from the chyle, and excites the peristaltic motion of the intestines.

23. *Secretion of urine.* The urine is secreted by the minute branches of the renal artery into the *corpora globosa,* or *cryptæ* of the kidney. From thence it passes through the *tubuli uriniferi* into the *ducti bellini,* then through the *papillæ,* or *mammary processes,* into the *calices,* or *infundibula.*

These uniting, form two or three principal tubes, which terminate in the *pelvis* of the kidney. The pelvis contracting forms the ureter, which carries it to the bladder.

24. The oblique manner in which the ureters penetrate the bladder prevents the urine from returning; the inner membrane of the bladder lying over the opening produces the effect of a valve.

25. *Excretion of urine.* As soon as there is a certain quantity of urine in the bladder, we feel an inclination to discharge it. This we effect partly by the contraction of the bladder itself, and partly by the action of the abdominal muscles and diaphragm, which press the intestines against the bladder.

26. *Secretion of semen.* The semen is secreted by the minute branches of the spermatic arteries in the testicles. It passes through the *tubuli seminiferi* into the *vasa recta;* these, by their communications, form the *rete testis.* From the rete testis the semen passes by the *vasa efferentia* into the *coni vasculosi,* forming the head, or *globus major* of the epipidymis; then through the body of the epipidymis into its lower part, called *globus minor,* or *cauda,* which terminates in the *vas deferens.* The vas deferens opens with the *vesicula seminalis* into the urethra.

27. *Use of the vesiculæ seminales.* They are generally supposed to receive the semen, and to effect some change upon it. By some they are considered to secrete a peculiar fluid.

28. *Use of the prostate gland.* The prostate gland secretes a peculiar fluid, which is discharged

into the urethra by ten or twelve ducts. This secretion is combined and discharged with the seminal fluid.

29. *Use of the uterus.* The use of the uterus seems principally for *menstruation*, and for the reception and nutrition of the *ovum*.

30. During coition, the uterus is supposed to open a little, and draw in the semen by aspiration; the Fallopian tube directs it to the ovarium; the contact of the semen determines the rupture of one of the ovarian vesicles, which passes into the uterus. Some authors imagine that it is not the semen that is carried to the ovarium, but only the vapour that exhales from it, or *aura seminalis*. Others think the semen is absorbed, and carried to the ovaria by means of the arteries.

OF THE BRAIN AND ORGANS OF SENSE.

31. *Of the physiology of the brain.* The uses of the brain in the animal economy are very numerous and important. It is the material organ of the *intellect*, or *mind;* it gives, through the medium of the nerves, the power of *voluntary motion;* it is the seat of *sensation* and of *sympathies*, and exerts more or less influence upon all the vital phenomena.

32. The *sensations* are those functions destined to receive the impression of external objects, and to transmit them to the intellect.

33. They are five in number, viz. *vision*, *hearing*, *smell*, *taste*, and *touch*.

34. *Mechanism of vision.* The rays of light, emanating from surrounding objects, which fall on the cornea, are in part reflected, and thus contribute

to form the brilliancy of the eye. The concave cornea refracts the remaining rays, and thus increase the intensity of light; the rays then pass through the anterior chamber, pupil, and posterior chamber to the lens. The number of rays which fall on the lens is regulated by the iris, which contracts or dilates, to allow more or less light to pass through the pupil, according as an object may be more or less lighted. Those rays that fall on the iris are reflected, and, returning through the cornea, exhibit the colours of the iris. The crystalline lens, both from its structure and form, very powerfully refracts the rays, and, by increasing their intensity, makes a distinct image at the bottom of the eye: from the crystalline they pass through the vitreous humour to the retina, where the impression is received, and conveyed along the optic nerve to the brain, and produces *vision*.

35. The *conjunctiva* protects the anterior surface of the eye; it secretes a fluid which mixes with the tears, and seems to have the same use; it supports the pressure when the eye is moved, and being always polished and humid, it gives much facility to motion.

36. The *sclerotic* is evidently to protect the interior parts of the eye, and to serve besides as a point of insertion for many muscles that move the eye.

37. The *choroid* membrane is the most vascular coat of the eye, allowing the ramifications of the vessels, and secreting the pigmentum nigrum.

38. The *pigmentum nigrum* absorbs the light after it has traversed the retina; and thus prevents dazzling.

39. The dark matter, called *uvea*, on the posterior surface of the iris, is to absorb those rays

that may be reflected by the polished surface of the crystalline.

40. The use of the *ciliary processes* is not perfectly understood. By some they are considered as secreting the aqueous humour. Haller thinks they maintain the lens in the most advantageous position.

41. The *eyebrows* guard the eyes from external violence by the projection which they form; they protect the eyes from too much light, particularly when it comes from above, and they prevent perspiration from flowing towards or irritating the surface of the eye.

42. The *eyelids* during sleep cover the eyes, and thus preserve them from the contact of any foreign bodies floating in the air; they moderate the force of a too brilliant light; and, by their regular and habitual motion, preserve the eyes from the effects of the continued contact of the air; and, by their sudden closure, guard them from any shock.

43. The secretion from the *meibomian glands* facilitates the motion of the eyelids.

44. *Hearing.* The external ear, or *pinna*, collects the sonorous undulations, and directs them towards the *meatus auditorius externus.* This trumpet-like tube concentrates and conveys them to the *membrana tympani.* The sonorous waves striking against this membrane cause it to vibrate; this vibratory motion will be also given to the *malleus*, which is in contact with the membrane. The malleus moves the *incus;* the incus, the *orbiculare;* and this latter moves the *stapes.* Now the base of the stapes being attached to the membrane closing the *fenestra ovalis*, it is evident that the stapes must act the part of a piston; that is, compressing or

dilating the fluid in the *vestibule, semicircular canals,* and *cochlea.* The motion of this fluid conveys the impression to the *acoustic nerve* which lines the labyrinth. This nerve, receiving the impression, conveys it to the brain.

45. The *Eustachian tube* admits the free passage of air into and from the cavity of the tympanum, thus preserving a due balance with the external atmosphere, and enabling the membrani tympani, to move in obedience to the slightest impression.

46. The *mastoid cells* are supposed to augment the intensity of the sound.

47. The *fenestra rotunda,* and *aqueducts,* are supposed to allow the liquid of the labyrinth to suffer vibrations.

48. Of *taste.* To produce the sensation of taste, the food must be moistened and applied to the tongue. The minute branches of the *lingual* branch of the third division of the fifth pair receive the impression, and convey it to the brain.

49. Of *smell.* The air filled with the odorous effluvia which exhale from most bodies, being received into the nostrils by inspiration, carries these particles to the olfactory nerve, which is expanded over the surface of the pituitary membrane. By this means a kind of sensation is produced, which we call smell. To preserve the extremities of the nerves, and to lessen the too strong impression that would arise from the immediate contact of the odoriferous particles, mucus is secreted.

50. *Of the functions of the skin.* The *cutis vera,* or true skin, forms the organ of touch, besides which it is formed for absorption, and has a function analogous to that of the lungs, namely, the discharge

of useless carbon from the system. The carbonic acid produced in the process, is formed by the union of the carbon with the oxygen of the atmosphere.

51. The *cuticle*, or *epidermis*, seems to blunt the otherwise too acute sensibility of the cutis vera, and to protect it from the impression of external bodies.

52. Of the *voice*. The air expelled from the lungs passes through the trachea and larynx. In the latter, the passage for it is much smaller than in the trachea, and the air is forced through a narrow slit, the two sides of which are vibrating planes, and which then produce sonorous undulations in the transmitted current of air. The intensity of the sound depends on the length of the *chordæ vocales*, and the force with which the air is expelled. The modifications of the voice depend upon the alterations produced on the opening of the glottis by its muscles and ligaments.

CULLEN'S NOSOLOGY.

ARRANGEMENT OF CLASSES AND ORDERS.

Classis 1. Pyrexiæ.	Class 1st. Febrile Diseases.
Ord. 1. Febres.	Ord. 1. Fevers.
2. Phlegmasiæ.	2. Inflammations.
3. Exanthemata.	3. Eruptive fevers.
4. Hemorrhagiæ.	4. Hæmorrhages.
5. Profluviæ.	5. Fluxes.
Classis 2. Neuroses.	Class 2d. Nervous Diseases.
Ord. 1. Comata.	Ord. 1. Soporose Diseases.
2. Adynamia.	2. Defect of Vital Powers
3. Spasmi.	3. Spasmodic Diseases.
4. Vesaniæ.	4. Mental diseases.
Classis 3. Cachexiæ.	Class 3d. Cachectic Diseases.
Ord. 1. Macores.	Ord. 1. Emaciations.

2. Intumescentiæ.	2. Swellings.
3. Impetigines.	3. Cutaneous Diseases.

Classis 4. Locales.	Class 4th. Local Diseases.
Ord. 1. Dysæsthesiæ.	Ord. 1. Diseases of the Senses.
2. Dysorexiæ.	2. Depraved Appetites.
3. Dyscinesiæ.	3. Depraved Motions.
4. Apocenoses.	4. Increased Discharges.
5. Epischeses.	5. Obstructions.
6. Tumores.	6. Tumors.
7. Ectopiæ.	7. Protrusions.
8. Dialyses.	8. Solutions of Continuity.

CLASS I.

ORDER I.

FEBRES. FEVERS.

Contains 6 *genera.*

(α) Intermittentes -	intermittent fevers.
1. Tertiana - - -	tertian ague.
2. Quartana - - -	quartan ague.
3. Quotidiana - -	every day ague.
(β) Continuæ - -	continued fevers.
4. Synocha - - -	inflammatory fever.

5. Typhus - - - - nervous fever.
6. Synochus - - - mixed fever.

ORDER II.

PHLEGMASIÆ. INFLAMMATIONS.

Contains 18 *genera.*

1. Phlogosis - - - inflammation.
2. Ophthalmia - - ——— of the eye.
3. Phrenitis - - - ——————— brain.
4. Cynanche - - ——————— throat.
5. Pneumonia - - ——————— lungs.
6. Carditis - - - ——————— heart.
7. Peritonitis - - ——————— peritoneum.
8. Gastritis - - - ——————— stomach.
9. Enteritis - - - ——————— bowels.
10. Hepatitis - - - ——————— liver.
11. Splenitis - - - ——————— spleen.
12. Nephritis - - - ——————— kidneys.
13. Cystitis - - - ——————— bladder.
14. Hysteritis - - ——————— womb.
15. Rheumatismus - rheumatism.
16. Odontalgia - - toothach.
17. Podagra - - - gout.
18. Arthropuosis - - pus in a joint.

ORDER III.

EXANTHEMATA. ERUPTIVE FEVERS.

Contains 10 *genera.*

1. Variola - - - smallpox.
2. Varicella - - - chicken pox.

3. Rubeola - - - measles.
4. Scarlatina - - scarlet fever,
5. Pestis - - - - plague.
6. Erysipelas - - St. Anthony's fire.
7. Miliaria - - - miliary fever.
8. Urticaria - - - nettle rash.
9. Pemphigus - - vesicular fever.
10. Aphtha - - - thrush.

ORDER IV.

HÆMORRHAGIÆ. HÆMORRHAGES.

Contains 6 *genera.*

1. Epistaxis - - - bleeding from the nose.
2. Hæmoptysis - - spitting of blood.
3. Hæmorrhois - - piles.
4. Menorrhagia - - overflow of the menses.
5. Hæmaturia - - voiding of blood by urine.
6. Hæmatamesis - vomiting of blood.

ORDER V.

PROFLUVIÆ. FLUXES.

Contains 2 *genera.*

1. Catarrhus - - catarrh.
2. Dysenteria - - dysentery.

CLASS II.

NEUROSES. NERVOUS DISEASES.

ORDER I.

COMATA. SOPOROSE DISEASES.

Contains 2 *genera.*

1. Apoplexia - - apoplexy.
2. Paralysis - - - palsy.

ORDER II.

ADYNAMIA. DEFECT OF PHYSICAL POWERS.

Contains 4 *genera.*

1. Syncope - - - fainting.
2. Dyspepsia - - indigestion.
3. Hypochondriasis - low spirits.
4. Chlorosis - - - green-sickness.

ORDER III.

SPASMI. SPASMODIC DISEASES.

Contains 17 *genera.*

1. Tetanus - - - cramp.
2. Trismus - - - locked jaw.
3. Convulsio - - - convulsions.
4. Chorea - - - St. Vitus's dance.
5. Raphania - - - raphany.
6. Epilepsia - - - epilepsy.

7. Palpitatio - - - palpitation.
8. Asthma - - - asthma.
9. Dyspnœa - - - difficult breathing.
10. Pertussis - - - hooping cough.
11. Pyrosis - - - water brash.
12. Colica - - - - colic.
13. Cholera - - - cholera.
14. Diarrhœa - - - purging.
15. Hysteria - - - hysteric diseases.
16. Hydrophobia - - canine madness.
17. Diabetes - - - excessive flow of urine.

ORDER III.

VESANIÆ. MENTAL DISEASES.

Contains 4 *genera.*

1. Amentia - - - fatuity.
2. Melancholia - - melancholy.
3. Mania - - - - madness.
4. Oneirodynia - - nightmare.

CLASS III.

CACHEXIÆ. CACHECTIC DISEASES.

ORDER I.

MARCORES. UNIVERSAL EMACIATION.

Contains 3 *genera.*

1. Tabes - - - - wasting away.
2. Atrophia - - - nervous consumption.
3. Pthisis - - - pulmonary consumption.

ORDER II.

INTUMESCENTIÆ. SWELLINGS.

Contains 13 *genera.*

	(α) Adiposæ - -	fatty swellings.
1.	Polysarcia - -	obesity.
	(β) Flatulosæ -	flatulent swelling.
2.	Pneumatosis - -	windy swellings.
3.	Tympanites - -	drum belly.
4.	Physometra - -	windy swelling of the uterus.
	(γ) Aquosæ - -	dropsies.
5.	Anasarca - - -	general dropsy.
6.	Hydrocephalus -	water in the head.
7.	Hydrorachitis -	——————— spine.
8.	Hydrothorax - -	dropsy in the chest.
9.	Ascites - - -	——————— belly.
10.	Hydrometra - -	——————— uterus.
11.	Hydrocele - -	——————— tunica vaginalis.
	(δ) Solidæ - -	swellings of the solids.
12.	Physconia - -	enlargement of the abdomen.
13.	Rachitis - - -	rickets.

ORDER III.

IMPETIGINES. CUTANEOUS DISEASES.

Contains 8 *genera.*

1.	Scrofula - -	scrofula.
2.	Syphilis - -	venereal disease.

3. Scorbutus - - - scurvy.
4. Elephantiasis - elephant-like eruption.
5. Lepra - - - - leprosy.
6. Frambæsia - - yaws.
7. Trichoma - - - plaited hair.
8. Icterus - - - - jaundice.

CLASS IV.

LOCALES. LOCAL DISEASES.

ORDER I.

DYSÆSTHESIÆ. DISEASES OF THE SENSES.

Contains 9 *genera.*

1. Caligo - - - - cataract.
2. Amaurosis - - loss of sight. Gutta serena.
3. Dysopia - - - bad sight.
4. Pseudoblepsis - false vision.
5. Dysecœa - - - deafness.
6. Paracusis - - - wrong hearing.
7. Anosmia - - - loss of the sense of smell.
8. Agheustia - - ——————— taste.
9. Anæsthesia - - ——————— touch.

ORDER II.

DYSOREXIÆ. ERROR OR DEFECT IN APPETITE.

Contains 9 *genera.*

(α) Appetitus erronei - - (α) Depraved appetites.

1. Bulimia - - - insatiable appetite.

2.	Polydipsia - -	excessive thirst.
3.	Pica - - - -	depraved appetite.
4.	Satyriasis - - -	incontinence in men.
5.	Nymphomania -	———————— women.
6.	Nostalgia - - -	longing for home.
	(β) Appetitus deficientes -	(β) Defective appetites.
7.	Anorexia - - -	diminished appetite.
8.	Adipsia - - -	want of thirst.
9.	Anaphrodisia - -	impotence.

ORDER III.

DYSCINESIÆ. IMPEDED MOTION FROM IMPERFECTION OF AN ORGAN.

Contains 7 *genera.*

1.	Aphonia - - -	loss of voice.
2.	Mutitas - - -	dumbness.
3.	Paraphonia - -	altered voice.
4.	Psellismus - -	defect in speech.
5.	Strabismus - -	squinting.
6.	Dysphagia - -	difficult deglutition.
7.	Contractura - -	cramp.

ORDER IV.

APOCENOSES. INCREASED DISCHARGES.

Contains 6 *genera.*

1.	Profusio - - -	loss of blood.
2.	Epidrosis - - -	excessive perspiration.
3.	Epiphora - - -	excessive flow of tears.
4.	Ptyalismus - -	salivation.

5. Enuresis - - - involuntary flow of urine.
6. Gonorrhœa - - a preternatural discharge of fluid from the urethra.

ORDER V.

EPISCHESES. OBSTRUCTIONS.

Contains 5 *genera.*

1. Obstipatio - - costiveness.
2. Ischuria - - - suppression of urine.
3. Dysuria - - - difficult discharge of urine.
4. Dyspermatismus - difficult discharge of semen.
5. Amenorrhœa - - stoppage of the menses.

ORDER VI.

TUMORES. TUMORS.

Contains 13 *genera.*

1. Aneurisma - - aneurism.
2. Varix - - - - dilated vein.
3. Ecchymoma - - extravasation.
4. Schirrus - - - hard indolent tumour.
5. Cancer - - - cancer.
6. Bubo - - - - a swelled gland.
7. Sarcoma - - - a fleshy excrescence.
8. Clavus - - - a corn.
9. Lupia - - - - encysted tumour.
10. Ganglion - - - tumor in the sheath of a tendon.

11. Hydatis - - - hydatids.
12. Hydarthrus - - white swelling.
13. Exostosis - - - a morbid hard tumor on a bone.

ORDER VII.

ECTOPIÆ. PARTS DISPLACED.

Contains 3 *genera.*

1. Hernia - - - rupture.
2. Prolapsus - - an uncovered protrusion of a part.
3. Luxatio - - - dislocation of a bone.

ORDER VIII.

DIALYSES. VISIBLE SOLUTIONS OF CONTINUITY.

Contains 7 *genera.*

1. Vulnus - - - a wound.
2. Ulcus - - - - an ulcer.
3. Herpes - - - tetters.
4. Tinea - - - - scald head.
5. Psora - - - - itch.
6. Fractura - - - fracture.
7. Caries - - - - carious bone.

PRACTICE OF MEDICINE.

Arrangement of diseases in the following pages, with the numbers referring to the different heads, or sections.

INFLAMMATION.

FEVERS.

DISEASES CONNECTED WITH THE DIGESTIVE SYSTEM.

DISEASES OF THE RESPIRATORY ORGANS.

DISEASES OF THE CIRCULATORY SYSTEM.

140. Angina Pectoris.
142. Carditis.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

144. Meningitis.
146. Phrenitis.
148. Hydrocephalus.
152. Apoplexia.
155. Paralysis.
157. Tetanus.
159. Epilepsia.
161. Chorea.
164. Hysteria.

DISEASES OF THE SKIN.

166. Erysipelas.

DISEASES OF THE URINARY AND GENITAL ORGANS.

169. Nephritis.
172. Cystitis.
174. Hysteritis.
176. Hæmaturia.
178. Chlorosis.
180. Menorrhagia.

DISEASES PRINCIPALLY ATTACKING FIBROUS AND SYNOVIAL MEMBRANES.

182. Podagra.
187. Rheumatismus.

HYDROPES.

189. Anasarca.
190. Ascites.
191. Hydrothorax.

INFLAMMATION.

1. The characters of external inflammation, are pain, heat, redness, and swelling.

2. Internal inflammation is judged of by the local pain increased upon pressure; the functional disorder, and general derangement of the system; and the blood, when drawn, is generally more or less buffy.

3. The exciting causes are mechanical and chemical irritants, cold, morbid poisons, and metastasis.

4. The pain in inflammation is produced by pressure or distension of the nervous filaments,

which probably possess at that time a greater degree of sensibility.

5. The heat may depend upon the increased quantity of blood in the part, and some peculiar property of the nerves.

6. The redness is occasioned by the accumulation of the blood in the vessels, a portion of which previously carried only the colourless parts of the blood.

7. The swelling is effected by the accumulation of blood, and the effusion of lymph, into the cellular tissue; the action of the absorbents being, at the same time, somewhat suspended.

8. Inflammation terminates by resolution, induration, effusion, suppuration, ulceration, and gangrene.

9. Resolution implies a subsidence of the inflammation, without any apparent organic alteration.

10. In suppuration a new fluid, named pus, is formed. When it takes place internally, it is known by the pain becoming of a throbbing kind; there is a sensation of weight in the part; the pulse continues frequent, but is soft and full; and rigors and night sweats, or hectic fever, supervene.

11. In ulceration there is an increased action of the absorbent vessels, which remove a portion of the living solids. This process is of service in separating the dead from the living parts.

12. When gangrene, sphacelus, or mortification, takes place, it is known by the sudden cessation of pain, a sinking irregular pulse, a cadaverous and wild countenance, and delirium; where it occurs externally, the parts which were red, become

of a dark dusky colour, vesications take place, and there is a peculiar fœtor produced.

FEVERS.

13. General character of Fevers. There is, at first, a sensation of chilliness, with cold surface, succeeded by increased heat, a full pulse, a flushed countenance; thirst, debility, languor, and pain in the limbs; loss of appetite, nausea, vomiting, and restlessness. The tongue is white, and the different secretions are disordered.

14. Cullen divides fevers into idiopathic and symptomatic; some others arrange them in five classes, including intermittents, remittents, continued fevers, hectic fever, and fevers with eruptions.

15. Fever may depend upon three principal causes: first, inflammation of an acute or subacute character of any viscus of the body; second, upon some functional derangement without inflammation; and third, upon mere loss of balance of the circulation.

Intermittents.

16. In intermittents there are distinct paroxysms of fever, between which there is an apparently perfect intermission, or period free from fever.

17. There are three kinds of intermittents, the *quotidian*, *tertian*, and *quartan*.

18. In the *quotidian*, the febrile paroxysm recurs daily in the morning, and is in general the longest.

19. In the *tertian*, the paroxysm takes place every second day, in the forenoon. The hot fit is generally the longest.

20. In the *quartan*, the paroxysm recurs every third day in the afternoon. The cold stage is the longest and most violent.

21. *Causes* of intermittents. The predisposing causes are cold, combined with moisture, debility of the system, from low diet, fatigue, preceding disease, and anxiety of mind. The common *exciting* cause is considered to be the effluvium from marshy soils, called *marsh miasma*.

22. The paroxysm of an intermittent is distinctly marked by three stages: the cold, the hot, and the sweating.

23. In the *cold stage*, a sensation of cold is first felt in the extremities, and extends over the whole body; there is a pale constricted skin, great languor and listlessness, hurried respiration, oppression at the præcordia, diminished secretions, a small, frequent, and sometimes irregular pulse; the teeth chatter, the limbs tremble, and there is a convulsive shaking which affects the whole body.

The duration of a cold stage is from one to four hours.

24. *Hot stage.* After an uncertain space of time, reaction gradually comes on with heat, which extends over the whole body. The sensibility, from being as it were benumbed, becomes acute; the pulse is quick, strong, and hard; the tongue white; the urine scanty and high coloured; there is a nausea and vomiting, confusion of intellect, and sometimes delirium. The duration of this stage is generally much longer than the preceding.

25. *Sweating stage.* After an indefinite time, a moisture breaks out upon the face and neck, and by degrees extends over the whole body. The febrile symptoms gradually diminish; the pulse becomes natural; the feeling of weakness goes off;

the heat of the skin, thirst, and headach diminish; the appetite returns, and the secretions are restored to their healthy condition.

26. In the cold stage, the symptoms produced may be referred to the long accumulation of the blood in the vessels of the brain, and lungs, and viscera. In the hot, the heart becomes excited by congestion, producing febrile symptoms, which are relieved by the blood separating portion of its thinner parts, forming the profuse perspiration which may be of great service in cooling the surface of the body.

27. *Treatment of Intermittents.* In the treatment of these fevers there are two objects in view: the one by palliative means, to modify and shorten the paroxysms; the other, which is curative, to prevent their return. The indication in the cold stage is to restore the natural warmth to the body, to shorten the paroxysm, and to bring on the hot stage. This is usually attempted by applying heat externally, giving stimulants and diaphoretics, using the foot bath, and by warmly covering the patient up in bed.

28. Another mode of treatment, suggested and practised by Dr. Mackintosh, consists of bleeding in the cold stage, by which means an immediate relief of the urgent symptoms is felt, and the paroxysm is very frequently entirely suspended. This mode of treatment is said to have been even successful where all other remedies have failed. The quantity of blood necessary to be drawn varies considerably, from four to twenty ounces. This treatment has not many advocates in London.

29. In the hot stage, means should be employed to lower the temperature. Cold acidulated drinks may be administered, the body may be sponged

with cold water, and the greater portion of the bed-clothes removed. Bleeding will become necessary, in case of any local determination or inflammation.

30. In the sweating stage caution is required not to allow the body to be chilled too suddenly, and it is generally requisite to keep up the perspiration till any painful or uneasy sensations be mitigated.

31. *Treatment during the intermission.* At this period, various vegetable and mineral tonics are administered, to prevent the recurrence of the paroxysm.

32. The vegetable tonics used for this purpose, are *cinchona, simarouba, willow,* and *cascarilla* barks.

33. The cinchona is most efficacious, and seems to possess a specific property in arresting the paroxysms. The most common, but oldest form of administering cinchona, is in powder: a drachm to two drachms may be given every three or four hours; so that nearly two ounces may be given during the intermission. The sulphate of quinine is the most eligible form for administering cinchona, as it is less liable to oppress the stomach or irritate the bowels. It may be given in doses of two or three grains every fourth hour, for twenty four hours before the expected accession.

34. Should there be any imflammatory diathesis, or local inflammation, bleeding and purging must be had recourse to before cinchona is admissible, or so likely to be useful.

35. When intermittent fever exists, combined with great debility and without local inflammation, wine, opium, and cordials may be administered.

36. The mineral tonics used in the cure of intermittents are arsenious acid, sulphate of zinc, and

sulphate of copper. Fowler's solution may be given in doses of from five to fifteen minims.

37. *Remittent fevers* likewise arise from malaria in many instances. They have no apparently perfect intermission, but have evident periods of paroxysms.

38. The principal disease of this description is the yellow fever of hot countries. It is usually attended with symptoms indicating disease affecting the brain, lungs, or abdominal viscera. There is violent vomiting, consisting at first principally of bile, afterwards of dark matter, resembling coffee grounds. The skin and conjunctiva are of a yellow tinge, and there are violent cramps in the belly and legs.

39. The treatment most efficacious consists in bleeding largely at the commencement, afterwards applying blisters and counter-irritants, and sponging the body with vinegar and water. Brandy and wine are sometimes administered with apparent success.

Idiopathic or Continued Fevers.

Synocha, Inflammatory Fever.

40. *Symptoms.* This fever commences with rigors and lassitude, and is followed by flushings and excessive heat. The pulse is full and frequent; the countenance and eyes suffused. There is pain in some part of the body, frequently of the head or back. The tongue is dry and white; the urine scanty, and high coloured. There is costiveness, excited sensibility, quick respiration, and great anxiety.

This disease is generally dependent upon some local inflammation of a subacute character.

42. *Causes.* Sudden change of temperature, over exertion, alarm, the abuse of liquors, and the suppression of some usual evacuation.

43. *Treatment.* Blood must generally be drawn from the arm, or locally, according to the age and strength of the patient, and violence of the fever. Emetics may be administered, and followed by purgatives, especially the saline ones. Counter-irritants may be applied; and the medicines to be given constantly should be, cool drinks, acetate of ammonia, antimonial preparations, and in some cases Dover's powder. Great relief is sometimes experienced by sponging the body with cool vinegar and water. The usual diet should be entirely forbidden.

Congestive or Typhus Fever.

44. *Symptoms.* At first, languor, chilliness, and depressed spirits, with sighing and oppression in the breathing, followed by pain in the head, or some other part of the body; confusion of thought; vomiting; pulse quick and weak, sometimes intermittent; the tongue becomes dry, brown, and tremulous; the countenance is expressive of anxiety, and the cheeks are tinged with a circumscribed blush; urine pale, watery, and in small quantity; muttering delirium; subsultus tendinum; diarrhœa; involuntary excretions; and cold extremities. Exacerbations are generally observed in the evening, and relief is experienced in the morning.

45. *Causes.* Powerful emotions of the mind; exposure to cold and moisture; excessive fatigue, and contagion.

46. *Treatment.* In the commencement, give

an emetic. Bleed moderately from the arm, or apply eight or ten leeches to the temples; apply a blister to the nape of the neck, or to any part where more indicated; give diaphoretics, and mild purgatives, and sponge the body with vinegar and water, if the skin be very hot and parched. The horizontal posture must be insisted upon, and the patient must abstain entirely from animal food; these precautions apply to all kinds of continued fevers.

47. When the violence of the symptoms has abated, give cinchona, serpentary, and other tonics, and opium to procure sleep.

Typhus Gravior, Putrid Fever.

48. *Symptoms.* The same as in typhus mitior at first, but run through their stages more rapidly. Symptoms of malignancy soon appear. The tongue is covered with a brown or black crust; the fæces pass involuntarily; hæmorrhage breaks out; petechiæ show themselves; the pulse sinks and intermits; the skin is cold; hiccup comes on, and death follows. When the above symptoms come on, stimulants become necessary; the best are sulphuric æther, brandy, wine, and ammonia.

Synochus or Mixed Fever.

49. The symptoms are the same as in synocha, in the commencement, but in the latter stage resemble typhus.

The treatment must partake of that necessary for both forms of fever: bloodletting and evacuants are necessary in the commencement; but, in the

advanced stage, the warm bath, stimulants, &c. become requisite.

Hectic Fever.

50. This fever is a concomitant of other diseases, and generally of those in which suppuration has taken place. It is considered by some to be produced by the absorption of pus, and by others to be dependent upon inflammation of mucous membrane, when occurring during the progress of other diseases.

51. *Symptoms.* Rigors, followed by heat, and succeeded by perspiration, which may be brought on by any over exertion. There is a redness on the cheek, called hectic blush, and diarrhœa is a very common attendant.

52. *Treatment.* Little can be done to remove this fever, without, at the same time, removing the cause. The perspiration may be checked by acids, and the diarrhœa restrained by astringents.

53. *Exanthemata, Eruptive Fevers.*

Scarlatina.

54. Scarlatina is described by Cullen as of three kinds, *simplex*, *anginosa*, and *maligna*.

The first is the mildest form of the disease; the second is attended with symptoms of sore throat; and the third assumes a typhoid or congestive character.

55. *Symptoms.* In the commencement, there is pyrexia, with full and frequent pulse. On the second or third day, an eruption shows itself upon

the skin, commencing about the face and neck; it is diffused in broad patches, and nearly of the colour of a boiled lobster. The conjunctiva is red; the tongue furred, dry, and red at the edges, and the papillæ are raised upon it. The eruption lasts a few days, and generally terminates in desquamation. In scarlatina anginosa, there is ulceration of the fauces and tonsils.

Scarlatina is accompanied by inflammation of the mucous membranes, and is sometimes followed by anasarca.

56. *Treatment.* In mild cases, simple antiphlogistics are all that is required. If inflammation of any part supervenes, general and local bloodletting may be had recourse to, and, in some cases, followed by a blister. The patient should be kept at a temperate heat, take cool drinks, and abstain from all stimulants. Laxatives are of great service, and great relief is sometimes experienced by sponging the body with tepid water. When gargles are necessary, warm water forms one of the best, and is of great use when its vapour is inhaled by the mouth.

The dropsy, which sometimes follows, generally requires bloodletting, in addition to purgatives and diuretics.

Morbilli or Rubeola, Measles.

57. *Symptoms* of the common inflammatory form: pyrexia, cough, hoarseness, dyspnœa, sneezing, coryza, and drowsiness. On about the fourth day, an eruption of dingy red prominent spots, arranged in patches, with rather crescentic margins, show themselves about the face and neck, and gradually

spread over the whole body; small red spots are also observed upon the palate. In three or four days the eruption begins to disappear, and generally leaves desquamation of the cuticle.

This disease, which is always accompanied by some degree of inflammation of the pulmonary system, is liable to assume a congestive or typhoid form, and consequently becomes highly dangerous.

58. *Diagnosis.* Measles is distinguished from scarlatina by the colour of the eruption, the coryza, the spots are more elevated, and are not arranged in patches of so large a size; the throat is likewise not so often attacked.

59. *Treatment.* Keep the patient at a temperate heat; give diaphoretics, refrigerants, and saline purgatives. If the local symptoms run high, bleed generally and locally; if the chest be much oppressed, a blister may be applied after blood-letting, and ipecacuanha, in small doses, will be found very useful.

If the eruption leaves the surface, congestion and inflammation of the brain, pulmonary or abdominal viscera, are to be guarded against; and the eruption may sometimes be restored by having recourse to the warm bath, and stimulants rubbed upon the body.

Rubeola is very often followed by disease in the lungs.

Variola, Small Pox.

60. *Symptoms.* This disease commences with rigors, and pain, referred to the back and epigastrium; there is uneasiness at the stomach, with retching and vomiting; the eyes are redder than natural; the tongue is covered with a white fur;

there is a hot skin and quick pulse. On the third day an eruption shows itself, and gradually spreads over the whole body. About the fifth day, vesicles form in each spot; in a few days the vesicles lose their elevation, and a puriform fluid is effused in each. About the ninth day the pustules are completely formed, and, in two or three days, begin to break and dry up.

Secondary fever sometimes comes on, and is generally occasioned by an overloaded state of the bowels, and the cessation of the cutaneous discharge.

61. There are two forms of small-pox commonly described: the *distinct* and *confluent;* in the first the pustules are separated, in the latter they run one into the other.

62. *Diagnosis.* This disease can only be mistaken for varicella, from which it is distinguished by the pustules always presenting the central depression; by being of longer duration; and the areola being more red, larger, and more raised.

63. *Treatment.* The treatment is the same as for fevers in general: in some cases general and local bloodletting are necessary, and the room should be cool and ventilated. It is recommended to open the pustules on the face early, to prevent the marks which usually follow.

Varicella, Chicken-pox.

64. *Symptoms.* Pyrexia, with an eruption of small red protuberances, or vesicles without depression. The fluid in the vesicle becomes white, and, about the third day, straw-coloured; on the fifth and sixth day, the disease begins to subside very fast.

65. *Diagnosis.* It is distinguished from small-pox by the slight fever; the vesicles contain serum on the first day of the eruption; the areola is not so red, and raised; and the vesicles do not present the central depression. No suppuration takes place, and the eruption scarcely remains entire on the fifth day.

66. *Treatment.* Gentle laxatives, refrigerants, and diaphoretics, proportionate to the symptoms, may be given.

Miliaria, Miliary Fever.

67. *Symptoms.* There is pyrexia, great languor and depression of spirits, laborious respiration, heat of the body, aud a tingling sensation is felt over the skin; there is profuse sweat, of a sour, unpleasant smell. Pimples, about the size of millet seeds, appear about the body, filled with a whitish, serous fluid. In two or three days the vesicles break, and desquamation follows.

68. *Diagnostic character.* The profuse unpleasant perspiration, and peculiar eruption.

69. *Treatment.* Give saline purgatives, admit cool air, and allow only light clothing; it is seldom that more than the mildest measures are necessary.

DISEASES CONNECTED WITH THE DIGESTIVE SYSTEM.

Aphtha.

70. *Symptoms.* In this disease there are small, pearl-coloured, white vesicles on the tongue, lips, and inner surface of the mouth and throat; pro-

ceeding to superficial ulceration, and terminating in exfoliation of the cuticle. In some cases it extends along the entire alimentary canal, producing diarrhœa. The anus appears very often inflamed, and, in females, occasionally the vagina. There is always some febrile excitement, and there is generally drowsiness as a precursory symptom.

71. *Treatment.* An emetic may be given, and followed by gentle purgatives. Emollient enemas, containing a few drops of laudanum, occasionally give great relief; where there is much depression, aromatic powder and wine, in small doses, become necessary. Some practitioners apply stimulant embrocations to the abdomen, and rub the mouth with a mixture of borax and honey.

Cynanche Tonsillaris, Inflammatory Sore Throat.

72. *Symptoms.* Pyrexia; redness and swelling of the tonsils and fauces, sometimes extending to the Eustachian tubes, producing deafness, and affecting the uvula, producing an elongation of it; thus giving rise to an incessant desire to swallow. The deglutition is impeded; the voice is indistinct; and there is dyspnœa and headach; the tongue is white and brown; and the fauces occasionally become covered with white specks, which terminate in sloughs. This disease is prone to terminate in ulceration or suppuration.

It is generally brought on by wet and cold, particularly when the digestive functions are disordered.

73. *Treatment.* Bloodletting is seldom necessary. Leeches and blisters may be applied externally. An emetic is sometimes useful; but

purgatives are necessary in nearly all cases. The vapour of vinegar and water should be inhaled.

Cynanche Maligna, Putrid Sore Throat.

74. Cynanche tonsillaris sometimes assumes a typhoid character, resembling the state of throat, occasionally occurring in scarlatina maligna.

75. *Symptoms.* Shivering, anxiety, and great restlessness. The fauces are tumid, and of a deep red colour, interspersed with white specks, which are also found in the mouth. The pulse is quick but weak, and sometimes irregular; there is pain at the throat; the voice is indistinct, and deglutition very painful; the tongue dry, and covered with a dark thick fur; diarrhœa, and great prostration of strength; a papulous eruption breaks out about the neck, of a fiery-red colour, and gradually extends over the whole body. The ulceration increases, and extends to the alimentary canal, or trachea; gangrene supervenes, and death follows.

76. *Treatment.* At the commencement of the attack, leeches may be applied to the throat, and followed by a blister; an emetic also has been found serviceable; but, as soon as an evident depression of the system takes place, the strength must be supported by stimulants and aromatics, as wine and bark, with cinnamon, and the like. The room should be well ventilated, and all effluvia removed; light nourishment should be administered, and the throat may be gargled with stimulant astringent gargles. The disease generally arrives at a crisis about the fifth or seventh day.

Cynanche Pharyngea, Inflammation of the Pharynx.

77. This disease occupies the parts posterior to the soft palate, which are generally observed very red, and covered with a thick viscid secretion. There is an incessant desire to be spitting. Deglutition is exceedingly painful. The treatment is the same as for cynanche tonsillaris, and particular attention must be paid to the bowels.

Dyspepsia, Indigestion.

78. *Symptoms.* The symptoms of this disease are of so varied a nature, that it is difficult to describe concisely the order in which they occur. There is generally loss of appetite; nausea; headach; depression of spirits; acrid eructations; heartburn; costiveness, or diarrhœa; a small slow pulse; a white furred tongue, and disturbed sleep. The fæces are either very dark, or of a clay colour, and very fœtid.

79. *Treatment.* The remedies most efficacious are gentle purgatives, such as rhubarb, with small doses of mercury; bitter tonics, such as gentian, cascarilla, and small doses of the aloetic preparations, combined with alkalies, to correct the acidity. The diet should be light and nutritious, and not sufficient to completely satisfy the appetite. Much may be done by gentle exercise, and by attending to the habits and state of mind of the patient.

Hæmatemesis, Vomiting of Blood.

80. *Symptoms.* Clotted blood is vomited up of a dark colour, and this comes on rather suddenly.

It is often preceded by a sensation of weight and pain at the stomach. On examination, it is seldom that any large vessel is found ruptured. The blood is generally poured out by the exhalant extremities of the arteries.

81. This disease may be mistaken for hæmoptysis, from which it is distinguished by the blood being brought up by vomiting, being more clotted, and of a less florid colour, and not attended with cough.

82. *Treatment.* In plethoric habits, bloodletting is necessary; acids and astringents, in a cool state, may be given, and followed by purgatives. Superacetate of lead is sometimes very efficacious.

Colica, Colic.

83. *Symptoms.* Violent pain in the abdomen, with a twisting sensation about the umbilicus; there is spasmodic contraction of the abdominal muscles; sometimes constipation and vomiting, with hiccup and flatulent eructations. Colic is distinguished from enteritis and peritonitis by the pain being somewhat diminished upon pressure.

Another form of colic attacks painters, and is named

84. *Colica Pictonum.* In this disease, the pain is more constant, and not so diffused, although quite as violent. Constipation is a constant symptom; and there is a peculiar appearance in the colour of the countenance. The feet and toes are sometimes affected, and there is oftentimes paralysis of the upper or lower extremities.

85. *Treatment.* In common colic, an enema of tobacco or turpentine, opiates, and castor oil, with

aromatics, may be administered, and hot fomentations may be applied to the abdomen.

86. In colica pictonum, bloodletting is frequently necessary, in consequence of inflammation of the mucous membrane of the intestines, which frequently supervenes. The medicines most useful afterwards are, calomel and opium, castor and croton oils, and turpentine, taken by the mouth, and used as an enema. Cupping over the abdomen is sometimes useful, as well as warm fomentations.

Vermes, Intestinal Worms.

87. The worms which infest the human intestines are principally of three kinds: the *tænia*, *lumbricus teres*, and *ascaris*.

The *tænia* is found in the small and large intestines, and is seldom found in children. There are two species of this worm, the *tænia solium* and the *tænia vulgaris*.

The *lumbricus teres* is found in the small intestines and stomach. It somewhat resembles the earthworm, and is occasionally brought up by vomiting.

The *ascaris* is found chiefly in the rectum, and is principally troublesome to children.

88. *Symptoms produced by worms.* In children, one of the first circumstances which leads to a suspicion of their existence, is picking at the nose; the face is pallid; there is emaciation of the body, and swelling of the abdomen; a furred tongue, impaired appetite, peevishness, and want of sleep; occasionally there is great pain in the abdomen, with purging, and epileptic fits or convulsions.

89. *Treatment.* Anthelmintics act either by

dislodging the worms, or by exerting some poisonous influence upon them. The best for ascarides are, calomel with scammony or jalap, cowhage, and injections into the rectum of turpentine or decoction of aloes. For the lumbricus and tænia, the best remedy is spiritus terebinthinæ; and, if that should not be used, the male fern root, the root of the pomegranate, or spigelia marilandica, may be tried.

At the time that the above remedies are used, the vegetable tonics should be given, as worms very generally depend upon a weakened state of the digestive functions.

Peritonitis, Inflammation of the Peritoneum.

90. *Symptoms.* Pyrexia, great heat and pain in the abdomen, at first confined to a small space, but subsequently diffused over the whole surface, which is tense, and so painfully tender that the weight of the bed-clothes is unsupportable; the knees are drawn up to take off the tension. The pulse is an uncertain symptom: sometimes it is quick, full, and hard; at other times, slow, soft, and contracted. The tongue is at first white, afterwards brown and red at the edges. There is some constipation. The respiration is quick and difficult; but there is seldom much vomiting, unless the peritoneal covering of the stomach be attacked.

91. *Causes.* It is generally brought on by cold, by habitual costiveness, contusions, and wounds produced by accident or surgical operations.

92. This disease might be mistaken for enteritis, hepatitis, and splenitis.

93. *Treatment.* The principal part of the treatment consists in bloodletting from the arm, and by leeches, which are to be repeated after short intervals, if the disease does not yield. Gentle laxatives should be given, and soothing enemas be administered, combined, in some cases, with tobacco. After bleeding, some practitioners rely very much upon large doses of calomel and opium. When the bowels become tympanitic, an enema, containing turpentine, may be thrown up. The regimen must be completely antiphlogistic. Late in the disease, blisters over the abdomen may be applied.

Another kind of peritonitis attacks females after parturition, and is called *Puerperal Fever.* It differs from the other, inasmuch as it occurs in patients who have for months past been debilitated by the progress of utero-gestation, and more recently by the enfeebling efforts of parturition. It also attacks debilitated constitutions; and, from assuming a masked character, has been generally more fatal than common peritonitis.

The seat of disease is essentially the same: it is commonly accompanied by excessive pain, and the head and stomach is distressed. Bloodletting is the main dependence in this form of disease. When it has been coexistent with congestion, large doses of spirits of turpentine have been found singularly useful.

Gastritis, Inflammation of the Mucous Coat of the Stomach.

94. *Symptoms.* Pyrexia; thirst, with great desire for cold drinks; great heat and dryness of the skin; pain at the epigastrium, increased upon pressure; retching and vomiting of nearly every thing taken into the stomach; the pulse is quick, but small and compressible; there is great prostration of strength; frequent hiccup; and the tongue is generally rough and much furred, with red tip and margins.

Diagnostic Character. The excessive vomiting, the seat of pain, and great heat of the epigastrium.

95. *Treatment.* The best remedial means are, copious bloodletting, by venesection and leeches applied to the epigastrium; fomentations, the warm bath, enemas, and, after copious bloodletting, laxatives, demulcents, and diaphoretics; opium may also be given in small doses, combined with calomel.

Enteritis, Inflammation of the Mucous coat of the Intestines.

96. *Symptoms.* Pyrexia; pain in the abdomen, increased upon pressure, but not so acute as in peritonitis. There is frequently some tension, a weak, contracted, and compressible pulse; great depression and loss of strength; high coloured urine. The tongue is furred, and generally very red at its apex and margins. The pain varies in situation, according to the part affected: if the upper portion of the small intestines is attacked,

there will be vomitings, and pain about the umbilicus; if the colon is suffering, there is pain extending along its course, called tormina, and there will often be diarrhœa; when the rectum is the part affected, there is violent bearing down, with tenesmus, and evacuation of bloody mucus.

97. *Treatment.* Bloodletting, enemas, &c. may be resorted to, as in peritonitis, and the general treatment will be much the same. Blisters are not very often necessary; but stimulant embrocations over the abdomen may be substituted for them. Laxatives of the mildest kind only are admissible.

Diarrhœa, Looseness.

98. *Symptoms.* Frequent discharges of liquid fæcal motions, with pain and griping; may be considered only as symptomatic of some other disease.

99. Diarrhœa may depend upon irritation or inflammation of the mucous membrane of the bowels, produced by indigestible food, accumulation of fæces, vitiated biliary secretions, cold, &c. When it depends on any acute inflammation, it may be known by other constitutional symptoms.

100. *Treatment.* The treatment must vary with its causes. If diarrhœa arises from cold, a warm bath is indicated; if it depends upon inflammation of the intestines, bloodletting and leeches will be necessary; if from vitiated bile, accompanied by vomiting, calomel and rhubarb will be useful, followed by small doses of opium; if it is occasioned by acrid indigestible food, the bowels should be relieved by castor oil, followed by mild astringents and tonics.

Dysenteria, Dysentery.

101. *Symptoms.* Pyrexia; flatulence, and griping of the bowels; frequent inclination to go to stool; tenesmus; nausea, or vomiting; frequent evacuations from the rectum of mucus, mixed with fæces or blood; sometimes films, like membranes or fat, are passed, with portions of indurated fæces; great debility; and violent sensation of bearing down.

102. *Treatment.* The remedies to be employed are, bloodletting and leeches; purgatives, such as rhubarb, calomel, and sulphate of magnesia, castor oil with opium, antimonials, ipecacuanha, and astringents. Counter-irritants may be applied to the abdomen; and a suppository of opium be introduced into the rectum.

The disease is principally seated in the large intestines.

Cholera Morbus.

103. *Symptoms.* A sensation of heat at the scrobiculus cordis; vomiting and purging of bilious matter; hurried respiration; great depression and anxiety; griping pains in the abdomen; a quick, but small and contracted, pulse; excessive thirst; spasmodic contraction of the muscles of the abdomen and extremities. The surface is pale, and exceedingly cold; and the blood, when drawn, is very dark and thick, approaching to a pitchy consistence. There is also suppression of urine.

104. The *morbid appearances* found on dissection are generally those of congestion of the different viscera. The stomach and intestines are some-

times of a scarlet colour, and there is a copious secretion of thick mucus within them. The urinary bladder is found nearly always contracted.

105. *Treatment.* The means to be used in this disease are pretty generally agreed upon. At the commencement, blood should be drawn from the arm, and heat be applied to the surface, to restore the balance of the circulation. Strong stimulants are to be given, (as the disease is not one of simple inflammation,) and followed by repeated doses of calomel and opium. When the early danger has subsided, light nourishment should be administered, and care taken that re-action does not bring on visceral inflammation.

Hepatitis, Inflammation of the Liver.

106. Inflammation of the liver is generally seated in the peritoneal covering, rarely attacking the substance itself.

Symptoms of acute hepatitis. Pyrexia; pain felt in the right hypochondrium, increased upon pressure; tongue covered with a yellowish fur; difficult respiration; dry cough; a pain is felt in the shoulder; the urine is high coloured; the pulse is quick and hard. There is gastric irritability; in the commencement there is diarrhœa; but, if the inflammation be very acute, the secretion of bile is suspended, and the fæces assume a clay colour. The skin also assumes a yellow tinge, and there is a difficulty in lying on the left side, arising from distention of the ligaments and peritoneal covering.

107. In chronic hepatitis, there is pain in the shoulder, dyspepsia; sallow countenance; attacks

of jaundice; nausea; low spirits; costiveness, and general derangement of the whole system.

108. *Treatment.* Take blood away from the arm, and apply leeches over the seat of pain. Counter-irritants may be applied. Gentle laxatives and enemas should be administered, and recourse be had to the warm bath. Some practitioners give calomel in large doses; but it appears to be more useful in the chronic form of the disease.

109. Chronic hepatitis is most relieved by calomel, chalybeate waters, mild purgatives, and tonics.

Icterus, Jaundice.

110. Jaundice arises from some obstruction to the course of the bile, either depending upon inflammation or mechanical pressure upon the minute ducts, or the large duct itself. The causes are generally acute and chronic disease of the liver, increasing or diminishing the flow of the bile; gall stones obstructing the duct; inflammation, contraction, or spasm of the duct, and mechanical pressure, as during pregnancy, &c.

111. *Symptoms.* Yellowness of the skin, affecting the conjunctiva, and sometimes causing objects to be seen of a greenish colour. There is often pain in the right hypochondrium; nausea and vomiting; great lassitude and languor; the fæces are white, and the urine high-coloured, generally giving a yellow tinge to the linen, if touched. The pulse is rather slower than usual, unless there be subacute hepatic inflammation.

112. *Treatment.* When there is pain in the hypochondrium, leeches should be applied. Emetics are sometimes useful, and may be followed by

mild mercurials, laxatives, and the warm bath. The diet should be of the lightest kind.

Splenitis, Inflammation of the Spleen.

113. *Symptoms.* Pyrexia; pain in the left hypochondrium, increased upon pressure; difficulty of lying on the affected side; a yellowish tinge of the skin. In chronic splenitis, and frequently in intermittent fever, the spleen is found greatly enlarged.

114. *Treatment.* Bloodletting, generally and locally, purgatives, warm bath, and counter-irritants, are the remedies to be employed.

DISEASES OF THE RESPIRATORY ORGANS.

Catarrhus, Catarrh.

115. *Symptoms.* Sneezing, with increased secretion of mucus from the nose and fauces; pyrexia; cough; pain in the head and chest. Sometimes the inflammation extends down the larynx and trachea, giving rise to copious expectoration. The fluid expectorated generally becomes thicker as the disease declines.

Under the name catarrh, bronchitis of the subacute kind is often described.

116. *Treatment.* Confinement to a warm room, antiphlogistics, the warm bath, and diaphoretics, such as antimonials and ipecacuanha.

Bronchitis.

117. This disease has obtained several names from the different authors who have treated upon it. It is called *peripneumonia notha, catarrhus suffocativus;* and when in the chronic form, *catarrhus senilis.*

118. *Symptoms of Acute Bronchitis.* Pyrexia; heat of the skin; dyspnœa, with hurried and laborious respiration; hoarseness; oppression at the præcordia; and dry cough. After a short time there is an accumulation of mucus, giving rise to a wheezing noise in expiration. There is a leaden colour of the lips and cheeks, caused by the blood not being properly decarbonized or oxygenized. The pulse is quick, but soft and compressible; there is great prostration of strength, and anxiety; pain and giddiness of the head; sometimes delirium.

119. *In chronic bronchitis,* the expectorated fluid resembles that emitted during the latter stages of the acute form; there are sometimes night sweats, with emaciation; quick and short respiration.

120. *Treatment.* Bloodletting, but with great caution, is necessary; it is very beneficial at the commencement; but, when fluid has been effused into the bronchi, the strength should not be too much lowered, for fear that there will not be sufficient power in the system to throw off what has been accumulated. The best medicines are emetics and antimonials; counter-irritation should be produced by a blister or tartar emetic ointment, and purgatives may be given when required.

Laryngitis, Inflammation of the Larynx.

121. *Symptoms.* Pyrexia; a sensation of constriction and pain about the larynx; hoarseness; respiration quick and laborious; anxious expression of the countenance; pulse quick and small, and a peculiar noise attends expiration. This inflammation frequently accompanies small-pox and scarlet fever.

122. *Treatment.* The same as for croup.

Cynanche Trachealis, Croup.

123. *Symptoms.* Pyrexia; difficulty in breathing, attended with a peculiar stridulous cough; great anxiety; the face and neck are flushed, but rather livid in appearance; the voice acquires a sound similar to the crow of the cock; there is cough, at first dry, which becomes subsequently more free, and a viscid glairy matter is expectorated with great pain. This disease generally attacks children between the first and third year of their age. When fatal, it terminates generally about the third or fourth day. The principal cause of death is the formation of a false membrane, which occupies the trachea, and sometimes extends to the larynx and bronchi.

124. *Treatment.* Bloodletting, from a vein, is absolutely necessary at the commencement; leeches are to be applied along the course of the trachea. An antimonial emetic should be given, and followed by nauseants, purgatives, and warm bath. In some cases a blister is necessary after leeching.

Calomel, in large repeated doses, is relied upon by some persons.

Pertussis, Hooping Cough.

125. *Symptoms.* A peculiar convulsive cough, attended with a sonorous inspiration, which has obtained the name of a hoop. The cough returns in paroxysms; and, after each, a quantity of mucus is brought off the lungs, or the contents of the stomach, by vomiting. If the fits are violent, great lassitude follows. This disease is nearly limited to infancy, and is sometimes epidemic. It generally lasts about six weeks.

126. *Treatment.* General and local bloodletting; emetics; blisters; narcotics, in small doses; expectorants; stimulating embrocations to the chest and back; change of air.

Pneumonia, Inflammation of the Lungs.

127. *Symptoms.* Pyrexia; hot skin; dyspnœa: there is a sensation of constriction; painful cough; the pain is more obtuse than in pleuritis, and there is a greater sensation of oppression. The respiration is quick and difficult, and the countenance often assumes a purple colour. The pulse is generally quick, and not very full. The expectorated matter is at first muco-sanguinolent, but becomes afterwards thick, opaque, and puriform. When suppuration takes place, it is known by rigors coming on, the pain is more fixed, and there is hectic fever.

128. *Treatment.* Bleed freely from the arm, and locally by leeches and cupping; give brisk pur-

gatives; apply blisters; then great reliance may be placed in nauseating doses of tartarized antimony and ipecacuanha.

Pleuritis, Inflammation of the Pleura.

129. *Symptoms.* Pyrexia; acute pain in some part of the chest, increased by a deep inspiration; percussion is painful; there is immobility of the ribs corresponding to the affected part; inspiration is hurried, but expiration is comparatively slow. The breathing is not so oppressed as in pneumonia. The pulse is quicker and harder, resembling whipcord, which is always the case when the serous membranes are inflamed. The skin is hot, and the tongue much furred. The expectorated fluid is more watery than that of pneumonia and bronchitis.

130. Pleuritis terminates in effusion of a yellowish serous fluid, empyema, and by forming adhesions between the pleura costalis and pulmonalis.

131. *Treatment.* The means to be employed are the same as those necessary for pneumonia.

Hæmoptysis, Spitting of Blood.

132. Spitting of blood, brought from the lungs, may depend upon three principal causes, viz. exhalation of blood upon the surface; upon rupture of a conjected vessel, as in apoplexy of the lungs; and upon ulceration.

133. *Symptoms.* There is a sensation of weight and oppression at the chest; a tickling feel about the larynx, trachea, and bronchi; there is a dry cough and dyspnœa; a pulse generally full and

hard; the tongue is white; a saltish taste in the mouth; and, in a fit of coughing, a quantity of blood is brought up, which is of a florid red colour and frothy.

134. *Treatment.* It is often necessary to take away blood from the arm. The patient should be kept quite quiet, and at a cool temperature; he should take cold acidulated drinks, and the diet should be of the mildest nature. The medicines most useful are, purgatives, superacetate of lead, sulphuric acid, digitalis, and most of the astringents.

Phthisis, Pulmonary Consumption.

135. *Symptoms.* In the first stage, during the formation of tubercles, there is cough with slight expectoration, languor and debility, and a quick and soft pulse. In the second stage, the tubercles being increased, oppress the lungs, producing dyspnœa; hæmoptysis sometimes supervenes at this period. In the third stage, the tubercles are softened, and purulent matter is ejected; there is hectic fever, night-sweats, emaciation, and purulent expectoration, with some pain. There is frequently a flushed cheek; diarrhœa is a common attendant, and is frequently occasioned by ulceration of the intestines.

136. *Treatment.* The remedies employed are: bloodletting in small quantity; purgatives, sedatives, acids, rubefacients, and blisters. In the commencement, removal to a warm climate may retard the development of many of the symptoms; but, when vomicæ have once formed, there are but slight hopes of any recovery.

Asthma, Asthma.

137. *Symptoms.* A periodical difficulty of breathing, generally coming on about evening and diminishing in the morning. There is a sensation of tightness and fulness of the chest. Expiration is accompanied with a wheezing sound. At the commencement of the paroxysm there is very little cough; but, towards the end, there is a free cough with expectoration of mucus. The face is much flushed, and of a livid tinge.

138. This disease depends either upon chronic bronchitis, emphysema, congestion, or some peculiar property in the nerves, producing spasmodic stricture of the bronchial tubes.

139. *Treatment.* The remedies most efficacious are: bloodletting in small quantity; the foot bath, laxatives, emetics and counter-irritants, and, in some cases, opium.

DISEASES OF THE CIRCULATORY SYSTEM.

Angina Pectoris.

140. *Symptoms.* A sudden pain is felt across the chest, and particularly about the heart; there is a sensation of constriction, approaching to suffocation; difficulty of breathing. These symptoms come on in paroxysms, particularly after walking or eating. The pulse is weak and irregular; the countenance pale; there is cough, and slight expectoration. There is sometimes difficulty in

lying down, and, occasionally, a peculiar sensation of numbness extending down the arm.

141. *Treatment.* Moderate bloodletting sometimes relieves. Some give antispasmodics with opium; the lightest food only should be allowed, and all exercise and mental agitation guarded against; issues, blisters, and mineral tonics are found serviceable.

Carditis, Pericarditis, Inflammation of the Heart and Pericardium.

142. *Symptoms.* Inflammation of the heart and pericardium so generally exist together, that cases are very rare of their being affected separately. There is palpitation and syncope; pulse quick and irregular; a troublesome, distressing cough, without expectoration corresponding to the exertion. In the commencement, syncope is easily brought on by going up stairs.

143. *Treatment.* Bleeding generally and locally, by leeches or cupping; and, in more chronic cases, a seton has been found of service. The recumbent position is absolutely requisite.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

Inflammation of the Membranes of the Brain.

144. *Symptoms.* This disease presents symptoms so varied, that no short description can convey an adequate idea. There is pyrexia; a quick pulse; pain about the head, particularly at the top; tinnitus

aurium; disturbed intellect; delirium; convulsions; coma, and paralysis: the bowels are generally costive, and the skin hot and dry. The tongue is furred, and, when protruded, is often inclined to one side. There is sometimes squinting, and the pupil, which is at first contracted, becomes in the latter stages dilated. The countenance has a stupid expression, and there is great loss of memory.

145. *Treatment.* Blood may generally be taken away, either from the arm, by the lancet, or from the temples by leeches. Drastic purgatives should be given, and frequently repeated; the head should be shaved, and cold applied to it nearly constantly. Blisters and sinapisms may be applied to the extremities, but not to the head or in its immediate vicinity.

Inflammation of the substance of the Brain.

146. *Symptoms.* The symptoms resemble very closely those arising from inflammation of the membranes. There is pain and a sensation of weight in the head; vomiting; tinnitus aurium; strabismus; difficult articulation, and great restlessness; in a short time convulsions come on, and are followed by paralysis or coma. The flexors of the paralysed limb are often contracted. There is frequently constipation, and the patient generally lies upon his back.

147. *Treatment.* The same treatment is required as for the inflammation of the membranes of the brain.

Hydrocephalus, Water in the Head.

148. *Symptoms.* The acute form is known by fever, headach, contracted pupil, restlessness, vomiting, pulse quick, and costiveness; subsequently strabismus, dilated pupil, convulsions, and involuntary discharge of fæces.

149. *Treatment.* General and local bloodletting, drastic purgatives, calomel and opium, blisters, digitalis, pediluvia, mustard cataplasms, &c.

150. The chronic form is known by the drowsiness, strabismus, general debility, and immense size of the head.

151. *Treatment.* Blisters, diuretics, and purgatives and mercury to salivation, are the remedies most to be depended upon.

Apoplexia, Apoplexy.

152. *Symptoms.* Sudden loss of power, sense, and motion; coma; stertorous breathing; countenance flushed, or livid; pupil generally dilated; foaming at the mouth; pulse full, and sometimes slow. The symptoms preceding are such as arise from determination of blood to the head. Permanent paralysis is a frequent consequence.

153. Sanguineous apoplexy, or the effusion of blood, is more sudden than the serous, and occurs in plethoric habits. The serous occurs to old debilitated persons.

154. *Treatment.* Bloodletting, general and local; drastic purgatives, such as croton oil; cold applications to the head, and a blister to the nape of the neck; sinapisms to the feet; irritating

injections; the head should be elevated and exposed to fresh air.

Paralysis, Palsy.

155. *Symptoms.* Loss of motion in some part of the body, preceded either by apoplexy, or by a diseased state, known by a tingling sensation, pain in the head, and loss of memory. Paralysis of one side of the body is called hemiplegia; that of the lower half is named paraplegia.

156. *Treatment.* At first, general and local bloodletting, proportionate to the individual; purgatives, and blisters. This disease, likewise, arises occasionally from debility. Stimulants, both external and internal, may be had recourse to, as well as towards the latter stages of the inflammatory cases. Arnica and strychnine have been highly commended by some practitioners.

Tetanus, Rigid Spasm.

157. *Symptoms.* Rigid spasm of the voluntary muscles of some portion of the body. It generally commences in the muscles of the neck. The spasmodic contraction of the muscles of the jaw and throat is called *trismus;* that of the muscles of the back, in which the body is bent backwards, is called *opisthotonos;* that when the body is bent forwards, *emprosthotonos*; and when bent laterally, *pleurosthotonos.* Traumatic tetanus arises from wounds.

158. *Treatment.* The treatment must vary according to the causes, and probable effect on the system. If it arise from wounds, and there is

evident inflammatory diathesis, bleed largely from the arm; cold bath, and cold affusion; give purgatives and mercury to salivation, and prussic acid. Idiopathic tetanus requires powerful antispasmodics, such as opium, musk, camphor, and æther, warm bath, Peruvian bark, and wine, embrocations, and stimulant applications externally.

Epilepsia, Epilepsy.

159. *Symptoms.* Sudden loss of sense and power; pupil fixed and immoveable; respiration hurried, with an apparent sense of suffocation; convulsive fits, with spasmodic contraction of various muscles of the body, especially those of the face. They gradually diminish, but leave the person still insensible, and apparently comatose. The fit is generally preceded by a cold sensation, like something creeping up the body, and is called *aura epileptica;* and oftentimes by pains in the head, and unusual distressing feelings.

160. *Treatment.* During the fit, prevent the patient from hurting himself; if plethoric, bleed from the arm, jugular vein, or temporal artery; if debilitated, give stimulants and antispasmodics. During the interval, apply the treatment requisite for the plethoric or the debilitated condition of the system.

Chorea, St. Vitus's Dance.

161. This disease generally attacks females, and those only who have not arrived at puberty, most commonly between the tenth and fourteenth year.

162. *Symptoms.* Convulsive motion, affecting

generally the extremities of one side only. The muscles of the face, and, indeed, all the voluntary muscles, are sometimes affected. These motions are observed most in an attempt being made to walk, or to grasp any thing.

163. *Treatment.* Cold bathing, tonics, such as sulphate of zinc, and purgatives. The subcarbonate of iron, in large doses, has been successful in many cases.

Hysteria, Hysterics.

164. *Symptoms.* A general symptom is a sensation of a ball rising in the throat, from the abdomen and stomach; syncope; insensibility; breathing very quick; involuntary laughing or crying, and a variety of other symptoms.

165. *Treatment.* Bloodletting, if the patient be young and plethoric; stimulants to the nose and temples: give antispasmodics, purgatives, and tonics, after the attack.

DISEASES OF THE SKIN.

Erysipelas, St. Anthony's Fire.

166. *Symptoms.* Erysipelas always commences with febrile symptoms, which accompany it, till its termination. There is nausea and vomiting; pulse generally hard and full. About the second or third day, the eruption appears of a deep red colour; the inflamed part is much swollen, and has a sensation of tingling and great heat. When the head and face are attacked, (which is of frequent

occurrence,) great pain is felt, and confusion of thought and delirium ensue. The face becomes very œdematous, and the eyes are closed. The eruption terminates in a few days by desquamation, phlyctenæ or vesicles, and the symptoms gradually subside. Œdematous effusion is not an unfrequent consequence.

167. *Causes.* Checked perspiration; abuse of liquors; but most frequently some irritating matter in the primæ vitæ.

168. *Treatment.* The treatment, at first, must be purely antiphlogistic, modified according to the age and constitution of the patient. Emetics at the commencement are generally very useful, and should be followed by a dose of castor oil, and, subsequently, saline purges. Wine, bark, and stimulants in general, may be given to debilitated persons. When the violence of the inflammation has abated, cold spirituous lotions may be applied to the part affected. Blisters, applied locally, are advocated by some persons.

DISEASES OF THE URINARY AND GENITAL ORGANS.

Nephritis, Inflammation of the Kidney.

169. *Symptoms.* Pyrexia; pain in the region of the kidney, which is felt along the course of the ureters; in the male, there is often a retraction of the testicle, or a sensation of pain in it; a numbness in the leg and thigh of the affected side; urine scanty, and high-coloured, sometimes tinged with blood; nausea and vomiting.

170. *Diagnostic characters.* Retraction of the testicle, and vomiting; pain not materially increased by the erect position.

171. *Treatment.* General and local bloodletting by leeches or cupping, cathartics, diaphoretics, and copious mucilaginous drinks; warm bath. Blisters are improper, as they are apt to induce strangury.

Cystitis, Inflammation of the Bladder.

172. *Symptoms.* Pyrexia; pain and soreness about the perineum, with pain, heat, and sometimes swelling in the hypogastrium; frequent attempts to make water, which is evacuated high-coloured, in small quantity, and with great pain; tenesmus, sickness, and vomiting, and occasionally delirium.

173. *Treatment.* The same as for nephritis.

Hysteritis, Inflammation of the Uterus.

174. *Symptoms.* Pyrexia; pain and tension in the hypogastric region, the pain being increased upon pressure; vomiting; when the inflammation is slight, there is a frequent desire to pass the urine and fæces; if the inflammation runs high, there is constipation and dysuria.

175. *Treatment.* The usual antiphlogistic treatment.

Hæmaturia, Voiding of Blood through the Urethra.

176. *Symptoms.* Pain, with a sensation of weight in the loins, and in the region of the kidneys. Urine is evacuated, mixed with blood, which may

come from the kidneys, bladder, or urethra. It is generally a symptom of other diseases.

177. *Treatment.* The treatment must depend on the precise seat of the affection; therefore the antiphlogistic remedies must be adapted according to the part affected.

Chlorosis, Retention of the Menses.

178. *Symptoms.* Dyspepsia; pale countenance; listlessness, and disinclination for exercise or fatigue; palpitations, and sometimes syncope. Depraved appetite, and dislike to usual food; the legs become sometimes œdematous.

179. *Treatment.* A light nutritious diet; gentle exercise, particularly on horseback; bitter purgatives especially aloes; the preparations of iron are singularly efficacious, when combined with mild aperients; tonics may be given, such as cascarilla, chamomile, gentian, &c.; and, when there is a great languor, stimulants are admissible, such as camphor, and ammonia; cold and warm bath, chalybeate waters, and electricity.

Menorrhagia, Immoderate Flow of the Menses.

180. *Symptoms.* Great discharge of fluid or blood, accompanied by pain in the back and loins. There is generally pyrexia; it occurs both to plethoric and debilitated habits, and may depend upon inflammation of the lining mucous membrane of the uterus, polypi, and other organic diseases of this viscus.

181. *Treatment.* The remedies to be employed are bleeding and purgatives for the plethoric; for

the debilitated, cooling astringents; the horizontal position is necessary in all cases, and cold may be applied to the pubes.

Podagra, Gout.

182. *Symptoms.* Pyrexia; disordered state of the digestive organs; pain, swelling, and redness of the smaller joints, most frequently of the great toe. The violence of the symptoms recurs in paroxysms, being most severe towards night. In some cases, the pain of the joints is less severe, and some viscus is more particularly attacked, constituting *podagra atonica.* In *podagra retrograda,* the swelling suddenly disappears from the joints, and a metastasis takes place to the stomach or some other viscus.

183. Gout is one of those diseases called hereditary, seldom coming on before the age of puberty, and more generally attacking males. It is commonly preceded or dependent upon some disorder in the functions of the stomach, small intestines, skin, or liver; and the more immediately exciting causes are: excess in diet, want of exercise, suppressed evacuations, and depressing emotions of the mind. The parts attacked by it in common cases, are the skin, cellular, fibrous, and serous membranes.

184. Diagnosis, between gout and rheumatism. Gout scarcely ever occurs before puberty; is generally preceded and accompanied by considerable disorder of the alimentary canal; is generally seated in the great toe on the first attack; and the inflamed part is more tumid, more painful, and of a brighter vivid colour.

Rheumatism is brought on by exposure to cold, comes on more suddenly, has not the remissions like gout, and attacks fewer structures at the same time.

185. *Treatment.* Antiphlogistic. Bloodletting is seldom required; cooling laxatives may be given, and the affected part may be enclosed in flannel, so as to excite diaphoresis. The colchicum is found almost a specific in removing the acuteness of the pain. Rest in recumbent posture is necessary.

186. Chronic gout must be treated by attention to diet, abstinence from heating liquors, gentle exercise, mild aperients, and sudorifics. If internal inflammation comes on, venesection may be necessary, and leeches may nearly always be applied over the part attacked.

Rheumatismus, Rheumatism.

187. *Symptoms.* Pyrexia; swelling, redness, and tension of the larger joints; urine high coloured; occasionally profuse perspiration. There is a tendency in the inflammation to change its seat from one joint to another. Sometimes the heart becomes attacked.

In chronic rheumatism, the part affected is not always red, but is rigid and painful on pressure. When chronic rheumatism attacks parts about the hip in the course of the sciatic nerve, it is called *sciatica;* when it attacks parts about the lumbar fascia and muscles, it is called *lumbago.*

The seat of the rheumatism is in the fasciæ, muscles, synovial membranes, and sheaths of the nerves.

188. *Treatment.* Common antiphlogistic; general and local bloodletting; purgatives; colchicum;

diaphoretics; narcotics and fomentations are of great benefit. Chronic rheumatism is to be combated by colchicum, guaiacum, Dover's powder, warm bath, small repeated doses of mercury, blisters, exercise, and friction.

HYDROPES.

Dropsies.

Dropsical effusions may be produced by several different states of disease. They may depend upon membranous inflammation; mechanical obstruction, as by tumours or enlarged and hardened viscera pressing upon the large venous trunks, thus preventing the free flow of blood, so that the vessels are compelled to relieve themselves by discharging a portion of their limpid contents. They may also depend upon general debility of the system, when the exhalants become patulous, from the weakened nervous energy which usually presides over secretion. Some explain the effusion by supposing an increased secretion, and decreased power of absorption. The fault, however, does not appear to be so much in the absorbents as in the exhalants, for if exhalation be stopped, in nearly every case the absorbents will rapidly remove the effused fluid. The diseased viscera which most generally bring on dropsy, are the heart, the liver, and the kidneys.

Anasarca, General Dropsy.

189. *Symptoms.* A soft inelastic swelling of the whole body, or some part of it. If pressed upon,

the impression of the finger remains for some time, producing the appearance called pitting. This effusion when partial is called *œdema.*

Ascites, Dropsy of the Belly.

190. *Symptoms.* A tense, slightly elastic, and fluctuating swelling at the abdomen. As the disease advances, the urine becomes scanty and high coloured, dyspnœa, and, in general, anasarca of the lower extremities.

Hydrothorax, Water in the Chest.

191. *Symptoms.* Difficulty of breathing, particularly in the horizontal posture; paleness of the face; lividness of the lips; scanty urine; starting from sleep; palpitation; and anasarca of the legs and feet.

192. *Treatment.* The general treatment of dropsies is very similar. If they depend on an inflammatory state, general and local bleeding must be resorted to; drastic and hydragogue purgatives; diaphoretics and diuretics are to be given. If the dropsies depend on debility, give stimulants, such as wine, opium, &c.

INTRODUCTION

TO THE

TABLE OF ATOMIC WEIGHTS.

In order to understand the *Atomic Theory*, the following axioms, or laws of chemical combination, should be recollected:

1. The composition of bodies is definite and invariable, both as regards the elements and their proportions. Thus, water is always composed of 1 hydrogen and 8 oxygen, and no other elements or proportions can form it.

2. Bodies combine in a few proportions only. Thus, zinc and oxygen combine in one proportion only; oxygen and hydrogen in two proportions: some bodies unite in 3, 4, 5, &c. proportions. We do not know the limit, but it seldom exceeds 5 proportions.

3. When one body, A, unites with another, B, in more than one proportion, the quantities of B are multiples by a simple whole number of the smallest quantity of B with which A can unite. Thus

Nitrous Oxide is composed of	Nitrogen 14,	Oxygen 8
Nitric Oxide . .	Nitrogen 14,	Oxygen 16
Hypo-nitrous Acid .	Nitrogen 14,	Oxygen 24
Nitrous Acid . .	Nitrogen 14,	Oxygen 32
Nitric Acid . . .	Nitrogen 14,	Oxygen 40.

From this table it will be easily seen that the quantities of oxygen contained in the four latter compounds, are multiples of the quantity of oxygen contained in the first compound, viz. nitrous oxide. Thus nitric oxide contains twice as much oxygen as nitrous oxide; hypo-nitrous acid thrice as much; and so on.

A knowledge of these three laws will assist the student most materially in understanding the *Atomic Theory*.

Two opinions have divided philosophers respecting the nature of the ultimate elements of bodies, ever since they began to speculate on the subject. According to one party these ultimate elements are infinitely divisible, every particle of matter, however small, being capable of still further division, if our instruments and organs were adapted for the operation. According to the other party, these ultimate elements consist of certain small particles incapable of further division, and to which the term *atoms* is applied.

In order to avoid discussion, the term *atom* is used in chemistry to signify the ultimate particles of which any body is composed, without considering whether the further division of these particles be possible or not. The *shape* of the particles, their *size*, and their *weight*, are of course perfectly unknown.

But, although the *weight* of the atoms be unknown, yet we know that the atoms of different bodies differ from each other in weight. Thus, although we cannot say what the *actual* weight of an atom of oxygen or of an atom of hydrogen is, yet we can tell what the *relative* weight of these atoms are. We can tell that an atom of oxygen

is eight times heavier than an atom of hydrogen. So, also, we can determine the relative weights of the atoms of almost all other bodies.

Now, whenever combination between bodies takes place, it is between their ultimate particles or *atoms*. Thus, when oxygen and hydrogen combine to form water, the combination is between the particles or *atoms* of these elements, one atom of oxygen combining with one atom of hydrogen. An atom of one body may unite with 1, 2, 3, 4, or 5 (seldom more than this,) atoms of another. Thus, in the foregoing table of the compounds of nitrogen and oxygen, it will be seen that nitrogen combines with 5 proportions of oxygen. In other words, 1 atom of nitrogen combines with 1, 2, 3, 4, 5 atoms of oxygen, forming five distinct compounds. It will be seen 14 represents an atom of nitrogen, and 8 an atom of oxygen.

The mode of ascertaining the *proportional* or *atomic* numbers is as follows: A definite compound of two simple substances which have an extensive range of affinity, is to be carefully analysed. Now oxygen and hydrogen have an extensive range of affinity for other bodies; hence a compound of these two is selected. There are two compounds of oxygen and hydrogen, *water* and the *peroxide of hydrogen;* water is selected because it contains the smallest proportion of oxygen and hydrogen. Water is regarded as a compound of one proportion (that is 1 *atom*) oxygen, and one proportion (that is 1 *atom*) hydrogen. But analysis proves that water is composed of 8 parts, by weight, oxygen, and 1 part hydrogen. Hence, then, it follows that an atom of oxygen must weigh eight times as much as an atom of hydrogen.

Some compounds are next examined which contain either oxygen or hydrogen in combination with some other substance, the quantities of each being the smallest that can unite together. Carbonic oxide is composed of 8 oxygen and 6 carbon; sulphuretted hydrogen of 1 hydrogen and 16 sulphur. Hence the *atomic* or proportional number for carbon is 6, and for sulphur 16. The numbers of all other bodies may be determined in the same manner.

In the following *Tables of Chemical Equivalents*, hydrogen is expressed by 1, and other bodies are referred to it as 1. But it is very evident that it is perfectly immaterial what figures are employed, so that the *relation* between them be strictly observed. Accordingly, different chemists use different numbers. Thus, Dr. Thomson makes oxygen 1, so that hydrogen is eight times less than unity, or 0,125; carbon 0,75; and sulphur 2. But this is inconvenient, as we are obliged to use fractional or decimal numbers. The following Tables may, however, be easily reduced to Dr. Thomson's, by simply dividing the numbers by 8, and using decimals. Thus carbon is represented in these tables by 6; now, if we want to reduce it to Dr. Thomson's scale, this number must be divided by 8; carbon will then be $\frac{3}{4}$, or 0,75.

TABLE OF ATOMIC WEIGHTS, OR PROPORTIONAL NUMBERS,

HYDROGEN BEING 1.

		Atomic Weights.
Acid, acetic		50
crystallized, (1 portion water)		59
arsenic		62
arsenious		54
benzoic		120
boracic		24
crystallized, (2 prop. water)		42
carbonic	1 carbon 6; 2 oxygen 16	22
chloric	1 chlorine 36; 5 oxygen 40	76
chloriodic	2 chlorine 72; 2 iodine 124	196
chlorocarbonic	1 carb. oxide (gas) 14; 1 chlorine 36	50
chlorocyanic		62
chromic	1 chromium 32; 2½ oxygen 20	52
citric dry		58
crystallized (2 water, 18)		76
columbic		152
ferrocyanic		108
fluoric		10
fluoboric		34
formic		37
fluosilic		26
gallic		62
hydriodic		125
hydrochloric (muriatic)		37

Acid, hydrocyanic	1 cyanogen 26 1 hydrogen 1	27
hydrofluoric		19
hyponitrous	1 nitrogen 14 3 oxygen 24	38
hypophosphorous	2 phosphorous 24 1 oxygen 8	32
hyposulphurous	2 sulphur 32 1 oxygen 8	40
hyposulphuric	2 sulphur 32 5 oxygen 40	72
iodic	1 iodine 124 5 oxygen 40	164
malic		60
manganeseous	1 manganese 28 3 oxygen 24	52
manganesic	1 manganese 28 4 oxygen 32	60
molybdic		72
molybdous		64
muriatic		37
nitric, dry	1 nitrogen 14 5 oxygen 40	54
liquid, spec. gr. 1·5, (2 prop. water)		72
nitrous	1 nitrogen 14 4 oxygen 32	46
oxalic, dry		36
cryst. (4 prop. water)		72
perchloric	1 chlorine 36 7 oxygen 56	92
phosphoric	1 phosphorous 12 2 oxygen 16	28
phosphorous	1 phosphorous 12 1 oxygen 8	20
purpuric		44
pyro-uric		251
saccholactic		105
selenic	1 selenium 40 2 oxygen 16	56
succinic		50

Acid, sulphuric, dry	{ 1 sulphur 16 / 3 oxygen 24 }	40
sp. grav. 1·85 (1 prop. water)		49
sulphurous	{ 1 sulphur 16 / 2 oxygen 16 }	32
sulphocyanic		57
tartaric, dry		66
crystallized, (1 prop. water)		75
tungstic		150
uric		72
crystallized, (2 water)		90
Alcohol	{ 1 olefiant gas 14 / 1 aqueous vapour 9 }	23
Alum, dry		262
crystallized, (25 water)		487
Alumina, (27 Phillips)		18
sulphate		58
Aluminum (18 Phillips)		10
Ammonia		17
acetate		67
bicarbonate	{ 1 ammonia 17 / 2 carbonic acid 44 }	61
hydrated crystallized, (2 water)		79
carbonate	{ 1 ammonia 17 / 1 carbonic acid 22 }	39
hydrated sesquicarbonate		118
chlorate, dry		93
citrate, ditto		75
fluoborate, ditto		51
hydriodate		142
iodate		181
muriate	{ 1 ammonia 17 / 1 muriatic acid 37 }	54
nitrate, dry		71
crystallized, (1 water)		80
oxalate, dry		53
crystallized, (2 water)		71
phosphate, dry		45
cystallized, (2 water)		63

Ammonia, phosphite, dry			37
succinate, ditto			67
sulphate, ditto			57
crystallized, (2 water)			75
sulphite, dry			49
tartrate, dry			83
Antimony, (Brande 45)			44
chloride			80
deutoxide	1 antimony 44 1½ oxygen 12		56
hydrosulphuret			69
iodide			168
peroxide	1 antimony 44 2 oxygen 16		60
protoxide	1 antimony 44 1 oxygen 8		52
sulphuret	1 antimony 44 1 sulphur 16		60
tartarized, (Thomson, 2 water)			354
(Phillips, 3 water)			363
Arsenite of potassa, dry			110
soda, dry			94
Arsenic			38
chloride of			74
iodide			162
sulphuret			54
sesqui-sulphuret			62
Azote			14
Barium			70
chloride of,	1 barium 70 4 chlorine 36		106
iodide			194
peroxide	1 barium 70 2 oxygen 16		86
protoxide	1 barium 70 1 oxygen 8		78
sulphuret			86
Baryta, dry	1 barium 70 1 oxygen 8		78

Baryta,	crystallized, (20 water)		258
	acetate, dry		128
	crystallized, (3 water)		155
	arseniate, dry		140
	arsenite, dry		132
	binhyposulphite		126
	biphosphate, dry		124
	carbonate, dry		100
	chlorate, dry		154
	chromate dry		130
	hydrate, crystallized, (20 water)		258
	hydriodate, dry		203
	iodate, dry		242
	nitrate, crystallized, (no water)		132
	oxalate, dry		114
	ferro cyanate		145
	muriate, crystallized, (1 water)		124
	phosphate, dry		106
	phospite, dry		98
	crystallized, (1 water)		107
	sulphate, dry		118
	sulphite, dry		110
	tartrate, dry		144
	tungstate, dry		198
Bismuth			72
	chloride { 1 bismuth 72 / 1 chlorine 36 }		108
	iodate { 1 iodic acid 164 / 1 oxide of bismuth 80 }		244
	nitrate, dry		134
	crystallized, (3 water)		161
	oxalate, dry		116
	oxide		80
	subsulphate { 3 oxide of bismuth 240 / 1 acid, sulphuric 40 }		289
	sulphate, dry		88
	sulphuret		88
Borax			80

Borax, crystallized, (8 water)			152
Boron			8
Cadmium			56
chloride			92
iodide			180
nitrate, dry			118
oxide			64
phosphate, dry			92
phosphuret			68
sulphate, dry			104
sulphuret	1 cadmium 56 1 sulphur 16		72
Calcium			20
chloride			56
iodide			144
fluoride, (fluor spar)			38
oxide, (lime)			28
phosphuret			32
sulphuret			36
Calomel, see Mercury, protochloride.			
Carbon			6
bisulphuret	1 carbon 6 2 sulphur 32		38
hydriodide			138
hydrochloride			43
oxide gas	1 carbon 6 1 oxygen 8		14
perchloride	2 carbon 12 3 chlorine 108		120
protochloride	1 carbon 6 1 chlorine 36		42
subchloride	2 carbon 12 1 chlorine 36		48
Carburetted hydrogen, light	1 carbon 6 2 hydrogen 2		8
olefiant gas	2 carbon 12 2 hydrogen 2		14
Cerium, (Thomson)			50
protoxide			58

Cerium, peroxide			62
Chlorine			36
	protoxide	1 chlorine 36 1 oxygen 8	44
	peroxide	1 chlorine 36 4 oxygen 32	68
Chromium			32
	protoxide	1 chromium 32 1 oxygen 8	40
	chromic acid	1 chromium 32 2½ oxygen 20	52
Cobalt, (Thomson)			26
	arseniate, dry		96
	chloride		62
	iodide		150
	nitrate, dry		88
	oxalate, dry		70
	peroxide	1 cobalt 26 1½ oxygen 12	38
	phosphate, dry		74
	protoxide	1 cobalt 26 1 oxygen 8	34
	sulphate, dry		74
	crystallized, (7 water)		137
	sulphuret		42
Chloride of Nitrogen		4 chlorine 144 1 nitrogen 14	158
Columbium			144
Copper, (32 Thomson)			64
	acetate	1 acid 50 1 peroxide 80	130
	crystallized, (3 water)		207
	biphosphate, (2 water)		126
	bisulphate		160
	crystallized, (10 water) blue vitriol		250
	bisulphuret	1 copper 64 2 sulphur 32	96
	binitrate	1 peroxide 80 2 acid 108	188

Copper, iodide				188
perchloride	1 copper	64		136
	2 chlorine	72		
protochloride	1 copper	64		100
	1 chlorine	36		
protoxide	1 copper	64		72
	1 oxygen	8		
peroxide	1 copper	64		80
	2 oxygen	16		
subnitrate, dry	4 peroxide	320		374
	1 acid	54		
subacetate	2 peroxide	160		210
	1 acid	50		
subsulphate	1 peroxide	160		200
	1 acid	40		
Corrosive sublimate				272
Cyanogen	1 nitrogen	14		26
	2 carbon	12		
Cyanuret of sulphur				58
Ether, sulphuric	2 olefiant gas	28		37
	1 aqueous vapour	9		
muriatic				44
chloric				43
Fluorine, (18, 86, Berzelius)				18 (Thom.)
Glucina				26
Glucinium				18
Gold				200
chloride				236
iodide				324
protoxide	1 gold	200		208
	1 oxygen	8		
peroxide	1 gold	200		224
	3 oxygen	24		
perchloride				272
sulphuret	1 gold	200		248
	3 sulphur	48		
Gum, (Ure 68)				90
Hydrogen				1
Iodine				124
Iridium, (Thomson)				30

Iridium, chloride			66
oxide			38
peroxide			46
Iron			28
protochloride	1 iron 28 / 1 chlorine 36		64
perchloride	1 iron 28 / 1½ chlorine 54		82
iodide			152
protoxide	1 iron 28 / 1 oxygen 8		36
peroxide	1 iron 28 / 1½ oxygen 12		40
persulphate	1 peroxide 40 / 1½ acid 60		100
persulphuret	1 iron 28 / 2 sulphur 32		60
protosulphuret	1 iron 28 / 1 sulphur 16		44
subsulphate	4 peroxide 160 / 1 acid 40		200
protosulphate, dry	1 protoxide 36 / 1 acid 40		76
crystallized, (7 water)			139
Lead			104
acetate, dry			162
crystallized, (3 water)			189
arseniate, dry			174
carbonate, dry			134
chloride			140
chromate, dry	1 protoxide 112 / 1 chromic acid 52		164
bichromate	1 protoxide 112 / 2 chromic acid 104		216
subchromate	2 protoxide 224 / 1 chromic acid 52		276
deutoxide	1 lead 104 / 1½ oxygen 12		116
gallate			175
malate, dry			172

LEAD, molybdate (dry)			176
nitrate, crystallized (no water)			166
nitrite			450
oxalate (dry)			148
peroxide	1 lead 104 2 oxygen 16		120
phosphate (dry)			140
phosphite			132
protoxide	1 lead 104 1 oxygen 8		112
subnitrate			278
sub-trit-acetate	3 protoxide 335 1 acetic acid 50		386
sulphate (dry)			152
sulphite (dry)			144
sulphuret			120
tartrate (dry)			178
LIME	1 calcium 20 1 oxygen 8		28
acetate (dry)			78
arseniate			90
binhyposulphite (6 water)			130
biphosphate (dry)			84
carbonate (dry)			50
chlorate (dry)			104
chloride	1 lime 28 1 chlorine 36		64
citrate (dry)			86
chromate (dry)			80
hydrate	1 aqueous vapour 9 1 lime 28		37
hydroguretted sulphuret	1 lime 28 2 sulphur 32 1 hydrogen 1		61
iodate			193
muriate			65
(crystallized, 5 water)			110
oxalate (dry)			64
phosphate (dry)			56

Lime, phosphite (dry)				48
subchloride	2 lime	56		92
	1 chlorine	36		
(6 water)				146
sulphate (dry)				68
(crystallized, 2 water)				86
tartrate				94
(4 water)				130
tungstate				178
Lithia				18
carbonate				40
nitrate (dry)				72
phosphate				46
sulphate (dry)				58
Lithium				10
chloride				46
iodide				134
sulphuret				26
Magnesia	1 magnesium	12		20
	1 oxygen	8		
ammonia-phosphate				93
(crystallized, 5 water)				138
carbonate (dry)	1 magnesia		20	42
	1 carbonic acid		22	
(crystallized, 3 water)				69
common				182
chloride (dry)				56
hydrate	1 magnesia	20		29
	1 water	9		
muriate				57
nitrate (dry)				74
phosphate (dry)				48
sulphate (dry)				60
(crystallized, 7 water)				123
tartrate				87
Magnesium				12
chloride				48
sulphuret				28

MANGANESE			28
	carbonate	1 protoxide 36, 1 carbonic acid 22	58
	chloride	1 manganese 28, 1 chloride 36	64
	deutoxide (brown)	1 manganese 28, 1½ oxygen 12	40
	oxalate (dry)		72
	phosphate (dry)		64
	protoxide (green)	1 manganese 28, 1 oxygen 8	36
	tritoxide	1 manganese 28, 2 oxygen 16	44
	sulphate	1 protoxide 36, 1 sulphuric acid 40	76
		(crystallized, 5 water)	121
MERCURY			200
	bichloride (corrosive sublimate)		272
	bicyanide		252
	bipernitrate	1 peroxide 216, 2 nitric acid 108	324
	bipersulphate (dry)		296
	bisulphuret (cinnabar)		232
	iodide		324
	periodide		448
	perchloride (corrosive sublimate)		272
	peroxide	1 mercury 200, 2 oxygen 16	216
	protochloride (calomel)		236
	protonitrate	1 protoxide 208, 1 nitric acid 54	262
	protosulphate	1 protoxide 208, 1 sulphuric acid 40	248
	protoxide	1 mercury 200, 1 oxygen 8	208
	sulphate		256
	sulphuret		216
	persulphuret		232
MOLYBDENUM			48
	protoxide		56

Morphia			322
Nickel (26 Thomson, 30 Brande)			26
acetate (dry)			84
arseniate (dry)			88
carbonate (dry)			56
chlorite (dry)			76
nitrate (dry)			88
oxalate (dry)			70
peroxide (38 Thompson)			38
protoxide (Thompson)			34
sulphate (dry)			74
(crystallized, 7 water)			137
sulphuret			42
Nitric oxide, or nitrous gas	1 nitrogen	14	30
	2 oxygen	16	
Nitrogen			14
Nitrous oxide	1 nitrogen	14	22
	1 oxygen	8	
Oil, olive			79
Olefiant gas			14
Osmium			
oxide			
Oxygen			8
Palladium			56
carburet			18
chloride			48
perchloride			84
sulphuret			28
bi-hydruret	1 phosphorus	12	14
	2 hydrogen	2	
hydruret	1 phosphorus	12	13
	1 hydrogen	1	
Platinum			96
ammonia, muriate			222
bisulphuret			128
perchloride			168
peroxide			112
protochloride			132

Platinum, protoxide				104
sulphuret				112
persulphuret				128
Potassa (dry)	1 potassium	40		48
	1 oxygen	8		
arseniate (dry 164)				110
arsenite (dry 148)				102
bicarbonate	1 potassa	48		92
	2 carbonic acid	44		
(crystallized, 1 water)				101
binarseniate (dry)				172
bichromate (dry)				152
binoxalate	1 potash	48		120
	2 oxalic acid	72		
biphosphate				104
bisulphate				128
(crystallized, 2 water)				146
bitartrate				180
(crystallized, 1 water)				189
carbonate	1 potash	48		70
	1 carbonic acid	22		
chlorate (dry)				124
chromate (dry)				100
citrate (dry)				106
hydrate, solid, (1 water)				57
hydriodate (dry)				174
iodate (dry)				213
molybdate (dry)				120
muriate				85
nitrate (no water)				102
oxalate	1 potash	48		84
	1 oxalic acid	36		
perchlorate (dry)				140
phosphate (dry)				76
quadroxalate	1 potash	48		192
	4 oxalic acid	144		
subcarbonate. See Carbonate.				
Potassa, succinate, (dry)				98

Potassa, sulphite				80
sulphate				88
tartrate				114
tungstate				198
Potassium				40
chloride				76
iodide				164
peroxide	1 potassium	40		64
	3 oxygen	24		
phosphuret	1 phosphorus	12		52
	1 potassium	40		
protoxide (dry)	1 potassium	40		48
	1 oxygen	8		
subphosphuret	2 potassium	80		92
	1 phosphorus	12		
sulphuret				56
Rhodium				44
protoxide				52
peroxide				60
Selenium				40
Selenuretted hydrogen				41
Silica				16
Silicum, or silicon				8
Silver				110
chlorate (dry)				186
chloride (dry)				146
iodate (dry)				283
iodide (dry)				234
nitrate (dry)				172
oxalate (dry)				154
Silver, oxide	1 silver	110		118
	1 oxygen	8		
suboxide	3 silver	330		346
	2 oxygen	16		
phosphate (dry)				146
phosphuret				122
sulphate (dry)				158
sulphuret				126

SODA	{ 1 sodium 24 } { 1 oxygen 8 }	32
acetate (dry)		82
(crystallized, 6 water)		136
arseniate (dry)		94
bicarbonate (dry)		76
(crystallized, 2 water)		94
carbonate, (subcarb., dry)		54
(crystallized, 10 water)		144
sesquicarbonate (2 water)		84
chlorate (dry)		108
chromate		84
hydrate		41
hydriodate (dry)		158
iodate (dry)		197
nitrate (dry)		86
oxalate (dry)		68
sulphate		72
(crystallized, 10 water)		162
sulphite (dry)		64
tartrate		98
tartarized		212
SODIUM		24
SODIUM chloride		60
iodide		148
peroxide	{ 1 sodium 24 } { 1½ oxygen 12 }	36
protoxide	{ 1 sodium 24 } { 1 oxygen 8 }	32
sulphuret		60
STARCH		142
STRONTIA		52
carbonate (dry)		74
hydrate, (1 water)		61
muriate		89
(crystallized, 8 water)		161
nitrate (dry)		106
phosphate (dry)		80

Strontia, oxalate, (dry)			88
sulphate (dry)			92
Strontium			44
chloride			80
iodate			168
oxide			52
phosphuret			56
sulphuret			60
Strychnia			380
Sugar			15 (Prout)
Sulphur			16
chloride	1 sulphur	16	52
	1 chlorine	36	
iodide			140
phosphuret			28
Sulphuretted hydrogen			17
carbon. See Carbon.			
Tannin			71
Tellurium			32
chloride			68
oxide			40
Tin			58
bisulphuret			90
peroxide	1 tin	58	74
	2 oxygen	16	
protoxide	1 tin	58	66
	1 oxygen	8	
perchloride	1 tin	58	130
	2 chlorine	72	
protochloride	1 tin	58	94
	1 chlorine	36	
sulphuret			74
Titanium (Thomson)			32
protoxide			40
titanic acid			48
Tungsten			126?
bisulphuret			158
oxide	1 tungsten	126	142
	2 oxygen	16	

URANIUM	208
oxide	216
peroxide	224
WATER	9
YTTRIA	42
YTTRIUM	34
ZINC	34
carbonate	64
chloride	70
hydriodate (dry)	162
iodide	159
iodate (dry)	207
nitrate (dry)	96
oxalate, (dry)	78
oxide	42
phosphate (dry)	70
phosphuret	46
sulphate (dry)	82
(crystallized, 7 water)	145
sulphite, (dry)	74
sulphuret	50
ZIRCONIA	48
ZIRCONIUM	40

TABLE

OF

PHARMACEUTICAL EQUIVALENTS.

				Atomic Numbers.
Acid, acetic (dry)	4 carbon	6 × 4 =	24	50
	3 oxygen	8 × 3 =	24	
	2 hydrogen	=	2	
(crystallized or glacial)	1 dry acid	=	50	59
	1 water	=	9	
arsenious (dry)	1 arsenic	=	38	54
	2 oxygen	8 × 2 =	16	
benzoic (dry)	15 carbon	6 × 15 =	90	120
	3 oxygen	8 × 3 =	24	
	6 hydrogen	=	6	
boracic (dry)	1 boron	=	*8	24
	2 oxygen	8 × 2 =	16	
(crystallized)	1 dry acid	=	24	42
	2 water	9 × 2 =	18	
carbonic (dry)	1 carbon	=	6	22
	2 oxygen	8 × 2 =	16	
citric (dry)	4 carbon	6 × 4 =	24	58
	4 oxygen	8 × 4 =	32	
	4 hydrogen	=	2	
citric (dry) crystallized	1 dry acid	=	58	76
	2 water	9 × 2 =	18	
hydriodic (dry)	1 iodine†	=	124	125
	1 hydrogen	=	1	

* Mr. Brande states the atomic number of boron to be 6, and consequently boracic acid 22. According to the researches of Thompson and others, the numbers should be 8 and 24.

† Mr. Brande gives 125 as the number for iodine, and 126 therefore for hydriodic acid.

Acid, hydrocyanic (dry)	1 cyanogen	=	26	27
	1 hydrogen	=	1	
muriatic (dry)	1 chlorine	=	36	37
	1 hydrogen	=	1	
nitric (dry)	1 nitrogen	=	14	54
	5 oxygen	8 × 5 =	40	
(liquid, sp. gr. 1·5)	1 dry acid	=	54	72
	2 water	9 × 2 =	18	
oxalic (dry)	2 carbon	6 × 2 =	12	36
	3 oxygen	8 × 3 =	24	
(crystallized)	1 dry acid	=	36	72
	4 water	9 × 4 =	36	
phosphoric (dry)	1 phosphorus	=	12	28
	2 oxygen	8 × 2 =	16	
succinic (dry, or anhydrous crystals,	4 carbon	6 × 4 =	24	50
	3 oxygen	8 × 3 =	24	
	2 hydrogen	=	2	
sulphuric (dry)	1 sulphur	=	16	40
	3 oxygen	8 × 3 =	24	
(liquid, sp. gr. 1·85)	1 dry acid	=	40	49
	1 water	=	9	
tartaric (dry)*	4 carbon	6 × 4 =	24	66
	5 oxygen	8 × 5 =	40	
	2 hydrogen	=	2	
(crystallized)	1 dry acid	=	66	75
	1 water	=	9	
Alcohol	2 carbon	6 × 2 =	12	23
	1 oxygen	=	8	
	3 hydrogen	=	3	
Alum† (dry)	1 sulphate of potash	=	88	262
	3 sulphate of alumina	58 × 3 =	174	
crystallized	1 dry alum	=	262	487
	25 water	=	225	

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* Brande and Phillips mention 3 atoms of hydrogen; and 67 as the number for tartaric acid

† According to Mr. Phillips, alum is composed of

2 sulphate alumina	67 × 2 = 134	262
1 bisulphate potassa	= 128	

ALUMINA .	1 aluminum* = 10 1 oxygen = 8		18
sulphate (dry)	1 alumina = 18 1 sulphuric acid = 40		58
AMMONIA .	1 nitrogen = 14 3 hydrogen = 3		17
acetate	1 ammonia = 17 1 acetic acid = 50		67
hydrated bicarbonate	1 ammonia = 17 2 carbonic acid 22 × 2 = 44 2 water 9 × 2 = 18		79
carbonate	1 ammonia = 17 1 carbonic acid = 22		39
hydrated sesquicarbonate†	2 ammonia 17 × 2 = 34 3 carbonic acid 22 × 3 = 66 2 water 9 × 2 = 18		118
citrate (dry)	1 ammonia = 17 1 citric acid = 58		75
muriate	1 ammonia = 17 1 muriatic = 37		54
sulphate (crystallized)	1 ammonia = 17 1 sulphuric acid = 40 2 water = 18		75
ANTIMONY .	(Brande 45) .		44
chloride	1 antimony = 44 1 chlorine = 36		80
protoxide	1 antimony = 44 1 oxygen = 8		52
pulvis antimonialis of Pharmacopœia	peroxide of antimony = 35 phosphate of lime = 65		100
peroxide	1 antimony = 44 2 oxygen 8 × 2 = 16		60
sulphuret‡	1 antimony = 44 1 sulphur = 16		60

* Mr. Phillips's number for aluminum is 18. According to Dr. Thompson it should be 10.

† Subcarbonate of the Pharmacopœia.

‡ Rose and Berzelius have ascertained that the combining proportions of the elements of the red and black sulphuret of antimony are the same, and, consequently, the atomic number of each will be 60.

ANTIMONY, potassa tartrate (dry)	3 protoxide of antimony	= 156	336
	1 bitartrate of potassa	= 180	
(hydrated)	1 antimony potassa tartrate	= 336	354
	*2 water	= 18	
ARSENIC			38
oxide (arsenious acid)	1 arsenic	= 38	54
	2 oxygen	= 16	
BISMUTH			72
oxide	1 bismuth	= 72	80
	1 oxygen	= 8	
subnitrate	2 oxide of bismuth	80 × 2 = 160	214?
	1 nitric acid	= 54	
BORON			8?
CALCIUM			20
chloride	1 calcium	= 20	56
	1 chlorine	= 36	
oxide, (see *Lime*)	1 calcium	= 20	28
	1 oxygen	= 8	
CARBON			6
CARBURET OF NITROGEN (cyanogen)	2 carbon	6 × 2 = 12	26
	1 nitrogen	= 14	
CHLORINE			36
CINCHONIA			315
COPPER			64
acetate (dry)	1 peroxide of copper	= 80	130
	1 acetic acid	= 50	
(crystallized common verdigris)	1 acetate	= 130	184
	6 water	9 × 6 = 54	
binacetate (dry)	1 peroxide of copper	= 80	180
	2 acetic acid	50 × 2 = 100	
binacetate (crystallized or distilled verdigris)	1 binacetate	= 100	207
	3 water	9 × 3 = 27	
ammoniated	1 bisulphate of copper	= 160	231
	1 ammonia	= 17	
	6 water	9 × 6 = 54	

* According to Mr. R. Phillips, it contains 3 water.

COPPER, peroxide	1 copper	= 64	80
	2 oxygen	8 × 2 = 16	
bisulphate (dry)	1 peroxide of copper	= 80	160
	2 sulphuric acid	40 × 2 = 80	
(crystallized)*	1 bisulphate of copper	= 160	250
	10 water	9 × 10 = 90	
ETHER	4 carbon	6 × 4 = 24	37
	1 oxygen	= 8	
	5 hydrogen	= 5	
Hydrogen			1
IODINE			124†
IRON			28
ammonia muriate (crystallized, Thomson)	1 permuriate of iron	95	149
	1 muriate of ammonia	54	
protoxide	1 iron	= 28	36
	1 oxygen	= 8	
peroxide	1 iron	= 28	40
	1½ oxygen	= 12	
perchloride	1 iron	= 28	82
	1½ chlorine	= 54	
carbonate‡	1 protoxide of iron	= 36	58
	1 carbonic acid	= 22	
sulphate (dry)	1 protoxide of iron	= 36	76
	1 sulphuric acid	= 40	
(crystallized)	1 dry sulphate	= 76	139
	7 water	9 × 7 = 63	
LEAD			104
acetate (dry)	1 protoxide of lead	= 112	162
	1 acetic acid	= 50	
(crystallized)	1 dry acetate	= 162	189
	3 water	9 × 3 = 27	
subacetate	3 protoxide of lead	112 × 3 = 336	386
	1 acetic acid	= 50	

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* The sulphas cupri of the Pharmacopœia.

† Mr. Brande gives it as 125.

‡ The Ferri Subcarbonas of the Pharmacopœia is a mixture of the above carbonate of iron with the peroxide of iron.

LEAD, protoxide	1 lead	= 104	112
	1 oxygen	= 8	
carbonate	1 protoxide of Lead	= 112	134
	1 carbonic acid	= 22	
LIME . .	1 calcium	= 20	28
	1 oxygen	= 8	
carbonate	1 lime	= 28	50
	1 carbonic acid	= 22	
hydrate (slaked lime)	1 lime	= 28	37
	1 water	= 9	
phosphate	1 lime	= 28	56
	1 phosphoric acid	= 28	
sulphate (dry)	1 lime	= 28	68
	1 sulphuric acid	= 40	
tartrate (dry)	1 lime	= 28	94
	1 tartaric acid	= 66	
MAGNESIA .	1 magnesium	= 12	20
	1 oxygen	= 8	
carbonate (dry)	1 magnesia	= 20	42
	1 carbonic acid	= 22	
sulphate (dry)	1 magnesia	= 20	60
	1 sulphuric acid	= 40	
(crystallized)	1 dry sulphate	= 60	123
	7 water 9×7	= 63	
MERCURY			200
protoxide	1 mercury	= 200	208
	1 oxygen	= 8	
peroxide	1 mercury	= 200	216
	2 oxygen 8×2	= 16	
protochloride (calomel)	1 mercury	200	236
	1 chlorine	= 36	
bichloride (corrosive sublimate)	1 mercury	200	272
	chlorine 36×2	= 72	
protosulphate (dry)	1 protoxide of mercury	= 208	248
	1 sulphuric acid	= 40	
bipersulphate (dry)	1 peroxide of mercury	= 216	296
	2 sulphuric acid 40×2	= 80	
protosulphuret	1 mercury	= 200	216
	1 sulphur	= 16	

Mercury, bisulphuret	1 mercury	= 200		232
	2 sulphur	16 × 2 = 32		

Sulphuretum nigrum (pharm.) is a chemical mixture of the proto- (Phillips) or bi- (Brande) sulphuret and sulphur.

Mercury,* bicyanuret	1 mercury	= 200		252
	2 cyanogen	26 × 2 = 52		
protonitrate (dry)	1 protoxide of mercury	= 208		262
	1 nitric acid	= 54		
bipernitrate	1 peroxide of mercury	= 216		324
	2 nitric acid	54 × 2 = 108		
Morphia				325†
Nitrogen				14
Oxygen				8
Phosphorus				12
Potassa (dry)	1 potassium	= 40		48
	1 oxygen	= 8		
(hydrate)	1 dry potassa	= 48		57
	1 water	= 9		
acetate (dry)	1 potassa	= 48		98
	1 acetic acid	= 50		
arseniate (dry)	1 potassa	= 48		110
	1 arsenic acid	= 62		
arsenite (dry)	1 potassa	= 48		102
	1 arsenious acid	= 54		
bicarbonate (dry)	1 potassa	= 48		92
	2 carbonic acid	22 × 2 = 44		
(crystallized)‡	1 dry bicarbonate	= 92		101
	1 water	= 9		
bisulphate (dry)	1 potassa	= 48		128
	2 sulphuric acid	40 × 2 = 80		
(crystallized)	1 dry bisulphate	= 128		146
	2 water	= 18		

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* Syn. prussiate of mercury, cyanide or cyanuret.

† The number for morphia is uncertain. The above is Mr. Brande's.

‡ Potassæ carbonas of the Pharmacopœia.

Potassa, bitartrate (dry)	1 potassa	= 48	180
	2 tartaric acid 66 × 2	= 132	
(crystallized)	1 dry bitartrate	= 180	198
	2 water	= 18	
carbonate (dry)*	1 potassa	= 48	70
	1 carbonic acid	= 22	
citrate (dry)	1 potassa	= 48	106
	1 citric acid	= 58	
nitrate	1 potassa	= 48	102
	1 nitric acid	= 54	
sulphate	1 potassa	= 48	88
	1 sulphuric acid	= 40	
sulphuret (of Pharmacopœia,	3 sulphuret of potassium 56 × 3	= 168	256
	1 sulphate of potash	= 88	
tartrate (dry)	1 potassa	= 48	114
	1 tartaric acid	= 66	
Potassium			40
chloride	1 potassium	= 40	76
	1 chlorine	= 36	
sulphuret	1 potassium	= 40	56
	1 sulphur	= 16	
bisulphuret	1 potassium	= 40	72
	2 sulphur 16 × 2	= 32	
Quinia			360
Silver			110
oxide	1 silver	= 110	118
	1 oxygen	= 8	
chloride	1 silver	= 110	146
	1 chlorine	= 36	
nitrate	1 oxide of silver	= 118	172
	1 nitric acid	= 54	
Soda (dry)	1 sodium	= 24	32
	1 oxygen	= 8	
hydrated	1 dry soda	= 32	41
	1 water	= 9	
acetate (dry)	1 soda	= 32	82
	1 acetic acid	= 50	

* Potassæ subcarbonas of the Pharmacopœia.

SODA, (crystallized)	1 dry acetate	=	82	136
	6 water	9 × 6 =	54	
carbonate (dry)	1 soda	=	32	54
	1 carbonic acid	=	22	
(crystallized)*	1 dry carbonate	=	55	144
	10 water	9 × 10 =	90	
citrate (dry)	1 soda	=	32	90
	1 citric acid	=	58	
sulphate (dry)	1 soda	=	32	72
	1 sulphuric acid	=	40	
(crystallized)	1 dry sulphate	=	72	162
	10 water	9 × 10 =	90	
tartrate (dry)	1 soda	=	32	98
	1 tartaric acid	=	66	
(crystallized)	1 dry tartrate	=	98	116
	2 water	9 × 2 =	18	
potassa tartrate	1 soda	=	32	212
	1 potassa	=	48	
	2 tartaric acid	65 × 2 =	132	
hydrated sesquicarbonate†	2 soda	32 × 2 =	64	166
	3 carbonic acid	22 × 3 =	66	
	4 water	9 × 4 =	36	
bicarbonate	1 soda	=	32	76
	2 carbonic acid	22 × 2 =	44	
SODIUM				24
chloride (common salt)	1 sodium	=	24	60
	1 chlorine	=	36	
oxide (soda)	1 sodium	=	24	32
	1 oxygen	=	8	
STRYCHNIA				380
SUGAR (prout)	1 oxygen	=	8	15
	1 hydrogen	=	1	
	1 carbon	=	6	
SULPHUR				16
hydrated‡	1 sulphur	=	16	25
	1 water	=	9	

* Sodæ subcarbonas of the Pharmacopœia.
† Sodæ carbonas of the Pharmacopœia.
‡ This is the sulphur præcipitatum of the Pharmacopœia.

Sulphuretted hydrogen	1 sulphur	=	16	17
	1 hydrogen	=	1	
Tin				58
Water	1 oxygen	=	8	9
	1 hydrogen	=	1	
Zinc				34
oxide	1 zinc	=	34	42
	1 oxygen	=	8	
carbonate	1 oxide of zinc	=	42	64
	1 carbonic acid	=	22	
sulphate (dry)	1 oxide of zinc	=	42	82
	1 sulphuric acid	=	40	
(crystallized)	1 dry sulphate	=	82	145
	7 water	9×7 =	63	

QUESTIONS

ON

CHEMICAL DECOMPOSITIONS.

---

2. How is vinegar made?

What is the theory of the formation of acetic acid?

In what respect does acetic acid differ from vinegar?

In preparing it, why are the last and first pints rejected?

6. Whence is the oil which is separated by pressing the benzoic acid in bibulous paper?

What is meant by the term balsam?

9. Why is the citrate of lime washed?

11. Why is water put into the receiver in making muriatic acid?

How many compounds are there of oxygen and chlorine?

What are the properties of chlorine?

14. Why is an excess of sulphuric acid added in making nitric acid?

15. How many are the compounds of oxygen and nitrogen?

16. What is the specific gravity of sulphuric acid?

17. How is it obtained?

Why is heat evolved when sulphuric acid and water are mixed together?

22. Why is there a preponderance of carbonic acid in the ammonia subcarbonas?

25. What is the composition and properties of ammoniacal gas?

32. What is potash?

34. How is potassium obtained?

Who discovered it?

What are its peculiarities?

39. How much carbonic acid is contained in the potassæ carbonas?

43. How is sulphate of potash made?

49. How is sodium obtained, and in what does it differ from potassium?

60. What is the difference between calx and creta preparata?

65. What takes place in making magnesiæ subcarbonas?

66. Why is the quantity of water varied in dissolving different salts?

67. What is sulphuret of antimony composed of?

How many are the oxides of antimony?

68. What changes take place in making antimonii sulph. præcip.?

70. How is glass of antimony made?

How much oxygen does it contain?

73. What takes place in making pulvis antimonialis?

74. What is the cause of the uncertainty of its operation?

76. How many oxides of silver are there?

78. What is white arsenic adulterated with?

86. How many oxides of copper are there?

87. What is ferrum ammoniatum composed of?

What effect has drying upon muriate of iron?

90. What takes place if subcarbonate of iron be exposed to the air?

91. How much oxygen is contained in the sulphate of iron?

93. How much oxygen is there in ferrum tartarizatum?

96. What takes place in making liquor ferri alkalini.

104. What is the difference between the red oxide and red nitric oxide of mercury?

105. At what heat does mercury boil, and at what degree of temperature does it freeze, and with how many proportions of oxygen does it combine?

106. How is the mercury oxidized in making hyd. oxydum cinereum?

108. How much chlorine is contained in corrosive sublimate?

111. What takes place when this salt is dissolved in water?

114. How is white precipitate formed?

115. Why is it necessary to purify mercury?

116. What is the composition of calomel;

Why is it washed with muriate of ammonia?

And why tested with liq. ammoniæ?

118. What is the difference between the two sulphurets of mercury?

122. How much oxygen is contained in the carbonate of lead?

124. Name the oxides of lead?

127. How many oxides of zinc are there?

129. What gas is evolved in making sulphate of zinc?

131. What decomposition ensues in making sulphuret of potash?

132. How is sulphur præcipitatum formed?

134. How many compounds are there of sulphur and oxygen?

135. What are the chemical changes in making mist. ferri. comp.?

136. What is the composition of alcohol?

137. What is the product of vinous fermentation? What change does the sugar undergo?

138. How is rectified spirit purified?

139. What are the changes which take place in making spiritus ammoniæ?

140. What is the composition of sulphuric æther?

141. How may the formation of æther be explained?

How much olefiant gas is contained in it?

142. How is rectified æther made?

143. What is the composition of water?

144. What is the composition of the atmosphere?

ANIMAL CHEMISTRY.

1. What are the elements of animal substance?

2. What is blood composed of?

3. What is the composition of serum?

4. What of the crassamentum?

5. What is the composition of the bile?

6. What is the chief ingredient of biliary calculi?

7. Of what are bones composed?

9. What forms the chyle?

10. What is the composition of the concretions found in the pineal, salivary, pulmonary, and prostate glands?

11. What is the composition of chalk stones?

13. Of what do the humors of the eye consist?

14. Of what are ligaments and membranes composed?

15. Of what is milk composed?

16. What forms the mucus of the nose?

17. What is the principal ingredient of muscle?

18. What are the nails composed of?

20. What is the composition of saliva?

21. What are the components of synovia?

22. Of what do the tears consist?

23. What forms the substance of the teeth?

24. What are tendons composed of?

25. What are the chief ingredients of urine?

26. How many kinds of urinary calculi are generally enumerated?

TOXICOLOGY.

2. What are poisons?

4. What symptoms are produced by corrosive irritant poisons?

5. What poisons may be considered corrosive irritants?

6. What are the morbid appearances produced by them?

7. How can poisoning by corrosive sublimate be distinguished?

8. How can copper be known?

9. What evidence is there of poisoning by mineral acids?

10. How may the alkalies be known?

11. What is the treatment necessary for corrosive irritant poisons?

12, 13, 14, 15, 16, 17, 18, 19. What are the antidotes for arsenic, corrosive sublimate, copper, tartar emetic, barytes, nitrate of silver, mineral acids, oxalic acid, and alkalies?

20, 21, 22. What are the vegetable irritant poisons, their symptoms, and treatment?

23. Name the principal narcotic poisons.

24. What are the symptoms produced?

25. What is the treatment to be adopted?

26. What are the symptoms and treatment for poisoning by cantharides?

28. What symptoms are produced by poisonous fish, and what treatment is required?

30. What are the symptoms and treatment necessary for poisoning by serpents and insects?

32. What are the symptoms and treatment necessary for poisoning by the narcotico-acrid poisons?

TOXICOLOGICAL CHEMISTRY.

1. What are the tests for arsenic?
2. What are the tests for corrosive sublimate?
3. What are the tests for salts of copper?
4. What are the tests for tartar emetic?
5. How may the acids be distinguished?
7. What are the tests for sulphuric acid?
8. What are the tests for muriatic acid?
9. How may nitric acid be known?
10. What are the tests for oxalic acid?
11. What are the tests for prussic acid?
12. What are the tests for lead?
13. What are the tests for sulphate of zinc?

14. What are the tests for nitrate of silver?
15. What are the tests for iodine and hydriodate of potash?
16. What are the characters of the alkalies?
17. How may potash be known from soda?
19. How may lime be detected?
20. How may barytes be known?
21. How may nitrate of potash be distinguished?
22. Which are the tests for muriate of ammonia?

ANATOMY.

3. How many bones form the cranium?
4. What are the contents of the cranium?
6. Describe the dura mater.
7. How are the sinuses formed?
9. What are the processes of the dura mater?
10. Describe the course of the falx major.
11. What is the extent of the tentorium?
12. What is the course of the falx minor?
13. What arteries supply the dura mater?
14. What kind of membrane is the pia mater?
16. What kind of membrane is the tunica arachnoidea?
18. Of how many kinds of substance is the cerebro-spinal system composed?
19. How is the brain divided?
20. What are the divisions of the cerebrum
21. What is observed on its surface?
22. What is seen about the corpus callosum?
23. How is the centrum ovale formed?
24. Where are the lateral ventricles found?
25. What is the number of the proper ventricles?
26. What is the course of the lateral ventricles?
28. What parts are seen in them?

29. What is the situation of the corpora striata?

30. Where are the thalami optici situated?

32. How are the lateral ventricles separated?

33. What are the attachments of the fornix?

35, 36. How do its posterior crura terminate?

38. How is the felvor of the inferior cornu of the lateral ventricles formed?

41. What are the choroid plexuses, and their course?

43. Where is the pineal gland found?

45. Where is the fissure of Bichat?

46. What are the boundaries of the third ventricle?

47, 48. What parts do the anterior and posterior commissures unite?

49, 50. How does the third ventricle terminate?

51. What passage is there to the infundibulum?

53. What is the pituitary gland, and where is it situated?

54. What parts are seen at the base of the brain?

55. What is the situation of the cerebellum?

56, 57. What are its divisions and structure?

62. Where is the fourth ventricle situated?

63. What are its boundaries?

64. With what does it communicate?

66. How is the pons varolii formed?

67. What is the extent of the medulla spinalis?

68. What is its structure?

69. What are its divisions?

70. Whence does the brain receive the blood?

71. What branches are given off from the internal carotid?

72. What branches are given off from the vertebral arteries?

73. How is the circle of Willis formed?

76. What is the structure of the nerves?

81. How are they divided?

82. What is the number of the cerebral nerves?

83. By how many roots does the first pair arise?

85. What ganglion does the third pair communicate with?

86. Which are the smallest of the cerebral nerves?

87. How many principal trunks does the fifth pair give off?

89. What filaments does the vidian nerve give off?

98. Where is the par vagum distributed?

103. What is the origin and course of the phrenic nerves?

104 and following sections. What is the distribution of the sympathetic nerve? and with what other nerves does it principally communicate?

111. What is the situation of the lenticular ganglion?

117. Of what do the lachrymal organs consist?

122. What is the situation of the lachrymal sac?

125. What coats has the eye?

129. Describe the choroid coat.

131, 132. How is the retina formed? and by what membrane is it lined?

134. Describe the iris.

136. What is meant by the chambers of the eye?

137. How is the ciliary ligament formed?

140. Describe the vitreous humour.

141. How is the eye supplied with blood?

142. What nerves enter the orbit?
143. How is the eye moved?
144. What are the bony parts of the mouth?
149. What are the soft parts of the palate?
151. What is the situation of the parotid gland?
156. What forms the arches of the palate?
162. How many openings has the pharynx?
163. Describe the œsophagus.
164. What is the structure of the larynx?
167. What is the situation of the cricoid cartilage?
175. What is the extent of the trachea?
176. What is its structure?
178. What are the boundaries of the thorax?
179. What are the contents?
183. What parts are contained in the posterior mediastinum?
185. What is the difference between the right and left lung?
187. What arteries are distributed to the lungs?
192. What are the divisions of the heart?
197. How many openings has the right auricle?
205. How is the left auricular-ventricular opening protected?
206. What are the proper arteries of the heart?
207. What is the course of the aorta?
208. What branches are given off from its arch?
209. What are the branches of the external carotid?
210. What are the branches of the subclavian?
211. What branches are given off from the thoracic aorta?
212. What branches does the abdominal aorta give off?
213. What branches are given off by the hepatic?
214. What are the coats of the arteries?

218. How is the vena azygos formed?
220. What is the course of the thoracic duct?
221. Of what does the diaphragm consist?
222. What are its openings?
223. What are the boundaries of the abdomen?
224. How is it divided externally?
228. What are the contents of the abdomen?
229. Of what does the alimentary canal consist?
230. What are the reflexions of the peritoneum?
234. What arterial branches supply the stomach?
236. Of what do the small intestines consist?
237. What are the distinguishing characters of the duodenum?
238. What is its course?
240. Why is the jejunum so named?
242. What distinguishes the jejunum?
243. What is the length of the large intestines?
245. Where is the cœcum situated?
246. How is the valvula ilii formed?
248. How is the colon divided?
252. What are the distinctive characters of the rectum?
253. What arterial branches supply the intestines?
256. How is the liver divided?
257. How many ligaments has it, and how are they formed?
259. What are the depressions and fissures of the liver?
261. What blood-vessels circulate through the liver?
262. What are its excretory ducts?
264. What is the situation of the gall-bladder?
273. Which kidney is situated highest?
275. Through what parts does the urine pass?

278, 279. Which renal artery and vein is the largest?

281. By what means is the urine discharged?

283. What are the contents of the pelvis?

286. What are the divisions of the bladder?

287. How many openings are there into it?

291. How many coats has the testicle?

292. What is its structure?

294. How do the spermatic veins terminate?

298. Of what is the spermatic cord composed?

300. How many coats has the uterus?

307. In what parts of the body is there a communication between mucous and serous membranes?

312, et seq. What are the parts peculiar to the fœtus?

320. Of what does the umbilical cord consist?

321. What is the structure of the skin?

322. Describe the cutis vera, rete mucosum, and epidermis.

PHYSIOLOGY.

1. What are the agents of mastication and insalivation?

2. How is deglutition effected?

3. What is the process of digestion?

4. How is chylification effected?

5. By what means are the fæces excreted?

6. What is the course of the chyle?

7. What is the use of the spleen?

8. Describe the circulation of the blood.

9. How is respiration performed?

10. Describe the fœtal circulation.

11. What is the temperature of the blood, and the cause of its heat?
12. What is meant by secretion?
13. How are secretions divided?
14. What parts do the tears pass through?
15. What is their use?
16. Where is the milk secreted?
17. What parts secrete saliva?
18. Where is the gastric juice secreted?
19. What is secreted in the pancreas?
20. What parts does the bile pass through?
21. Describe the excretion of bile.
22. What is its use?
23. What parts does the urine pass through?
24. How is the urine prevented from returning?
25. How is the urine excreted?
26. What parts does the semen pass through?
27. What is the use of the vesiculæ seminales?
28. What is the use of the prostate gland?
29. What is the use of the uterus?
30. What is the theory of impregnation?
31. What are the functions of the brain?
32. What are the sensations?
33. What is their number?
34. Describe the mechanism of vision.
35. What is the use of the conjunctiva?
36. What is the use of the sclerotica?
37. Which coat of the eye is the most vascular?
38. What is the use of the pigmentum nigrum?
39. What is the function of the uvea?
40. What is the use of the ciliary processes?
41. What of the eyebrows?
42. What is the action of the eyelids?
43. Of what use are the meibomian glands?
44. How is hearing effected?

45. What is the use of the Eustachian tube?
46. What is the use of the mastoid cells?
47. What is the use of the fenestra rotunda and fenestra ovalis?
48. How is taste produced?
49. What is the physiology of smell?
50. What are the functions of the skin?
51. What is the use of the cuticle?
52. How is voice produced?

PRACTICE OF MEDICINE.

1. What are the characters of inflammation?
4, 5, 6, 7, 8. How are its different symptoms produced? and what termination do they lead to?
13. What is the general character of fevers?
14. How does Cullen divide them?
16. What is meant by intermittent fevers?
21. What is the cause of them?
22. What is meant by a paroxysm of these fevers?
23, 24, 25. What are the symptoms of the cold, the hot, and the sweating stages?
26. What is the pathology of these stages?
27. What is the treatment proper for intermittents?
31. What is to be done during the intermissions?
33. In what form and doses is cinchona to be administered?
35. What other kind of treatment is sometimes necessary?
37. What is meant by remittent fevers?
40. What are the symptoms of synocha?
44, 46. What are the symptoms and treatment for typhus?

50. What is hectic fever?

54. How many kinds of scarlatina does Cullen mention?

56. What morbid action is liable to follow it?

57. What are the symptoms of measles?

58. How is it distinguished from scarlatina?

59. What is the treatment necessary for measles?

60. What are the symptoms and course of small-pox?

61. How many kinds are there?

62. How is it distinguished from varicella?

68. What distinguishes miliaria?

70. What is the seat of aptha?

How many kinds of cynanche are there?

81. For what diseases may hæmatemesis be mistaken?

83. What are the symptoms of colic?

87. How many kinds of human intestinal worms are there most common?

And in what parts are they found most abundant?

90. What are the symptoms of peritonitis?

93. What is the nature and treatment of puerperal fever?

94. What are the symptoms and diagnostic characters of gastritis?

99. What may diarrhœa depend upon?

103, 104, 105. What are the symptoms, morbid appearances, and treatment for cholera morbus?

110. What may jaundice depend upon?

130. How does pleuritis terminate?

132. On what does hæmoptysis depend?

135. What is the progress of phthisis?

138. What is the pathology of asthma?

183. What are the symptoms, peculiarities, and treatment of gout?

186. How should chronic gout be treated?
189. How are dropsical effusions formed?

QUESTIONS ON ATOMIC THEORY.

What is meant by the word atom?

How are atoms known to differ in weight?

In what way does combination between bodies take place?

How are the atomic or proportional numbers to be ascertained?

A FEW

TEST OR CROSS QUESTIONS.

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1. Why does the College order vinegar to be distilled in a *glass* vessel?
2. Why is the strongest pint of vinegar left in the retort after distillation?
3. If benzoin be composed of resin and benzoic acid only, whence the empyreumatic oil which discolours the acid?
4. In making citric acid, why do we employ *excess* of sulphuric acid?
5. In making muriatic acid, why do we put water into the receiver?
6. Why do we dilute the sulphuric acid previous to adding it to the common salt?
7. In what manner can the carbonic acid gas be exhibited, medicinally?
8. Does hot or cold water dissolve lime most readily?
9. Why do the College order lime water to be kept in stoppered bottles?
10. What is the chemical difference between calomel and corrosive sublimate?
11. In what does corrosive sublimate differ from the white precipitated mercury?
12. Why do the College order calomel to be washed with a solution of muriate of ammonia?

And why do they order the washings to be tested with liquor ammoniæ?

13. In what does the red sulphuret of mercury differ from the black sulphuret?

14. Which are the best ways of procuring hydrogen gas?

15. What change does the sulphuret of potash undergo by exposure to the air?

16. Why do the College order the mistura ferri composita to be kept in stoppered bottles?

17. Does alcohol or æther contain most carbon?

18. What is the nature of the change effected upon white arsenic, by heating it in a glass tube with potash and charcoal?

19. In performing the galvanic tests for corrosive sublimate, how does the gold become whitened?

20. What liquid will dissolve uric acid calculi?

21. In what will the other calculi dissolve?

22. In cases of poisoning by opium, if vinegar be administered before the whole of the poison be evacuated, it only increases the patient's danger, but if given when all the poison has been rejected, it counteracts its effects. How is this to be explained?

23. Are all the sinuses of the dura mater of a triangular shape?

24. Are the inferior vena cava and sympathetic nerves contained in the posterior mediastinum?

25. In the adult, what arteries contain venous blood? and what veins contain arterial blood?

26. Is there any sensible difference between the arterial and venous blood of the fœtus?

27. Properly speaking, is there any abdominal viscus completely covered by peritoneum?

28. Is the peritoneum a complete sac without opening?

29. When the right auricle of the heart contracts, what prevents the blood regurgitating into the vena cavæ?

30. Is there any direct communication between the mother and fœtus?

31. What substance would be the best to administer as an emetic, in case of apoplexy and phrenitis?

32. What is the difference between pneumonia and peripneumonia?

33. To what part would you apply a blister in nephritis?

34. For what reason is the cinchona not administered during the paroxysm of an intermittent?

35. In what way do aloes occasionally prove emmenagogue? Is it by any specific effects on the uterus?

36. What acids, used medicinally, contain no oxygen?

ANSWERS

TO THE

FOREGOING TEST QUESTIONS.

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1. If vinegar be distilled either in a pewter or copper still, it is apt to acquire a metallic impregnation; to avoid this, the College order it to be distilled in a glass retort.

2. The pint of vinegar which remains in the retort after distillation, undoubtedly contains a large portion of the acetic acid; but it also contains a great quantity of mucilage. If the distillation be carried beyond the seventh pint, the mucilage is decomposed, and gives the whole of the acid an empyreumatic flavor.

3. The empyreumatic oil which discolours the benzoic acid arises from decomposition of part of the resin.

4. However carefully the citrate of lime be washed, we cannot separate the whole of the mucilage. Excess of sulphuric acid is, therefore, used to decompose any portion of it which may be combined with the citrate.

5. The natural state of muriatic acid being a gas, water is put into the receiver to dissolve it, and thus forms liquid muriatic acid.

6. The sulphuric acid is diluted before it is added to the salt, in order to prevent the too rapid disengagement of the muriatic acid.

7. In the effervescing draught.

8. Cold water dissolves more lime than hot water.

9. If lime water be exposed to the air it attracts carbonic acid.

10. Both calomel and corrosive sublimate are composed of chlorine and mercury; but sublimate contains a double portion of chlorine. In other words, calomel is composed of one atom chlorine and one atom mercury: corrosive sublimate, of two atoms chlorine and one atom mercury. Calomel has, therefore, been termed *chloride*, or *protochloride of mercury*, corrosive sublimate *bichloride*, *deutochloride*, or *perchloride* of mercury.

11. White precipitated mercury consists of oxide of mercury, muriatic acid, and ammonia. Corrosive sublimate consists of chlorine and mercury.

12. In the process for making calomel, there is danger of corrosive sublimate being formed. If this should be the case, a solution of muriate of ammonia removes the sublimate by rendering it very soluble.

The liquor ammoniæ indicates the presence of the sublimate in this solution, by occasioning a white precipitate, which is, in fact, a submuriate of ammonia and mercury.

The following is the explanation of the formation of this precipitate: upon the addition of ammonia to the solution of muriate of ammonia and mercury, it takes away a portion of the muriatic acid, reducing the triple compound to the state of a submuriate of ammonia and mercury, which is precipitated.

13. Black sulphuret of mercury is composed of one atom sulphur, and one atom mercury; the red sulphuret consists of *two* atoms sulphur, and one atom mercury. The red sulphuret has, therefore, been termed a *deuto-sulphuret of mercury*.

14. The processes for making sulphate of iron, or sulphate of zinc, are the best for making hydrogen, which in these cases flies off.

15. When sulphuret of potash is exposed to the air, it attracts oxygen, and becomes converted into a sulphate of potash.

16. When the mistura ferri composita is first made, it contains protoxide of iron, which by exposure to the air becomes peroxide.

17. Æther contains more carbon than alcohol.

18. When the white arsenic is heated with potash and charcoal, the arsenious acid unites with the potash, and forms arsenite of potash. When hot, the charcoal decomposes this, and becomes converted into carbonic acid, by combining with the oxygen of the white arsenic. The carbonic acid, thus formed, unites with the potash, forming carbonate of potash; while the metallic arsenic is sublimed. The use of the potash in the above process is to render the white arsenic less volatile; otherwise it would be sublimed by the heat, before the charcoal is hot enough to decompose it.

19. The effect of the galvanic circle is to decompose the sublimate. The iron combines with the muriatic acid, and the metallic mercury amalgamates with the gold, producing the white spot.

20. Uric acid calculi dissolve in a solution either of potash or soda.

21. The other varieties of urinary calculi are soluble in acids, particularly the muriatic acid.

22. It appears that if vinegar be administered before opium be evacuated from the stomach, an acetate of morphia is formed, which is the most active form of this substance; hence, therefore, the giving vinegar in such cases will only aggravate the symptoms. But if given after the opium *has been evacuated,* vinegar counteracts the effects of the poison.

23. Most of the sinuses of the dura mater are of a triangular form; but not all of them. As, for example, the inferior longitudinal, which is cylindrical.

24. The inferior vena cava and sympathetic nerves are undoubtedly not contained within the posterior mediastinum.

25. The pulmonary artery contains venous blood; and the pulmonary veins, arterial blood.

26. In the fœtus there is no sensible difference between arterial and venous blood.

27. The peritoneum cannot *completely* cover any of the abdominal viscera; because in every organ there must be a space for the vessels and nerves to enter it.

28. In the male subject, the peritoneum has no opening into it; it is a complete sac. In the female, however, this is not the case; the fimbriated extremities of the Fallopian tubes perforate the peritoneum, and the mucous membrane lining the former becomes continuous with the latter. This is the only example in the body, of a mucous membrane being continuous with a serous one. In consequence of this peculiarity, the water formed in ascites has, in some instances, been evacuated through the uterus and vagina.

29. When the right auricle of the heart contracts,

there is no occasion for valves to guard the venæ cavæ; because the whole of the circulating blood is pressing forwards, and thus prevents any regurgitation into the veins. When, however, from any obstruction in the lungs, the auricle cannot get rid of its blood, partial regurgitation does take place, and produces what is called the venous pulse.

30. We have no evidence of there being any direct communication between the mother and the fœtus. The nourishment of the latter is effected by something similar to secretion and absorption. The vessels of the mother secrete or deposit the blood in the cells of the placenta; the ramifications of the umbilical vein absorb the blood thus deposited.

31. In any case where there is a determination of blood to the brain, emetics are very improper, as likely to produce apoplexy. In phrenitis, therefore, they are evidently improper. In apoplexy, emetics can only increase the danger.

32. By some, the term pneumonia is understood as referring to inflammation in any of the structures within the thorax. In this sense it includes pleuritis, bronchitis, peripneumonia, pericarditis, and carditis. Dr. Cullen, however, appears to limit it to inflammation of the lungs; including pleuritis, or inflammation of the serous covering of the lungs, and *peripneumonia*, or *inflammation of the substance of the lungs.*

33. The use of blisters in nephritis is improper; when applied to the healthy subject, they are apt to induce this disease; and it would therefore be evidently improper to employ, as a remedy, a substance which is itself capable of producing the disease.

34. The subsidence of the paroxysm of an intermittent is checked by the exhibition of cinchona during the attack. If, however, this medicine be administered in the intermission, it prevents the accession of the paroxysm.

35. Aloes have no specific emmenagogue effects. They act chiefly on the colon and rectum, and by the extension of their stimulus to the uterine vessels, they, in consequence, have an emmenagogue effect.

36. Prussic and muriatic acids contain no oxygen.

THE END.

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ERRATA.

Page 36, line 11, *for* NARTICO *read* NARCOTICO.
133, 32, *for* chyle *read* chyme.