Syllabus of the university course of lectures on medical jurisprudence / by Robert Christison.

SYLLABUS

OF THE

UNIVERSITY

COURSE OF LECTURES

ON

MEDICAL JURISPRUDENCE,

BY

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SYLLABUS, &c.

INTRODUCTION. Definition and objects of Medical Jurisprudence. History. Causes of its slow progress in Britain. Its importance and distinctness as a science. Outlines of the Course.

FIRST DIVISION.

OF MEDICAL INQUIRIES INVOLVING THE CONSIDERATION OF THE CAUSES OF SUDDEN DEATH.

CHAPTER I.

OF SUDDEN NATURAL DEATH.

Introductory remarks on Apparent Death, and the Signs of Real Death.—Examples of Premature interment; once not uncommon on the Continent; very rare in Britain. Premature dissections. Chief criterions of real death; Incipient putrefaction; Flexibility subsequent to rigidity of the joints; Loss of contractility of the muscles under galvanism: these are not liable to any important fallacy; the rest are equivocal.

SECTION I.—*Diseases which may cause sudden Death, in its Medico-legal acceptation, and the circumstances under which they prove suddenly Fatal.*—Diseases which leave their signs in the head—chest—belly—spine; and those which do not leave any signs in the dead body.

Of *Latent* diseases, or those which may run their course without any symptoms during life; great importance in relation to legal medicine. Examples from diseases of the chest, to wit, pleurisy, hydrothorax, peripneumony: medico-legal cases. Practical inferences. Appearances adequate to account for death may be found in the dead body, and yet death have arisen from another cause, such as from violence—medico-legal examples. The question of the cause of death in such cases may be very intricate. Examples.

Method of determining whether appearances of disease found in the dead body really indicate the cause of death. 1. By inquiring whether the appearances are such as indicate unequivocally the proximate cause of death, namely, stoppage of the heart's action; of the respiration; of the function of the brain. 2. By considering whether, in the particular case, any of the collateral circumstances are present which usually occur when the disease, which has produced the appearances, proves fatal: These are—the symptoms previous to death having corresponded with the appearances—certain peculiarities in the appearances themselves, peculiarities which occur in fatal cases only—the great extent of the appearances—and, in the case of latent diseases, *extraneous* circumstances, particularly the accession of a new disease soon before death, or the occurrence of unusual exertion immediately before it; these being the circumstances under which latent diseases usually prove suddenly fatal. Inferences in those cases in which the natural disease, which has apparently caused death, does not leave any morbid appearances.

Section II.—*Of Pseudo-morbid Appearances*, or appearances which arise from natural causes, independently of disease, and which are often mistaken for its effects. Medico-legal questions involving the consideration of them. Their causes, namely, a kind of lingering vitality after apparent death, Bichat's *vie animale;* and transudation of the fluids. Medico-legal example of the nature and importance of questions on this subject.

1. Hemorrhage; is rare after death, without violence.

2. Congestion; on the external surface of the body, (to be considered in the next chapter;) on the membranes of the internal cavities and organs; often mistaken there for the marks of inflammation. How it is to be distinguished from inflammation on the serous membranes; on the mucous membranes of the stomach and intestines, and of the windpipe and air-tubes. Pseudo-morbid congestion of the lungs; how it is to be distinguished. *Appendix:*—Coloration of the arteries, caused by dyeing in the blood, mistaken for inflammation.

3. Effusion of serum. Whether it is caused after death, and where it arises. Its principal seat; outer surface of the brain; within the ventricles; and sheath of the spinal chord; in the chest and belly; how the morbid and pseudo-morbid varieties are to be distinguished in each of these situations.

4. Pseudo-separation of lymph from the blood; on the pia mater of the brain; in the heart and great vessels, forming pseudo-polypi.

CHAPTER II.

OF DEATH FROM WOUNDS AND BLOWS, AND THE MEDICAL JURISPRUDENCE OF WOUNDS AND BLOWS GENERALLY.

SECTION I.—*Of the Mode in which Wounds and Blows cause Death, and more particularly Sudden Death.* What injuries cause instant death—medico-legal case to illustrate the importance of determining that point. What injuries incapacitate the individual from stirring from the spot where he received them—medico-legal case in illustration.

Of death by hemorrhage, as common to all wounds. What extent of hemorrhage is required to prove fatal. Method of recognising death by hemorrhage, when the quantity of blood lost is not known; blanching or exsanguification of the viscera; a wound in a large vessel, bear-

ing evidence of having been inflicted during life. Method of distinguishing real blood in certain circumstances of difficulty; when extravasated inwardly; when dried on clothes or weapons.

Mode in which injuries of the head prove fatal. *Concussion* may cause death instantaneously, or in a few minutes, and then leave no sign in the dead body,—or after a time, from inflammation succeeding. *Laceration* of the brain, not necessarily attended with hemorrhage. *Extravasation*; how it is to be distinguished from bloody serum. It may exist long without causing death or any symptom; how that which has been the cause of death is to be known in the dead body. There may be a considerable interval before fatal extravasation causes death. *Fracture* of the skull; is in itself unimportant. *Contused wounds* of the scalp; often cause death by the supervention of erysipelas, or by inflammation of the dura mater. The latter is a very important sequela in regard to medical jurisprudence, on account of the long interval of health betwixt the wound and the subsequent disease.

How injuries of the chest prove fatal. The internal organs may be ruptured without an external mark. Their rupture from violence is rare unless they are previously diseased. Caution in regard to the examination and prognostics of wounds apparently non-penetrant.

How injuries of the belly prove fatal; concussion of the pit of the stomach,—the real cause of death. Laceration may cause almost instant death. Puncture. Inflammation. Inanition.

Mode in which injuries of the spine prove fatal.

Mode in which injuries of the extremities prove fatal.

Section II.—*Of the Circumstances which alter the Medico-legal Character of Injuries.* Introductory remark on the medico-legal classification of external injuries. What are the leading inquiries at law in regard to them. Arrangement of injuries into slight, severe, dangerous, and mortal. But injuries naturally belonging to one of these classes may acquire the character of another from the co-operation of circumstances more or less extraneous,

and therefore relieving the inflictor more or less from his criminal responsibility.

1. *Age.* Why adult age is, on the whole, most favourable to recovery from injuries. Example from the effects of burns. Exception in the case of fractures, which are least fatal in children.

2. *Sex*—is a circumstance of aggravation, in the case of blows on the breast of a female, and in that of wounds and blows on the belly of a pregnant woman; and likewise in the case of mutilating and disfiguring wounds on a female, as lessening the chance of marriage.

3. *Constitutional Peculiarities* do not form a good plea of exculpation, unless the injury is slight. They are of two kinds, constitutional infirmities and malformations. Examples of constitutional infirmity rendering trivial injuries severe, dangerous or mortal,—scrofulous diathesis,—hemorrhœal diathesis. Examples of malformations aggravating the medico-legal character of injuries; transposition of the viscera—absurd refinement of foreign authors on this subject; congenital hernia; superficial course of arteries usually deep-seated.

4. *Previous Injury or Disease* is not a good exculpatory plea; is untenable if the injury is naturally dangerous, or manifestly accelerated death; but substantial if the injury was slight. Medico-legal example of the difficulty of deciding what weight should be allowed in law to the plea of previous harm. Chief questions on the subject.

a. Was the new injury adequate to cause serious mischief in ordinary circumstances? Medico-legal examples of pleas of exculpation on the ground of the injury having proved fatal by rupture of an aneurysm, or of ossified veins, or of a brittle spleen, or by a cachectic state of the body.

b. Whether did the injury or the previous disease occasion death? Circumstances which may render this a nice question to answer. *α.* The disease and the injury may cause the same symptoms and appearances: medico-legal example in the case of apoplexy and extravasation from a blow, and in that of palsy and concussion. *β.* The

disease and the injury may each cause appearances sufficient to account for death. Medico-legal example.

c. Did the alleged previous harm really pre-exist, or was it the consequence of the injury?—circumstances which render this question a nice one. The alleged previous harm, and the recent injury, may affect the same organ. Medico-legal example in the case of caries of the skull causing fatal inflammation of the brain, a blow of the head having intervened. The organs affected, although different, may be connected by sympathy. Medico-legal examples in the case of inflammation of the liver accompanied with inflammation of the brain.

5. *Subsequent Injury or Disease.*—The modifying circumstances of this description are of two sorts,—some depending for their existence on that of the previous injury, others being wholly independent of the injury. The former constitute doubtful, the latter unexceptionable pleas of exculpation.

a. Subsequent causes, to whose action the existence of the previous injury is indispensable. Fresh violence applied to a wound. Intervention of a disease on a wound; hospital gangrene; spreading subcutaneous inflammation; tetanus. What influence these subsequent diseases would have in the eye of the law.

b. Subsequent causes independent of the previous injury. Subsequent injuries; examples. Relative priority and fatality of wounds; how to be determined. Subsequent diseases. Modifying circumstances of this description are the most important of all, on account of the strength of the plea they furnish, and the complex questions connected with them. The diseases which occasion the greatest embarrassment are, *α.* Those not marked by prominent symptoms during the patient's life; example in inflammation of the veins. *β.* Those which cause death very suddenly; medico-legal example in the case of apoplexy. *γ.* Those resembling the internal inflammations caused by violence; medico-legal example in the instance of continued fever; erysipelas; phrenitis coming on during symptomatic fever, when the brain is

not the seat of injury. *b.* Those which do not leave distinct signs in the dead body: medico-legal example in the case of cholera.

Remarks on the question, whether the disease which causes death depends for its existence on the pre-existence of the injury, or is an entirely independent disease. Medico-legal examples in the case of subfascial abscess in the thigh after a gunshot wound of the arm, and in that of peritonitis after a wound of the liver.

6. *Malum Regimen*,—often constitutes a very strong exculpatory plea. Accidental or inevitable want of attendance is not a valid plea; but the plea is good if the want was intentional or avoidable. *a.* Misgovernment on the part of the patient; mere want of attendance, or bad attendance when he might, in the ordinary course of things, have had better; actual irregularities; concealment of the real cause of his illness: medico-legal examples. *b.* Misgovernment on the part of the surgeon; bad treatment; neglect: medico-legal cases.

7. *Trade.* Not important to the medical jurist; operates by rendering particular damage greater to particular tradesmen.

Appendix.—On the operation of modifying circumstances in *lessening* the danger of injuries. Subdivision of the medico-legal classification of injuries.

Section III.—*Circumstances to be attended to in the Medico-legal Examination of External Injuries.*—1. Their *Seat*,—will often determine the prisoner's intent,—the truth of the declaration of the prisoner, and evidence of witnesses as to the circumstances under which the injury was inflicted,—and the question of murder, suicide, or accident. Trial of *Earl Warwick*; of *Simmonds*, Edinburgh; cases from Wildberg; Pyl; trial of *Patch*, London. 2. Their *Direction*; likewise often determines the intent, as well as the truth of the moral evidence, and the question of murder, &c. How to distinguish the exit wound from the entrance wound. Trial of *Annesley*; *Barbot*, St. Christophers; case from Kopp; trial of *MacKinnon*, Edinburgh; *Bourke*, Lewes; case from

Franklin's Travels; trial of *Hamilton*, Maidstone. 3. *Probable weapon*,—characters for determining this point; foreign bodies in wounds; case from Foderé,—Wildberg; trial of *Barbot*; case from Kopp. 4. *Probable force*,—How to investigate this particular,—case from Pyl,—Wildberg.

Section IV.—*Appearances produced in the Body after Death, which are apt to be mistaken for the effects of violence during Life.*—1. Those produced by natural processes.—*a.* Livor; examples of its having been mistaken for contusions; trial of *Lawson* and *Smith*, Edinburgh; *Keir*, Aberdeen; *Dyson*, London. Definition of livor; general appearances at various intervals after death; causes; actual seat; method of distinguishing it from contusions. Cases from Wildberg,—Mertzdorff; trial of *Clarke*, Perth. *b.* Certain effects of putrefaction; pseudo-contusions from this cause; how distinguished; trial of the alleged murderers of *Sir E. B. Godfrey.*

2. Those caused by external force; sometimes imitate closely the effects of violence during life. *a.* Hemorrhage; immediately after death; a considerable interval after death; how distinguished from vital hemorrhage; when internal; when external. Case from Mertzdorff; trial in the case of Sir E. B. Godfrey. *b.* Bruises. *c.* Wounds; characters to distinguish them from wounds during life. Cases from Pyl; Kopp; Osiander. *d.* Fractures and dislocations. *e.* Burns.

Section V.—*Method of distinguishing whether Death from External Injuries has been the consequence of Suicide, Murder, or Accident.*—External circumstances. State of the clothes. Position and expression of the body, and stains on it. The weapon,—Case from Pyl. Substances found in the wound. Its seat; influence of language on the seat of wounds. Its direction. The kind of injury,—Case from Mertzdorff. Trial of *Pollock*, Edinburgh. The number of injuries,—Cases from Osiander; Bucholz; Rust. Methodical distribution of the injuries,—Case from Osiander. The circumstance, whether there are two or more wounds, such as made it im-

possible for the deceased to inflict one if he had inflicted the other,—Cases from Metzger. State of mind.

Appendix.—Mode of recognising pretended injuries on the living body. Extraordinary length to which people sometimes go in the voluntary infliction of injuries. Cases from Osiander. Examples of false accusations for alleged injuries, from Chaussier; Wildberg.

CHAPTER III.

OF DEATH BY POISON.

Statutes relative to the Crime of Poisoning. Preliminary View of the Physiological Action of Poisons.

Section I.—*Of the Action of Poisons.—A.* Local, namely, chemical corrosion; irritation; nervous impressions without organic injury; question regarding the existence of such impressions. *B.* Remote action. The local action of poisons is rarely the direct cause of death, or of the leading symptoms. *A.* Action through *sympathy.* Proofs of the existence of sympathetic action; in the case of local corrosion, and irritation. Its existence in the case of imperceptible nervous impressions is doubtful. Inquiries on this subject by Crumpe, Brodie, Magendie, Emmert, Whytt, Monro, Coullon, Christison, and Coindet. Organs affected through the sympathetic transmission of local impressions; correction of the general ideas entertained on this subject. *B.* Action through *absorption.* Proofs of its existence; in the actual absorption of poisons; in their action being independent of the entireness of the nerves; and dependent on that of the circulation; and on the relative absorbing power of each tissue. Can poisons of this kind be detected in the blood? Why many of them cannot. Organs affected through absorption. Organs necessary to life; heart—lungs—brain—spinal chord—several of these at once. Organs not necessary to life.

Section II.—*Of the Causes which modify the Action of Poisons.*—Effects—1. Of quantity. 2. State of aggregation. 3. Chemical combination; general laws as to the influence of chemical combination. 4. Mixture. 5. Difference of tissue. The relative action of poisons by absorption; through the skin—the mucous membrane of the alimentary canal—the serous membranes—wounded veins—the mucous membrane of the air tubes—the nervous tissue—the cellular tissue. Relative action of poisons which operate through sympathy. 6. Difference of organ. 7. Habit and idiosyncracy; their influence is chiefly confined to the organic poisons—whence arises the influence of habit.

On General Poisoning.

Introductory remarks on the objects of this inquiry. Of secret poisoning. Absurdities on the subject.

Section I.—*Of the Evidence from Symptoms generally.*—General characteristics of the symptoms of poisoning. 1. Suddenness and rapidity; effect of lingering death in lessening criminal responsibility. 2. Regularity of increase. 3. Uniformity in kind throughout their progress. 4. Their originating soon after a meal; and, 5. During a state of perfect health. How far these characteristics are general or universal in the case of poisoning—how far they differ from the characteristics of the symptoms of natural disease. General conclusion. The foregoing characters can very rarely justify an opinion in favour of more than probability on either side. Exceptions to this rule.

Section II.—*Of the Evidence from Morbid Appearances.* There are not any morbid appearances peculiar to poisoning generally. Common errors on this subject; excessive lividity; early putrefaction. Under what circumstances evidence from morbid appearances is necessary to decide the question of poisoning.

Section III.—*Of the Evidence from Chemical Analysis.*—This, on the whole, is the strongest of all; other proof, however, is also required in some cases; as, in cases of alleged introduction of poison into the body after death;

or when, poisoning being proved, there is doubt whether it caused death. Poison may not be detected, and yet have been the cause of death; whence this arises, namely, from the poison being removed out of reach by vomiting and purging—by absorption—by organic or chemical decomposition.

Section IV.—*Evidence from Experiments on Animals.*—Is on the whole equivocal, but often useful nevertheless; it should never form part of an express medico-legal inquiry. Evidence from the effects of suspected food, drink, or medicine, is less objectionable than that from the effects of the matters of vomiting, or contents of the stomach. Relative effects of poison on man and the lower animals. What animals are fittest for the purpose of experiments; how such experiments should be performed. The contents of the stomach are themselves sometimes poisonous; if putrid; and after diseases. Circumstances under which evidence from intentional or accidental experiments on animals may decide the question of poisoning. Utility of experiments on animals to settle disputed points in the physiology and pathology of poisoning.

Section V.—*Of the Moral Evidence.* What part of the moral evidence falls under the province of the medical witness. Strength of the evidence from the effects of a suspected meal, or particular articles of it, on several individuals,—from several suffering and others escaping—from those poisoned suffering in proportion to the quantity they each took of particular dishes. The medical attendant should endeavour to determine whether the person poisoned took the poison voluntarily or not. He should also observe the actions of the individual suspected to have been the poisoner.

On Individual Poisons.

Classification of poisons, necessarily very imperfect and illogical. Division into irritants, narcotics, and narcotico-acrids.

Of Irritant Poisons.

Introductory observations on their symptoms and morbid appearances, and on those of the natural diseases which resemble their effects. Of the *symptoms* of the irritant poisons; when taken internally; when applied externally. Of the symptoms of the diseases which resemble the effects of irritant poisons; distention and rupture of the stomach; effects of drinking cold water: bilious vomiting and cholera; inflammation of the stomach: of the intestines; of the peritonæum; spontaneous perforation; melæna and hematemesis; colic, iliac passion, obstructed intestine, and strangulated hernia. How these affections are to be distinguished from poisoning with the irritants. Of the *morbid appearances* caused by the irritants. Appearances in the stomach; redness; extravasation of blood; corrugation and thickening of the mucous coat; effusion of lymph on it; corrosion, softening and ulceration of the coats. Appearances in the mouth; gullet; intestines; body generally; organs not locally acted on. Appearances caused by natural disease resembling those caused by irritant poisons. Idiopathic inflammation of the alimentary canal generally; spontaneous perforation; its causes, namely, worms, scirrhus, simple gelatinization; pathological controversies on the subject, and method of distinguishing such perforations from those produced by poisons.

First Order of the Irritant Poisons.—*Acids.*

Section I.—*The mineral acids.* Sulphuric, muriatic, and nitric acids. Physical and chemical properties; tests for them in their pure state, and when mixed with animal matter. Physiological action, as deduced from experiments on animals. Their symptoms; differ much in the case of speedy death; lingering death; imperfect recovery; perfect recovery; sometimes decisive of the question of poisoning. Death is sometimes caused although the poison does not reach the stomach. The

morbid appearances; in the case of speedy death; of lingering death. In some cases the morbid appearances alone will decide the question of poisoning. Treatment.

Section II.—*Phosphoric acid and phosphorus.*—Symptoms caused by them on animals.

Section III.—*Chlorine and iodine.*—Symptoms caused by iodine on man and animals.

Section IV.—*Oxalic acid.*—Physical and chemical characters, and tests for it in its pure and mixed state. Its mode of action twofold; it is a corrosive, and acts through absorption; remarkable effect of dilution. Symptoms in man; morbid appearances; treatment. Effects of the oxalates. *Appendix* on citric and tartaric acids.

SECOND ORDER OF THE IRRITANTS.—*Alkalies and their Salts.*

Section V.—*The fixed alkalies, and their subcarbonates and nitrates.*—Chemical tests; symptoms and morbid appearances; especially of the subcarbonates and of nitre. *Appendix.*—Lime.

Section VI.—*Ammonia* and its salts.—Symptoms and morbid appearances.

Section VII.—*Sulphuret of potass; chloride of lime.*

THIRD ORDER OF THE IRRITANTS.—*Metallic Compounds.*

Section VIII.—*Arsenic and its compounds.*—Metallic arsenic; its physical and chemical properties. *Fliagenstein* or tarnished arsenic, an imperfect oxide. White oxide or *arsenious acid.* Introductory remarks on its appearance, taste, volatility, solubility in various fluids, and crystallization. Tests for it in the solid form.—1. Reduction; is extremely delicate; and not liable to any important fallacy. Every risk of error may be avoided by a supplementary test; re-conversion into the oxide; conversion into the arsenite of copper; its smell; property of alloying with copper. 2. Conversion of the solid oxide into the arsenite of copper.—Tests for it in

the fluid state and when pure. The best are lime water; sulphuretted hydrogen and the alkaline hydrosulphates; salts of copper in various forms; salts of silver. Best methods of applying these tests.

Sulphurets of arsenic.—Orpiment; realgar. Difference between the sulphurets of commerce and the pure sulphurets. King's yellow.

Arsenic acid, and the *arsenite of potass; Scheele's green; Vert de Schweinfurt.*—Method of determining the nature of all these compounds.

Tests for the oxide of arsenic dissolved in its impure state. 1. When mingled with mineral substances. Fallacies thence arising in the case of lime water; sulphuretted hydrogen; ammoniacal sulphate of copper; ammoniacal nitrate of silver. Method of obviating these fallacies; validity of evidence founded on the fluid tests, in the face of these fallacies. 2. Tests for it when dissolved along with vegetable and animal fluids. The fluid tests are rendered almost useless. Methods proposed for detecting it. Process of Phillips, Rose, Rapp, Orfila; objections to those processes. Method by which, in every state of mixture, whether in the solid or in the fluid form, arsenic may be detected and separated in its pure solid state, with as great delicacy as by the fluid tests applied to a pure solution; peculiar advantages, and infallibility of the process; trial-test; conversion of the oxide into the sulphuret; of that into the metal; and of that into the oxide again, in its solid crystalline form.

Of the mode of action of arsenic. It is an irritant; and also acts through absorption on distant organs; influence of variety in tissue on its action; what preparations of it are poisonous.

Of the symptoms caused by it. Advancement of the cases in four groupes. 1. Symptoms in the most common cases, in which the patient lives longer than a day, and dies within three or four, namely, the symptoms of violent irritation in the alimentary canal. Detailed account of the ordinary progress of the symptoms, of the varieties

to which each is liable, of the anomalies occasionally met with; examples of the ordinary course of the symptoms. 2. Symptoms when death occurs within eight or ten hours; those of irritation are indistinct, and the leading symptom is excessive faintness: examples. 3. Symptoms when death is protracted beyond four days, or when the individual recovers after a tedious and severe illness. The first symptoms are the same as those of groupe 1st; but these are succeeded by some symptom of an injury of the nervous system resembling epilepsy, hysteria, tetanus, palsy, mania. 4. Symptoms in imperfectly formed cases, in which the poison is all evacuated soon after it is taken. Sequelæ of poisoning with arsenic. Effects ascribed to the *aqua toffana*.

Comparative effects of arsenic on man when applied to the body through other channels besides the stomach; surfaces deprived of the cuticle; the anus; surface of the vagina; surface of the air-tubes of the lungs; unbroken skin. Arsenic acts more or less actively through all these mediums.

General conclusions on the evidence derived from the symptoms of poisoning with arsenic. The symptoms in general infer only probability of poisoning; but in well-marked cases of the third variety the evidence is certain.

Of the morbid appearances caused by arsenic. Sometimes no morbid appearance is to be found at all: examples Redness of the gullet; of the stomach; erosion of the villous coat; perforation very rarely produced; extravasation of blood into the stomach; effusion of coagulable lymph; elevation of the villous coat into pimples; sloughing of the villous coat. Redness of the intestines; of the pleura and lungs; of the heart; of the windpipe; inflammation of the genital organs; lividity of the skin; fluidity of the blood; irritability of the muscles; early putrefaction; incorruptibility; question as to the power of arsenic to preserve from decay the bodies of persons poisoned by it; important cases on the subject. Local effects of arsenic applied outwardly. Force of the evidence from morbid appearances. Criterions for distinguishing the

application of arsenic to the living and to the dead body.

Treatment of poisoning with arsenic; supposed antidotes; general treatment; emetics; diluents; blood-letting; blood-letting combined with opiates; laxatives; blisters.

Illustrations of the preceding lectures on arsenic, by reference to the trials of the Ogilvies at Edinburgh in 1765, of Miss Blandy at Oxford in 1752; of Mr. Donnal at Launceston in 1817; of Eliza Fenning at London in 1815.

Section IX.—*Of Poisoning by Mercury and its Compounds.* Metallic mercury; its physical and chemical properties; *protoxide; red oxide*, or red precipitate; *sulphuret*, or cinnabar; *subsulphate*, or turbeth mineral; *bichloride*, or corrosive sublimate; physical and chemical properties in its solid state; sublimation; reduction in the dry way; in the humid way; separation of its oxide by potass. Tests for it in its fluid state when pure; crystallization; lime water; caustic potass; caustic ammonia; subcarbonate of potass; proto-hydrochlorate of tin; hydrocyanate of potass; nitrate of silver; a copper plate; amalgamation with gold by the aid of galvanism; solution of albumen. *Protochloride*, or calomel—its tests; *acetate; nitrate.*

Effects of vegetable and animal substances on corrosive sublimate; their power of decomposing it; vegetable substances; albumen; gelatin; milk; muscular fibre. Influence of these chemical phenomena on the operation of the fluid tests. Method of detecting mercury in such mixtures; in fluid mixtures; delicate method for the separation of metallic mercury in all fluid mixtures, and in all solid mixtures which yield a portion of the poison to water.

Symptoms of poisoning with corrosive sublimate; mode of action. It is a corrosive, an irritant, and also acts through absorption; question with regard to the detection of mercury throughout the system when it has been long taken. It acts in whatever way it is applied to the body, to wounds or ulcers, to the membrane of the pul-

monary air-tubes, to the unbroken skin, to the stomach. Relative activity of the preparations of mercury. The symptoms in man are of three kinds; *first*, Those which occur in rapidly fatal cases; 1. Namely, when violent corrosion proves fatal in a few hours by sympathetic injury of the heart. 2. Those occurring in cases which last for a day or two. 3. Those arising from mercurial erethysm, either united or not united with the symptoms of inflammation in the stomach, according as the poison has been taken inwardly or applied outwardly. The former is the most common form of poisoning with corrosive sublimate. Chronic erethysm; can it recur after an interval of absence without the repetition of the poison? varieties; salivation; distinction between mercurial salivation and other kinds of it; tremor of the joints. Diseases to which the use of mercury predisposes the system. General conclusions as to the force of evidence from the symptoms of poisoning with mercury: when the symptoms of irritation of the stomach and erethysm are combined, the proof of poisoning is often almost certain.

Morbid appearances caused by corrosive sublimate; nature of the erosions caused by it; whether they can be distinguished from other erosions; chemical corrosion; ulceration; inflammation of the peritoneum; of the kidneys. Signs of mercurial erethysm in the dead body. Method of distinguishing whether corrosive sublimate has been introduced during life or after death. Force of the evidence from morbid appearances; somewhat greater than in the case of arsenic.

Treatment; antidotes; albumen; gluten; general treatment. Treatment of mercurial erethysm.

Illustration of the foregoing remarks, by reference to the case of Bridon, reported by Professor Chaussier; trial of Paterson at Edinburgh in 1816; of Mr. Hodgson at Sunderland in 1824.

Section X.—*Of Poisoning by Copper and its Compounds.* Physical and chemical properties for distinguishing metallic copper, and its oxides. *Sulphate of copper.* Tests for it in the solid state. Tests for it in solution: metallic

iron; caustic potass; ammonia; hydrocyanate of potass; sulphuretted hydrogen; arsenite of potass or ammonia. *Nitrate of copper* is known by the same tests, and by the effect of nitric acid on the precipitate by barytic water. *Carbonate of copper*. *Acetate of copper*, and verdigris; its tests. *Ammoniacal sulphate of copper*.

Effects of animal and vegetable substances on metallic copper; circumstances which govern its solution in various fluids used in cooking; and preventatives to be employed when copper vessels are used for cooking.

Influence of vegetable and animal fluids on the operation of the tests for copper. Method for discovering its presence in minute quantities in the most composite fluids.

Symptoms produced by the sulphate and acetate of copper. Mode of action. It is an active irritant, and likewise acts through absorption. Successful attempts to detect copper in the blood of animals poisoned by it. Symptoms caused by the soluble salts of copper on man; cases in illustration. Effects on workmen.

Morbid appearances caused by them; and treatment; antidotes.

Section XI.—*Of Poisoning by Antimony and its Compounds.* Tests for determining the nature of antimony; its sulphuret; tartar emetic; its tests; lime water; sulphuretted hydrogen; infusion of galls. Effects of vegetable and animal fluids on solutions of tartar emetic, and on its tests, and method of detecting it when mixed with them.

Symptoms caused by tartar emetic. Its mode of action is twofold; it irritates and acts through absorption; can it act through any other channel but the stomach? In man it rarely causes much injury, because it is generally vomited. Exceptions and their cause. Symptoms when not vomited; question as to its harmlessness as a *counter-stimulant*, when given in large doses. Cases of poisoning. Morbid appearances and treatment.

Section XII.—Hydrochlorates of tin; nitrate of silver; muriate of gold; nitrate of bismuth; chromate of

potass; sulphate of zinc. Short remarks on their chemical tests, mode of action, symptoms, morbid appearances, and treatment.

Section XIII.—*Of Poisoning with Lead and its Compounds.* Physical and chemical properties of lead; tests for its *oxides*, particularly litharge and minium; cerusse or its *carbonate; acetate;* tests for it in the solid state; method of reducing it on the small scale; in the fluid state; sulphuric acid and the sulphates; sulphuretted hydrogen; alkaline carbonates; hydrocyanate of potass; hydriodate of potass; metallic zinc. Effects of vegetable and animal fluids on acetate of lead.

Action of water on leaden pipes and cisterns. Circumstances which regulate the solvent power of water over metallic lead; effect of pure water; of water with various saline impregnations; of water impregnated with vegetable acids; adulteration of articles of food and drink with lead; of wine and other spirituous liquors; cyder; rum. Effect of tin in preventing its solution.

Symptoms of poisoning with lead. Of the mode of action of the acetate; it is an irritant and acts through absorption on the nervous system. Symptoms in man produced by the acetate as an irritant. Symptoms produced by all the preparations of lead when gradually introduced into the system; colica pictorum; symptoms in its different stages. It may be produced by the application of lead in any form to any part of the body. Anomalies in the operation of lead when constantly applied to the body.

Morbid appearances; in the case of irritant poisoning; of colica pictorum. Treatment of irritant poisoning and of colica pictorum. Preventatives to be observed by those who work with lead. Statement of the different trades that expose workmen to colica pictorum, of the frequency of the disease among them, and of the average mortality.

Section XIV.—*Of Poisoning with Baryta and its Compounds.* Tests for baryta, its carbonate and muriate. Influence of vegetable and animal fluids in disguising the

action of the tests. Action of the salts of baryta on the animal body; it is an irritant, and also acts through absorption; symptoms; morbid appearances; treatment. *Appendix.* Strontia and its salts are not poisonous.

FOURTH ORDER OF THE IRRITANTS.—*Vegetable and Animal Irritants.*

Introductory remarks on their peculiar mode of action; their remarkable effects when applied to wounds; spreading inflammation of the subcutaneous cellular tissue. Few of them enter the blood. Symptoms in man.

SECTION XV.—Of poisons belonging to the natural order *Tithymaloidæ*, viz. *Euphorbia*, effects of the various species on man and animals. *Castor-oil-tree*,—*Jatropha*, or bitter cassada.

SECTION XVI.—Of poisons belonging to the natural order *Cucurbitaceæ*; the *Bryony*, *Elaterium*, colocynth. Their effects on animals and on man in poisonous doses.

SECTION XVII.—Of poisons belonging to the natural order *Ranunculaceæ*; *Ranunculus*; *Anemone*; *Delphinium*, or Staves-acre, and its alkaline principle the Delphinia; Celandine; Clematis; Marsh-marigold; Globe-flower.

SECTION XVIII.—Of poisons scattered throughout various natural orders.—*Gamboge*; *Mezereon*; *Savine.* List of plants not well examined, but probably belonging to the present order of poisons.

SECTION XIX.—*Of poisoning with cantharides.*—Physical characters of cantharides—powder; and method of ascertaining its nature. Action on animals; is an irritant, and likewise acts through the circulation. Symptoms in man; are in some respects peculiar; inflammation of the urinary organs frequent; irritation of the genital system by no means regular; can never be excited without other symptoms of poisoning and great danger to life. Morbid appearances; treatment.

SECTION XX.—Poisonous fish; of the tropics; more particularly poisonous muscles. Symptoms produced by them, and the controversies regarding the cause of their

occasional poisonous properties; real cause unknown; idiosyncrasy is the cause in some people. Poisonous oysters.

Section XXI.—*Of Poisonous Serpents.*—Effects of the poison of the viper; cobra di capello; rattlesnake; poisonous insects.

Section XXII.—*Of the Poisonous effect of Putrid and Diseased Animal Matters* when used as food, or applied to the skin, or to wounds, or injected into the veins, or when their effluvia are breathed. Effects of habit on the operation of these poisons. Symptoms in man.

FIFTH ORDER OF THE IRRITANTS.—*Mechanical Irritants.*

Section XXIII.—Effects of fragments of metals; stones; kernels of fruits; pounded glass; the last is not a poison; boiling water; melted lead.

Of Narcotic Poisons.

Introductory observations on their symptoms and morbid appearances, and on the diseases which produce similar effects; of their symptoms; morbid appearances generally trifling. Of the diseases which cause similar symptoms; apoplexy; inflammation of the cerebral tissue; worms in the intestines; epilepsy; hysteria; concussion of the brain. Method of determining, by comparison of the symptoms and morbid appearances, whether death has taken place by one of these diseases, or by narcotic poison. Is it always or ever possible to distinguish the two causes by this kind of evidence alone? Several observations on the principles to which the narcotic poisons owe their properties.

Section XXIV.—*Of Poisoning with Opium.*—On the various modes in which it has been and may be secretly taken. Physical properties. *Morphia*, its alkaline properties. Mode of preparing it; physical and chemical properties; its right to the name of alkali considered. *Narcotine*, another crystalline principle in opium; its

properties. Method of detecting opium or morphia by chemical analysis in composite fluids.

Mode of action of opium; does it act through sympathy? doubtful; but it certainly acts also through absorption—and chiefly on the brain. Symptoms produced by opium on man; pure sopor; occasionally convulsions; which are more common in animals. Differences caused in its effects by difference in dose. Cases; anomalies in the symptoms; vomiting; intermission of the sopor; what dose is requisite to prove fatal; action of morphia on animals; on man; case of *Castaing;* action of narcotine.

Morbid appearances; are in general insignificant; as they appear in the best marked cases; an example; varieties in the state of the lungs; stomach; skin; blood; tendency of the body to decay. General remarks on the force of evidence drawn from the symptoms and morbid appearances, when the poison is not detected.

Treatment; emetics; extracting syringe; constant agitation or motion: dashing cold water on the body; artificial respiration; acids; treatment of the sequelæ.

Section XXV.—*Of Poisoning with the Hyoscyamus, or Henbane.*—Botanical characters of the hyoscyamus; physical properties of the roots. Action on animals. Symptoms produced in man. Circumstances that affect the energy of the root; of the leaves; of the extract.

Section XXVI.—Of poisoning with the Lactuca or *Opium-Lettuce*, and with the different species of *Solanum;* nigrum; dulcamara.

Section XXVII.—*Of Poisoning with the Hydrocyanic Acid and its Compounds.*

Of pure hydrocyanic acid. Its preparation and characters when concentrated; when diluted. Its mode of action; does it act through sympathy? this question doubtful, but it certainly acts also through absorption. Symptoms in man; in the largest doses that are safe; in poisonous doses. Morbid appearances are trifling; such as occur in a well-marked case; varieties; in the

state of the blood; brain; stomach; rapidity of putrefaction; treatment. Effects of its compounds; the hydrocyanates are very active; the *triple prussiates* or ferrocyanates are not poisonous.

Of the substances which contain hydrocyanic acid. The *Bitter almond.* Effects of the fruit itself and of its essential oil on animals and on man. The *Cherry-Laurel.* Properties of its essential oil; of its distilled water. Detailed account of the symptoms caused by the latter on man; of the morbid appearances. The *Peach* blossom; the *Bird-cherry.*

Illustration of the foregoing inquiries by reference to the trial of Captain Donnellan.

Section XXIX.—*Of the Deleterious Gases.* Many of them are not narcotic; reasons for considering them all under one head. Great importance of this subject in regard both to medical jurisprudence and medical police. Method of determining whether a gas is positively poisonous, or negatively so by being simply irrespirable. By injection into the veins and arteries; precautions; validity of conclusions; effects of *oxygen* and *azote* when injected into the veins and arteries; of *carbonic acid;* of *sulphuretted hydrogen;* of *nitric oxide gas;* of *ammonia.*

Of the effects of the gases on man. 1. The irritant gases. *Nitric oxide gas* and *nitrous acid vapour; chlorine; ammonia; muriatic acid gas.* 2. Narcotic gases. *Sulphuretted hydrogen;* its very noxious properties even when diluted. *Carburetted hydrogen. Carbonic acid.* Is it positively or negatively poisonous? proofs that it is a positive poison. Effects of carbonated waters; of the gas itself in a state of purity; when diluted with air; as produced by burning charcoal; from burning candles; from burning coal; by the respiration of animals. Difference in the symptoms according to the impurities derived along with it from its source. Morbid appearances. *Carbonic oxide.* Nitrous oxide, or intoxicating gas.

Of Narcotico-Acrid Poisons.

Of the symptoms and morbid appearances caused by

this class of poisons, and of the diseases which may be confounded with them.

Section XXX.—Of the narcotico-acrid poisons of the natural order *Solaneæ*. *Belladonna;* its mode of action; symptoms; morbid appearances. *Thorn-apple;* mode of action; symptoms; morbid appearances. *Tobacco;* mode of action of the leaves; of an infusion; of their essential oil; effects on man.

Section XXXI.—Of the narcotico-acrids of the natural order *Umbelliferæ*. *Hemlock;* effects on animals; symptoms in man; morbid appearances. *Water-hemlock;* effects on animals and on man. *Hemlock dropwort;* effects on man. *Fool's parsley;* effects on animals and on man.

Section XXXII.—Of the narcotico-acrids of the natural order *Ranunculaceæ*. *Monk's hood;* effects on animals; symptoms in man. *Black hellebore;* effects on animals and on man.

Section XXXIII.—Of the narcotico-acrids allied to the preceding in property, and derived from various natural oders. *Squill;* effects on man and animals. *White hellebore* and *Meadow Saffron;* their effects on animals and man; effects of their alkali the *Veratria*. *Foxglove.*

Section XXXIV.—Of the narcotico-acrids which excite pure tetanus. *Strychnia;* its chemical and physical properties; remarkable action on animals; plants which contain it. *Nux Vomica;* its chemical characters; its effects on animals; symptoms in man, and morbid appearances; cases; the symptoms are quite characteristic of poisons of this section. *The Ignatia bean. Upas Tieuté. Brucia;* its chemical properties and effects on animals. *Brucea antidysenterica.* American poisons of unknown origin.

Section XXXV.—Of the narcotico-acrids which excite tetanus and coma together. *Camphor. Cocculus Indicus* and its alkali the *Picrotoxia. Upas Antiar.*

Section XXXVI.—Of the poisonous *Mushrooms*; list and botanical description of the chief poisonous genera which are liable to be mistaken for those which are edi-

ble; general characters for the poisonous species; circumstances which modify their poisonous properties. Symptoms caused by them in man; sometimes very characteristic; morbid appearances. Poisoning of edible mushrooms with other poisons.

Section XXXVII.—*Spoiled Grains. Spurred Rye.* Its cause and physical characters; remarkable effects on man. In a large dose it causes convulsions and coma; in repeated small doses dry gangrene; supposed effect in accelerating delivery, and bringing on abortion. *White Darnel.* Symptoms in man; general remarks on the diseases of other grains.

Section XXXVIII.—Alcohol and ether. *Alcohol;* its relative effects according to the dose; poisoning in large doses; sometimes causes inflammation; effects of its long-continued use; morbid appearances; poisoning of alcohol with other poisons. Its mode of action. *Sulphuric ether;* its effects on animals.

CHAPTER IV.

OF DEATH BY ASPHYXIA OR STOPPAGE OF THE RESPIRATION.

Introductory observations on the physiology and pathology of death by Asphyxia; its causes; phenomena; outward symptoms; internal changes; manner of death, viz. poisoning of the system with venous blood. Appearances seen after death; black blood in the arteries; congestion of the great veins; congestion of the lungs. Sometimes no congestion at all; causes of the difference. General treatment of asphyxia; interval during which resuscitation is possible and probable. Artificial breathing; mode of operating, and precautions. Stimuli, internal and external. Venesection. Tobacco clysters. Electricity and galvanism.

Section I.—*Of Death by Suffocation.*—The signs of apoplexia are generally distinct in this species of it; and why? The various modes of suffocation; accidental, in-

tentional. Is voluntary suffocation possible? By swallowing foreign bodies; by suspension of the breath; by long-continued running.

Section II.—*Of Death by Strangling.*—Is difficult to accomplish. Various ways of strangling; accidental strangling; of strangling as the consequence of murder; of suicide; is suicide in this way possible? Appearances produced by strangling; those of asphyxia generally; those peculiar to this variety.

Section III.—*Of Death by Hanging.*—Method of causing it; generally is the consequence of suicide; exceptions; accidental hanging. Complete and incomplete asphyxia by hanging. Cause of death in this variety of asphyxia; various, but generally simple deprivation of air; exceptions; is death ever the consequence of apoplexy? Appearances in the body after death; common errors on the subject; the rope-mark; lividity; congestion, &c. Circumstances which render the appearances occasionally strong, occasionally trifling; namely, incomplete or complete obstruction of the windpipe; non-removal or removal of the rope; period of the examination; concussion of the brain and spine. Treatment.

Section IV.—*Of Death by Drowning.*—Difficulty and importance of this subject. Various opinions at different periods as to the cause of death by drowning; it is simple obstruction of the windpipe. Phenomena of drowning in animals; differences observed among different men in the phenomena of drowning. Syncopal asphyxia and asphyxia by inhalation of water; differences between these two varieties, and causes of the differences. Appearances in the dead body; great discrepance among authors on the subject; causes of their disagreement; lividity; expression of the countenance and body generally; cerebral congestion; pulmonary congestion; presence of water in the air-passages,—various opinions and experiments on the subject; erection of the epiglottis; froth in the air-passages; presence of water in the stomach; distension of the belly; rigidity of the limbs; fluidity of the blood; excoriation of the fingers and face.

Why these signs are sometimes absent, sometimes present; in what way they are usually combined.

Section V.—*Of the Imitative Signs of Death by Asphyxia.*—Congestion on the skin; of the lungs; marks imitating the effects of strangling and hanging during life.

Section VI.—*Of the chief Questions regarding Death by Asphyxia, which may occur in Courts of Law.*

1. *When a person is found dead by Asphyxia, is Death the consequence of accident, murder, or suicide?* Distinctions as to agency in the case of suffocation; strangling; hanging; drowning. *a. Suffocation*—signs of accident, suicide, murder. *b. Strangling*—generally the work of another; how it may be done by the individual himself; case of *General Pichgru;* comparison of the mark with the instrument; collateral circumstances; trial of *Captain Goodere*, London. *c. Hanging*—generally the effect of suicide; exceptions. Method of investigation; determination that death was actually caused by hanging; position of the body and collateral circumstances; the cord; marks of other injuries; state of the clothes, habits of the deceased. Illustrations; trial of *Jean Calas*, Thoulouse; cases from Louis; case of *Hebner*, London, 1796. *d. Drowning*—are the chances on the side of accident, suicide, or murder? are there any varieties in the natural signs of asphyxia, according to a difference as to agency? Method of investigating the question of agency; the place; circumstances relative to the body, namely, marks of violence, and extraneous circumstances independent of violence; character and habits of the deceased. Illustrations; case of *Paulet*, from the *Causes Célèbres;* interesting case by Professor Chaussier.

2. *If a body is found apparently strangled, was strangulation the cause of death?* Criterions derived from the mark round the neck; from the presence or absence of the signs of asphyxia. Illustrations. Trial in the case of the murder of *Sir E. B. Godfrey.*

3. *If a body is found hanging, was hanging the cause of death?* Criterions derived from the rope-mark; signs of

other violence; has death been caused by strangling or hanging? Illustrations. Case from Deveaux; from Chaussier.

4. *If a body is found in the water, was the individual drowned?* Are the appearances such as were formerly mentioned under SECTION IV, characteristic of drowning? Answer to this question in the case of water in the air-passages; froth in the air-passages; water in the stomach; scratching of the fingers. Evidence from the signs of other violence on the body. Illustrations. Case of *Maizières* from Foderé; trial of *Standfield* for parricide, Edinburgh; of *Cowper*, Hertford.

CHAPTER V.

OF DEATH BY BURNING.

Effects of heat when applied in various degrees of violence; local effects; constitutional effects; irritative fever; nervous depression. Great degree of heat required for the combustion of the body in its natural state; preternatural combustibility, ordinarily called spontaneous combustion. Cases in illustration of the phenomena of preternatural combustibility. Is there any reason to believe in spontaneous inflammation and combustion of the body? Alleged cases of the kind; their import considered. Summation of the evidence in favour of the occurrence of preternatural combustibility; remarks on its probable cause.

Effects of heat on the dead body; how are they to be distinguished from the appearances in the case of death by burning? Illustrations of the foregoing inquiries by reference to two recent trials in Scotland; probability of preternatural combustibility in both instances. General method of investigating questions regarding death by burning. *Appendix*—of the *coup de soleil.* Of the cause of death, and appearances in the body.

CHAPTER VI.

OF DEATH BY COLD.

Local effects of cold; frostbite. Constitutional or general effects. Symptoms and manner of death. Varieties in the effects of cold according to collateral circumstances; when combined with exposure to wet; with ascent into the higher regions of the atmosphere. Appearances in the dead body.

CHAPTER VII.

OF DEATH BY LIGHTNING.

Manner of death: local effects of lightning. Does the electric fluid pass along the skin, or through the internal parts of the body? Probably sometimes one way and sometimes the other; proofs that it passes through the internal parts. Varieties of the effects of electricity; death by lightning without thunder. Appearances in the body; of two kinds, probably depending on the transmission or non-transmission of the shock *through* the body.

CHAPTER VIII.

OF DEATH BY HUNGER.

Symptoms of starvation in its several degrees and stages; general symptoms; varieties according as the deprivation of food is complete or incomplete, according to varieties of constitution; appearances in the body. Voluntary death by starvation; extraordinary examples in persons not insane; forcible starvation; trial from Foderé; trial in the case of *Elizabeth Canning*.

Appendix *to the* First Division.

1. *Of Medico-legal Inspections.* Necessity for considering this subject.

Of the forms to be observed. Forms in Germany; in Scotland and England; too little attended to in Britain. Of the warrant for inspection, and the power it gives the inspector. Of the persons who ought to be present, and of those who ought not to be present. Mental prepara-f tion of the inspector; he should not consider himsel bound to prove the case for the crown, and should inspect with patience.

Is it necessary to examine the whole cavities of the body in every case? Reasons for never neglecting this point, and remarkable cases in illustration of its importance as a general rule; opinion of foreign authors on the subject. Should the whole cavities be examined in the *pro forma* inspections for coroner's inquests? Suppose a surgeon has neglected to examine certain cavities, what influence has his neglect on the evidence from the inspection? Absurdity of some continental decisions regarding this question; circumstances under which a defective examination will influence the force of the evidence, and those under which the evidence continues valid.

Of inspections after burial, and the interval after which they become useless or dangerous. Remarks on the progress of putrefaction, as affecting appearances of disease or violence on the body, and on the causes which accelerate or retard it. Inference, that a stated period cannot be laid down, within which inspections must be made, and after which they become useless. Opinions of foreign authors on the subject. The general rule should be to disinter the body whenever that is ordered.

This being done, is it always safe to proceed? Is a practitioner obliged to proceed in the face of danger? Risks from the inspection of decayed bodies; are much exaggerated. Inhalation of irrespirable gases; when concentrated dangerous; when diffused hardly so. Can they

produce putrid fevers? At what stage of putrefaction do they become dangerous? Inoculation with putrid animal matter; not more dangerous than with morbid matters from fresh bodies. Opinion of Professor Bernt, that bodies should be inspected in every stage of putrefaction. Rules laid down by him to ensure safety.

Suppose it is granted that the inspection is safe, will it be useful? The answer must vary with circumstances, and particularly with the main object of the inspection: answer when the object is to identify the body;—to examine bruises, or contused and simple wounds;—to search for poison: remarkable examples of the detection of arsenic four, five, and fourteen months after interment;—to determine whether a child has been born alive or dead; to examine injuries of the bones: examples of the detection of murder by examining the bones ten and thirteen years after death.

Method of inspecting the body. Instruments necessary. The inspector should be supplied with the evidence as to the manner of death; great defect in British practice in this particular.

Examination of the floor or ground, and objects in the neighbourhood; evidence as to these points which ought to be collected by a medical man: examples. Trial of *White* for libel; of *Thornton* for murder. How to distinguish the pace of any one by the length of the step and character of the foot print. Examination of the dress. Striking examples of medical evidence from this part of the inspection. Examination of the external surface of the body; of the internal organs; mode of opening the head, chest, belly, spine, and of examining their organs, either when injured or when not injured by external violence.

2. *Of Medico-legal Reports.* Method of framing reports adopted on the continent. Reports required in this country; defects of the present system; how they may be supplied. General instructions on the framing of reports in the case of inspections after death; of inspections during

life for ascertaining the progress of cure, or degree of injury sustained.

3. *Of Medical Evidence.* General remarks on the estimation in which it is held.

A. Of the nature of medical evidence. Poverty of information among legal and medico-legal writers on the subject. Evidence consists in facts only; exceptions to that rule; the whole of medical evidence is an exception; by being allowed to give opinions the medical witness properly assumes the province of the jury.

Of the *Facts* in medical evidence, and their characteristics; 1. They are delicate, and therefore require a talent for observation to collect them. 2. They are apt to be confounded with opinions, which is one great cause of the discrepant testimony of medical witnesses: illustrations in the case of poisoning; in the case of imitative injuries; obscurities often thrown over the primary inspections in consequence of opinions being mistaken for facts. 3. Are they mutable? why has the character of uncertainty been attached to medical facts? Injustice of this in a great proportion of instances.

Of *Opinions* in medical evidence. General qualifications required for giving medico-legal opinions. Of derived experience; state of the law regarding the competency of derived experience as evidence; defects of the present practice in this particular; inconsistency of the English practice; practice in Scotland; disquisition on the reasonableness and consequences of prohibiting reference to authorities; it strikes at the root of all medical evidence whatsoever. Of personal experience; the name is often misused in medico-legal proceedings; experience in ordinary practice, and in medico-legal practice, are by no means synonymous; and why. Medico-legal opinion should rarely depend on personal experience alone.

B. Of the qualifications, disqualifications, and conduct of medical witnesses. Loose practice of our courts as to the admissibility of medical witnesses; even quacks are admissible; none but persons legally qualified to practice should be admitted to depone to medical facts, unless

cum nota. What qualifications should be required of regular practioners? a man may be qualified to depone to facts, though not to give his opinion; propriety of drawing this distinction in legal practice. A man may be qualified to give an opinion, although he has not personally ascertained the facts; is his opinion equally valid with that of the original inspector? disquisition on the present practice on this point; and proof that for the most part his opinion is superior, or would be so, if the present system of reporting was improved; mode of improving the reports; should the inspectors be allowed to add any facts to the case as detailed in their report? or modify their opinion? In what manner it may be determined whether the evidence of a witness should be restricted to his facts. Should errors in his evidence invalidate his whole testimony? opinions of foreign writers on the subject; inconvenience of the opinions in practice.

Of the disqualification of medical witnesses arising from *undue influence.* Legal definition of undue influence in its several varieties; instructions how to depose; medical witnesses incur this disqualification without being disqualified; question as to the propriety of their seeing each other's reports and declarations; question as to the propriety of their consulting together before the trial; great advantages to justice derived from such consultations; practice in foreign countries; reference of important questions to medical corporations; objections of lawyers to medical consultations; weakness of these objections; practice on the subject unsettled; but now frequently admits consultations. Corrupt bias; eagerness to be employed in a case, or to prove the case; does it affect a witness's competency or credibility.

Of the disqualification arising from *partial counsel.* Legal definition; effect of suggesting inquiries to magistrates; offering to give evidence; advising the prosecutor how to conduct his cause; peculiar situation of medical witnesses in the last respect; impropriety of the practice permitted in England of a medical man first prompting counsel in the examination of his brethren, and then giv-

ing his own evidence; he may suggest questions for information as to facts.

Of the conduct of medical witnesses; necessity of avoiding all hesitation in giving opinions; of doubting when they are not doubtful. Should the witness always return a simple answer to the question? Impropriety of *lecturing*. Can he refer to notes in his examination? Under what conditions this is permitted. He should avoid professional language as much as possible, particularly terms which have both a vulgar and a professional meaning.

SECOND DIVISION.

OF MEDICO-LEGAL INQUIRIES RELATIVE TO THE ORGANS AND FUNCTION OF GENERATION IN THE FEMALE.

CHAPTER I.

OF THE INQUIRIES NECESSARY IN CHARGES OF RAPE.

Structure of the female organs of generation in the virgin state; appearances after simple defloration; after frequent sexual intercourse. State of the labia, nymphæ, fourchette, orifice of the vagina, canal of the vagina, hymen; discordant statements as to the existence or non-existence of the hymen; varieties to which its structure is liable; inferences as to virginity from its structure. Its presence is not necessarily a proof of virginity, for impregnation may take place without its having been passed, and without its having been ruptured, although passed. Its absence is not necessarily a sign of the loss of virginity, because it is probably sometimes wanting, or at least of such a structure as not to be torn, or materially altered, by sexual intercourse; or because it may be ruptured by other causes. Value of hemorrhage during connexion as a sign of previous virginity.

General observations on the crime of rape, and the relative medico-legal questions that occur on trials. Statutes on the subject; protect every female whatsoever; hence, in regard to medical inquiries, the crime may be considered as perpetrated in three circumstances; before puberty; in an adult virgin; in one who has been connected before. In the first case violence is not necessary to constitute the crime, and the medical investigation is generally decisive. Difficulties in the second case; whence they arise. In the third case medical inquiries are seldom useful.—Evidence on charges of rape; from the presence or absence of the signs of virginity; marks of other violence near the organs of generation; marks on other parts of the body; presence or absence of venereal diseases on one or other of the parties; chief questions on the last point. Necessity of an early examination in charges of rape; inferences from delay in the accuser to inform. What are the conditions necessary to establish a charge of rape; in a physiological point of view; in the actual practice of courts of law; errors of law-courts on the subject. Is complete penetration necessary? is emission necessary? ought they to be accounted necessary? What degree of force is necessary to establish a charge of rape; exceptions to the condition of force; can a ravished person conceive? Illustrations of the foregoing inquiries; cases of false charge of rape from Foderé,—Trial of *Bryant*, London.

CHAPTER II.

OF THE INQUIRIES NECESSARY IN ACCUSATIONS FOR PROCURING ABORTION.

Changes which the female organs of generation undergo in consequence of conception. Of the signs of pregnancy; enlargement of the abdomen; changes in the state of the breasts; suppression of the catamenia; nausea, loss of appetite, and other disorders of the general

constitution; movements of the fœtus; alterations in the state of the uterus,—mode of ascertaining them by the touch.

Signs of recent delivery in the living body; disappearance of the signs of pregnancy; state of the external organs of generation; state of the womb and os uteri; state of the belly; presence of milk in the mammæ; lochial discharge; milk fever; remarks on the evidence afforded by these circumstances separately; and conjunctly. Chief sources of fallacy. Dropsy and hydrometra; case of alleged delivery arising from hydrometra, from the *Causes Célèbres.* Moles; nature of them and phenomena they occasion; case from Foderé supposed to be pregnancy. Necessity of ascertaining the signs of recent delivery very soon after it has taken place.

Signs of recent delivery in the dead body. Corpora lutea. Is a corpus luteum a true sign of impregnation? Opinions of Sir Everard Home, and observations of Mr. Bauer on the origin and progressive changes of the ovary during the development of the corpus luteum; the corpus luteum is the bed in which the ovum is formed. Opinions and observations of Haller on the same subject; the corpus luteum is formed by matter deposited in the cavity from which the ovum has been extracted. Remarks on the relation of these opinions to the evidence of impregnation, as taken from the presence of corpora lutea. Changes in the Fallopian tubes; state of the uterus.

Statutes regarding the crime of procuring abortion; in Scotland; England; France. Distinction in the heinousness of the crime according to the stage of pregnancy. Exceptions to the rule that intentionally procuring abortion is criminal.

Method of investigating medico-legal questions respecting this crime. The circumstances relative to the previous history of the female; evidence as to her pregnancy and recent delivery; evidence as to the ovum thrown off; evidence as to the cause of the miscarriage.

Causes of miscarriage in a criminal point of view. Internal medicines. Mistaken ideas of the older physi-

cians and modern vulgar, respecting the power of medicines to occasion miscarriage. The only medicines which cause miscarriage are poisons; and they cannot cause miscarriage without also causing their other poisonous effects. Effect of violent purging; aloes; colocynth; savine. Effect of irritation of the organs of generation; cantharides. Effect of great impressions on the general system; blood-letting,—various statements on its influence; mercurial erethysm; spurred rye; these causes are much less certain than is generally thought, and probably seldom act but on a predisposed habit. External means of causing abortion. Violence applied to the whole body; kicks on the abdomen; violent agitation; continued pressure of the belly; electric shocks through the belly; tearing the membranes through the os uteri in the advanced stages; piercing the uterus in the earlier stages. *Trial of Angus* at Liverpool, in 1808; commentary on the evidence of criminal abortion in that case.

CHAPTER III.

OF THE INQUIRIES NECESSARY IN ACCUSATIONS OF CONCEALMENT OF PREGNANCY, EXPOSURE OF INFANTS, AND INFANTICIDE.

Physiological observations on the progress of the fœtus, with the view of establishing the criterions of its several stages of maturity. Brief summary of its progress in the early months. Detailed statement of the changes about the time when it becomes capable of surviving birth. State of the skin and its appendages in the sixth, seventh, eighth, and ninth months. Average weight in these successive months. Average length. Proportion of the upper and lower parts of the body. Size and texture of some of the internal organs; brain; lungs; liver; intestines as to contents; testicles and ovaries; ossification of the vertebræ. General statement of the changes which

the fœtus undergoes immediately after birth; changes in the lungs, heart, and great vessels; intestinal contents; umbilical chord.

Statutes on the subject of child murder, and concealment of pregnancy. Early statutes in the various European kingdoms; in Britain. Statutes of 1809. Conditions necessary for constituting the crimes of child murder, and concealment of pregnancy.

Questions arising out of these statutes.

I. *Has the prisoner been recently delivered?* already considered under chapter II.

II. *Was the child so mature as to render it probable it might have lived?* Recapitulation of the physiological inquiry at the head of this chapter. At how early a period is it possible for the fœtus to outlive delivery? controversies on this subject. On account of the particular circumstances attending cases of infanticide, the question of maturity is easily decided in general. Can the prisoner support the defence of immaturity in any other way than by producing the fœtus?

III. *Was the child found really that of the prisoner?* This question is determined, at least approximatively, by comparing together the state of the child's body and that of the prisoner. 1. Comparison of the probable duration of the prisoner's pregnancy with the state of maturity of the child. 2. Comparison of the signs which accompany the progressive changes of the female after delivery, with the age of the child when it died, together with the period that has elapsed after death;—signs of putrefaction in the womb. 3. Comparison of the signs of the kind of labour as judged of by marks on the child on the one hand, and by the structure of the prisoner's organs, or actually ascertained length of her labour.

IV. *Can the prisoner have been ignorant of her pregnancy and labour till it was too late to call for assistance, or till she was actually delivered?* Conditions requisite. 1. Impregnation must have taken place without her knowledge; under what circumstances this is possible; instances in point. 2. Her pregnancy must imitate some natural disease. Is this possible? Circumstances which render it so; and

instances in point. 3. She must have been delivered without her knowledge, which is possible in certain circumstances; or the labour must have come on so suddenly, and in such a situation, that she could not procure help, which is not uncommon. Circumstances which render these conditions at all times rare in conjunction, and particularly in medico-legal cases.

V. *Was the child born dead or alive?* This question may be decided; 1. By the signs of immaturity already considered.

2. By the marks of death in the womb or passages. Signs of death in the uterus; from Chaussier; Jaegar. Signs and causes of death during labour; from Capuron. The most important causes in relation to medical jurisprudence are protracted delivery of the chord; twisting of the chord round the child's neck; premature separation of the placenta, and rupture of the chord; general weakness of the child.

3. By the child having or not having breathed, or undergone the other vital changes attending respiration. Introduction to the tests derived from these circumstances; the *Docimasia pulmonum.*

Test from dilatation of the chest; proposed by Daniel; result of Professor Bernt's late experiments at Vienna. *Static* test, or test from the increased weight of the lungs; absolute weight, proposed by Daniel; relative weight to that of the body, by Plouquet. Commentary on the value of this test; exceptions to its application, as derived from the experiments of Chaussier, Schmitt, and Bernt, in the case of immature children, malconformed lungs, diseased lungs. *Hydrostatic* test, or test from the diminished specific gravity of the lungs. Fallacies and objections to this test. 1. The lungs may sink though the child survived birth, because it may live for some time without breathing. Digression on suits under the law of *Tenant by courtesy.* 2. The lungs may sink, though the child lived after birth, because the lungs are developed gradually after delivery; precautions on this account. 3. Because the lungs may be tubercular, œdematous,

gorged with blood; precautions on account of this fallacy. 4. The lungs may swim, though the child was still-born, because it breathed in the uterus; question of uterine respiration and *vagitus uterinus*; late observations of Bernt. 5. Because the child breathed in the passages; circumstances under which this may happen. 6. Because the lungs have been dilated artificially. Is this a valid objection? can a woman inflate the lungs of her child? can the fallacy be obviated by any collateral signs of artificial inflation? 7. Because the lungs have been distended by the gases of putrefaction. Force of this fallacy, and mode of obviating it. 8. Because the lungs may be distended by a sort of emphysema. Mode of obviating that fallacy. General remarks on the evidence furnished by the hydrostatic test. Test from the colour of the lungs, their consistence, and vesicular appearance. Tests from the contents of the stomach, intestines, and urinary bladder; from the contents of the trachea and its ramifications; from the state of the umbilical cord. The *Vienna* test lately proposed by Professor Bernt, and taken from the state of the arterial duct and relative size of the great vessels of the heart. Circumstances under which this test is applicable. General method of investigating the evidence relative to the present question. Rules as to the inferences to be drawn in some special cases.

VI. *What was the cause of the child's death?* Causes of death during labour. The natural causes *already mentioned.* Violent causes, as enumerated by Capuron. Causes of death after delivery. Natural causes; immaturity and malformations; general weakness; occlusion of the nostrils by the membranes or discharges; accidental fractures; accidental suffocation; injuries caused while the child is in the womb. Criminal causes of death after delivery. Child-murder by omission; omitting to tie the umbilical cord; exposing the child; neglecting to suckle it; child-murder by commission. Suffocation in privies; dislocation of the neck; bathing in hot water; injuries of the head; distinctions between accidental and intentional injuries, and between intentional injuries and those caused

by difficult labour; puncture of the fontanelles; cutting the *frænum linguæ*.

CHAPTER IV.

APPENDIX OF DETACHED SUBJECTS RELATIVE TO THE FUNCTION OF GENERATION.

Of the ordinary term of utero-gestation, and the varieties to which it is liable. Legal questions connected with the subject. Case of the Gardner Peerage. Of superfœtation, and the question regarding its possibility. Of the child-bearing period, and the varieties to which it is liable; questions regarding *substitution* of children.

THIRD DIVISION.

OF MEDICO-LEGAL INQUIRIES RELATIVE TO DISQUALIFICATIONS.

Importance and difficulty of this subject. Its object in regard to legal inquiries.

CHAPTER I.

OF DISQUALIFICATIONS ARISING FROM DERANGEMENTS OF THE MIND.

Section I.—*Of Idiopathic Derangements of the Mind.*—Preliminary remarks on the terms used by physicians and by lawyers to denote the different derangements of this description; confusion produced by them. Madness; idiocy; unsoundness of mind; difference between them; and non-existence of the last as a distinct species. In what does mental derangement consist? Want of the perception of moral right and wrong; want of control

over ideas and actions. Must the want of the perception of moral right and wrong be habitual. Is absolute irrationality in the act for which an individual is indicted, an adequate proof of mental derangement? Great difficulty of this question. Is probably valid in certain cases of sudden furiosity; instances in point; in other cases very questionable. Practice in verdicts on cases of suicide. A. *Of madness.* Its distinctions from idiocy. Its varieties in a medico-legal point of view. 1. Constant or intermitting. 2. Partial or universal. 3. Furious or manageable. 1. *Of lunacy.* In his lucid intervals a lunatic is responsible for crimes, and capable of discharging his social duties; at the same time, in questions as to acts during such intervals some account must be taken of the rationality of the acts. Principles of law as to this in the case of murder; testamentary deeds. 2. *Of partial madness,* or monomania. Singular instances of hallucination on single points only. Varieties of monomania; hallucination as to one's own person; one's affairs; his future state; his state of health. Method of ascertaining the existence of monomania. Question as to the criminal responsibility of a person affected with monomania, when the act does not regard the subject of his delusion; question in the case of his executing a testamentary deed; and of his mismanaging his property; question as to monomania as a plea in bar of execution for a capital crime. 3. Importance of the distribution of patients according as they are manageable or furious. *Appendix.* On somnambulism; case of purposed murder by a somnambulist; of homicide committed during the agitation caused by awaking from frightful dreams.

Symptoms of madness generally. The conceptions of unprofessional people are erroneous and vague. A medical man's opinion as to the existence of madness should not be founded on single facts or circumstances. Mode in which the various kinds of madness begin and terminate; relation of these circumstances to law proceedings. Actual terminations of madness. Morbid appearances

caused by madness; our information on this head is very imperfect.

B. *Of Idiocy.* Definition; varieties as to degree. Demency. Idiocy may be congenital or acquired; in the former case is generally connected with some perceptible malformation of the head. Questions in law relative to idiocy; pretended idiocy; question whether idiocy in a special case is great enough to remove criminal responsibility; to incapacitate from the discharge of social duties.

Treatment of madness and idiocy. Application of the foregoing remarks to questions in civil and criminal law. *Pretended insanity.* Mode of settling questions relative to that head, viz. by learning the history of the case as connected in point of time with acts which form the subject of question; expression of the features; symptoms; particular contrivances. *Imputed insanity.* What varieties may be imputed. Caution as to cases in which there is some weakness of mind, though not amounting to insanity. *Chance of Cure,*—according to the kind of insanity; according to the duration of the case; according to the age of the individual; according as there is a hereditary taint or not. Signs of returning reason. Can a medical man pronounce as to the state of mind of one he never saw? Difficulties in the way; defects in the present method of investigating such cases.

Section II.—*Of Symptomatic Derangements of the Mind.* Introductory remarks on the nature of such derangements, the light in which they are regarded by the law, and the confusion arising from their being confounded with idiopathic derangements.

1. Of those mental derangements which are the *sequelæ* of bodily diseases; hysteric mania; epileptic fatuity; epileptic furiosity, as succeeding the paroxysm; as preceding it; as taking the place of it. Puerperal furiosity.

2. Of those mental derangements which accompany bodily disorders throughout the whole or in the middle part of their course. Examples of mental derangement throughout their whole course; apoplexy; hypochondriasis. *Appendix*—on the deaf and dumb. Examples of

mental derangement occurring only during the height of the disease; occurs in most febrile diseases; form of the derangement in such cases. Examples of mental derangement occurring frequently in the course of a disease; hysteria; consumption.

3. Of those derangements of the mind which attend the final stage of most chronic and many acute diseases. Enumeration of the diseases whose close is accompanied by a long stage of stupor; those which cause gradual exhaustion; diseases of the head; chest; belly; pelvis; diseases of the general constitution.

4. Of that derangement or weakness of mind which the Scottish law of deathbed assumes to be present in all diseases whatsoever. Origin of the law. Restrictions. Irrationality both of the law itself and of the restrictions. Medico-legal questions which the law of death-bed may give rise to.

CHAPTER II.

OF DISQUALIFICATIONS ARISING FROM DISEASES OF THE BODY.

Disqualifications for military service. Bodily diseases which disqualify recruits. Enumeration of them. *Appendix* on feigned diseases generally, and in reference to military service particularly.

Disqualifications for other public burdens and duties, such as for holding offices of various kinds.

Disqualifications for marriage. Impotence and sterility. Their causes; external signs. Question in law relative to them.

Disqualifications for effecting life insurances. General remarks on life insurances in their relation to medical police and medical jurisprudence. What diseases do, and which ought to disqualify altogether from effecting them; and what diseases entitle insurance companies to demand an additional premium.