Edited by
Jason Payne-James
and Roger W Byard

Forensic and Legal Medicine

Clinical and Pathological Aspects

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Forensic and Legal Medicine

Clinical and Pathological Aspects

A comprehensive and accessible resource covering all aspects of forensic and legal medicine. The text provides a foundation for those working in both the clinical and forensic aspects of care and will also be an asset to those involved in the police or judicial systems. Including clear guidelines with practical applications, and further enhanced by its many illustrations and case examples, this text is a valuable resource in an increasingly complex field. The authoritative work is written by those who have extensive experience for a wide audience including, but not limited to, forensic pathologists, general pathologists, pediatric pathologists, forensic physicians, forensic scientists, coroners, emergency department physicians, judges and legal practitioners.

Forensic and Legal Medicine

Clinical and Pathological Aspects

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To Lucy without whose unwavering support this text would not have been possible

Roger Byard, Adelaide, Australia

With thanks to my family for their support and to the many friends and colleagues with whom I have collaborated over the years.

Jason Payne-James, Southminster, UK

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Jason Payne-James LLM, MSc, FFFLM, FRCS, FRCP, FCSFS, FRFCFM(RCPA), RCPathME, DFM, LBIPP, Dip MOD is a Specialist in Forensic and Legal Medicine and is based in the UK. He has been a forensic physician for 30 years. Previously he worked in hospital medicine, predominantly in surgical, trauma and gastroenterological specialties.

He has published on a wide range of subjects including injury, wound and scar documentation and interpretation, imaging of injury and scars, clinical and ethical aspects of healthcare in custody, complaints against healthcare professionals, forensic evidence collection, restraint and less-lethal systems, miscarriages of justice, harm and death in custody and torture.

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He co-edited Age Estimation in the Living Current Practice in Forensic Medicine (1st & 2nd volumes); Monitoring Detention, Custody, Torture and Ill-treatment. He designed the ForensiGraph® and the ForensiDoc® App. He was lead editor on the 1st edition of Forensic Medicine: Clinical & Pathological Aspects.

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In November 2021, in the Australian National Research Awards Professor Byard was named a world leader in forensic science among Australia's top lifetime achievers, and in 2022 was ranked as the top-rated expert of 83 821 published authors internationally in the Forensic Sciences 2012–2022 (https://expertscape.com/ex/forensic+science).

In 2004, he was awarded the Australian Public Service Medal (PSM) for outstanding service to paediatric pathology, and in 2013 became an Officer in the Order of Australia (AO) for distinguished service to medicine in the field of forensic pathology. He was registered as an Expert with the International Criminal Court (ICC) in the Hague in 2009. In 2016, he was elected a Fellow of the Australian Academy of Health and Medical Sciences (FAHMS) for distinguished professional achievements and outstanding leadership in a field related to health and medicine.

In 2016, he was also the recipient of the Distinguished Researcher Award from the International Society for the Study and Prevention of Perinatal and Infant Death (ISPID). He has received 18 awards for published papers and book chapters from the National Institute of Forensic Science, Australia. In 2018, he received the John Harbor Phillips Award from ANZPAA/NIFS (National Institute of Forensic Science) for outstanding achievement and excellence in the advancement of the forensic sciences in Australia and New Zealand.

He is an alumnus of six universities: the University of Tasmania (Distinguished Alumnus 2016), The University of Adelaide (Distinguished Alumnus 2013), the University of South Australia (Australia), McMaster University, the University of Toronto and the University of Ottawa (Canada).

He has a specific interest in sudden infant and childhood death, and general forensic research, and has published over 1 000 chapters and peer-reviewed papers (>550 first authorships) and a number of textbooks.

He was the Editor-in-Chief/Managing Editor of *Forensic Science Medicine and Pathology* (Springer Publishers, New York) from 2008 to 2021.

He was awarded the Humanitarian Overseas Service Medal (HOSM – Indian Ocean clasp – for "humanitarian service overseas in hazardous circumstances"), the RCPA medal and the Australian Federal Police (AFP) Operations Medal (Cawdor and Alliance clasps) for disaster victim identification work in Bali after the bombings in 2002 and in Thailand after the tsunami in 2004.

He has been invited to give educational forensic workshops/presentations in a number of countries including Argentina, Austria, Canada, China, Croatia, Denmark, Finland, France, Germany, Hong Kong, Iceland, India, Indonesia, Israel, Italy, Japan, Kazakhstan, Malaysia, Myanmar, New Guinea, New Zealand, Norway, Portugal, Saudi Arabia, Serbia, Singapore, South Africa, Spain, Sri Lanka, Switzerland, the Netherlands, the United Kingdom, the United States and Uruguay.

He was made a Distinguished Fellow of the Royal College of Pathologists of Australasia in 2018 in recognition of outstanding contributions to pathology and to the medical and wider community. In addition to his basic medical and other post graduate qualifications Professor Byard has three higher doctorates: a Doctor of Philosophy (PhD), a Doctor of Medicine (MD) and a Doctor of Science (DSc).

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Preface

> "Convictions are more dangerous enemies of truths than lies".
>
> Friedrich Nietzsche (1844–1900)

Increasingly the field of forensic and legal medicine has become more complex in many areas that include not only the recording, investigation and processing of cases, but also in dealing with the increasing sophistication of laboratory analyses and in navigating the sometimes byzantine world of court interrogations and processes. Media scrutiny, often with criticism, is ever present in high profile cases.

Practitioners in all medicolegal areas are now required to keep abreast of the literature which entails not only reading current research and opinion papers but also being able to correctly identify bogus reports propagated by so-called predatory journals. The adversarial system encourages debate which unfortunately may be based on convictions rather than on a careful and dispassionate analysis of the facts; Nietzsche clearly pointed out his concerns about the dangers of convictions.

For this reason, the era of the solo practitioner is coming to an end. Peer review with more collaborative case analyses in the workplace is becoming the norm in an attempt to circumvent idiosyncratic practices with erroneous conclusions that did occur in the past when practitioners were isolated. The same is occurring with textbooks, with considerable strength and credibility being achieved by multi-author content. While this has occurred in the following chapters, it is not imagined that there is going to be agreement on all of the topics discussed. However, it is hoped that clear analysis of the literature with well-founded and defensible opinions by individual authors or groups of authors may be useful to the reader. It is felt that the text will act as a substantial foundation for further reading on specific topics.

The text is, therefore, an attempt to provide an up-to-date general treatise on forensic and legal medicine covering both clinical and pathologic aspects with a multitude of high-quality images and practical tables. It has been broadly divided into four sections dealing firstly with general principles of forensic and legal medicine. In this section, topics include the history and development of forensic and legal medicine, international ethical principles and human rights law, issues around euthanasia and professional conduct for not only medical practitioners but also for nurses and paramedics. Overviews of the roles of medical defense organizations, coroners and medical examiners and the United Nations and non-governmental organizations are provided. The principles of death investigations are outlined, with pointers on how to give evidence in court.

The second section deals with traditional pathologic issues such as the differences between hospital and medicolegal autopsies and the analysis of sharp and blunt force trauma to various bodily regions. Natural deaths (including those related to COVID-19), suicides and homicides are described, along with infant and childhood, maternal and perioperative deaths. Ballistic and blast trauma are evaluated, with an assessment of custody and restraint deaths. Problems with the timing of death and post-mortem identifications and age assessments are listed. Environmental issues such as thunderstorm asthma are investigated with chapters on heat deaths, drowning, burns and electrocution. Forensic post-mortem imaging and associated technologies are summarized with comments on the Minnesota Protocol.

The third section covers all aspects of clinical forensic medicine ranging from the role of the forensic physician and sexual offense examiner to healthcare in detention and determination of fitness to detain and interview, as well as issues with the use of herbal medicines and the features of female genital mutilation. Novel psychoactive substances are described with sections on substance misuse in detention and acute behavioral disturbances. The interpretation of injuries and those pertaining to sexual assault are reviewed in addition to the role of the Istanbul Protocol in monitoring ill treatment and abuse in custody. Restraint and control techniques, including the use of conducted energy devices are analysed.

The fourth and final section provides information on a range of forensic science and related specialities including chapters on misinterpretation and fallacies in forensic evidence and the principles of crime scene management and blood pattern analysis. In addition, there is information on forensic photography, odontology, toxicology, DNA analysis, microbiology, anthropology and entomology. Other topics covered include disaster victim identification, veterinary forensic pathology and working with the media. The full listing of topics may be found in the Table of Contents.

Thus, this text provides over 100 chapters written by contemporary experts in their fields from all over the globe, on a full range of medicolegal topics. The editors also have considerable experience in forensic medicine and pathology and have published extensively in the peer-reviewed literature on a wide range of subjects. For this reason, the book stands alone as an example of international multidisciplinary collaboration that has produced a definitive new multi-layered text on medicolegal matters that will be essential reading for forensic clinical practitioners, pathologists, medical examiners, coroners, lawyers and any individual involved in forensic case work and the courts. In addition, it will be a

necessary text for university and college libraries to provide access for students of law, medicine, nursing, forensic science and ancillary disciplines.

It has been a great privilege to work with contributors of such high caliber and to see the text evolve into such an impressive tome. We look forward to seeing it extensively utilized over the years and hope that it will assist in the guidance, development and practice of this most complex of disciplines.

Jason Payne-James
Roger Byard

SECTION
1

Principles of Forensic & Legal Medicine

CHAPTER

1

History and Current Status of Forensic and Legal Medicine

Jason Payne-James

INTRODUCTION

Forensic medicine, legal medicine, and forensic pathology are terms that have been used interchangeably around the world. The term "forensic & legal medicine" embraces these and brings them together to indicate all branches of medicine and related specialties that interact with legal processes, either directly or indirectly. Forensic & legal medicine is recognized as a specialty area of medicine in some countries, but not all. Although not a monospecialty, the Union Européenne des Médecine Spécialistes (European Union of Medical Specialists [UEMS]) recognizes "legal & forensic medicine" as a thematic federation (1). Forensic & legal medicine embraces forensic pathology, which investigates unnatural, unexpected, or violent death, or when the cause of death is unknown, and clinical forensic medicine, which is used to refer to that branch of medicine which involves interaction between the living person, medicine and legal or judicial processes (2).

A forensic pathologist does not usually (in general) deal with living individuals, whereas a forensic physician does not usually deal with the deceased. There are, however, many medical practitioners in some jurisdictions whose workloads embrace both clinical and pathological aspects of forensic & legal medicine. Many practitioners have qualifications or training in medicine, law, and science. There are many areas where both clinical and pathological aspects of forensic & legal medicine overlap, and this is reflected in the history and development of the field and its contribution to part of the wide field of forensic sciences. The term "forensic pathologist" is used generally to describe those who undertake autopsies performed on the instructions and request of legal bodies responsible for the investigation of sudden, suspicious, obscure, unnatural, litigious, or criminal deaths. A forensic pathologist undertakes the examinations to assist and advise the state or other investigating agencies in the interpretation of the findings and to suggest further relevant investigation. The legal bodies that may make these requests may be agents of the state, the judiciary, the police, lawyers representing those arrested for murder, those involved in legal action, health and safety organisations, and many other possible sources.

"Clinical forensic medicine" refers to medical practice whose scope involves interaction between the law, the judiciary and the police involving (generally) living persons. Clinical forensic medicine is a term that has become generally recognized in the last four decades or so, although the phrase has been used at least since 1951 in the UK, when the Association of Police Surgeons (which became the Association of Forensic Physicians in 2003 until it in turn was replaced by the Faculty of Forensic & Legal Medicine of the Royal College of Physicians) was first established. Previously, terms such as police surgeon, divisional surgeon, forensic medical officer (FMO) and forensic medical examiner (FME) have been used and persist in some jurisdictions. Table 1.1 gives examples of the range of roles which may be applicable to forensic physicians and Table 1.2 illustrates themes that may have relevance to all practitioners of forensic & legal medicine. Some forensic practitioners work in all these areas, while others (such as sexual offense examiners) focus on one aspect. A forensic pathologist and forensic physician need to have a good knowledge of "medical jurisprudence" – the application of medical science and related specialties to the law. The function and role of forensic pathologists and forensic physicians can differ widely or overlap, depending on local judicial systems or statute and, in many cases, result in the need for a special understanding of medical law and medical ethics.

ORIGINS AND DEVELOPMENT

The origins of forensic and legal medicine go back many centuries although the terms forensic medicine and medical jurisprudence date back to the earliest part of the nineteenth century. In 1840, Thomas Stuart Traill emphasized the range of terminology used, stating "*…it is known in Germany, the country in which it took its rise, by the name of State Medicine, in Italy and France it is termed Legal Medicine; and with us it is usually denominated Medical Jurisprudence or Forensic Medicine*" (3).

Pharmacology and pharmacognosy (the branch of knowledge concerned with medicinal drugs obtained from plants or other natural sources) were subjects of writings in China from around 3000 BCE. In 1975, Chinese

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TABLE 1.1 Examples of some current functions of forensic physicians (roles and functions vary in different jurisdictions)
Medical care of prisoners in police custody
Forensic assessment of prisoners in police custody
Assessment of those arrested for traffic offenses
Forensic assessment of complainants (including biological sample taking and wound documentation)
Medical care of complainants
Mental health assessment of complainants
Assessment of complainants of sexual assault
Assessment of complainants or suspects in hospitals/police custody/prison custody
Child protection/safeguarding
Adult safeguarding
Assessment of intimate partner violence
Medical assessment of police or prison personnel
Forensic assessment of police or prison personnel
Refugee and asylum seeker assessment
Assessment of detainees in Immigration Removal Centers
Assessment of torture and CIDT claims
Written evidence to courts, tribunals, coroners and others
Live evidence to courts, tribunals, coroners and others

TABLE 1.2 Contemporary themes in forensic and legal medicine
Abusive head trauma in children
Causes of death in custody
Disclosure of evidence in sexual assault cases
DNA: current developments and perspectives
Fitness to plead and stand trial
Forensic radiology in evaluation of soft-tissue injury
Medical and toxicological aspects of chemical warfare
Needs and problems of the older person in prison
Non-fatal strangulation
Non-lethal physical abuse in the elderly
Post-mortem radiological autopsy
Sudden death
Weapons used to police public assemblies around the world
Who makes false allegations and why?
Working with torture victims

archeologists discovered a number of bamboo pieces that had information on the rules and regulations for examining injuries – these dated from approximately 220 BCE. The Hammurabi Code (named after the king of Babylon – now in modern Iraq) dated back to approximately 2200 BCE and dealt specifically with the rights and duties of physicians, including medical malpractice. Penalties for such malpractice ranged from cutting off the hands of the offending physician to financial compensation.

The Law of Manu (India) dates back to approximately 10 BCE and dealt with issues still particularly relevant today, including the competence of witnesses in courts. In Egypt, laws regulated the medical profession and physicians had to strictly follow the methods used by ancient physicians. Stab wounds were categorized and closed head injuries with skull fractures described. Papyri related to Roman Egypt dating from the latter part of the first to the latter part of the fourth century AD contain information about forensic medical examination or investigation. In Persia (now Iran), there was an official scale of medical fees and a restriction of medical practices to certain castes and classes of the community, and penalties were meted out for medical malpractice. Injuries were subdivided into several groups; abortion was a serious crime.

Amundsen and Ferngren reviewed the role of physicians as expert witnesses in classical Greece and concluded that forensic medicine was used by Athenian courts and other public bodies and that the testimony of physicians in matters of a medical nature was given particular credence (4,5). In the Roman Republic, the Lex Duodecim Tabularum (449 BCE) made minor reference to medicolegal matters including length of gestation (to determine legitimacy), disposal of the dead, punishments dependent on the degree of injury caused by an assailant, and poisoning (6). The Lex Aquilia of 572 BCE dealt with the lethality of wounds. The "novus actus interveniens" in relation to deaths from wounds was brought into play and declared as a break in causation. Sulla's "Lex Cornelia" (138–78 BCE) declared that a physician should be exiled or executed if it was established that he had caused the death of his patient. The body of Julius Caesar (100–44 BCE) after his murder in the forum was examined by the physician Antistius who declared that there were 23 stab wounds, only one of which was a fatal wound. The Emperor Justinian (AD 483–565) in his "Digest", recorded that "*physicians are not ordinary witnesses, but give judgment rather than testimony*" which is also an early indicator of the role of opinion rather than factual evidence.

Between the fifth and the tenth centuries, the "Dark Ages", the "Leges Barbarorum" of the Goths, Visigoths and Vandals laid down clearly when medical experts were called for. "Wergeld" (blood money) was payable to the victim or on death to relatives of the decedent by the perpetrator – and these principles apply in certain cultures today. The first Holy Roman Emperor, Charlemagne (742–814) had his bishops produce the "Capitularies" in which the need for expert medical testimony was required in wounding, abortion, rape, incest, infanticide and suicide. In 1209, the influence of the Church was formalized by Pope Innocent III with the appointment of physicians to the courts. In 1234, Gregory IX in his "Compilatio Decretalium"

collected all decisions and edicts in relation to medicolegal matters and these held sway in France until 1677.

Many forensic and legal medicine texts were produced from a wide variety of centers in the sixteenth to eighteenth centuries, and these and earlier key dates are identified by Madea (7) summarizing data from Payne-James (8), Bonte (9) and Smith (10).

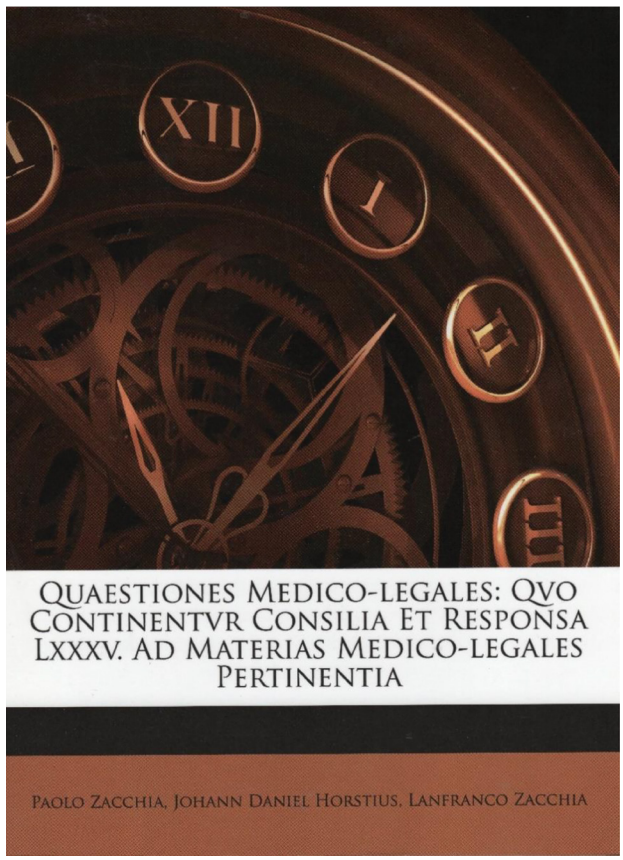
Traill (3) stated that "*Medical Jurisprudence as a science cannot date farther back than the 16th century*" and identified George, Bishop of Bamberg who proclaimed a penal code in 1507, as the originator of the first examples of codes where medical evidence was a necessity in certain cases. However, it was the Constitutio Criminalis Carolina – the code of law published and proclaimed in 1553 in Germany by Emperor Charles V – that has a reasonable claim to have originated legal medicine as a specialty. Within these codes of 1553, expert medical testimony became a requirement rather than an option to give opinions in cases of murder, wounding, poisoning, hanging, drowning, infanticide and abortion. In 1575, the military surgeon Ambrose Paré produced his book on medicolegal reports and also wrote about deaths from lightning, antemortem versus post-mortem injuries, and poisoning by carbon monoxide and corrosives.

In 1595, the text "Methods Testificandi" was published by Codronchius, a physician from Imola and, in the following year, Fortunatus Fidelis published "De Relationibus Medicorum" from Palermo. The French physician, Séverin Pineau wrote his book on defloration and virginity, and he discussed at some length the existence of the hymen. Paulo Zacchia (1584–1659) was the principal physician to Pope Innocent X and Alexander VII and between 1621 and 1635 published "Quaestiones Medico Legales", a huge and authoritative work in several volumes including subjects such as age, legitimacy, insanity poisoning, virginity, rape and wounds. Paolo Zacchia has been referred to as "*the father of forensic medicine*" (7). Figure 1.1 shows the frontispiece of one of the original volumes and a facsimile version of that is still available (Figure 1.2). Beck & Darwell also referred to the "Pandects of Valentini" published in Germany in 1702 which they describe as "*an extensive retrospect of the opinions and decisions of preceding writers on legal medicine*" (11). In France in 1796, Fodere published the first edition in three octavo volumes of his work "Les lois éclairées par les sciences physiques, ou traité de médecine-légale et d'hygiène publique".

Autopsies for medicolegal purposes were well documented in parts of Italy and Germany five centuries


PAVLI
ZACCHIÆ
ROMANI,
TOTIVS STATVS ECCLESIASTICI
PROTO-MEDICI GENERALIS,
QVÆSTIONVM
MEDICO-LEGALIVM,
TOMI TRES
Editio nova à variis mendis purgata, passimque interpolata, & novis recentiorum Authorum Inventis ac Observationibus aucta,
Curâ IOAN. DANIELIS HORSTII, diversorum S.R.I. Principum Archiatri, & Collegij Medici Mœno-Francofurtani Senioris.
Opus omnibus Medicinæ & Iuris utriusque peritis, necnon Tribunalium (Ecclesiastici, Civilis) Assessoribus maximè necessarium.
Præter Indices Librorum, Titulorum & Quæstionum, annexus est Index Rerum Notabilium locupletissimus.
DE FORTI DVCETO
LVGDVNI,
Ex Typographia GERMANI NANTY.
M. DC. LXXIV.
CVM SVPERIORVM PERMISSV.

1.1 Frontispiece of one of the original volumes of Paulo Zacchia's *Quaestiones Medico Legales*. This one dates from 1674.



1.2 A facsmile version of Paulo Zacchia's *Quaestiones Medico Legales*.

before the use of such procedures within the English coronial setting. The use of such expertise was not limited to deaths or to Europe. Cassar describes an early example of such expertise reviewing a recorded medicolegal report of the sixteenth century from Malta from 1542, which refers to the depositions of two medical experts, Dr Joseph Callus and Dr Rainerio de Bonellis in which it was established that the male partner was incapable of sexual intercourse, and this resulted in a marriage annulment (12).

These historical references of medical expertise being used in the context of law prior to the eighteenth and nineteenth centuries confirm the longstanding recognition of the need for, and the status of, forensic and legal medicine in many jurisdictions.

PUBLISHED WORKS FROM THE EIGHTEENTH CENTURY ONWARD

Multiple books and treatises concerning forensic medicine and medical jurisprudence were published in the English language (or translated into English) in the eighteenth century. What is notable is that the issues addressed by many of the authors are ones that would not be out of place in a contemporary setting, although many of these principles are restated today as though they are new. Table 1.3 provides examples of questions addressed in such texts that have direct relevance today (13–15). During the course of the next two centuries, numerous medicolegal texts appeared in Germany and France; chairs of medical jurisprudence were installed in Paris, Strasbourg, and Montpellier with such major authorities as Mahon, and later Orfila and Tardieu in Paris, Chaussier in Dijon, Foderé in Strasbourg, Johann Ludwig Casper in Berlin, and Eduard Ritter von Hofmann in Vienna.

In 1783, William Hunter (16) published essays related to the findings in the murder of bastard children, and this may be the earliest "forensic medicine" publication from England. The first larger work ("Elements of Medical Jurisprudence") was published in 1788 by Samuel Farr, itself translated from 1767 Fazelius of Geneva's publication "Elementa Medicinae Forensis". Davis refers to these and to "Remarks on Medical Jurisprudence" by William Dease of Dublin, and OW Bartley of Bristol's "Treatise on Forensic Medicine or Medical Jurisprudence" (17). Davis considers both of these of poor quality and makes the statement that the "first original and satisfactory work" was George Male's "Epitome of Juridical or Forensic Medicine", published in 1816. A second edition was published in 1821. Male was a physician at Birmingham General Hospital and is sometimes considered to be the father of English medical jurisprudence. However, the first course of lectures to medical students on legal medicine were given in Britain by Andrew Duncan (senior), then Professor of Physiology in Edinburgh, in 1789. These were published in 1792 as the Heads of Lectures on Medical Jurisprudence or the Institutiones Medicinae Legalis. Duncan's eldest son occupied the first chair of medical jurisprudence and medical police created by central government as a Regius Chair with royal patronage in 1807. Chairs were later established in Glasgow (1839) – Robert Cowan, and in Aberdeen (1857) – Francis Ogston. In England, the first professor was John Gordon Smith (1773–1832) and later George Edward Male (1779–1845). Others followed later in the London medical schools. In 1856, a course in medical jurisprudence was an essential prerequisite for admission to the Faculty of Advocates in Edinburgh (18, 19).

Benjamin Rush (1745–1813) in New York (yet another Edinburgh medical graduate) and a signatory of the Declaration of Independence, wrote on medical jurisprudence. In 1804, an Edinburgh-trained physician, JA Stringham (1775–1813), was appointed as a lecturer in medical jurisprudence at the College of Physicians and Surgeons of New York and was appointed to a Chair in 1813.

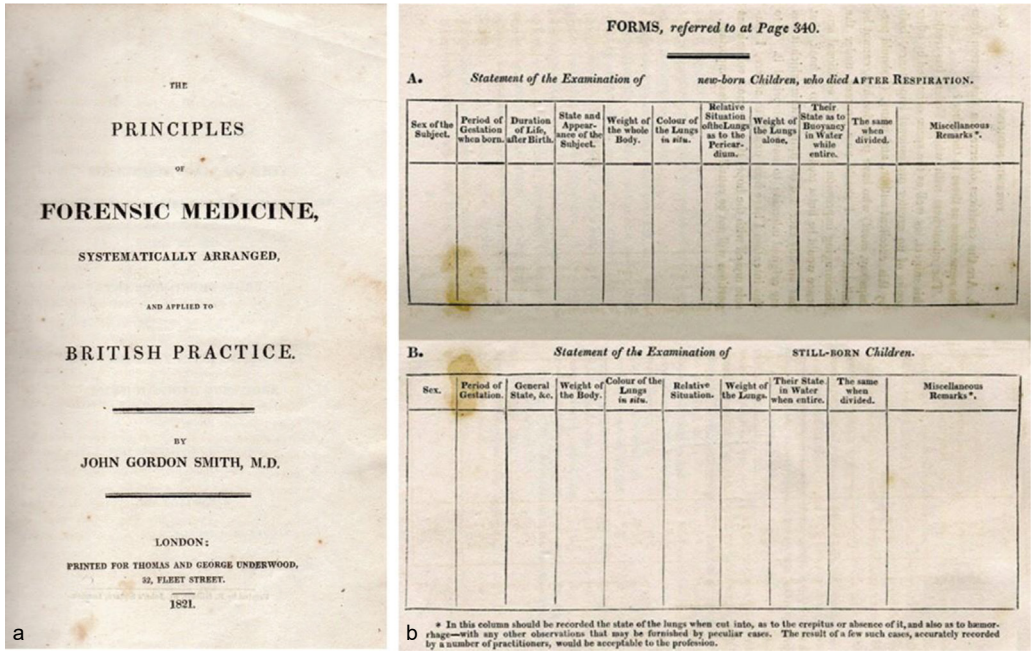
Texts on forensic medicine began to appear more rapidly with much broader content. John Gordon Smith (17) in his book "The Principles of Forensic Medicine Systematically Arranged and Applied to British Practice", published in 1821, stated that "*Forensic Medicine – Legal, Judiciary, or Juridical Medicine – and Medical Jurisprudence are synonymous terms*."

Figure 1.3(a) and (b) shows the frontispiece of this book and reproduces the forms from it used to document information about neonatal deaths and stillborn babies. Smith refers in his Preface to the earlier books and notes: "*It is but justice to mention that the American schools have outstripped us in attention to Forensic Medicine*" – and he may have been referring to the work of Theodore Romeyn Beck and others. TR Beck and his brother JB Beck (both pupils of Stringham) became leaders in their field by their publications and lecturing.

TR Beck published the first American textbook two years later. The 3rd edition of "Elements of Medical Jurisprudence" was published (with John Darwall) in 1829 and this edition helpfully provides (for medical historians at least) a "*catalogue of books referred to*" extracts of which are reproduced in Figure 1.4 (20). He had provided his first lectures on medical jurisprudence in 1815 at Western Medical College, New York.

TABLE 1.3 Examples of questions (and their sources) raised in historical texts relevant today

How far can medical jurists, from the external inspection of a body, form an opinion as to the length of time that a person has been dead? (13)
What weapon was used? Was the injury inflicted during life or after death? Was the injury the result of accident, or self-inflicted or inflicted by another? (14)
Was death due to drowning or to some other cause operating before immersion? (14)
Was the drowning accidental, suicidal or homicidal? (14)
Can a female during sleep be violated without her knowledge? (14)
Of whom is this body? (13)
Is ecchymosis a necessary result of violence? (20)



THE

PRINCIPLES

OF

FORENSIC MEDICINE,

SYSTEMATICALLY ARRANGED,

AND APPLIED TO

BRITISH PRACTICE.

BY

JOHN GORDON SMITH, M.D.

LONDON:

PRINTED FOR THOMAS AND GEORGE UNDERWOOD,

32, FLEET STREET.

1821.

a

FORMS, *referred to at Page 340.*

A. *Statement of the Examination of new-born Children, who died* AFTER RESPIRATION.

Sex of the Subject.	Period of Gestation when born.	Duration of Life, after Birth.	State and Appearance of the Subject.	Weight of the whole Body.	Colour of the Lungs *in situ*.	Relative Situation of the Lungs as to the Pericardium.	Weight of the Lungs alone.	Their State as to Buoyancy in Water while entire.	The same when divided.	Miscellaneous Remarks*.

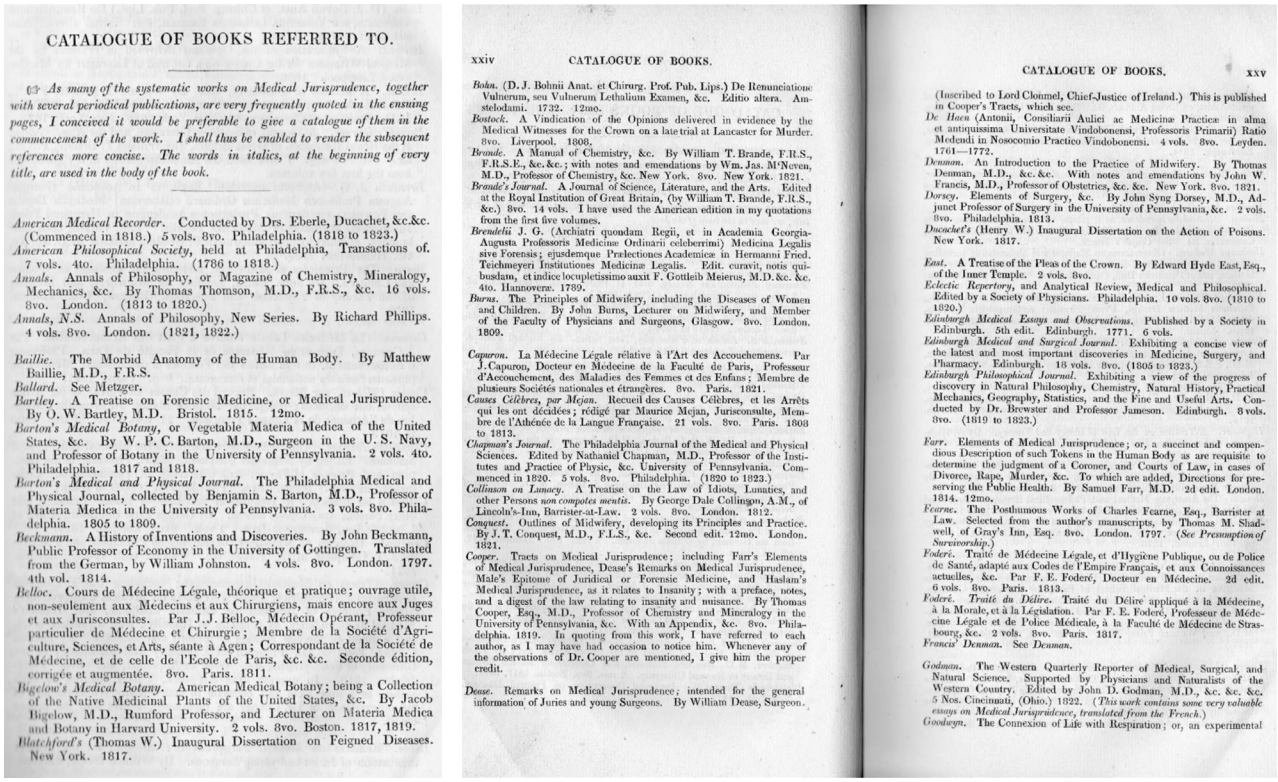
B. *Statement of the Examination of* STILL-BORN *Children.*

Sex.	Period of Gestation.	General State, &c.	Weight of the Body.	Colour of the Lungs *in situ*.	Relative Situation.	Weight of the Lungs.	Their State in Water when entire.	The same when divided.	Miscellaneous Remarks*.

* In this column should be recorded the state of the lungs when cut into, as to the crepitus or absence of it, and also as to hæmorrhage—with any other observations that may be furnished by peculiar cases. The result of a few such cases, accurately recorded by a number of practitioners, would be acceptable to the profession.

b

1.3 John Gordon Smith's 1821 *The principles of forensic medicine systematically arranged and applied to British practice*. **(a)** and **(b)** show the frontispiece of this book and reproduce the forms from it used to document information about neonatal deaths and stillborn babies.



CATALOGUE OF BOOKS REFERRED TO.

☞ *As many of the systematic works on Medical Jurisprudence, together with several periodical publications, are very frequently quoted in the ensuing pages, I conceived it would be preferable to give a catalogue of them in the commencement of the work. I shall thus be enabled to render the subsequent references more concise. The words in italics, at the beginning of every title, are used in the body of the book.*

American Medical Recorder. Conducted by Drs. Eberle, Ducachet, &c.&c. (Commenced in 1818.) 5 vols. 8vo. Philadelphia. (1818 to 1823.)
American Philosophical Society, held at Philadelphia, Transactions of. 7 vols. 4to. Philadelphia. (1786 to 1818.)
Annals. Annals of Philosophy, or Magazine of Chemistry, Mineralogy, Mechanics, &c. By Thomas Thomson, M.D., F.R.S., &c. 16 vols. 8vo. London. (1813 to 1820.)
Annals, N.S. Annals of Philosophy, New Series. By Richard Phillips. 4 vols. 8vo. London. (1821, 1822.)

Baillie. The Morbid Anatomy of the Human Body. By Matthew Baillie, M.D., F.R.S.
Ballard. See Metzger.
Bartley. A Treatise on Forensic Medicine, or Medical Jurisprudence. By O. W. Bartley, M.D. Bristol. 1815. 12mo.
Barton's Medical Botany, or Vegetable Materia Medica of the United States, &c. By W. P. C. Barton, M.D., Surgeon in the U. S. Navy, and Professor of Botany in the University of Pennsylvania. 2 vols. 4to. Philadelphia. 1817 and 1818.
Barton's Medical and Physical Journal. The Philadelphia Medical and Physical Journal, collected by Benjamin S. Barton, M.D., Professor of Materia Medica in the University of Pennsylvania. 3 vols. 8vo. Philadelphia. 1805 to 1809.
Beckmann. A History of Inventions and Discoveries. By John Beckmann, Public Professor of Economy in the University of Gottingen. Translated from the German, by William Johnston. 4 vols. 8vo. London. 1797. 4th vol. 1814.
Belloc. Cours de Médecine Légale, théorique et pratique; ouvrage utile, non-seulement aux Médecins et aux Chirurgiens, mais encore aux Juges et aux Jurisconsultes. Par J. J. Belloc, Médecin Opérant, Professeur particulier de Médecine et Chirurgie; Membre de la Société d'Agriculture, Sciences, et Arts, séante à Agen; Correspondant de la Société de Médecine, et de celle de l'Ecole de Paris, &c. &c. Seconde édition, corrigée et augmentée. 8vo. Paris. 1811.
Bigelow's Medical Botany. American Medical Botany; being a Collection of the Native Medicinal Plants of the United States, &c. By Jacob Bigelow, M.D., Rumford Professor, and Lecturer on Materia Medica and Botany in Harvard University. 2 vols. 8vo. Boston. 1817, 1819.
Blatchford's (Thomas W.) Inaugural Dissertation on Feigned Diseases. New York. 1817.

Bohn. (D. J. Bohnii Anat. et Chirurg. Prof. Pub. Lips.) De Renunciatione Vulnerum, seu Vulnerum Lethalium Examen, &c. Editio altera. Amstelodami. 1732. 12mo.
Bostock. A Vindication of the Opinions delivered in evidence by the Medical Witnesses for the Crown on a late trial at Lancaster for Murder. 8vo. Liverpool. 1808.
Brande. A Manual of Chemistry, &c. By William T. Brande, F.R.S., F.R.S.E., &c. &c.; with notes and emendations by Wm. Jas. M'Neven, M.D., Professor of Chemistry, &c. New York. 8vo. New York. 1821.
Brande's Journal. A Journal of Science, Literature, and the Arts. Edited at the Royal Institution of Great Britain, (by William T. Brande, F.R.S., &c.) 8vo. 14 vols. I have used the American edition in my quotations from the first five volumes.
Brendelii J. G. (Archiatri quondam Regii, et in Academia Georgia-Augusta Professoris Medicinæ Ordinarii celeberrimi) Medicina Legalis sive Forensis; ejusdemque Prælectiones Academicæ in Hermanni Fried. Teichmeyeri Institutiones Medicinæ Legalis. Edit. curavit, notis quibusdam, et indice locupletissimo auxit F. Gottlieb Meierus, M.D. &c. &c. 4to. Hannoveræ. 1789.
Burns. The Principles of Midwifery, including the Diseases of Women and Children. By John Burns, Lecturer on Midwifery, and Member of the Faculty of Physicians and Surgeons, Glasgow. 8vo. London. 1809.

Capuron. La Médecine Légale relative à l'Art des Accouchemens. Par J. Capuron, Docteur en Medecine de la Faculté de Paris, Professeur d'Accouchemens, des Maladies des Femmes et des Enfans; Membre de plusieurs Sociétés nationales et étrangères. 8vo. Paris. 1821.
Causes Célèbres, par Mejan. Recueil des Causes Célèbres, et les Arrêts qui les ont décidées; rédigé par Maurice Mejan, Jurisconsulte, Membre de l'Athénée de la Langue Française. 21 vols. 8vo. Paris. 1808 to 1813.
Chapman's Journal. The Philadelphia Journal of the Medical and Physical Sciences. Edited by Nathaniel Chapman, M.D., Professor of the Institutes and Practice of Physic, &c. University of Pennsylvania. Commenced in 1820. 5 vols. 8vo. Philadelphia. (1820 to 1823.)
Collinson on Lunacy. A Treatise on the Law of Idiots, Lunatics, and other Persons *non compotes mentis*. By George Dale Collinson, A.M., of Lincoln's-Inn, Barrister-at-Law. 2 vols. 8vo. London. 1812.
Conquest. Outlines of Midwifery, developing its Principles and Practice. By J. T. Conquest, M.D., F.L.S., &c. Second edit. 12mo. London. 1821.
Cooper. Tracts on Medical Jurisprudence; including Farr's Elements of Medical Jurisprudence, Dease's Remarks on Medical Jurisprudence, Male's Epitome of Juridical or Forensic Medicine, and Haslam's Medical Jurisprudence, as it relates to Insanity; with a preface, notes, and a digest of the law relating to insanity and nuisance. By Thomas Cooper, Esq., M.D., Professor of Chemistry and Mineralogy in the University of Pennsylvania, &c. With an Appendix, &c. 8vo. Philadelphia. 1819. In quoting from this work, I have referred to each author, as I may have had occasion to notice him. Whenever any of the observations of Dr. Cooper are mentioned, I give him the proper credit.

Dease. Remarks on Medical Jurisprudence; intended for the general information of Juries and young Surgeons. By William Dease, Surgeon.

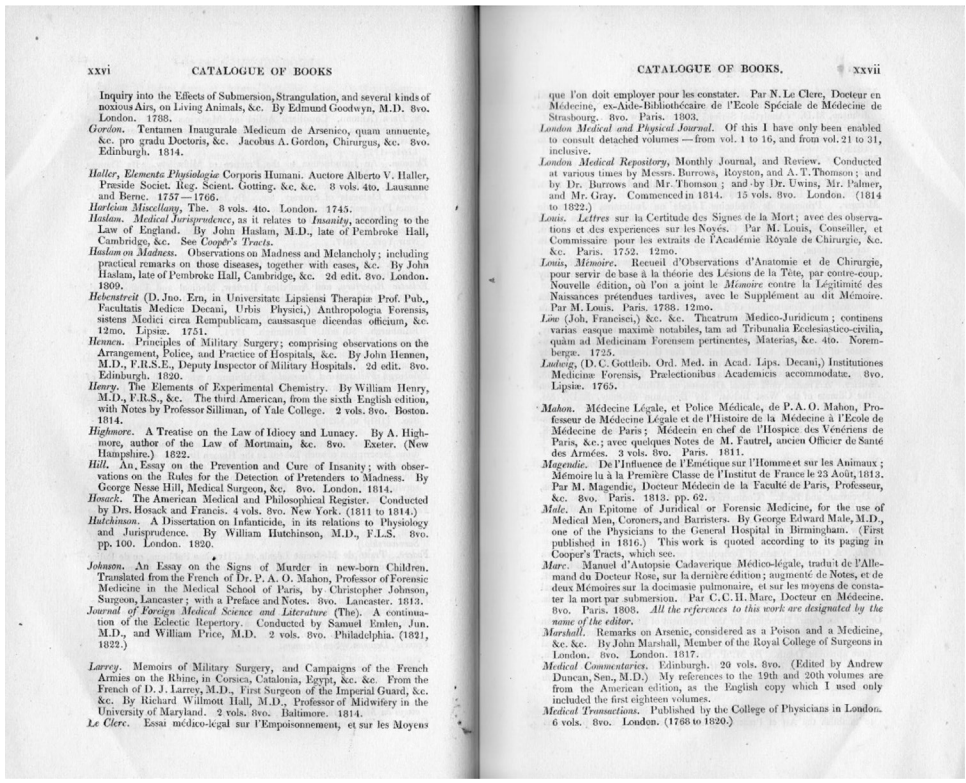
(Inscribed to Lord Clonmel, Chief-Justice of Ireland.) This is published in Cooper's Tracts, which see.
De Haen (Antonii, Consiliarii Aulici ac Medicinæ Practicæ in alma et antiquissima Universitate Vindobonensi, Professoris Primarii) Ratio Medendi in Nosocomio Practico Vindobonensi. 4 vols. 8vo. Leyden. 1761—1772.
Denman. An Introduction to the Practice of Midwifery. By Thomas Denman, M.D., &c. &c. With notes and emendations by John W. Francis, M.D., Professor of Obstetrics, &c. &c. New York. 8vo. 1821.
Dorsey. Elements of Surgery, &c. By John Syng Dorsey, M.D., Adjunct Professor of Surgery in the University of Pennsylvania, &c. 2 vols. 8vo. Philadelphia. 1813.
Ducachet's (Henry W.) Inaugural Dissertation on the Action of Poisons. New York. 1817.

East. A Treatise of the Pleas of the Crown. By Edward Hyde East, Esq., of the Inner Temple. 2 vols. 8vo.
Eclectic Repertory, and Analytical Review, Medical and Philosophical. Edited by a Society of Physicians. Philadelphia. 10 vols. 8vo. (1810 to 1820.)
Edinburgh Medical Essays and Observations. Published by a Society in Edinburgh. 5th edit. Edinburgh. 1771. 6 vols.
Edinburgh Medical and Surgical Journal. Exhibiting a concise view of the latest and most important discoveries in Medicine, Surgery, and Pharmacy. Edinburgh. 18 vols. 8vo. (1805 to 1823.)
Edinburgh Philosophical Journal. Exhibiting a view of the progress of discovery in Natural Philosophy, Chemistry, Natural History, Practical Mechanics, Geography, Statistics, and the Fine and Useful Arts. Conducted by Dr. Brewster and Professor Jameson. Edinburgh. 8 vols. 8vo. (1819 to 1823.)

Farr. Elements of Medical Jurisprudence; or, a succinct and compendious Description of such Tokens in the Human Body as are requisite to determine the judgment of a Coroner, and Courts of Law, in cases of Divorce, Rape, Murder, &c. To which are added, Directions for preserving the Public Health. By Samuel Farr, M.D. 2d edit. London. 1814. 12mo.
Fearne. The Posthumous Works of Charles Fearne, Esq., Barrister at Law. Selected from the author's manuscripts, by Thomas M. Shadwell, of Gray's Inn, Esq. 8vo. London. 1797. (*See Presumption of Survivorship.*)
Foderé. Traité de Médecine Légale, et d'Hygiène Publique, ou de Police de Santé, adapté aux Codes de l'Empire Français, et aux Connoissances actuelles, &c. Par F. E. Foderé, Docteur en Médecine. 2d edit. 6 vols. 8vo. Paris. 1813.
Foderé. Traité du Délire. Traité du Délire appliqué à la Médecine, à la Morale, et à la Législation. Par F. E. Foderé, Professeur de Médecine Légale et de Police Médicale, à la Faculté de Médecine de Strasbourg, &c. 2 vols. 8vo. Paris. 1817.
Francis' Denman. See *Denman*.

Godman. The Western Quarterly Reporter of Medical, Surgical, and Natural Science. Supported by Physicians and Naturalists of the Western Country. Edited by John D. Godman, M.D., &c. &c. &c. 5 Nos. Cincinnati, (Ohio.) 1822. (*This work contains some very valuable essays on Medical Jurisprudence, translated from the French.*)
Goodwyn. The Connexion of Life with Respiration; or, an experimental

1.4 "Catalogue of books referred to" from Theodore Romeyn Beck's 3rd Edition of *Elements of jurisprudence*, published in 1824.



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Inquiry into the Effects of Submersion, Strangulation, and several kinds of noxious Airs, on Living Animals, &c. By Edmund Goodwyn, M.D. 8vo. London. 1788.

Gordon. Tentamen Inaugurale Medicum de Arsenico, quam annuente, &c. pro gradu Doctoris, &c. Jacobus A. Gordon, Chirurgus, &c. 8vo. Edinburgh. 1814.

Haller, Elementa Physiologiæ Corporis Humani. Auctore Alberto V. Haller, Præside Societ. Reg. Scient. Gotting. &c. &c. 8 vols. 4to. Lausanne and Berne. 1757—1766.

Harleian Miscellany, The. 8 vols. 4to. London. 1745.

Haslam. Medical Jurisprudence, as it relates to *Insanity,* according to the Law of England. By John Haslam, M.D., late of Pembroke Hall, Cambridge, &c. See *Cooper's Tracts.*

Haslam on Madness. Observations on Madness and Melancholy; including practical remarks on those diseases, together with cases, &c. By John Haslam, late of Pembroke Hall, Cambridge, &c. 2d edit. 8vo. London. 1809.

Hebenstreit (D. Jno. Ern, in Universitate Lipsiensi Therapiæ Prof. Pub., Facultatis Medicæ Decani, Urbis Physici,) Anthropologia Forensis, sistens Medici circa Rempublicam, causasque dicendas officium, &c. 12mo. Lipsiæ. 1751.

Hennen. Principles of Military Surgery; comprising observations on the Arrangement, Police, and Practice of Hospitals, &c. By John Hennen, M.D., F.R.S.E., Deputy Inspector of Military Hospitals. 2d edit. 8vo. Edinburgh. 1820.

Henry. The Elements of Experimental Chemistry. By William Henry, M.D., F.R.S., &c. The third American, from the sixth English edition, with Notes by Professor Silliman, of Yale College. 2 vols. 8vo. Boston. 1814.

Highmore. A Treatise on the Law of Idiocy and Lunacy. By A. Highmore, author of the Law of Mortmain, &c. 8vo. Exeter. (New Hampshire.) 1822.

Hill. An Essay on the Prevention and Cure of Insanity; with observations on the Rules for the Detection of Pretenders to Madness. By George Nesse Hill, Medical Surgeon, &c. 8vo. London. 1814.

Hosack. The American Medical and Philosophical Register. Conducted by Drs. Hosack and Francis. 4 vols. 8vo. New York. (1811 to 1814.)

Hutchinson. A Dissertation on Infanticide, in its relations to Physiology and Jurisprudence. By William Hutchinson, M.D., F.L.S. 8vo. pp. 100. London. 1820.

Johnson. An Essay on the Signs of Murder in new-born Children. Translated from the French of Dr. P. A. O. Mahon, Professor of Forensic Medicine in the Medical School of Paris, by Christopher Johnson, Surgeon, Lancaster; with a Preface and Notes. 8vo. Lancaster. 1813.

Journal of Foreign Medical Science and Literature (The). A continuation of the Eclectic Repertory. Conducted by Samuel Emlen, Jun. M.D., and William Price, M.D. 2 vols. 8vo. Philadelphia. (1821, 1822.)

Larrey. Memoirs of Military Surgery, and Campaigns of the French Armies on the Rhine, in Corsica, Catalonia, Egypt, &c. &c. From the French of D. J. Larrey, M.D., First Surgeon of the Imperial Guard, &c. &c. By Richard Willmott Hall, M.D., Professor of Midwifery in the University of Maryland. 2 vols. 8vo. Baltimore. 1814.

Le Clerc. Essai médico-légal sur l'Empoisonnement, et sur les Moyens

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que l'on doit employer pour les constater. Par N. Le Clerc, Docteur en Médecine, ex-Aide-Bibliothécaire de l'Ecole Spéciale de Médecine de Strasbourg. 8vo. Paris. 1903.

London Medical and Physical Journal. Of this I have only been enabled to consult detached volumes — from vol. 1 to 16, and from vol. 21 to 31, inclusive.

London Medical Repository, Monthly Journal, and Review. Conducted at various times by Messrs. Burrows, Royston, and A. T. Thomson; and by Dr. Burrows and Mr. Thomson; and by Dr. Uwins, Mr. Palmer, and Mr. Gray. Commenced in 1814. 15 vols. 8vo. London. (1814 to 1822.)

Louis. Lettres sur la Certitude des Signes de la Mort; avec des observations et des expériences sur les Noyes. Par M. Louis, Conseiller, et Commissaire pour les extraits de l'Académie Royale de Chirurgie, &c. &c. Paris. 1752. 12mo.

Louis, Mémoire. Recueil d'Observations d'Anatomie et de Chirurgie, pour servir de base à la théorie des Lésions de la Tête, par contre-coup. Nouvelle édition, où l'on a joint le *Mémoire* contre la Légitimité des Naissances prétendues tardives, avec le Supplément au dit Mémoire. Par M. Louis. Paris. 1788. 12mo.

Linæ (Joh. Francisci,) &c. &c. Theatrum Medico-Juridicum; continens varias easque maximè notabiles, tam ad Tribunalia Ecclesiastico-civilia, quàm ad Medicinam Forensem pertinentes, Materias, &c. 4to. Norembergæ. 1725.

Ludwig, (D. C. Gottleib. Ord. Med. in Acad. Lips. Decani,) Institutiones Medicinæ Forensis, Prælectionibus Academicis accommodatæ. 8vo. Lipsiæ. 1765.

Mahon. Médecine Légale, et Police Médicale, de P. A. O. Mahon, Professeur de Médecine Légale et de l'Histoire de la Médecine à l'Ecole de Médecine de Paris; Médecin en chef de l'Hospice des Vénériens de Paris, &c.; avec quelques Notes de M. Fautrel, ancien Officier de Santé des Armées. 3 vols. 8vo. Paris. 1811.

Magendie. De l'Influence de l'Emétique sur l'Homme et sur les Animaux; Mémoire lu à la Première Classe de l'Institut de France le 23 Août, 1813. Par M. Magendie, Docteur Médecin de la Faculté de Paris, Professeur, &c. 8vo. Paris. 1813. pp. 62.

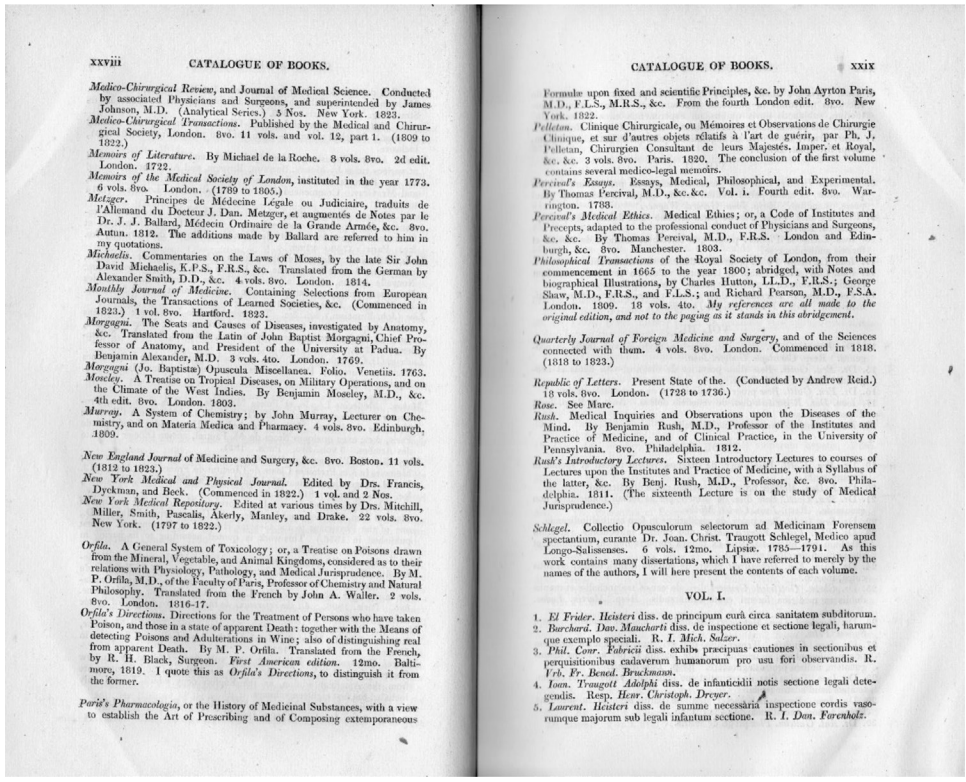
Male. An Epitome of Juridical or Forensic Medicine, for the use of Medical Men, Coroners, and Barristers. By George Edward Male, M.D., one of the Physicians to the General Hospital in Birmingham. (First published in 1816.) This work is quoted according to its paging in Cooper's Tracts, which see.

Marc. Manuel d'Autopsie Cadaverique Médico-légale, traduit de l'Allemand du Docteur Rose, sur la dernière édition; augmenté de Notes, et de deux Mémoires sur la docimasie pulmonaire, et sur les moyens de constater la mort par submersion. Par C. C. H. Marc, Docteur en Médecine. 8vo. Paris. 1808. *All the references to this work are designated by the name of the editor.*

Marshall. Remarks on Arsenic, considered as a Poison and a Medicine, &c. &c. By John Marshall, Member of the Royal College of Surgeons in London. 8vo. London. 1817.

Medical Commentaries. Edinburgh. 20 vols. 8vo. (Edited by Andrew Duncan, Sen., M.D.) My references to the 19th and 20th volumes are from the American edition, as the English copy which I used only included the first eighteen volumes.

Medical Transactions. Published by the College of Physicians in London. 6 vols. 8vo. London. (1768 to 1820.)



xxviii CATALOGUE OF BOOKS.

Medico-Chirurgical Review, and Journal of Medical Science. Conducted by associated Physicians and Surgeons, and superintended by James Johnson, M.D. (Analytical Series.) 5 Nos. New York. 1823.

Medico-Chirurgical Transactions. Published by the Medical and Chirurgical Society, London. 8vo. 11 vols. and vol. 12, part 1. (1809 to 1822.)

Memoirs of Literature. By Michael de la Roche. 8 vols. 8vo. 2d edit. London. 1722.

Memoirs of the Medical Society of London, instituted in the year 1773. 6 vols. 8vo. London. (1789 to 1805.)

Metgeer. Principes de Médecine Légale ou Judiciaire, traduits de l'Allemand du Docteur J. Dan. Metzger, et augmentés de Notes par le Dr. J. J. Ballard, Médecin Ordinaire de la Grande Armée, &c. 8vo. Autun. 1812. The additions made by Ballard are referred to him in my quotations.

Michaelis. Commentaries on the Laws of Moses, by the late Sir John David Michaelis, K.P.S., F.R.S., &c. Translated from the German by Alexander Smith, D.D., &c. 4 vols. 8vo. London. 1814.

Monthly Journal of Medicine. Containing Selections from European Journals, the Transactions of Learned Societies, &c. (Commenced in 1823.) 1 vol. 8vo. Hartford. 1823.

Morgagni. The Seats and Causes of Diseases, investigated by Anatomy, &c. Translated from the Latin of John Baptist Morgagni, Chief Professor of Anatomy, and President of the University at Padua. By Benjamin Alexander, M.D. 3 vols. 4to. London. 1769.

Morgagni (Jo. Baptistæ) Opuscula Miscellanea. Folio. Venetiis. 1763.

Moseley. A Treatise on Tropical Diseases, on Military Operations, and on the Climate of the West Indies. By Benjamin Moseley, M.D., &c. 4th edit. 8vo. London. 1803.

Murray. A System of Chemistry; by John Murray, Lecturer on Chemistry, and on Materia Medica and Pharmacy. 4 vols. 8vo. Edinburgh. 1809.

New England Journal of Medicine and Surgery, &c. 8vo. Boston. 11 vols. (1812 to 1823.)

New York Medical and Physical Journal. Edited by Drs. Francis, Dyckman, and Beck. (Commenced in 1822.) 1 vol. and 2 Nos.

New York Medical Repository. Edited at various times by Drs. Mitchill, Miller, Smith, Pascalis, Akerly, Manley, and Drake. 22 vols. 8vo. New York. (1797 to 1822.)

Orfila. A General System of Toxicology; or, a Treatise on Poisons drawn from the Mineral, Vegetable, and Animal Kingdoms, considered as to their relations with Physiology, Pathology, and Medical Jurisprudence. By M. P. Orfila, M.D., of the Faculty of Paris, Professor of Chemistry and Natural Philosophy. Translated from the French by John A. Walter. 2 vols. 8vo. London. 1816-17.

Orfila's Directions. Directions for the Treatment of Persons who have taken Poison, and those in a state of apparent Death: together with the Means of detecting Poisons and Adulterations in Wine; also of distinguishing real from apparent Death. By M. P. Orfila. Translated from the French, by R. H. Black, Surgeon. *First American edition.* 12mo. Baltimore, 1819. I quote this as *Orfila's Directions,* to distinguish it from the former.

Paris's Pharmacologia, or the History of Medicinal Substances, with a view to establish the Art of Prescribing and of Composing extemporaneous

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Formulæ upon fixed and scientific Principles, &c. by John Ayrton Paris, M.D., F.L.S., M.R.S., &c. From the fourth London edit. 8vo. New York. 1822.

Pelletan. Clinique Chirurgicale, ou Mémoires et Observations de Chirurgie Clinique, et sur d'autres objets relatifs à l'art de guérir, par Ph. J. Pelletan, Chirurgien Consultant de leurs Majestés. Imper. et Royal, &c. &c. 3 vols. 8vo. Paris. 1820. The conclusion of the first volume contains several medico-legal memoirs.

Percival's Essays. Essays, Medical, Philosophical, and Experimental. By Thomas Percival, M.D., &c. &c. Vol. 1. Fourth edit. 8vo. Warrington. 1788.

Percival's Medical Ethics. Medical Ethics; or, a Code of Institutes and Precepts, adapted to the professional conduct of Physicians and Surgeons, &c. &c. By Thomas Percival, M.D., F.R.S. London and Edinburgh, &c. 8vo. Manchester. 1803.

Philosophical Transactions of the Royal Society of London, from their commencement in 1665 to the year 1800; abridged, with Notes and biographical Illustrations, by Charles Hutton, LL.D., F.R.S.; George Shaw, M.D., F.R.S., and F.L.S.; and Richard Pearson, M.D., F.S.A. London. 1809. 18 vols. 4to. *My references are all made to the original edition, and not to the paging as it stands in this abridgement.*

Quarterly Journal of Foreign Medicine and Surgery, and of the Sciences connected with them. 4 vols. 8vo. London. Commenced in 1818. (1818 to 1823.)

Republic of Letters. Present State of the. (Conducted by Andrew Reid.) 18 vols. 8vo. London. (1728 to 1736.)

Rose. See Marc.

Rush. Medical Inquiries and Observations upon the Diseases of the Mind. By Benjamin Rush, M.D., Professor of the Institutes and Practice of Medicine, and of Clinical Practice, in the University of Pennsylvania. 8vo. Philadelphia. 1812.

Rush's Introductory Lectures. Sixteen Introductory Lectures to courses of Lectures upon the Institutes and Practice of Medicine, with a Syllabus of the latter, &c. By Benj. Rush, M.D., Professor, &c. 8vo. Philadelphia. 1811. (The sixteenth Lecture is on the study of Medical Jurisprudence.)

Schlegel. Collectio Opusculorum selectorum ad Medicinam Forensem spectantium, curante Dr. Joan. Christ. Traugott Schlegel, Medico apud Longo-Salissenses. 6 vols. 12mo. Lipsiæ. 1785—1791. As this work contains many dissertations, which I have referred to merely by the names of the authors, I will here present the contents of each volume.

VOL. I.

1. *El Frider. Heisteri* diss. de principum curâ circa sanitatem subditorum.
2. *Barchard. Dav. Maucharti* diss. de inspectione et sectione legali, harumque exemplo speciali. R. *I. Mich. Salzer.*
3. *Phil. Conr. Fabricii* diss. exhibs præcipuas cautiones in sectionibus et perquisitionibus cadaverum humanorum pro usu fori observandis. R. *Vrb. Fr. Bened. Bruckmann.*
4. *Joan. Traugott Adolphi* diss. de infanticidii notis sectione legali detegendis. Resp. *Henr. Christoph. Dreyer.*
5. *Laurent. Heisteri* diss. de summe necessaria inspectione cordis vasorumque majorum sub legali infantum sectione. R. *I. Dan. Farenholz.*

1.4 (Continued)

Alfred Swaine Taylor (Lecturer on Medical Jurisprudence at Guy's Hospital) in his book "A Manual of Medical Jurisprudence" defined medical jurisprudence as "*that science, which teaches the application of every branch of medical knowledge to the purpose of the law*" (21). In his preface to the 5th edition in 1854 he notes that ". . . *there have been issues from the press, since the first publication of this work in November 1843, ten thousand seven hundred and fifty copies*" – a number which must have delighted the publishers (22).

There was a clear demand for such books and for repeat editions, and "Traill's Outlines of a Course of Lectures on Medical Jurisprudence" (3) (published in 1840 when he was Regius Professor of Jurisprudence and Medical Police at Edinburgh) was the second edition of a book initially published in 1834 (3). It was in Edinburgh in 1807 where the first Chair of Forensic Medicine was established in the UK, with subsequent non-professorial academic forensic medicine posts at Guy's Hospital and Charing Cross Hospital, London. In 1839 and 1875, respectively, academic chairs of medical jurisprudence were created in Glasgow and Aberdeen (23).

This demand for publications was not limited to the USA and Europe. IB Lyon – Brigade Surgeon to Bombay Medical Services and Professor of Chemistry and Medical Jurisprudence at Grant Medical College, Bombay makes reference to the availability of other works from India in his 1889 "A Textbook of Medical Jurisprudence for India" stating in the Preface ". . . *my object has been to supply a want which I have often felt while lecturing on Medical Jurisprudence in an Indian college, viz, that of a concise manual specially adapted for use in India. In doing so I have made the freest use of the numerous standard treatises on Medical Jurisprudence and subject allied to it and of the admirable Bengal Medico-legal Reports of my friends Surgeons-Major K McLeod and R Harvey*" (14).

A common theme of most of these texts could not be said to be brevity. It is of note, and possibly reflecting the verbosity and length of some texts, that William McCallin in his 1901 "Introduction to Medical Jurisprudence" stated "…*In this book an attempt has been made to state the essentials of Medical Jurisprudence and, at the same time, as briefly as possible…The points of law most likely to arise are set forth without comment, since in this form the reader can find out what the law ….more satisfactorily than when it is stated together with confusing opinions with regard to what it ought to be*" (24). Sentiments with which it is hard to disagree.

Illustrations were initially quite limited, often simple line drawings, or simple concepts such as the series of heart tracings taken after judicial hanging (25) (Figure 1.5). However, by the end of the nineteenth century, new techniques meant that images could be reproduced providing striking examples of conditions described. Figure 1.6 shows examples from the 1898 "Atlas of Legal Medicine" produced by Dr E Von Hofmann, Professor of Legal Medicine and Director of the Medical Institute in Vienna. In the Preface to the English translation of the Atlas, Frederick Peterson states "*There is perhaps no field*

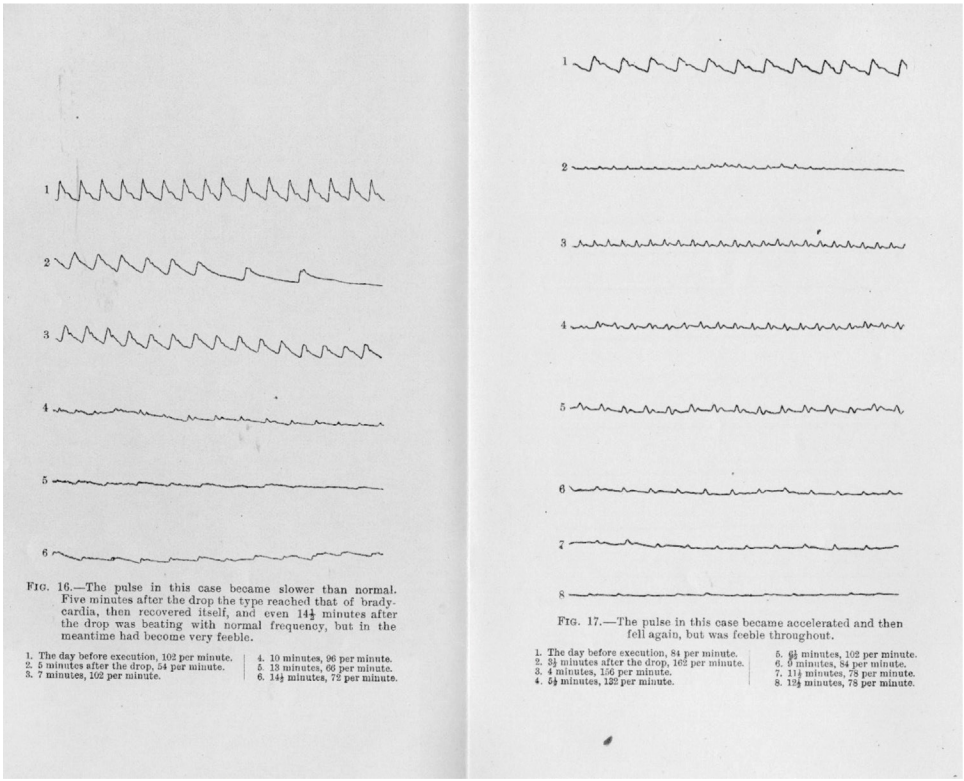


FIG. 16.—The pulse in this case became slower than normal. Five minutes after the drop the type reached that of bradycardia, then recovered itself, and even 14½ minutes after the drop was beating with normal frequency, but in the meantime had become very feeble.

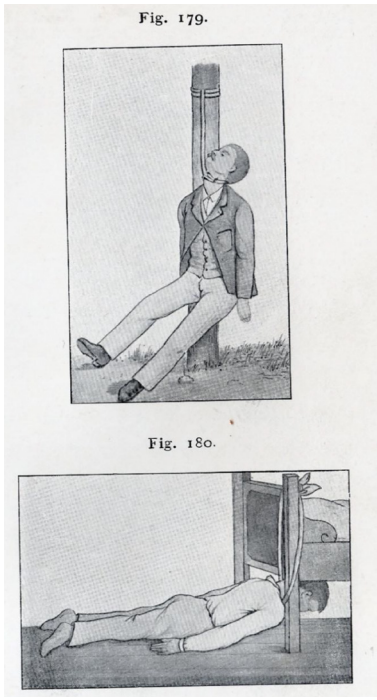
1. The day before execution, 102 per minute.
2. 5 minutes after the drop, 54 per minute.
3. 7 minutes, 102 per minute.
4. 10 minutes, 96 per minute.
5. 13 minutes, 66 per minute.
6. 14½ minutes, 72 per minute.

FIG. 17.—The pulse in this case became accelerated and then fell again, but was feeble throughout.

1. The day before execution, 84 per minute.
2. 3½ minutes after the drop, 162 per minute.
3. 4 minutes, 156 per minute.
4. 5½ minutes, 132 per minute.
5. 6½ minutes, 102 per minute.
6. 9 minutes, 84 per minute.
7. 11½ minutes, 78 per minute.
8. 12½ minutes, 78 per minute.

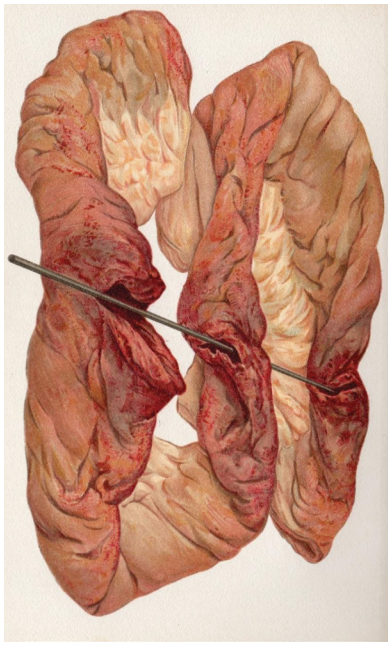
1.5 A series of heart tracings taken after judicial hanging taken from RJM Buchanan (25) Dr Buchanan writes: "The heart may, however, continue to beat for a varying period after death – in some cases as long as 14 and a half minutes. The following interesting series of pulse tracings were taken by Dr Llewellyn Morgan of Liverpool and kindly placed at my disposal."

(a)



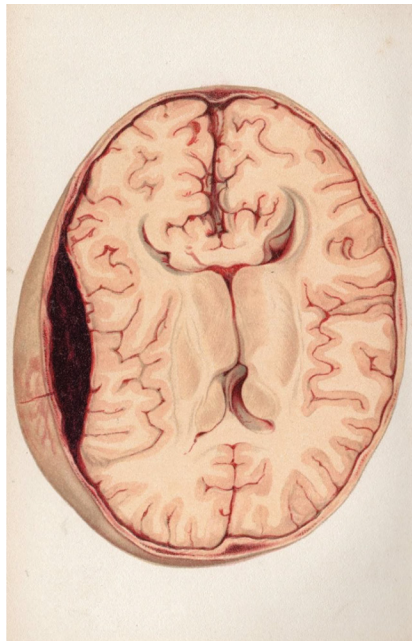
(b)

(c)



(d)

(e)



(f)

1.6 Images from E. Von Hofmann *Atlas of Legal Medicine*. WB Saunders. Philadelphia. 1898 (26). **(a)** Poisoning with concentrated nitric acid. **(b)** Suicide by hanging in the semi-sitting posture and suicide by hanging in the prone posture. **(c)** Burns produced by flames. **(d)** Triple injury to the small intestine produced by a stab. Peritonitis. **(e)** Murder as the result of various blows inflicted with different instruments. **(f)** Fracture of the base of the skull with extradural hemorrhage.

in science in which the value of illustration is greater than in forensic medicine" (26). A point well made.

The relevant areas of interest to forensic medicine and medical jurisprudence were gradually becoming better defined. Table 1.4 summarizes the chapter contents of Smith's (1821) text (17). It will be noted that almost two centuries ago much of the content is recognizable and relevant to contemporary forensic physicians and forensic pathologists. So, by the end of the nineteenth century, in Europe, India, the UK, and USA and those related jurisdictions a framework of forensic and legal medicine was established that persists today.

TABLE 1.4 Example chapter contents of Smith's (1821) text *The principles of forensic medicine systematically arranged and applied to British practice* (17)

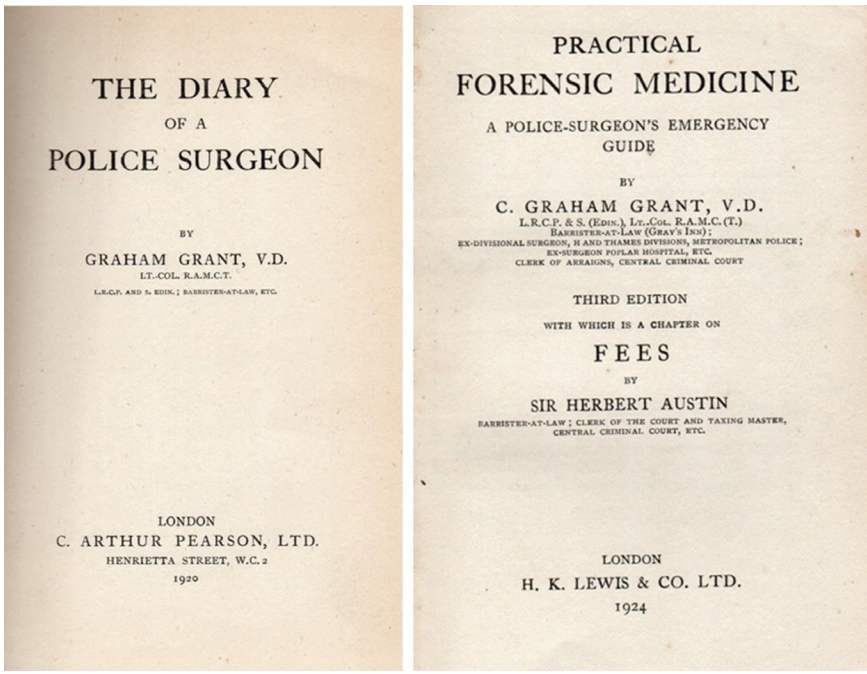
Of sudden death in the healthy state:
• The phenomena of death
• States of the living body resembling death
• Tests of the reality of death
• Sudden death without cause of crimination
• Sudden death from intrinsic or morbid causes
• Death by personal agency or homicide
• Mineral poisons
• Vegetable poisons
• Occult poisoning
• Suffocation
• Drowning
• Hanging
• Smothering
• Death by spontaneous agency or suicide
• Infanticide
Questions arising from injuries done to the person not leading to the extinction of life
• Mutilation
• Rape
Disqualifications for the discharge of social or civil functions
• Mental disqualification
• Mania sexual identity
Personal identity

CONTEMPORARY FORENSIC PATHOLOGY

The forensic pathologist's work is directed to assisting in predominantly judicial or legal processes by establishing manner, time and cause of death. Forensic pathology is a recognized part of the specialty of pathology. Forensic pathology is generally practiced by those with a background in histopathology or anatomic pathology. Their pathologic skills must be supported by an ability to integrate the medical aspects of the workload with toxicologic, scientific and legal issues. Forensic pathologists are assigned a variety of names around the world, for example, legal medicine specialists, medical examiners (the latter with the exception of England & Wales) – but all are primarily involved in the investigation of death – by the use of autopsy and associated techniques including histopathology, toxicology, radiology and genetics. Forensic pathologists may work in academic departments, state or government institutions, or independently. It is to be expected that their work and the reporting of their work is and is seen to be independent of any body or organization, whether police or governmental, and free from political interference. A forensic pathologist is expected to have special knowledge in the following areas: anatomy, cytopathology, hematology, microbiology, immunology, chemical pathology and toxicology. Many forensic pathologists around the world will also have special relationships with public health, occupational health and community health issues, reflecting for some, the historic origins of the workload. Many will be employed by the state or official bodies. Many forensic pathologists will also have workloads relating to the clinical aspects of forensic medicine.

CONTEMPORARY CLINICAL FORENSIC MEDICINE

One definition of clinical forensic medicine is: ". . . Clinical forensic medicine includes all medical (healthcare) fields which may relate to legal, judicial, and police systems" (2). It is only in the last two decades that research and academic interest in clinical forensic medicine has become an area of much more focused interest and research, although doctors have worked with the police in London, UK for more than a century. Figure 1.7 shows the frontispiece of two books written by a police surgeon working in the East End of London in the late 1800s/early 1900s. The nature of the cases is not far removed from those seen today. In part, this increased relevance relates to much wider awareness of human rights abuses and civil liberties which, in turn, have directed much attention to the conditions of detention of prisoners, and to the application of justice to both victim and suspect. The differing and potentially conflicting roles that a forensic physician may have when attending a prisoner or other person detained by the state or other body have been recognized by identifying three possible facets of medical care: (1) the role of medicolegal expert for a law enforcement agency, (2) the role of a treating doctor and (3) the examination and treatment of detainees who allege that they have been mistreated by the police during their arrest, during interrogation, or during the various stages of police custody. This conflict is well recognized by forensic physicians (27). Some jurisdictions recognize clinical forensic medicine as a distinct medical specialty. The European Council of Legal Medicine continues to make progress to have Legal and Forensic Medicine (which includes both forensic pathology and clinical forensic medicine) as a recognized monospecialty. As yet, this has still to be achieved although the UEMS has now created a thematic federation in the subject. In both the UK and Australasia, applications to create specialties of respectively forensic and legal medicine and clinical forensic medicine are in progress. These applications and the processes attached to them may take some years to complete. Some countries (e.g. France) have developed a group of regional centers (Urgences Medico-Judiciaires) which are medicolegal units sitting alongside hospital emergency departments and having access to their facilities. There are no international standards of practice or training – international standards are still lacking, but more countries appear to be developing national standards. The Faculty of Forensic and Legal Medicine of the Royal College of Physicians (www.fflm.ac.uk) has pioneered the



1.7 Frontispiece of two books written by a police surgeon (forensic physician) working in the East End of London around the turn of the twentieth century.

development of quality standards for healthcare professionals working in custodial and sexual offense settings but also produces consensus guidelines on other matters, such as standards for those working with victims of torture.

CONCLUSION

Forensic and legal medicine arises from a long tradition of links between the law and medicine and now includes a wide variety of complementary needs and skills intertwining medicine, pathology, science, the law and ethics. Forensic and legal medicine in its various forms may represent the oldest true medical specialty with its current functions capable of being traced back in academic writings globally for five centuries and beyond. Various individuals have been proposed as the "father of" the discipline and many texts "the first." All are open to challenge as it is clear that it is possible to find in all cultures and jurisdictions the essence of forensic and legal medicine in some form or another. This also confirms that forensic and legal medicine is crucial to the proper administration of justice in all its formats and origins. Every forensic practitioner, whether clinical, pathologic, or both, should be aware of their responsibilities, not only to their patient or the deceased, but to society as whole, and be able to utilize their skills and competences to provide robust evidence and opinions to ensure that their contribution to the justice process is unimpeachable.

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