

# **Poisoning Crimes and Forensic Toxicology since the Eighteenth Century**

**Katherine Watson, Oxford Brookes University**

## **ABSTRACT**

The easy availability of deadly poisons in nineteenth-century Britain, western Europe and the United States led to widespread public anxiety about the prevalence of murder by poison, resulting in what might be termed a 'poison panic'. The fear was fed by well-publicised reports of trials and executions which, though not especially numerous, seemed indicative of the dangerous incidence of a unique type of homicide, one that was particularly difficult to prevent or detect. As a result, poisoning crimes stimulated the development of the earliest medico-legal specialism, forensic toxicology, and consequently the careers of some of the best-known expert witnesses of the Victorian era, including Mathieu Orfila, Alfred Swaine Taylor, Thomas Stevenson and Theodore Wormley. This article traces the history of poisoning crimes and the related medico-scientific discipline of forensic toxicology, using textbooks, key trials and crime statistics to examine and evaluate their contribution to the historical development of forensic expertise and practice.

## INTRODUCTION

*“The different kinds of murder, or the different means by which it is committed, may be reduced to poisons, wounds, bruises, drowning, and strangulation. The two first seem to be the most common; the third is often rather a remote than a proximate cause, and the two others are chiefly discovered by the facts, rather than by any peculiar marks they leave on the body.”*

— Samuel Farr. Elements of medical jurisprudence; 1788 (1).

In this first English-language textbook of forensic medicine, the provincial physician Samuel Farr (1741-95) devoted 12 pages to poisoning, providing brief details of the principal types of poisons (acids, alkalis, narcotics, gases, plant and animal) before summarising some tests used to identify them. He focused mainly on arsenic, which had a long history of nefarious use in Western Europe, but was unable to provide much more detail than had the Parisian forensic expert Jean Devaux (1649-1729) over 80 years earlier. In his guide to writing medical reports, Devaux had instructed surgeons to perform a post-mortem examination of any suspected victim of poison, but cited no specific tests of any kind (2). By the end of the century, however, there was a growing professional recognition of the importance of medical evidence in criminal trials, most specifically those that involved an accusation of poisoning, when the proof of experts was seen as particularly desirable (3). Although French and German doctors began publishing medico-legal texts decades earlier than their British and American counterparts, by the 1820s a flourishing international literature on forensic medicine (also known as medical jurisprudence or legal medicine), invariably included lengthy chapters on poisoning and the exciting new science of toxicology.

Historically, proof of poisoning relied on a combination of signs and symptoms in life, internal and external appearances after death, and crude chemical and physiological tests on stomach contents and suspect substances. None of these were especially reliable, but a number of accused poisoners were convicted and executed in England in the second half of the eighteenth century, most famously perhaps Mary Blandy at Oxford (Image 1) and Captain John Donellan at Warwick (1781) – their genteel status served as a key source of popular fascination. Poison murders remained relatively sporadic until the early decades of the nineteenth century, when a number of shocking cases came to light: two serial arsenic poisoners were convicted in Germany (Sophie Ursinus, 1803 and Anna Margaretha Zwanziger, 1811) (4); Mary Bateman, the Yorkshire Witch, was hanged in 1809 for a poisoning she had carried out two years earlier and Daniel Dawson was executed in 1812 for poisoning a series of valuable racehorses at Newmarket (5); in the United States, the conviction of Abraham Kesler for the 1817 arsenic murder of his wife was so controversial that the New York state legislature overrode the governor’s stay of execution (6); and in 1823 French doctor Edme-Samuel Castaing became the first person convicted of using morphine to commit murder (7). The public began to fear that poison murders were easily committed but difficult to detect, and thus likely to be far more prevalent than the number of prosecutions might suggest.

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In the absence of irrefutable chemical proof of poisoning, convictions usually relied on circumstantial evidence or the occasional confession. However, this was about to change, stimulated by the original research of M.J.B. Orfila (1787-1853), the world’s foremost authority on poisons and their detection and essentially the founder of toxicology, developments in analytical chemistry, and the proliferation

of textbooks of forensic medicine. As more and more poisonings came to light, toxicology became a key aspect of forensic practice and teaching and a small group of men built careers as experts, in the modern sense of a witness 'specifically called in by one side or the other to interpret the facts using his or her expertise' (8). By the middle of the twentieth century their preeminent position as expert witnesses had been superseded by the 'medical detectives', essentially celebrity pathologists (9, 10), and by the end of the century homicidal poisoning was noted mostly for its rarity, so that 'books on medical jurisprudence and forensic investigation have devoted only a few pages to this important subject' (11).

## **DISCUSSION**

### **Statistical Prevalence of Criminal Poisoning**

There is no complete list of known poison murders or prosecutions of the last two centuries, but some comparative numbers for Britain, France and Belgium can be assembled from official statistics, textbooks of forensic medicine, and historical studies. These show that the incidence of criminal poisoning in all three countries began to rise in the late 1820s, continued to do so throughout the 1840s and 1850s, and then began to decline in a trend that picked up speed after 1870. Similar quantitative data does not yet appear to be available for the United States, but indicative evidence can be gleaned from the work of historians who have studied the development of forensic toxicology in nineteenth-century America. In addition, there is some numerical information for the Canadian province of Ontario. Taken together, these data show that criminal poisoning amounted to no more than 20 per cent of known homicides in the nineteenth century but generally much less; and as its incidence declined, suicidal poisoning increased.

Forbes identified 83 poisoning trials (for murder and attempted murder) held at London's main criminal court, the Old Bailey, between 1739 and 1878, of which only 20 occurred before 1839 (12). Watson studied criminal poisoning in England and Wales, collecting 540 cases that occurred in the period 1750-1914. Of those in which an identifiable substance was named (504 cases), 47% involved the use of arsenic, followed by opiates (10%), strychnine (8%), acids (7%) and mercury compounds (6%). She concluded that the 'story of poisoning in England and Wales is in many ways a chronicle of the rise and fall of arsenic' (5), the sale of which became subject to control in 1851 when the Arsenic Act (14 & 15 Vict c.13) came into force. While the new law did not prevent criminal, suicidal or accidental arsenical poisoning from continuing into the twentieth century, it did lead to a significant decline in its incidence in the later decades of the Victorian era (13). A further study of 563 trials for criminal poisoning in the period 1720-1914 found that 49% occurred between 1815 and 1860, with total numbers increasing by about 50% every decade before reaching a peak in the 1840s and then declining slightly in the 1850s (14).

The government recognised this mid-century surge in criminal poisoning, recording a total of 240 trials for murder and attempted murder by poison throughout the United Kingdom in the decade 1839-49 (15). In England and Wales, this amounted to approximately 17 trials per year, 20% of the average number of 85 trials for murder and attempted murder that took place annually in the years from 1842 through 1845 (or 27% of 63 trials annually if infanticide is excluded) (16). At this time the yearly toll of deaths from poison in England and Wales was 500 to 600 people, about 100 of whom

were killed by arsenic (17). Forty years later, the medical press highlighted the continuing need to regulate the sale of poisons, noting that death rates from accidental and suicidal poisoning had been steadily increasing during the 1870s; in 1880 a total of 568 people died from poison in England and Wales, but not as victims of homicide (18). The overall murder rate continued to fall until the Second World War, and criminal poisoning with it: despite several high-profile interwar trials for arsenic or strychnine murder, for example those of Beatrice Pace, Herbert Rowse Armstrong and Ethel Major, the principal danger posed by poison was its role in suicide, which in 1932 accounted for 90% of all deaths from poison, the rest being accidents (19). The Dangerous Drugs Acts of 1920 and 1928 and the Pharmacy and Poisons Act of 1933 restricted access to the classic poisons, recreational and other dangerous drugs, thereby ending the easy availability of the substances preferred by poisoners.

A similar development occurred in Scotland, for which Karen Merry conducted a study of criminal poisoning in the period 1800-1916. She found 62 cases, most of which involved arsenic (34 cases), opium (12 cases) or strychnine (6 cases). Half of the killings occurred between 1821 and 1860, and a further three were noted between 1924 and 1965 (20). There were 15 Scottish trials for poison murder and attempted murder in the 1840s (15), mirroring the spike seen in England and Wales, but the annual average of less than one accused poisoner per year represents a tiny proportion of known murders in Victorian Scotland: 257 individuals were charged with murder in the period 1857-63, although only 149 were actually tried; in 1880 there were 28 murder charges, and only 17 in 1886. Thereafter the annual total of investigated murders and attempted murders stood at about 20 until 1960 (21), but poison was almost never used.

The medical community in both Britain and France was aware that the incidence of criminal poisoning had begun to rise in the late 1820s (22). The French physician and criminologist Alexandre Lacassagne (1843-1924) compiled judicial statistics of criminal poisoning in France for the period 1825-1900, revealing a trend similar to that observed in Great Britain. Although the average annual number of suicides by poisoning was lower, it was also increasing, from under 100 (1836-70) to 200 (1875-95) and then to 220 (1895-1900). The total number of criminal poisonings (murder and attempted murder) in the 75-year period was 2,304. The rate increased from 1823 to 1850, reached a maximum from 1850 to 1855 (a total of 294), and then declined. In the half-decade between 1860 and 1865 the number of arsenic poisonings dropped by 77, and the use of phosphorus became more frequent thereafter. The general decrease in homicidal poisoning was especially noticeable from 1875 to 1900, with the last five years representing the minimum point in this long series: only 34 cases were recorded. Between 1833 and 1880, 6% of death sentences were pronounced against convicted poisoners, but this proportion dropped to just under 1% during the last two decades of the century. In France, those who wanted to kill with poison used mainly seven substances: arsenic (36%), phosphorus (15%), copper salts (11%), sulphuric acid (3%), cantharides (2.5%), opium (1%) and strychnine (0.7%) (23).

An analogous criminality emerged in Belgium, where 2.1% (22 individuals) of all those sentenced to death between 1796 and 1833 were poisoners. From 1840 until the turn of the century, poisoners accounted for 1.9% of all people tried for crimes against the person (93/4,827). The maximum was reached in 1846-55 when 12 people were prosecuted in each 5-year period, amounting to 6.2% and 27.8% of all prosecutions, respectively. In the last three decades of the century, 1870-99, the victims of murder by poison accounted for 1.1% (31/2,892) of all murder victims, reaching a high point in 1880-84 (8/503, 1.6%). In the same 30-year period, murder accounted for 3.6% of all 858 poison

deaths (31 deaths); suicides (58.4%) and accidents (38%) accounted for the rest. Two poisons tended to be used for homicidal purposes throughout the period 1795-1914: arsenic (57.4%) and phosphorus (11.1%). The Belgian statistics confirm the trends observed in Britain and France, and show that poisoning was a minor aspect of crime as a whole (24).

There are no comparable figures for the United States, unfortunately, but James Mohr has shown that Americans feared secret poisoning from at least the 1820s, 'and considered the incidence of murder by poison to be quite high through the first half of the century'. Even after the Civil War it was presumed to remain America's 'most common form of homicide' (25). Poison panics emerged periodically, generally sparked by prominent trials such as those of John Hendrickson (aconitine, 1851); Paul Schoeppe (prussic acid, 1869), Elizabeth Wharton (antimony, 1871) and Lydia Sherman (arsenic, 1872); and a spate of trials in the 1890s, including those of wife-killers Carlyle Harris (morphine, 1892) and Dr Robert Buchanan (morphine, 1893), both in New York (26). More detailed numbers were compiled by Lepp for Ontario, as quoted by Pilarczyk: ten out of 101 husbands used poison, and ten out of 26 wives did so to commit spousal murder in Ontario, 1830 to 1920 (27). In the 1980s, 292 documented poison murders were committed in the United States (28). Trestrail has since compiled a total of 1,026 documented 'poisoning crimes' for which the accused person was convicted, including an unstated number of historical cases but also recent killings (twentieth and twenty-first centuries). Of the total, 39% occurred in the United States and 25% in the United Kingdom; arsenic was used in 26% of the crimes (11). Homicidal poisoning is now uncommon but not unheard of, amounting to an unspecified but probably small proportion of the average number of 1,600 homicides committed annually by unknown or 'other' means such as strangulation and drowning, 1980-2016 (29). Most modern poisonings are accidents, suicides or overdoses, but when murder is involved, victims are disproportionately juveniles or over 50 years of age (30). However, the percentage of criminal poisoning that is never identified is likely to be much higher than for other forms of homicide, and there has been a disconcerting trend towards serial poisoning by healthcare professionals in the United States and elsewhere (31).

### **Two Reasons for the Observed Trends**

The trends observed can be related to two central factors. Firstly, there was indeed an actual rise in the incidence of criminal poisoning: it began in the late 1820s, continued through the 1850s and was largely spent by the end of the century. This epidemic of poisoning was prompted by poverty, greed and resentment, promulgated by publicity, and facilitated by easy access to deadly substances used in medicaments or sold cheaply for household cleaning and vermin control, or for use in agriculture and manufacturing. In the United States, poison deaths were caused by phosphorus matches, rat poisons, soothing syrups, and indiscriminate embalming (32), while in Britain and Europe the widespread use of rodenticides proved especially dangerous because they often contained arsenic, strychnine or, particularly in France and Belgium, phosphorus. At the end of the eighteenth century people were employed to exterminate vermin (Image 2), but by the 1840s it was more common for householders to poison rats, mice and insects with powders purchased from local shops, and newspaper advertisements reflected this shifting fashion.

Possibly the earliest product to enjoy national recognition was Butler's Vermin Killer, made in High Wycombe, Buckinghamshire, and widely advertised. It was suspected to be the source of arsenic

used in a murder in 1854, but when forensic toxicologist Alfred Swaine Taylor (1806-80) wrote to Mr Butler to ascertain the formula of his powder, he was told that at the beginning of 1847 Butler had substituted barium carbonate for arsenic, to prevent suicides (33). Although still used as a rat poison today, barium carbonate has rarely been used for homicide: Lacassagne did not record a single case; Taylor noted only accidental and suicidal deaths from barium salts (34); and Emsley cites only one confirmed murder, at Mansfield in Texas in 1994 (35). But other proprietorial preparations took the place of Butler's: by the 1880s British powders included Battle's, Craven's and Steiner's, all of which contained strychnine; and Burton's and Harrison's, containing arsenic. Phosphorus rodenticides were generally sold as pastes and were less popular in Britain than on the other side of the Channel, where products like Tord-Boyaux (Image 3), 'twist guts', remained common in the early twentieth century: in 1912 the French were exporting large quantities of this product to Germany and an American company recognised that there was a European market for imports of this kind, on which a clear profit of about 20% could be expected (36). One of the most iconic products of the day was American: 'Rough on Rats' was invented by Jersey City manufacturer Ephraim Wells (1841-1913) in 1872 and enjoyed considerable success. It was mainly arsenic, with coal dust added for colouring, and by the 1880s it was being advertised in newspapers published throughout the United Kingdom:

*'Rough on Rats.'* —*The thing desired found at last. Ask chemists, grocers or oilmen, for 'Rough on Rats'. It clears out rats, mice, Beetles, roaches, flies, bedbugs, insects, ground moles, &c. 7½d. and 1s. boxes* (37).

Although the advertisements seem to have ceased in the 1890s, possibly as city and county councils took more responsibility for pest control, the phrase was used in English newspaper articles about rodent-related matters until the 1940s (38). By then, other substances had replaced the Victorian vermin killers — for example, a thallium-based rodent killer used in Texas in the late 1950s led to a spate of poisonings (35), but such products were not closely associated with homicidal poisoning and are now being phased out in favour of substances that pose a lesser risk of accidental poisoning and secondary danger to wildlife.

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The second explanation for the observed trends in criminal poisoning is that a rising proportion of cases were detected as a result of three complementary factors: mounting scientific knowledge of poisons; the vigilance of the public and medical profession; and improvements in chemical methods for detecting poisons, all of which prompted more accusations, investigations, and prosecutions. The modern expert witness emerged into public prominence as a direct result of this confluence, as they testified in the spate of poisoning trials that the new methods of detection enabled.

### **Key Discoveries in 19th-Century Toxicology**

When the notable American toxicologist Dr Rudolph Witthaus (1846-1915) of Cornell University reviewed the chief nineteenth-century developments in 'toxicological chemistry', he identified six key advances:

- 1) The practical application of the properties of hydrogen arsenide (arsine) to the detection of arsenic by the English chemist James Marsh (1794-1846) in 1836. This method, in a much modified and improved form, remains a delicate and reliable test for arsenic.
- 2) In 1839 Orfila extracted notable quantities of arsenic from the internal organs, blood and muscle of convicted murderer Jean-Victor Soufflard, who had committed suicide. This was the first instance of the extraction of absorbed arsenic from the human body, previous analyses having been confined to the alimentary canal.
- 3) In 1844 the German chemists C.R. Fresenius (1818-97) and L.H. von Babo (1818-99) devised a systematic screening method for all mineral poisons.
- 4) The separation of the vegetable alkaloids from medicinal and poisonous plants, beginning with the investigation of opium by the German pharmacist F.W.A. Sertürner (1783-1841), published in 1805, opened up a new field in toxicology.
- 5) In connection with the investigation of the death of Gustave Fougères, poisoned by the forcible administration of nicotine by his brother-in-law, the Count Bocarmé, in 1850, the Belgian analytical chemist J.S. Stas (1813-91) devised a process for extracting alkaloids from the body.
- 6) In 1874 the Italian chemist Francesco Selmi (1817-81) discovered the first ptomaine, or cadaveric alkaloid, compounds that simulate the vegetable alkaloids in their chemical and physiological characteristics (32).

Chemists, toxicologists and historians might wish to suggest additional or different turning points, but Witthaus's list gives a good overview of the main areas of forensic practice of the nineteenth and early twentieth centuries – the heyday of criminal poisoning. Isolating and identifying the many different alkaloids became an important goal for toxicologists everywhere, and some of the most complicated trials for murder involved alkaloids that were not yet well known: Castaing's trial was matched or exceeded in controversy by those of William Palmer (strychnine, 1856), Dr George Lamson (aconitine, 1882), and H.H. Crippen (hyoscine, 1910) — all medical men who believed these poisons would not be detected. The unseemly battle of experts that took place at Palmer's trial, when 17 medico-scientific witnesses testified for the prosecution and 15 for the defence, was especially detrimental to the reputation of forensic toxicology in general and A.S. Taylor in particular (39), and a similar dimming of the public appreciation of forensic expertise followed in the wake of the Buchanan trial in New York (26). However, a comment by Lacassagne probably serves as an accurate summary of the views of those who acted as toxicological experts:

*Some resounding trials have brought to light the great talent of remarkable scholars who, like Orfila, Stas, etc, have been able to remove the poison itself from the victim's body and present it to the judges. It even seemed to be the case for all cases and it was believed and said that as long as the poison was not found, there was no poisoning. One cannot rail enough against this perception. Who would dare in our time to claim that an individual was not poisoned because his organs had no trace of poison on chemical examination (23)?*

The long-term importance of toxicology to authors of one-volume textbooks of forensic medicine is most clearly demonstrated in the following table, which sets out a simple list of the number of pages devoted to poisons and poisoning in a range of highly reputed general works on forensic medicine

published up to the Second World War. Three modern texts are included for comparative purposes. Books published in France have apparently devoted less attention to toxicology than those published by Americans (Beck and Reese), or by academics in Scotland (Ogston, Kerr and Smith), Germany (Madea) or England (all other authors). However, without a comparative analysis of the full contents of these volumes it is impossible to identify the extent of or reasons for this divergence.

Table 1: Number of pages on poisoning in standard one-volume textbooks of forensic medicine

Author	Year	Title	Total No. of Pages	No. of Pages on Poisons	%
G.E. Male	1818	Elements of Juridical or Forensic Medicine, 2nd ed.	278	95	34.2
T.R. Beck	1825	Elements of Medical Jurisprudence, 2nd ed.	640	226	35.3
A.S. Taylor	1844	A Manual of Medical Jurisprudence	679	282	41.5
A.S. Taylor	1865	Principles and Practice of Medical Jurisprudence	1186	244	20.6
F. Ogston	1878	Lectures on Medical Jurisprudence	663	70	10.6
A. Lacassagne	1886	Précis de médecine judiciaire, 2nd ed.	592	65	11.0
W.A. Guy & D. Ferrier	1888	Principles of Forensic Medicine, 6th ed.	605	280	46.3
G. Tourdes & E. Metzquer	1896	Traité de médecine légale	956	48	5.0
J.J. Reese	1906	Medical Jurisprudence and Toxicology, 7th ed.	656	280	42.7
J. Dixon Mann	1922	Forensic Medicine and Toxicology, 6th ed.	573	225	39.3
D.J.A. Kerr	1936	Forensic Medicine, 2nd ed.	331	102	30.1
S. Smith	1943	Forensic Medicine, 8th ed.	660	199	30.2
J.P. Beauthier, ed.	2008	Traité de médecine légale	837	36	4.3
J. Wyatt et al, eds.	2011	Oxford Handbook of Forensic Medicine	543	47	8.7
B. Madea, ed.	2014	Handbook of Forensic Medicine	1312	165	12.6

### The Century of the Expert: Forensic Toxicologists of the 19th and Early 20th Centuries

It was precisely their ability to detect poison in the bodies of victims and show it to juries — in the form of crystals, metallic mirrors and precipitates that could be measured, weighed, sketched and even brought into court — that established toxicologists as expert witnesses. The most well-known of this exclusive group of doctors and chemists were employed in hospitals and universities; some, but not all, also wrote textbooks. In the first half of the century, the most highly reputed toxicologist was undoubtedly Mathieu Orfila (Image 4), author of the first textbook of experimental and forensic



toxicology, *Traité des poisons tirés des règnes minéral, végétal et animal ou toxicologie générale* (2 vols, 1814-15) and of a general work on forensic medicine, *Leçons de médecine légale* (2 vols, 1821-23), half of which was on toxicology. His nearest British equivalent was Robert Christison (1797-1882) of Edinburgh (Image 5), who published the first modern English-language text on poisons in 1829 (40).

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Christison's work was superseded in 1848 by Alfred Swaine Taylor's *On poisons* (41), published in a third edition in 1875. Taylor (Image 6) was a prolific author on forensic medicine and toxicology; his books, combined with his regular appearances in criminal trials, established him as England's leading forensic expert (42). In the United States, Theodore Wormley (1826-97) had a similar expert status, based on his *Micro-chemistry of poisons* (1867), research on poisons and chemicals, and frequent trial testimony (43). Wormley's colleague at the University of Pennsylvania, John J. Reese (1818-92), had testified for the defence in the Schoeppe and Wharton trials as a similarly renowned toxicologist (44). He too produced a textbook of forensic toxicology, albeit somewhat derivative in that it drew freely on the works of other experts such as Christison, Orfila, Taylor and Wormley (45), following it up ten years later with another well-received book on forensic medicine and toxicology (46).

By the turn of the twentieth century, Rudolph Witthaus had assumed the mantle as the most highly respected toxicologist in the United States, on the strength of his textbooks and appearances in the trials of Harris and Buchanan (32, 47, 48). In France, the most pre-eminent forensic practitioner and expert witness of the fin-de-siècle was undoubtedly Lacassagne, but he and the equally famous Paul Brouardel (1837-1906) were not noted for their exclusive interest in toxicology, as it was but one of many areas of forensic practice with which they engaged. Conversely, their contemporaries in England, Thomas Scattergood (1826-1900) and Thomas Stevenson (1838-1908) were predominantly known for their expertise as toxicologists, but published very little. While Scattergood had a regional reputation (49), Stevenson was known nationally because, having been appointed to a position as Home Office Analyst in 1872, he appeared as the prosecution's principal scientific witness in many of the most prominent poisoning trials of the period, including those of Dr Lamson, Adelaide Bartlett (chloroform, 1886), Florence Maybrick (arsenic, 1889), Dr Thomas Neill or Cream (strychnine, 1892), George Chapman (who murdered three women with antimony in 1903), and Arthur Devereux (morphine, 1905). The caricature in Image 7 suggests the extent of Stevenson's fame.

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However, the era of the nationally-recognised toxicological expert was beginning to draw to a close. Stevenson's successor as Home Office Analyst, William Willcox (1870-1941, Image 8), did have such a reputation and, exactly like Christison, Taylor, Scattergood and Stevenson, his medical training allowed him to extend his sphere of activity into areas that are now firmly identified with pathology and forensic science (50). But after the Second World War the forensic focus in England moved in the direction of more rigid professional demarcations between forensic medicine, which had always included toxicology, and forensic science, which began to focus more explicitly on crime scenes and

new areas of science such as serology, gradually incorporating toxicology from a more chemical than pathological perspective. This development began in the 1930s when the Home Office set up a number of regional forensic science laboratories from which pathology was excluded, and was complete when the role of Home Office Analyst became defunct in 1954 upon the retirement of the last post-holder, Dr Gerald Roche Lynch (1889-1957) (51, 52).

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In Scotland, forensic medicine and science remained associated with university departments, but the professors who served as expert witnesses were among the 'medical detectives' — a select group of forensic pathologists in the period from about 1910 to 1960 who undertook all aspects of forensic practice including toxicology. Thus, Sydney Smith (1883-1969) and John Glaister junior (1892-1971) provided toxicological evidence in a number of poisoning trials, such as those of Annie Hearn (arsenic, 1931) and Margaret McMillan (arsenic, 1940), but their expert reputations were based more firmly on pathology and trace evidence (53). Both Smith and Glaister continued the Victorian tradition of writing and editing textbooks of forensic medicine and toxicology — the latter 'almost a science in itself' by 1925, according to Smith in the first edition of his text:

*The isolation and identification of poisons has not been included in the text, as the practitioner has rarely the time or experience to undertake a serious analysis (54).*

But such comprehensive single-author works were among the last of their kind. Increasing medical and scientific complexity, the associated divergence in education and training, and the expanding scope of forensic practice made all-inclusive textbooks impractical if not impossible unless, as is now typical, they are undertaken as the collaborative effort of a number of experts in progressively more specialised fields.

One of the last forensic toxicologists to attain widespread public prominence was the Austrian-American Alexander Gettler (1883-1968), who worked for the Office of Chief Medical Examiner of the City of New York from 1918 until his retirement in 1959 and

*earned the reputation of having sent more criminals to the electric chair through his tests than any police detective applying all of the police department's methods of investigation. He was called upon to testify at many hundreds of trials (48).*

Gettler was a true pioneer, acknowledged as the 'founding father of forensic toxicology in the United States'; in 1983 the first Alexander O. Gettler Award for analytical achievement in forensic toxicology was conferred by the American Academy of Forensic Sciences (55). In 1937 three of Gettler's OCME colleagues produced what became a classic post-war work on forensic medicine; this text followed a nineteenth-century format in its strong focus on pathology and toxicology (56, 57).

## **CONCLUSION**

According to Essig, *from the nineteenth century through the first few decades of the twentieth, some of the most celebrated cases involving expert testimony were poison murder trials (26)*. However, the fear of poisoning was out of proportion to the actual number of poison murders, and textbooks of

forensic medicine confirm the disproportionate British and American medico-legal interest in poison, in relation to more usual forms of sudden or unnatural death. The development and refinement of reliable techniques for isolating and identifying arsenic and alkaloids in human viscera were the most prominent aspects of toxicological practice before the Second World War, and even though the range of drugs and chemicals available in the modern world has expanded exponentially, it appears that the classic nineteenth-century poisons have not been entirely displaced as methods of murder (11). But criminal poisoning is now rare enough that the public no longer fears it, even though there may still be a significant unknown offender rate; and as the prevalence of criminal poisoning waned, the public turned its attention to another group of forensic experts, the interwar medical detectives.

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*MISS BLANDY at the place of Execution near  
Oxford, attended by the Rev<sup>d</sup> M<sup>r</sup> Swinton*

Image 1: The execution of Miss Mary Blandy, for the murder of her father, near Oxford on 6th April 1752, with the Rev. Swinton in attendance. Wellcome Collection.



RAT - CATCHER

*Pub<sup>d</sup> Jan<sup>y</sup> 27. 1796. by G. Thompson N<sup>o</sup> 50. Old Bailey, & J. Evans N<sup>o</sup> 41. Long Lane. W. Smith<sup>d</sup>*

Image 2: A rat-catcher and his dog; to the right a woman looks on. Stipple engraving, 1796. Wellcome Collection.





Image 3: Advertisement for rat poison Tord-Boyaux; showing a rat lying dead on the ground, three rats crying by his side and a tin of Tord-Boyaux. Engraving, c.1880. Wellcome Collection.



Image 4: Pierre Matthieu Joseph Bonaventure Orfila. Lithograph by Z. Belliard. Wellcome Collection.

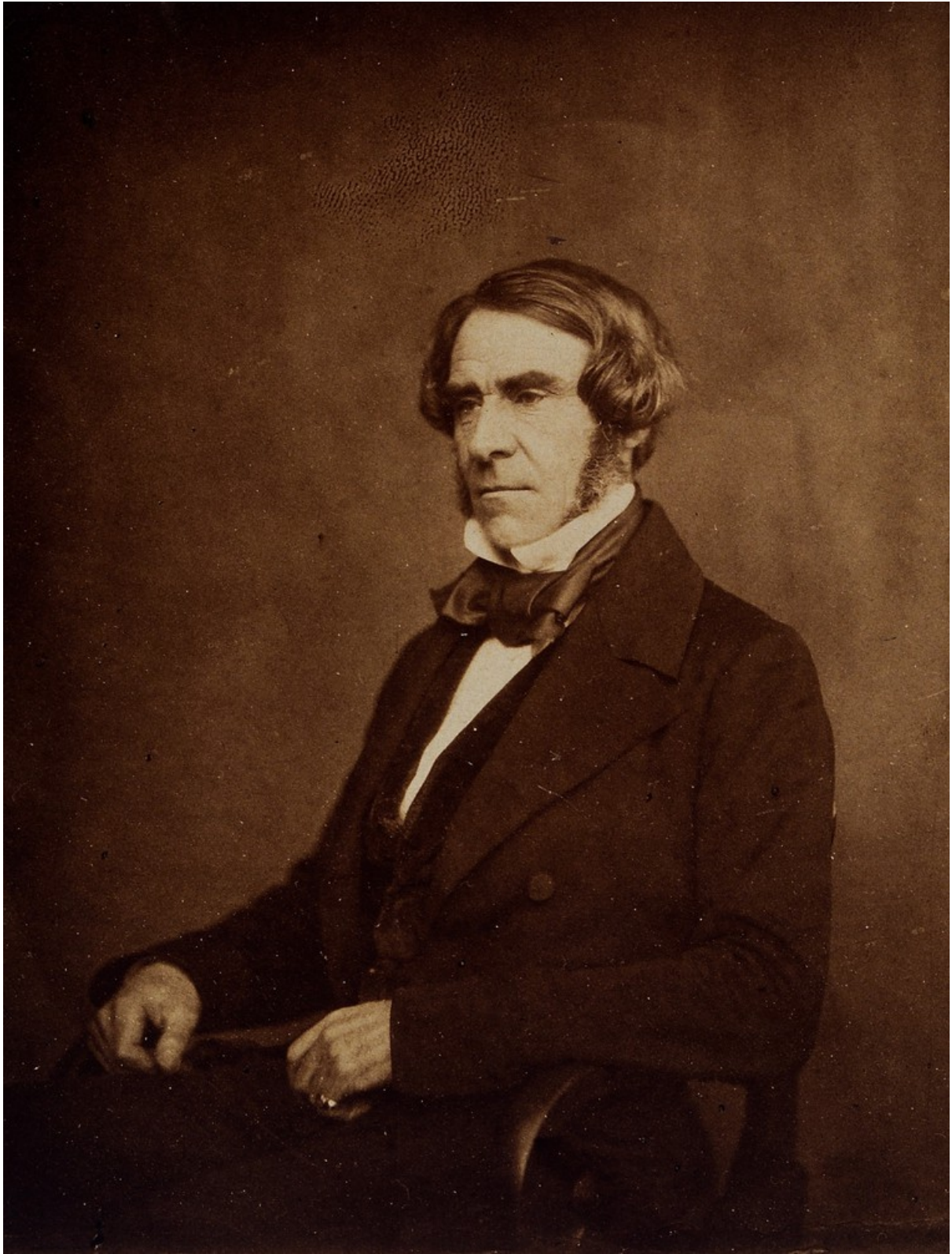


Image 5: Sir Robert Christison. Photograph, unknown date. Wellcome Collection.



Image 6: Alfred Swaine Taylor. Photograph, unknown date. Wellcome Collection.



Vincenz. Brooks, Day & Son Lith.

"Medical Jurisprudence"

Image 7: Sir Thomas Stevenson. Colour lithograph by A.G. Witherby [Wag], 1899. Wellcome Collection.



Image 8: Portrait of Sir W.H. Willcox, unknown date. Wellcome Collection.