

Forensic medicine in Scotland, 1914-39

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Illustrations

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Abbreviations

EUL SC: Edinburgh University Library, Special Collections

GUA: Glasgow University Archive

NRS: National Records of Scotland

RCPE: Royal College of Physicians of Edinburgh

Abstract

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This thesis examines the practice of forensic medicine in Scotland in the period 1914 to 1939. This was a time of significant dynamism for the discipline, in which it enjoyed a high public profile and played an important role in the investigation of crime. The project focuses in particular on medico-legal practice at an elite level, based in specialist departments in the universities of Edinburgh and Glasgow. As well as producing a significant amount of research and textbook material, and thus constituting authorities within the discipline, representatives of these institutions gave expert evidence in a number of high-profile trials. Thus, an examination of their work can show how medico-legal knowledge was constructed, presented and challenged.

To this end, four main areas of forensic medical practice are analysed, including the post-mortem examination, the laboratory analysis of trace evidence, the investigation of shootings and the use of photography. The development of the techniques contained within these categories is charted, as is the range of situations to which they were applied and the various ways in which their use was challenged in court by hostile legal counsel. Sources including textbooks and journal articles, medical case reports, photograph albums and trial transcripts are used. A fifth section explores an area of the public face of the discipline, specifically the popular output of two of its most famous practitioners, Sydney Smith and John Glaister Jr. Both produced memoirs and newspaper serials after retirement. These are used to explore the ways they reflected on their careers and spun their legacies, portraying themselves as impartial servants of science and justice.

The thesis argues that the place of forensic medicine in wider institutional, investigative and geographical networks was central to its existence. The discipline collaborated extensively, both with representatives of other areas of the medical profession and with external authorities, professions and trades. Means of communication, such as written reports and samples taken at autopsy, allowed experts in the universities to lend their expertise to the non-specialists in peripheries by providing expert opinions based on materials sent to them. The scrutiny of post-mortem reports produced by peripheral generalists allowed medico-legists' expertise to be spread over a wide geographical area.

The thesis also reflects on the ways in which medico-legists guarded against error. Techniques derived from other areas of medicine and science were not adopted for use in court until their reliability could be demonstrated satisfactorily, and controls and standards were built in to procedures.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or institute of learning.

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The Economic and Social Research Council have generously supported the project.

Finally, as I move into my 21st (!) year of full-time education, I would like to thank my parents for all the support and encouragement they have given me.

Introduction

This thesis explores the history of forensic medicine in Scotland during the period 1914 to 1939. This was a time of significant dynamism for the discipline, during which its practitioners enjoyed a high public profile. It was also a time in which this medical specialty occupied an important place in the investigation of serious crime, and had significant oversight of many of the scientific, as well as medical, techniques used to that end. Close links existed between forensic medicine, the legal authorities, and representatives of other disciplines that were of importance in criminal court cases, such as photographers and gunsmiths.

This thesis makes two overall arguments. The first is that forensic medicine at this time was multi-faceted. Rather than being wholly concerned with the body in the isolated context of the mortuary (although the post-mortem examination was an important element of the medico-legist's work), forensic medicine encompassed a variety of techniques and locations. Specialists in forensic medicine worked in mortuaries, laboratories, shooting ranges and crime scenes (often referred to as '*loci*'). They dissected bodies, tested bloodstains and examined discharged projectiles, among other activities. In many instances, individuals performed a wide range of activities themselves, for example, testing bloodstains one day and examining a corpse the next.

The second point relates to the networks of expertise and communication in which forensic medicine existed. The discipline enjoyed a high degree of connectivity, both internally between doctors, and with external authorities, professions and trades. Geographical links existed between doctors in regional peripheries charged with examining dead bodies and specialists based in urban centres, namely university departments of forensic medicine. Means of communication such as written reports and the dispatch of samples taken at autopsy allowed central experts to lend expertise to less experienced counterparts in peripheries by giving opinions about a death based on what had been sent to them. Forensic medical specialists also shared investigative spaces with those outside their own discipline. For example, medical experts worked

with gunsmiths when interpreting gunshot wounds, employing the latter's knowledge of the patterns left by powder residue to determine the distance between target and shooter. Forensic experts also liaised with those working in clinical laboratories to commission relevant tests, such as bacteriological ones, and worked with specialist police officers in photographing forensic subjects.

In addition to these major arguments of the thesis, a number of subsidiary themes emerge regarding various elements of medico-legal activity. These themes recur at some point in one or more of the following chapters, and include: the place of standards and quality assurance; the role of research and the experiment in forensic medicine; techniques of preserving and recording evidence; and the establishment, maintenance and challenging of the authority of the expert witness.

In this thesis, the issue of standards and quality assurance refers to practices which had the objective of ensuring that the technique employed was accurate, and that anything which could compromise the medico-legal object of the exercise, such as contamination, was avoided. This issue has been central to the historiography of forensic medicine and science concerning other periods. It has been most strikingly explored in relation to the early history of the use of DNA profiling, a technique used to identify people and traces. Concerns about experimental protocols, the possibility of contamination and poorly designed statistical sampling were particularly acute during the early years of DNA profiling in the 1990s, when the utility and reliability of DNA techniques for the courtroom were called into question.¹ Though the substance of these concerns was different from those regarding the early twentieth-century medico-legal laboratory, because of the different techniques employed, some thematic parallels can be identified, such as concerns with controls and contamination. The measurement of adherence to experimental standards, for example ensuring that the experiment replicated an incident as far as possible, or using an adequate control in a laboratory test, was a means of assessing expertise in court in the earlier period. For instance, an expert hired by the defence in a criminal trial might call into question the adequacy of their

¹ Michael Lynch et al., *Truth machine: the contentious history of DNA fingerprinting* (Chicago: The University of Chicago Press, 2008), 39-68, 113-41, 155-82.

opposite number's procedures for preventing error. This concern pervaded all aspects of forensic medicine. During the post-mortem dissection of bodies, protocols for the prevention of contamination, which might compromise further toxicological testing, were enacted. Laboratory tests for ascertaining the species of a bloodstain featured control samples. Shooting experiments, in which guns were fired at targets to replicate the incident under investigation, were argued to be invalid by courtroom adversaries if a different kind of cartridge to the one used in the crime had been used. The adverse consequences of disturbing a crime scene before it had been photographed were also well understood.

Given the institutional context of specialist forensic medicine in Scotland at the time, the question of research recurs in this project. The experts who enjoyed the greatest authority, and who undertook, or at least oversaw, the most diverse range of techniques were based in university departments of forensic medicine, most notably in Edinburgh and Glasgow. These departments were home to a number of significant research projects, many of which were carried out for research degrees. This work was practically oriented, and had the aim of improving results in casework.² Much of the focus of these research projects was on the identification of trace evidence, for example determining what species had shed a particular kind of hair, or improving the success rates of tests which determined whether questionable stains were blood or otherwise.

The preservation and recording of evidence were also of constant concern to experts and the legal authorities. The clear, comprehensive recording of post-mortem findings was an important tool for effective communication between experts and the wider legal world. Written information was not always sufficient. Objects, whether they had originated at the crime scene or in the body, had to be preserved for future reference without damaging them. Differing views existed among textbook authors regarding the best means for this. For example, some argued that alcohol and other preservative chemicals should not be used, whereas others argued that their use could be

² See, for example: Sydney A Smith, "The examination of blood stains in medico-legal cases: an investigation into the efficiency of existing tests and the spectroscopic differentiation of dyes and other pigments" (The University of Edinburgh, 1914); John Glaister, Jr., "The results of experimental work upon the serological or precipitin test for the detection of blood, considered from the medico-legal aspect" (University of Glasgow, 1925).

sanctioned under some circumstances, such as in hot climates. It was deemed important to record the position of a body, as well as any other objects of interest, such as bloodstains. This could be written down; however, photography could also be employed. The use of photography for investigative purposes (not confined to forensic medicine) allowed the condition of spaces and items which would be subject to change, such as crime scenes and perishable objects, to be revisited at a later stage, potentially by someone who had not viewed them in their original condition.

Finally, in each of the different areas in which specialists in forensic medicine worked, the authority of the expert witness in the courtroom had to be established and maintained. In order to achieve this, reference would be made to experience and length of service, as well as general reputation. Textbooks of forensic medicine contained advice on how best to establish courtroom authority, including exhortations to speak clearly and straightforwardly, and not become riled by hostile questioning. The study of the different areas of forensic medicine reveals the methods by which experts were challenged. Parallels for this can be drawn with the tactics of defence lawyers of the 1980s and 1990s whose task it was to challenge DNA evidence. Their strategies mirrored the methods of sociologists of science, in that they deconstructed the methods of their witnesses in order to criticize them.³ Another strategy to counter evidence was to use opposing experts. Historians have examined this in the context of science in the nineteenth-century courtroom. Expert witnesses were perceived to be partial quasi-advocates, a situation which was seen to be unedifying by many in the scientific community, who felt it reflected badly on their profession. Others believed that the aggressive questioning of scientific positions was conducive to the establishment of the truth.⁴ Defence lawyers faced with witnesses in early twentieth-century Scotland employed similar strategies. These included suggesting that a practitioner had been incompetent, that their protocols and procedures had failed to hedge against sources error; and the highlighting of contradictory evidence, whether from a defence witness

³ Michael Lynch, "The discursive production of uncertainty: the OJ Simpson 'Dream Team' and the sociology of knowledge machine," *Social Studies of Science* 28, no. 5-6 (1998): 830-3.

⁴ Christopher Hamlin, "Scientific method and expert witnessing: Victorian perspectives on a modern problem," *Social Studies of Science* 16, no. 3 (1986): 488-96; Tal Golan, *Laws of men and laws of nature* (Cambridge, MA: Harvard University Press, 2004), 110-20.

or from a photograph, for example. On occasion, however, the court accepted expert testimony over seemingly contradictory photographic representations, when experts themselves pointed out the shortcomings of the photographic process.

As this thesis will demonstrate, the above themes were common to many areas of forensic medicine in early twentieth-century Scotland. For the most part, all of the cases referred to in the thesis are drawn from forensic medicine as practised in Scotland. (An exception is the notorious Ruxton murder case of 1936, which involved cooperation between authorities on both sides of the border between England and Scotland. The case was tried in England, although the medical expertise was provided by Scottish doctors.) Much of the instructional writing, found in textbooks and journal articles, was produced by Scottish experts in forensic medicine. However, in places, particularly in the sections which deal with photography, these geographical and professional boundaries have been partially set aside. This is because the intellectual space occupied by medico-legal experts, in which they announced and published new techniques and engaged in debates about best practice, adhered neither to Scotland's geographical limits, nor to the boundaries of forensic medicine as a discipline, nor even the medical profession as a whole. For instance, research into forensic medicine was published in national, general publications, such as the *British Medical Journal*, as well as more specialized forums such as the Medico-Legal Society and its *Transactions*. Medico-legal experts and police photographers alike wrote articles on best practice in the *Police Journal*, a publication that devoted significant space to technical and scientific issues in policing. To segregate excessively would be artificial, and would undermine one of the central points of the thesis, that of the interdisciplinary networks of which forensic medicine was a part.

Scotland has been chosen as the focus of the study for a number of reasons. Forensic medicine enjoyed a relatively strong institutional base in the period under study, particularly in the universities of Edinburgh and Glasgow, both of which had Regius Chairs in Medical Jurisprudence. This has left a plentiful archival record relating to both the teaching and practice of forensic medicine in Scotland, including case records, lecture notes, photograph albums

and press cuttings. The material in university archives is coupled with prosecution and court records held at the National Records of Scotland, Edinburgh. These files include papers submitted to courts in evidence, such as medical reports, which reveal how prosecutors used medical expertise. In some cases, trial transcripts, which allow the historian to follow courtroom exchanges, also survive. These reveal how evidence in court was transmitted and scrutinized. Where transcripts are not available (they are normally only found for cases in which the verdict was appealed, due to the expense of production), coverage of the trials in newspapers can still provide a flavour of proceedings. Additionally, edited transcripts of a number of famous trials were published by the Edinburgh publisher Hodge in their *Notable British Trials* series.⁵ These have also been used here when an official transcript of a trial has been unavailable. The occupants of the Edinburgh and Glasgow chairs also produced a number of textbooks which give an insight into what was, at the time, considered to be best practice. Bearing in mind that the contents of these books represent an ideal, they nevertheless demonstrate the various practices that made up forensic medicine in early twentieth-century Scotland.

Perhaps as a consequence of its strong academic base, Scottish forensic medicine encompassed a wide range of techniques and areas of interest, as the thesis will demonstrate. This makes this context of particular interest to historians because it allows the examination of the confluence of different forms of expertise, such as post-mortem examinations and the laboratory testing of samples, in a convenient package.

Finally, Scotland has been chosen because of the high degree of centralized control of its prosecutorial system, in which local prosecutors, the Procurators Fiscal, referred decisions about serious cases, such as whether or not to commission laboratory tests, to the Crown Office headquarters in Edinburgh. The high level of prosecutorial decision-making that took place in that city meant that forensic specialists at the university there were consulted by the central prosecution authorities on medico-legal matters. Indeed, the ways in

⁵ This series, and its appeal to interwar crime aficionados, is discussed in Shani D'Cruze, "'The damned place was haunted': the gothic, middlebrow culture and inter-war notable trials," *Literature and history* 15, no. 1 (2006): 37-58.

which networks of medico-legal work were structured mirrored the layout of the prosecution system. Difficult cases requiring experienced opinion were referred to experts based in the centres of Edinburgh and Glasgow. Thus, Scottish forensic medicine provides an opportunity to examine the effect of the legal context on the development of a medical discipline.

This thesis is not a study of medicine as applied to the law in provincial areas of Scotland. Although it examines the networks of communication and the exchange of knowledge which existed between centre and periphery in Scotland, its main focus is on practice at an elite, metropolitan level (to the extent that Edinburgh and Glasgow can be considered metropolises), located largely in the universities and other major civic institutions, such as the mortuary of a city. This specificity of focus has been chosen for a number of reasons, aside from limits on space. First, it was at the elite level that the greatest breadth of practices within forensic medicine was performed, from the autopsy to laboratory-based tests for blood groups. Although police surgeons at the geographical peripheries would have visited crime scenes as well as examined dead bodies, they lacked the facilities to perform advanced scientific procedures. Second, elite practice left behind a longer paper trail, in the form of their institutional archives, than did more rural practitioners. Finally, elite practice was highly visible and culturally resonant, as a result of comprehensively reported court appearances and self-publicizing on the part of retired expert witnesses. Thus, it is of significant interest for wider social and cultural histories of Scotland.

The first four chapters of the thesis address various disciplinary techniques employed within forensic medicine. The first focuses on the post-mortem examination, the second the use of the laboratory for the analysis of samples taken from bodies and other locations, the third the investigation of gunshot wounds, and the fourth the use of photography for forensic purposes. The final chapter takes a different slant on the history of forensics, since it does not directly concern itself with a particular aspect of practice. Instead, it examines the public face and legacy of the discipline, through the popular writings and public engagement activities of the elite medico-legal practitioners. As the first four chapters make observations about general

characteristics of the discipline, namely its ability to form connections with other bodies and the wide range of its interests and expertise, so the final chapter examines the characteristics practitioners attributed to their own work, sometimes in the name of perpetuating its standing and influence in the criminal justice world.

Assisting the investigation of suspicious and unexplained deaths was one of the central tasks of forensic medicine. The first chapter therefore introduces the broad themes of the thesis in the context of the post-mortem examination, one of the discipline's fundamental procedures. The official responsible for the investigation of deaths in Scotland, the local procurator fiscal, ordered autopsies for a range of occurrences, including suspicious deaths, fatal accidents in the workplace, and deaths whilst under anaesthetic. The procedure was fairly consistent in its execution across the period of study and beyond, with very few changes having been made since the nineteenth century. Research projects in forensic medicine had a greater focus on the laboratory, rather than the body. Nevertheless, textbook authors, including those based in Scottish universities, argued for best practice precautions to be taken, for example performing the internal examination in a specific order, so as to gain the most information about the manner of life and death from the body, and to preserve information for further work, for example preventing contamination for the later testing of samples for poison. As the textbook authors and the guidelines for procurators fiscal made clear, the ideal post-mortem examiner would not forget the solemn, medico-legal nature of the task to be undertaken, given that findings could eventually lead to the execution of an accused person.

As well as outlining the general autopsy procedure, the chapter explores the importance of the wider geographical and disciplinary networks in which the post-mortem examination sat. Through the use of written reports, in which the observations and deductions of the doctor performing the autopsy were contained, essential information about the body's post-mortem appearances, from which details about the manner of death could be ascertained, could be transmitted to audiences some distance away. These audiences included medico-legal experts who might have more experience in the field than the

doctor performing the dissection. Through reading the information about the state of the corpse contained in the report, experts could form their own opinions about the death. Thus, expertise could be given at a remove from the original post mortem. The authorities sometimes referred cases to more experienced practitioners in this way, lending the prosecution's case more weight. The chapter argues that these written means of communicating the post mortem allowed participation over a significant distance. This fits in with a number of existing literatures, both in the history of forensic medicine and science, and further afield. The use of autopsy doctor's observations by others is reminiscent of Steven Shapin and Simon Schaffer's concept of 'virtual witnessing', defined as 'the production in a reader's mind of such an image of an experimental scene as obviates the necessity for either direct witness or replication'.⁶ The report author's descriptions and observations allowed other doctors to visualize it and form their own opinions about the cause of death. In a similar vein, Ian Burney has noted that Robert Christison, an early nineteenth-century Edinburgh toxicologist, stated that witnesses did not need to rely on direct observation. An important skill in medicine was the ability to interpret properly the observations of others.⁷

In addition to these geographical ties, the autopsy enjoyed firm links with other forms of evidence, including those from the wider selection of techniques of forensic medicine, as well as eyewitness testimony. For example, techniques such as the testing of the viscera for the presence of toxic material contributed to the final medical opinion as to the cause of death, which could not always be determined by pathological means. Similarly, eyewitness testimony played an important role in explaining some deaths, which could not easily be understood by dissection alone. Investigations of deaths of anaesthetized patients, which, in Scotland, were conducted by medico-legal experts under the procurator fiscal's direction, are a particularly instructive example of this. Knowledge of the patient's immediate medical history, gained through interviews with relatives and the medical staff treating the deceased,

⁶ Steven Shapin and Simon Schaffer, *Leviathan and the air-pump: Hobbes, Boyle, and the experimental life* (Princeton, NJ: Princeton University Press, 1985), 60-3.

⁷ Ian A Burney, "A poisoning of no substance: the trials of medico-legal proof in mid-Victorian England," *Journal of British Studies* 38, no. 1 (1999): 83-4.

was necessary in these cases. These investigations, namely the questioning of medical personnel in cases of anaesthetic death, were carried out by the medico-legal expert, who would thus have interacted to a significant degree with representatives of other medical specialties and other vocations entirely.

The second chapter examines the laboratory work of the medico-legal experts. In particular, I explore the changing techniques employed to analyse traces found at crime scenes and on the clothing of those directly concerned with the crime. These traces included bloodstains, hairs and fibres and semen stains. The chapter charts the developments of the various techniques of analysis. For instance, during the nineteenth century, the closest an investigator could come to reliably identifying the source of a bloodstain was to examine it under a microscope, and observe whether the red blood cells visible were mammalian-shaped or not. Although, as Tal Golan has observed, some microscope operators claimed to be able to differentiate between bloodstains of different species, through the differences in diameters of blood cells of different animals, this was controversial because of the high degree of variability of cell diameter within species.⁸ By the twentieth century, the range of analytical techniques had expanded to include various chemical tests to demonstrate quickly that a stain was blood. The thesis of Sydney Smith, who took his MD in forensic medicine at the University of Edinburgh in 1914 and became professor of forensic medicine there in 1928, examined the application and possible refinement of some of these tests for medico-legal purposes, demonstrating that positive results could be obtained from even the most difficult samples.⁹ Further developments included the forensic application of the precipitin test, which used the principle of antiserum reactions to identify the species from which a particular sample of blood had originated, and the use of blood grouping, which could categorize blood samples into particular sections of the human population. While these techniques did not originate from the discipline of forensic medicine, medico-legists carried out research work in order to refine them for their own purposes. Other research undertaken in the forensic medicine departments in Scottish universities included an analysis of the

⁸ Golan, *Laws of men and laws of nature* (2004), 148-59.

⁹ Smith, "The examination of blood stains."

usefulness of ultra-violet rays in the laboratory, which rendered semen stains, among others, more visible, allowing their easy location and sampling for microscopic analysis. As well as charting the technical developments, the chapter also explores how they were used in practice. The murder of Helen Priestly in Aberdeen in 1934 is taken as a case study. Investigators in this crime employed a wide range of forensic techniques, including the analysis of blood, hairs and bacteria. Experts from across Scotland collaborated in this case. Of course, experts did not work together in every case. Sometimes they appeared on opposite sides in a court, trying to undermine the other's testimony. The chapter ends with an examination of the ways in which expert evidence was challenged, including the use of counter-expertise and the hostile scrutiny of laboratory procedures.

The third chapter examines the medico-legal investigation of shootings, an area which sat at a confluence between the post-mortem room and the laboratory, since both the wounded body and the projectile, a source of trace evidence, were of interest. In particular, I focus on the investigation of gunshot wounds and the identification of projectiles. Although the latter might not appear initially to be a part of forensic medicine, Sydney Smith had undertaken considerable research on the matter whilst in his previous post in Cairo, and the practice was co-opted into textbooks of forensic medicine. Medico-legists performed investigations of this sort, further illustrating the broad range of activities which existed within the discipline. The chapter begins by outlining the development of forensic medicine as related to shootings. Early writings on the medico-legal investigation of shootings largely focussed on the wound as the major site of investigative scrutiny. By the 1920s, however, this had been complemented by greater attention to surrounding objects, such as projectiles and bullet-damaged furnishings. The chapter goes on to demonstrate the particular importance of cooperation between medico-legal experts and others in the investigation of the gunshot wound. Forensic medical experts worked in conjunction with gunsmiths in order to perform experiments to determine the distance from which a shot had been fired. Gunsmiths were also called as expert witnesses in court to answer technical questions about relevant firearms, for example its ease of operability and the likelihood of its accidental discharge.

Principles from scientific fields such as physics and chemistry, regarding projectile ballistics and the analysis of propellants, were included in medico-legal texts on the subject. However, there does not seem to have existed the same level of medico-legal collaboration with chemists and physicists as there was with gunsmiths, at least in shooting cases.

The final section of the chapter explores the themes of experimentation and cooperation in the context of a particularly illustrative case, the 1927 trial of John Donald Merrett for the murder of his mother, Bertha Merrett, in Edinburgh. Both the Crown and Merrett's defence called medico-legal specialists and gunsmiths as expert witnesses. This produced ample opportunities for the two sides to challenge each other's evidence, revealing some of the grounds on which expert testimony of this type was challenged. These included questions about experimental standards, focusing largely on the extent to which the original conditions of the incident were replicated. The importance of experimental conditions in this case mirrors the concern with standards in other areas of forensic medicine, from the avoidance of contamination at post mortem, to the employment of adequate controls in experiments on human blood samples and bloodstains, which was examined in the previous chapter.

The fourth chapter examines the role of photography in forensic medicine. The place of the photograph in the investigation of crime is another example of the inter-disciplinary connections which existed in the investigation of crime, since it cannot be said to belong wholly to any one particular discipline. Doctors, police specialists and others all produced, used and theorized the photograph. Representatives of different disciplines worked together and published material about the use of photography in the same journals. The chapter examines three main ways in which photography was used in forensic medicine. The first was as a means of recording, and by extension communicating, information about a case, whether directly about some aspect of the body during the post-mortem examination, or relating to the *locus* at which it was found. Although, as the first chapter argues, written reports were a crucial tool for communication in forensic medicine, textbook authors also lauded the photograph as an important means of communication,

for example demonstrating the position and nature of wounds on a body. Expert witnesses used photographs in court as visual aids to draw attention to specific points. However, these images also represented a means by which the experts' authority could be challenged, namely by highlighting differences between their testimony and what appeared on the photograph. This in turn provokes questions about photographic reliability. Some police specialists questioned the utility of photography as opposed to the drafting of plans, for example, for documenting the sites of road accidents. They found problems of perspective to be a particular hurdle because of the risk of distortion. The chapter also discusses the use of the photograph in teaching and as a method of recording items for posterity. Finally, the importance of the photograph as an analytical framing device will be addressed. Some authors argued that the photograph revealed things, such as markings on skin and stains on objects, which were not visible to the naked eye, especially when infrared photography was used. Others highlighted photography's ability to facilitate comparisons, for example between the features of two heads, as used in the notorious Ruxton case of 1935-6. This novel employment of the photograph for forensic purposes offers an interesting insight into the courtroom legitimization of a technique. This was achieved by demonstrating the possibility of obtaining a negative result for a test to determine whether a particular skull had the correct set of contours to have belonged to the subject of a photographic portrait. The demonstration of the possibility of a negative result added credence to the positive result necessary to help obtain a conviction. This use of a spectacle in the courtroom mirrors some of the early outings of latent-fingerprint identification, in which an impressive display was used to demonstrate the expert witness's skill and prowess.¹⁰ In the Ruxton case, incidentally, medico-legal experts directed the photography, which was performed by a police officer who specialized in photography, demonstrating cooperation between forensic medicine and outsiders.

The final chapter moves away from the practice of forensic medicine, instead exploring the attempts made by elite representatives of the discipline,

¹⁰ Simon A Cole, *Suspect identities: a history of fingerprinting and criminal identification* (Cambridge, MA: Harvard University Press, 2001), 181-5, 199.

such as Smith and his Glasgow-based counterpart John Glaister Jr., to cultivate a public face for their practice. This was done through their participation, especially once they had retired, in media output on the subject of forensic medicine. This included the production of autobiographies and newspaper serials dealing with their famous cases and, in Glaister's case, acting as a consultant to the producers of two television drama series, one of which was based on his own cases. The first section of the chapter will explore the extent to which the general themes of the thesis, such as the importance of collaboration and diligent practice, were reflected by this retrospective material. Although the memoirs and newspaper articles were compiled decades after the end of the period covered by the first four chapters, they are still of great interest. They allow an assessment of the extent to which practitioners at the highest level were conscious of some of the major characteristics of the discipline that I have identified, and the degree to which they promoted them. The chapter will also examine the public image of forensic medicine projected by the popular output, and the motives of the practitioners who participated. The objectives of the two authors differed. For example, although Smith and Glaister were both portrayed as fiercely impartial and devoted to science and justice, they held contrasting attitudes towards the courtroom encounter. Smith appeared to encourage his audience of potential jurors to treat courtroom evidence with greater scepticism, criticizing the tendency to take expert and police evidence at face value. Glaister, on the other hand, considered the adversarial trial to be the ideal forum for the testing of scientific evidence. He also took the opportunity to promote what he believed to be the ideal form the scientific investigation of crime might take, in which forensic medicine took a central role. I will also demonstrate that the medico-legists' public image was, to a degree, outside their control. The memoirs were ghost written and the newspaper serializations, although bearing the practitioners' names, were drafted by journalists, who added a more provocative and sensational slant. Archival evidence suggests that there was a degree of reaction to this on the part of Smith and Glaister, who attempted to exercise some control over their public faces, albeit with limited success.

This thesis, therefore, explores in significant detail medico-legal practice in a particular locality from the first half of the twentieth century. Forensic medicine and science in this period has attracted less attention from historians than that of other periods, such as the nineteenth and late-twentieth centuries, although the amount of material is growing. For example, Ian Burney and Neil Pemberton have recently examined the role of celebrity in English forensic medicine in the 1920s with reference to Bernard Spilsbury, a very well-known pathologist of the first half of the twentieth century.¹¹ Some contemporaries, at the time and in retrospect, observed that judges and juries were overawed by Spilsbury's celebrity, a point which is explored in chapter 5.

Spilsbury features prominently in one flourishing form of historiography of early twentieth-century forensics, popular accounts of famous cases, a large number of which have been produced over the decades. Some deal exclusively with Spilsbury. In 1951, four years after Spilsbury's death, Douglas Browne and Eric Tullett produced a compendium of his most famous cases.¹² More recently, Jane Robins has examined one of his most famous cases, the trial of George Joseph Smith, while Andrew Rose critically examines Spilsbury's practices, suggesting that his evidence led to a number of miscarriages of justice.¹³ Other medico-legal lives have also been the subject of books aimed at a general readership. For example, collections of the cases of William Willcox, a prominent toxicologist, and Francis Camps, who coordinated the forensic work on 10 Rillington Place in the 1950s, have also been published.¹⁴ While these works are of some interest, in particular demonstrating the place of forensic medicine and science in popular culture, they do not offer much analytical depth on key issues, such as the means by

¹¹ Ian A Burney and Neil Pemberton, "The rise and fall of celebrity pathology," *British Medical Journal* 341 (2010): 1319-21; Ian A Burney and Neil Pemberton, "Bruised witness: Bernard Spilsbury and the performance of early twentieth-century English forensic pathology," *Medical History* 55, no. 1 (2011): 41-60.

¹² Douglas G Browne and Eric Vivian Tullett, *Bernard Spilsbury: his life and cases* (London: Harrap, 1951).

¹³ Jane Robins, *The magnificent Spilsbury and the case of the brides in the bath* (London: John Murray, 2010); Andrew Rose, *Lethal witness: Sir Bernard Spilsbury honorary pathologist* (Stroud: Sutton, 2007).

¹⁴ Philip Henry Almroth Willcox, *The detective-physician: the life and work of Sir William Willcox 1870-1941* (London: Heinemann Medical, 1970); Robert Jackson, *Francis Camps: famous case histories of the celebrated pathologist* (London: Hart-Davis MacGibbon, 1975).

which evidence was constructed, or the relationships between the disciplines and the legal system.

Within academic history, there has been particularly extensive coverage of forensic practices with reference to both the nineteenth and the late-twentieth centuries. These works have influenced the present study, which contains significant discussion of medico-legal practice, suggesting models for the analysis of the development, execution and assessment of techniques. The study of nineteenth-century toxicology has been particularly fruitful in recent years. For instance, Burney's work on Victorian poisoning explores the development of toxicology as a discipline, as well as the means by which its novel techniques were communicated in the courtroom.¹⁵ Other works have charted the pan-European development of the discipline, for example the volume edited by José Ramón Bertomeu-Sanchez and Agustí Nieto-Galan, which examines the influence of Mateu Orfila, a French pioneer of toxicology, across the continent.¹⁶ Work on late twentieth-century forensic science, much of which has been written from the perspective of science studies, has paid particular attention to the use of DNA profiling in the detection of crime. Controversial cases in which DNA evidence was rebuffed, such as the murder trial of OJ Simpson in Los Angeles in 1994-5, provide a starting point for an analysis of how genetic evidence was put together and interrogated in the courtroom.¹⁷ However, a conscious attempt to address circumstances in which the technique had become routine has also been made by Saul Halfon, who argues that in many cases, the level of scrutiny to which a technique was subjected was dependent on the degree to which 'expert communities' deemed it controversial. Lawyers in court would be more likely to challenge witnesses over matters about which scientists were divided. As controversial issues were

¹⁵ Ian A Burney, *Poison, detection, and the Victorian imagination* (Manchester: Manchester University Press, 2006).

¹⁶ José Ramón Bertomeu-Sanchez and Agustí Nieto-Galan, eds., *Chemistry, medicine, and crime: Mateu J.B. Orfila (1787-1853) and his times* (Sagamore Beach, MA: Science History Publications, 2006).

¹⁷ Michael Lynch and Sheila Jasanoff, "Contested identities: science, law and forensic practice," *Social Studies of Science* 28, no. 5-6 (1998): 675-86; Sheila Jasanoff, "The eye of everyman: witnessing DNA in the Simpson trial," *Social Studies of Science* 28, no. 5-6 (1998): 713-40; Kathleen Jordan and Michael Lynch, "The dissemination, standardization and routinization of a molecular biological technique," *Social Studies of Science* 28, no. 5-6 (1998): 773-800; Lynch, "The discursive production of uncertainty," 829-68.

resolved, the procedure gained overall credibility.¹⁸ Much of the work on the forensic uses of DNA is thematically linked to histories of other identification techniques, such as fingerprinting, and studies of the development of genetics as a whole.¹⁹

An important theme to emerge from the present study is the influence of the legal context in Scotland upon the practice of forensic medicine. The role of the judicial system has been explored before with regard to the early modern period. In her comparison of the place of medical expertise in continental Roman-canon and English common-law systems, Catherine Crawford argues that the former was more propitious for the flourishing of a medico-legal discipline. There existed in Europe a degree of ‘deference to expertise’ not found in England. In particular, Crawford identifies the European experts’ production of written reports as being conducive to the consolidation of their practices. In England, on the other hand, there was a greater emphasis on lay decision-making, which precluded specialist, overly complicated evidence. On the continent, therefore, medical expertise was woven into the institutional fabric to a greater extent than in England.²⁰ The role of national context is also explored by Jennifer Ward in her thesis on the development of English forensic medicine and science. She suggests that English forensic medicine lagged behind the continent in part because of its links with the wider discipline of medical police, the precursor to public health medicine, which was associated, in the nineteenth century, with state surveillance and repressive governments’ interference in citizens’ affairs. Thus, the establishment of university chairs or departments in the subject might not have been politically acceptable.²¹ Matthew Kaufman has pointed out, with reference to the Regius chair in

¹⁸ Saul Halfon, "Collecting, testing and convincing: forensic DNA experts in the courts," *Social Studies of Science* 28, no. 5-6 (1998): 801-28.

¹⁹ Cole, *Suspect identities* (2001); Paul Rabinow, *Making PCR: a story of biotechnology* (Chicago: The University of Chicago Press, 1996).

²⁰ Catherine Crawford, "Legalizing medicine: early modern legal systems and the growth of medico-legal knowledge," in *Legal medicine in history*, ed. Michael Clark and Catherine Crawford (Cambridge: Cambridge University Press, 1994), 96-8, 102-5, 107.

²¹ Jennifer Ward, "Origins and development of forensic medicine and forensic science in England 1823-1946" (The Open University, 1993), 52.

Edinburgh, that the inception of such posts relied upon the auspicious circumstances of a moment in time.²²

The investigation of crime is not the only intersection of law and medicine to have been covered by historians. There exists a substantial body of work on the subject of psychiatry in the courtroom, which explores the question of culpability in cases in which the perpetrator suffered from mental ill health.²³ Additionally, medical evidence was deployed in civil cases, for instance in claims for damages after an injury. Anne Crowther and Brenda White use medical expertise in actions concerned with industrial accidents and insurance claims to track society's changing attitudes to property, labour, and their monetary value. They demonstrate that the definition of property was, by the later nineteenth century, no longer restricted to objects, but also included rights, such as the ability to work. This, they argue, is shown by the role of doctors in assessing injuries, in order to calculate appropriate compensation. The importance of medical opinion for these civil court cases is shown by the fact that railway companies, who were often sued by the victims of crashes, paid retainers to doctors in order to challenge those whom they believed to be malingering. Concerns were raised by some in the medical profession that this sort of work might damage the profession's reputation, especially if experts were seen to disagree in court. Thus, strategies were developed and disseminated through medical jurisprudence lectures to medical students, emphasizing the importance of caution during testimony.²⁴ The condition 'railway spine', an injury often claimed by passengers involved in railway crashes, has come under particular scrutiny in this area of historiography. Ralph Harrington has demonstrated the difficulty faced by medical experts in maintaining medicine's 'privileged scientific status', as the definitions of conditions and traumas became contested and moulded by interested parties

²² Matthew H Kaufman, "Origin and history of the Regius Chair of Medical Jurisprudence and Medical Police established in the University of Edinburgh in 1807," *Journal of Forensic and Legal Medicine* 14 (2007): 121-3.

²³ Roger Smith, *Trial by medicine: insanity and responsibility in Victorian trials* (Edinburgh: Edinburgh University Press, 1981); Joel Peter Eigen, "Delusion in the courtroom: the role of partial insanity in early forensic testimony," *Medical History* 35, no. 1 (1991): 25-49; Joel Peter Eigen, *Witnessing insanity: madness and mad-doctors in the English court* (New Haven, CT: Yale University Press, 1995).

²⁴ M Anne Crowther and Brenda M White, "Medicine, Property and the Law in Britain 1800-1914," *The Historical Journal* 31, no. 4 (1988): 853-70.

outside the profession who wished to use these conditions to facilitate their own ends.²⁵

The above overview of the literature linked to the history of forensic medicine and science shows that, although quite small and thinly spread over a variety of time periods, it represents a lively area of scholarship. However, the amount which has been written about the history of the discipline in Scotland is still quite limited, despite the significance of Scottish academic forensic medicine in the twentieth century compared with the rest of the United Kingdom. The only book-length study of the specialty in Scotland, Crowther and White's *On soul and conscience*, was published in 1988.²⁶ Crowther and White's book, which examines forensic medicine in Glasgow from the early-nineteenth century to the 1980s, did a great deal to establish the study of medical jurisprudence as a historical subject. It has provided a very valuable starting point, and is particularly strong in its analysis of the institutional and political contexts occupied by the discipline in Glasgow. This thesis aims to build on the pioneering work of Crowther and White, extending the scope of the history of Scottish forensic medicine eastwards. Taking advantage of the innovative approaches to the history of medicine, science and criminal investigation which have appeared between 1988 and the present, I aim in particular to provide insight into the practices of forensic medicine, from the mortuary and post-mortem slab to the laboratory and the photographic studio, and how these have been applied to the courtroom. I therefore begin my study with one of the central practices of forensic medicine, the post-mortem examination.

²⁵ Ralph Harrington, "On the tracks of trauma: railway spine reconsidered," *Social History of Medicine* 16, no. 2 (2003): 214.

²⁶ M Anne Crowther and Brenda M White, *On soul and conscience: the medical expert and crime: 150 years of forensic medicine in Glasgow* (Aberdeen: Aberdeen University Press, 1988).

Chapter 1: The autopsy in forensic medicine

Introduction

Assisting with the investigation of unexplained and suspicious deaths was one of the central tasks of forensic medicine. The main procedure used by the medical profession to explain why a person died was the post-mortem examination, or autopsy. It was, and still is, one of the most culturally visible manifestations of the discipline. In addition to its prominent place in the medico-legal workload, the post mortem has been chosen as a topic for study because it has left behind an impressive paper trail, in the form of practitioners' personal records and court documents, which illuminate the way the specialty in general interacted with other medical disciplines, including those from different geographical areas. This is possible largely because of the Scottish legal requirement that all medical findings for legal purposes be committed to a written report. Many of these reports have been preserved, in prosecution records and in the post-mortem notebooks of Henry Harvey Littlejohn, police surgeon of Edinburgh and Regius Professor of Forensic Medicine at the university until 1927.¹ This chapter examines the post-mortem examination as practised in Scotland in the period 1914 to 1939. I aim to demonstrate that the autopsy occupied a place in a wider network of forensic techniques and sources of knowledge with which it had close connections. Experts combined observations made at the post mortem with test findings and other circumstantial evidence to formulate a satisfactory account of a person's death.

This chapter sets out some of the ways the autopsy was connected to other areas of forensic medicine, as well as with the environments in which bodies were produced (namely crime scenes and ante-mortem medical procedures). The links between the mortuary, where the dead were examined, and the laboratory, where additional, and, as I will argue, complementary work was done, form parallels with those between the clinic and the laboratory, which have previously been explored in the context of Scotland in the first half

¹ Post-mortem case books of Sir Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2. In this thesis, the names of deceased persons and their families have been omitted except in cases which were tried in open court and widely reported in the press.

of the twentieth century.² The parallel relationship of the clinic and the lab forms a useful methodological backdrop which will be selectively employed here.

The post-mortem examination and the accompanying written record also afford the opportunity to examine the networks of forensic medicine which existed across Scotland. I will argue that the written medical reports, produced by the doctors who performed the autopsies, enabled communication between the provincial areas in which the bodies were examined and the centres of expertise in the university forensic medicine departments of the large cities. Police surgeons in smaller towns, who might not have had much experience of examining murder victims, for example, would perform the initial post mortem and record their findings in the report, which could then be shown, if necessary, to more experienced university experts, who might give additional opinions. The report thus gave these university experts a metaphorical ‘presence’ at these autopsies. As well as receiving the report, the experts might also be sent samples for further testing, either taken from the crime scene, or from the body at autopsy. This continues the theme of the autopsy’s part in a wider forensic network. This theme will be explored elsewhere in the thesis, regarding, for example, the collaboration between the medical profession and others, such as gunsmiths and police photographers.

In order to demonstrate the autopsy’s place in a forensic-medical network, the chapter is arranged into four sections. The first introduces the historiography relating to the forensic autopsy. The second section lays the groundwork for the rest of the chapter, detailing first the systemic and legal frameworks within which the medico-legal post mortem took place, and second

² LS Jacyna, "The laboratory and the clinic: the impact of pathology on surgical diagnosis in the Glasgow Western Infirmary, 1875-1910," *Bulletin of the History of Medicine* 62, no. 3 (1988): 384-406; David Smith and Malcolm Nicolson, "The 'Glasgow School' of Paton, Findlay and Cathcart: conservative thought in chemical physiology, nutrition and public health," *Social Studies of Science* 19, no. 2 (1989): 195-238; Christopher Lawrence, *Rockefeller money, the laboratory, and medicine in Edinburgh, 1919-1930: new science in an old country* (Rochester, NY: University of Rochester Press, 2005); Steve Sturdy, "Scientific method for medical practitioners: the case method of teaching pathology in early twentieth-century Edinburgh," *Bulletin of the History of Medicine* 81, no. 4 (2007): 760-92; Steve Sturdy, "Knowing cases: biomedicine in Edinburgh, 1887-1920," *Social Studies of Science* 37, no. 5 (2007): 659-89; Steve Sturdy, "Looking for trouble: medical science and clinical practice in the historiography of modern medicine," *Social History of Medicine* 24, no. 3 (2011): 739-57.

the way in which the autopsy was performed, namely the actors present, the location, and the order of dissection. I argue that the way in which the autopsy was conducted is important for understanding its place in a network which included the laboratory, and the courtroom. For example, the dissection of the body and the taking of samples were performed with a view to the samples' later use in a laboratory technique.

The communication of findings was a crucial element of all divisions of forensic medicine, especially the autopsy. The third section explores how these findings were first recorded and then disseminated via the written post-mortem report. The report facilitated communication between experts, and allowed participation in the post-mortem process from a distance; experts in other locales could deliver opinions on a body, without examining it in person, based on the descriptions in the report.

The final section explores the relations between the autopsy and other areas of forensic medicine, arguing that, for example, laboratory results or the previous medical history of a deceased person, helped to determine the cause of death at the post mortem. Thus, I will argue, as suggested by studies of the post mortem in relation to the nineteenth-century English coronial system and contemporary forensic medicine in the United States, that in the Scottish case there were close links between post-mortem findings and evidence drawn from other areas of forensics and criminal investigation.

Historiography

The history of the forensic autopsy has been dealt with in various historiographical and sociological works over the years, both specifically and in passing. Some of the questions which this chapter addresses, namely the place of the autopsy alongside other sources of information (such as laboratory tests, medical history and a body's juxtaposition with the rest of a crime scene), and the role of the medico-legal report, are touched upon in Stefan Timmermans's ethnomethodological study of the contemporary autopsy. However, while observations he makes about these issues can be applied to post mortems in the period of my study, this is possible only to a limited degree. This is particularly

true of the medical report, the role of which, in early twentieth-century Scotland, was complex and multifaceted.

Timmermans's study is based upon several years' worth of direct observation in a mortuary in the United States, recording and analysing the ways in which pathologists worked and established their authority, and the professional hierarchies they occupied. While showing forensic pathology to be one of medicine's bastions of anatomical authority, he demonstrates the importance of the context of the body, for example where it was found and whether it was surrounded by empty alcohol containers, in determining the course of the investigation and, ultimately, the cause of death. Likewise, decisions taken by pathologists about which autopsy procedure to use or test to order further limit the number of possible causes of death. For example, unless a test for the presence of cocaine is ordered, death brought on by cocaine use cannot be determined to be the cause of death.³

Such a finding, as will be demonstrated below, invites comparisons to the medical investigation of deaths in Scotland in the period 1914 to 1939, in which the background to a death was an important consideration for forensic medical experts. Indeed, in a number of cases, such as deaths under anaesthesia where the visible post-mortem signs indicating a cause of death were limited, background information about the case, such as the deceased's immediate medical history, took precedence over that which could be derived from the body. For instance, the medical expert might make a determination largely on the basis of an interview conducted with the deceased's anaesthetist.

Ian Burney has shown that the question of the context of the autopsy, namely its relation to other sources of information about a person's life and death, was an important factor in an on-going debate in England in the late-nineteenth and early-twentieth centuries about who should perform post-mortem examinations for coroners. Reformers argued that autopsies ought to be carried out by a specialist cadre of pathologists, whom they deemed to be more suitably skilled than the general practitioners who had most recently attended

³ Stefan Timmermans, *Postmortem: how medical examiners explain suspicious deaths* (Chicago: The University of Chicago Press, 2006), 41-7, 63, 69-70.

deceased persons. The pathologists focused primarily on the body as an object and were disinterested with regards to any previous dealings with a patient. Generalists, on the other hand, were perceived to be overly influenced by feelings for the deceased's family, whom they might have known personally, thus clouding their judgement. In response to this position, advocates of the general-practitioner autopsy argued that pathologists' perspectives were too narrow, whereas the generalist was better placed to adjudicate the cause of death, having a broader perspective and the ability to deploy important information which could only be found beyond the confines of the corpse, in the deceased's medical history.⁴ Burney's analysis thus shows the perceived importance of the context in which the post mortem sat, and the autopsy's contested boundary. The present study will demonstrate that, in the Scottish case, the wider circumstances of deaths were also of importance in relation to the post-mortem examination, in some cases informing their conclusions.

Timmermans also comments on the status of the report as an instrument of medical authority. Rather than being a descriptive narrative of the post-mortem procedure, he argues that the report forms an argument for a particular interpretation of the body, namely what the cause of the death had been. The most visible remnant of the post mortem, the report has to be thorough and tightly argued, to prevent it from being picked apart by hostile stakeholders. As such, Timmermans argues, the report represents a Latourian 'black box' (a concealed process), within which the uncertainties of the autopsy performance were masked. This presents a grim prospect for the historian, since any 'study of death investigators that relies only on the final products misses the gradual construction of a cause of death'.⁵ It is implied that an observational study, such as his own, is a more reliable approach.

The practice of history does not work like that, for obvious reasons, so we must make do with written material. The limitations of the report as a source for precise post-mortem practice should not come as a surprise to anyone who has read one. As well as their rhetorical qualities, brevity is

⁴ Ian A Burney, *Bodies of evidence: medicine and the politics of the English inquest, 1830-1926* (Baltimore: Johns Hopkins University Press, 2000), 107-36.

⁵ Timmermans, *Postmortem* (2006), 63-70, 294 n. 60.

another of their notable features. Textbooks can provide a more comprehensive, if idealized, portrait of post-mortem performance. Nevertheless, if we think outside of the black box, the report becomes a very valuable source, because of its use as a means of communication between experts. In dealing with this role of the medico-legal report, Shapin and Schaffer's concept of 'virtual witnessing' is helpful. They define virtual witnessing as 'the production in a reader's mind of such an image of an experimental scene as obviates the necessity for either direct witness or replication'.⁶ In the case of the medical report, the carefully structured document communicated essential findings both to the court and other experts, who had not been able to attend the original autopsy. It allowed them to visualize what the dissector had seen, and form their own opinions as to the cause of death, facilitating the contribution of central expertise to investigations of deaths in the geographical peripheries.

Interestingly, by allowing other doctors to form their own opinions, the descriptive features of the report enabled readers to challenge the interpretive conclusions of the author. This complicates Timmermans's notion of the report as a citadel of forensic authority, designed to repel all challenges. However, the remote expert's employment of the original author's observations in forming their own conclusions implied a certain degree of trust in their dissecting ability. The role of the report was therefore complex.

As the section of this chapter on post-mortem inscription will make clear, clarity of writing was an important skill for medical witnesses, in view of the report's importance in Scottish procedure.⁷ This chimes with the importance attached to practitioners' abilities to communicate in other contexts. Burney has shown that lucidity in the witness box was held to be an essential component of the medico-legist's art in the nineteenth century. Courtroom testimony was a crucial point in the boundary between public and specialist knowledge.⁸ While this thesis acknowledges the similar position of the Scottish report as a mediator between forensic medicine and the outside, namely lawyers and lay jurors, I will focus particular attention on its place as a mode of communication

⁶ Shapin and Schaffer, *Leviathan and the air-pump* (1985), 60-1.

⁷ Unlike in England, in Scotland, medical experts were obliged to submit written reports of their work to the authorities.

⁸ Burney, *Bodies of evidence* (2000), 118-20.

between medical practitioners, and the networks and hierarchies which this facilitated.

This chapter will also examine the place of the post mortem within the wider discipline of forensic medicine. Ideas about the relationship between the autopsy and other forensic techniques, such as toxicological testing, are paralleled by studies outside the field of the history of forensic medicine on the topic of the relationship between clinical medicine and the medical laboratory in the early-twentieth century. In particular, the contexts of Edinburgh and Glasgow have been analysed in a number of studies over the past decades. Conflict and cooperation between clinic and laboratory have been examined from traditional and revisionist perspectives. Some early studies emphasize the distinctions between clinicians and their laboratory-based counterparts. In the late 1980s, David Smith and Malcolm Nicolson emphasized the unwillingness of much of Glasgow's clinical establishment to engage with emerging laboratory disciplines such as biochemistry, which was a rival to the bedside's claim of diagnostic authority. Doctors instead maintained their preference for chemical physiology, which could be more clearly held subservient to the clinic. Smith and Nicolson argue that medicine's attitude towards the laboratory in this context was motivated by self-service and political conservatism.⁹ More recent treatments, on the other hand, have taken a more nuanced view, both in terms of the Glaswegian case, and elsewhere. Andrew Hull has provided an account of the relationship between clinicians and laboratory workers in Glasgow which illustrates a degree of collaboration between parties, as well as changing hierarchies of knowledge. He demonstrates that the importance of laboratory techniques and findings within the context of medical diagnosis grew in relation to clinical observations. Thus, instead of being merely a confirmation of the clinical observation and diagnosis, the laboratory began to guide clinical conclusions.¹⁰

Steve Sturdy has taken particular exception to the general view that a state of hostility existed between clinic and laboratory. He argues that while

⁹ Smith and Nicolson, "The 'Glasgow School'," 195-238.

¹⁰ Andrew J Hull, "Teamwork, clinical research, and the development of scientific medicines in interwar Britain: the "Glasgow school" revisited," *Bulletin of the History of Medicine* 81, no. 3 (2007): 580-91.

specific case studies which uncover conflict are not necessarily incorrect, historians' generalized view of enmity has been guided by contemporary attitudes towards medicine and science. Growing suspicions about overtly scientific medicine from the 1970s onwards encouraged medical historians to scrutinize the relationship between science and medicine, and to 'refute overly cosy and triumphalist assumptions about the inevitable and beneficial progress of scientific medicine', through the exposure of conflict. He also suggests that this standpoint was motivated by self-interest; medical historians emphasized medicine's distinctive qualities as an art, rather than a science, to ingratiate themselves with the medical schools which employed them to teach medical students about their heritage.¹¹ Instead, Sturdy uses one particular example, the laboratory of the Royal College of Physicians of Edinburgh, as a case study to illustrate the significant degree of cooperation between scientific researchers in the laboratory and the local medical community. Laboratory facilities were used both for routine diagnostic purposes and for biological research. Through studying clinical cases, Sturdy demonstrates that these two endeavours were not far apart; indeed, cases referred to the laboratory for diagnostic purposes were also used by researchers to advance their own work. Sturdy uses the concept of 'triangulation' to describe the process of amalgamating knowledge from a number of sources to produce a conclusion. These acts of triangulation could work in two ways, to bring about a diagnosis through a marriage of clinical observations and laboratory testing, or to improve general understanding of biological phenomena.¹²

Ideas of triangulation can also be applied to the forensic context. Information from a variety of sources – the corpse, the laboratory test, and the background to a case – was collated and employed to explain a death. Sometimes some sources of information took precedence over others, as the example of investigations into anaesthetic deaths will show. The medico-legal investigation of deaths in the operating theatre has previously been discussed with reference to the debate among anaesthetists about the necessity for

¹¹ Sturdy, "Looking for trouble," 750-1.

¹² Sturdy, "Knowing cases," 666-75.

coronial and procurator-fiscal investigation of these deaths.¹³ However, they are of interest to the present study because of the nature of the forensic expert's role in the investigations. As well as examining the body, the pathologist acted as a kind of detective in these cases, interviewing witnesses, namely the surgeons and anaesthetists involved, and reviewing the deceased's medical history. Because of the difficulty of locating signs of anaesthetic death on a body, the pathologist's interpretation of narrative accounts of the administration of the anaesthetic was central to this task, assigned by the procurator fiscal. In this regard, information derived from personnel from several medical fields, as well as the body, was triangulated.

The triangulation of different disciplinary sources of information to produce a conclusion and the attendant professional, institutional and disciplinary links were important to forensic medicine's determination of the cause of death; however, there are caveats to the application of the clinic-laboratory model. A first concerns professional background. Much of the medico-legal laboratory work, for example blood testing, was overseen by specialists in forensic medicine based at the universities; on the other hand, the laboratories juxtaposed with the clinics were staffed by scientists with scientific, rather than medical, degrees. Bridging the divide between the mortuary and the post-mortem room, there would also have been a common purpose, that of reaching a conclusion which would be of medico-legal use. Research work in the forensic medicine departments would have been limited, and would have had the eventual goal of practical application. Whilst practical outcomes and medical training would have been shared in some cases across the clinic-laboratory gulf, it was not uniform, although Sturdy blurs such a divide.

However, the question of hierarchy, raised by Hull, was an issue in the networks of forensic medicine. Professional hierarchies existed between the less experienced police surgeons, who performed the post mortem, and the professors of forensic medicine in the cities with whom they exchanged

¹³ Burney, *Bodies of evidence* (2000), 137-64; AL Gillies et al., "Reports by anaesthetists to procurators-fiscal: analysis of 'anaesthetic deaths' over 10 years in four Scottish teaching hospitals," *British Medical Journal* 1, no. 6173 (1979): 1246-7.

information, reports and samples. The university specialists, who operated in close proximity to the centres of the prosecution system, might be asked, for example, to review the findings of a more peripheral medical witness in a difficult case. There was, thus, a geographical element to this hierarchy, the illumination of which can be provided by an examination of the paper records of the post mortem. This will be discussed at length later in the chapter. However, it is first necessary to provide descriptions of the legal background to the medico-legal autopsy, the nature of the autopsy itself and the recording of findings in written reports.

Legal framework of the post mortem

Networks of medico-legal expertise can only be properly understood in the context of the legal system in Scotland as it related to the investigation of death. This system, which was of a centralized character, facilitated the centre-periphery communication between the forensic medical elites in university cities and rural practitioners engaged in medico-legal work.

The post-mortem dissection of a dead body for medico-legal purposes (as opposed to those of medical research and teaching) existed within a system for the investigation of death, which, in Scotland, revolved around the procurator fiscal, a lawyer responsible for public prosecutions in a given area. The procurator fiscal oversaw all investigations into suspicious and unexplained deaths, and, with the exception of some accidental deaths, was the overall arbiter of the ‘cause of death’, namely accident, suicide, murder, or natural causes. This differed from the procedure in England and Wales, in which a courtroom inquiry, the inquest, was used, overseen by a Coroner. The various intricacies of the system of coroner’s courts have been ably analysed elsewhere.¹⁴

In the case of a suspicious death in Scotland, the procurator fiscal would normally direct police inquiries. The police, on discovery of a dead body, would usually send for the divisional, or area, police surgeon, a doctor affiliated to the police force, who handled medical matters for them, including medico-legal work, as well as the medical needs of force employees. These doctors

¹⁴ Burney, *Bodies of evidence* (2000).

were often general practitioners.¹⁵ They would make preliminary observations about the body, and where it had been found, which would be particularly important if the doctor who eventually carried out the post mortem, who might be different, was not able to get to the scene. As soon as possible, the police would alert the procurator fiscal, who had overall responsibility for the investigation of the death.

If the death was suspicious or unexplained, the procurator fiscal would apply to a sheriff (a lower court judge in the Scottish legal system) for a warrant for a post-mortem examination. Before this took place, however, expert medical involvement at the *locus* (the preferred term at the time for the place the body lay) was preferable. Experience being a prized quality among medico-legal circles, John Glaister Jr., a specialist in forensic medicine based at the University of Glasgow, advised the best level of medical expertise at the crime scene once the police surgeon had made his initial observations:

In Scotland, in the more important cases, it is customary for a medico-legal examiner for the Crown to be requested by Police Headquarters, they having obtained the consent of the Procurator-Fiscal, to make an examination of the body of the victim of the tragedy in the company of the detectives. The Crown medico-legal examiners are specialists in medico-legal matters, in addition to being men of seniority, and with abundant experience in criminal work.¹⁶

It was important, Glaister argued, for the medico-legal examiners to visit the scene before the body was moved, so that they would be best informed when giving an opinion as to the cause of death, having examined the body where it lay.

The sheriff's warrant authorized the doctor named on it to perform a post-mortem examination, to ensure that there was no unintentional violation of the Anatomy Act. The doctor would then commence the examination, at which

¹⁵ Crowther and White, *On soul and conscience* (1988), 84.

¹⁶ John Glaister, Jr., *Legal medicine: for members of the legal profession and police forces* (Glasgow: Stenhouse, 1925), 13.

the body would be identified formally. In the case of a suspicious death, two doctors would carry out the dissection and compile a joint report, corroborating each other's observations as required by Scottish criminal procedure. In addition to the post mortem, the procurator fiscal could instruct the medical witnesses to examine any other relevant articles, such as items of stained clothing, and to perform any necessary laboratory tests.¹⁷ Any such examinations would also be documented in report form. These reports were then returned to the procurator fiscal, who would forward them, along with his own report, to his superiors at the Crown Office in Edinburgh, for instructions as to how to proceed.¹⁸

If a prosecution followed, witnesses, including medical experts, were interviewed by the procurator fiscal, or one of his staff, in a process known as precognition. Their statements were recorded, and used for reference in preparing the case.¹⁹ In the case of medical witnesses, the precognition facilitated clarification on important points. In a prosecution for murder, the case would be tried in the High Court, in an adversarial procedure, normally before a jury. A list of the items of physical evidence to be presented at the trial, known as productions, and a list of witnesses were circulated beforehand, along with the indictment. The productions included the written medical reports, which were admissible in court. Normally, when called, medical witnesses read out their reports, attesting to their veracity, and then answered questions from the prosecution and defence counsel. The judge could also ask questions, for example to clarify a matter.

So far this section has focussed on the role of the medical expert as utilized by the prosecutorial authorities. However, medical experts also played a role in some defences. While a great many defences did not consult a medical expert, or call one as a witness, when they did, the procedure was similar to that of the prosecution, albeit with some important differences. Defence lawyers also put together precognitions in which witnesses, including experts, were

¹⁷ John Glaister, Sr., *A text-book of medical jurisprudence and toxicology*, 3rd ed. (Edinburgh: E & S Livingstone, 1915), 32-4.

¹⁸ David Dewar, *Criminal procedure in England and Scotland* (Edinburgh: W Green, 1913), 31-4.

¹⁹ Robert Wemyss Renton, *Criminal procedure according to the law of Scotland* (Edinburgh: William Green, 1909), 49.

called. Defence experts put together written reports, and the procedures in court were broadly similar. However, they had not necessarily performed or attended the post mortem, and would have based much of their opinion on the Crown's medical reports. In a number of cases they were given the opportunity to analyse pieces of physical evidence, performing their own laboratory tests.

The procurator fiscal was also responsible for the investigation of fatal accidents. From the medical point of view, the procedures in the case of a suspicious death and an accidental one were not very different. The post mortem would be ordered in the same way by the procurator fiscal. However, they might also be asked to give evidence at a Fatal Accident Inquiry. Such inquiries were mandatory in the case of a death in a workplace or of a prisoner. This was a public inquiry before a sheriff, conducted by the procurator fiscal, to determine the cause of the death. Witnesses were called and questioned by the procurator fiscal, and by the legal representatives of any interested parties, for example, the deceased's family and employers.²⁰ The Crown authorities could also institute an inquiry into any sudden or suspicious death which they believed to be in the public interest, which would take the same format.²¹

Overall, therefore, the investigation of deaths in Scotland was of quite a structured character. Decisions about major prosecutions were taken in Edinburgh at the Crown Office's headquarters, rather than locally. This resulted in a flow of reporting from regional legal officers to the centre, with decisions returning in the opposite direction. It will be shown that this was mirrored by the system of medico-legal expertise. However, before this is discussed, it is worth outlining the nature of the autopsy itself, the format it took, and the extent to which this reflected its juridical purpose.

Post mortem procedure

One area of the practice of forensic medicine on which the historiographical record is still quite thin is the procedure of the autopsy itself. This is hardly surprising, since there are clear limits to the relevant source material. Aside from a small number of photographs, few of which depicted the post mortem

²⁰ Henry Hilton Brown, *The procedure in accident inquiries and investigations; according to the law of Scotland* (Edinburgh: T & T Clark, 1897), 41-2.

²¹ Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act, 1906, s. 3.

underway, and fairly brief reports prepared for court, there is little direct evidence of autopsy practices. Instead, the most complete picture has to be drawn in reverse, relying for the most part on instructional textbook accounts of how best to perform an examination, in the hope that practitioners followed these directions sufficiently closely for them to represent a reliable account of post-mortem procedures. On the one hand, this is feasible because the authors had themselves performed a large number of autopsies, and so would be familiar with their practice. On the other, the instructions contained in the texts represent a practical ideal. That various possible pitfalls were outlined in the texts suggests that at least some autopsies were carried out less proficiently, necessitating the authors to detail mistakes to avoid, such as using inappropriate instruments which might damage or destroy post-mortem clues, or conducting an incomplete examination. This section provides an outline of a post-mortem examination, as described in the books of Sydney Smith, Douglas Kerr and John Glaister Sr., all of whom practised and taught forensic medicine in Edinburgh or Glasgow during the period under study. It also highlights the adaptations made to the procedures and the precautions taken to ensure that their evidential reliability was not compromised.

The textbooks produced by the Scottish authors each contained a framework for the examination, and they did not deviate significantly from each other's general pattern. Various stages in the post-mortem procedure were described: the identification of the body; a close external examination of the body; and the internal examination.

Before the body could be dissected it had to be identified. In cases in which the identity of the deceased was already known, or at least strongly suspected, this was carried out by one or more family members or other associates along with, on occasion, a police officer concerned with the investigation. In many cases, for example in the case of newborn infants whose bodies had been abandoned, their identity was not known. In this case, the formal identification would often be carried out by the police officer who had discovered the body or been the first to arrive on the scene to begin the investigation. For example, Henry Harvey Littlejohn, Edinburgh police surgeon

and professor of medical jurisprudence at the university from 1906 to 1927, opened one report on the examination of an infant as follows:

On Thursday 22nd February, in the Forensic Medicine Department of the University, I examined the body of a newly born male child which was identified by Police Sergeant James Gall as that found in a parcel in the area at 19-27 Clarence Street on Monday, 19th February.²²

In such a case, the identification provided the necessary link between the investigation and the autopsy, to ensure the validity of evidence. The formal identification, which took place before the post-mortem began, was always recorded in the medical report, which was, of course, a legal document.

Once this had taken place, a thorough external examination of the body was made. According to John Glaister Sr., professor of forensic medicine at Glasgow from 1899 to 1931, this included noting ‘appearances indicative of the time of death and the position in which the body has lain for some time after death’, as well as any ‘marks of violence, or any other marks, from any cause whatever, pointing to the cause of death’.²³ Authors differed slightly on the importance of examining the clothing. Glaister wrote that, normally, even when identity was in dispute, ‘medical examiners need not extend their observations to the clothing, as that is the duty of the police’.²⁴ Smith, on the other hand, was bluntly comprehensive, stating ‘the clothing should be examined and described as regards its nature and condition, noting any tears, loss of buttons, or disarrangement indicating a struggle’, as well as any stains. Also, ‘any ligatures found on the body, and the method of tying should be described before removing them’.²⁵ Glaister acknowledged that in more violent cases, a close examination of the clothes should be made:

²² Post-mortem report on body of newly born male child, 22 February 1917, Post-mortem notebooks of Professor Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, Vol. XII (March 1915-March 1919), p. 96.

²³ Glaister, *Medical jurisprudence and toxicology* (1915), 34.

²⁴ *Ibid.*, 35.

²⁵ Sydney A Smith, *Forensic medicine: a textbook for students and practitioners* (London: J & A Churchill, 1925), 32.

It would fall within [the medico-legalist's] duty to carefully note, for example, the wrappings in which the body of an apparently newly-born child was enveloped, or the clothing or wrappings of a body which has been discovered in an advanced state of decomposition in some secret place, such as a trunk or bag. Clothing ought to be examined separately for stains, or for cuts, or perforation in cases of stabbing, shooting etc.; and it is better that each examination should form the subject of a separate report.²⁶

As this passage suggests, in many instances the medico-legalist would examine clothing anyway, in order to determine the presence of bloodstains, and other markings. They would also perform this task in cases in which no death had occurred, but where there were biological stains on clothing, for example in the investigation of sexual crimes.

If the identity of the cadaver had not been established already, characteristics likely to aid identification were noted in detail.²⁷ The deceased's height and weight would be measured; an estimate of their age made, based on the condition of their teeth, bones, and other factors; and the state and number of teeth and any other distinguishing features, such as abnormalities, tattoos and scars, would be noted.²⁸ Additionally, Smith recommended that the condition of the eyes, namely their sightedness, should not be overlooked. If it was known whether the deceased had been blind, the pool of potential identities could be narrowed.²⁹

The length of time since death would be determined by taking the rectal temperature, assessing the states of rigor mortis (the temporary stiffening of a body after death), lividity (the characteristic red marks caused by the pooling of blood in the parts of a dead body closest to the ground), and the extent of

²⁶ Glaister, *Medical jurisprudence and toxicology* (1915), 35.

²⁷ The process by which a range of individual characteristics was used to identify human remains has been discussed by Fraser Joyce with reference to the 1910 Crippen case in London. Fraser Joyce, "Experts, laymen, and the identification of Cora Crippen: an exercise in medicolegal cooperation," *Medico-Legal Journal* 79, no. 2 (2011): 58-63.

²⁸ Glaister, *Medical jurisprudence and toxicology* (1915), 35.

²⁹ Smith, *Forensic medicine* (1925), 33.

putrefaction.³⁰ Any injuries or wounds would also be noted. Glaister pointed out the importance of making incisions to confirm the status of any bruises, because ‘questions may arise in Court regarding their possible confusion with post-mortem lividity’.³¹ The survey of wounds was intended to be very thorough, as Smith made clear:

The number of wounds, their nature, direction and depth, the edges and extremities, the appearance of the deeper structures, whether cut or torn, and the presence or absence of foreign bodies, should be noted. The position of each wound should be accurately defined, and the amount of haemorrhage and the appearance of inflammatory reaction or colour change recorded.³²

He advocated making sketches and diagrams of the wounds, and indeed, such drawings can be found among the case notes of a number of practitioners.

According to Smith, once the body had been examined, it was washed, and the scalp shaved, to reveal any small wounds or marks which had been obscured by blood, dirt or hair, ‘especially about the neck and mouth’.³³ Once this second external examination had taken place, the body was ready to be opened, and the internal cavities and organs inspected.

The textbook authors were in agreement that the internal examination had to be thorough, with no organs being omitted. This point was framed both in terms of failing to determine as fully as possible the cause of death and of the courtroom consequences of an incomplete report. In the first sense, Glaister wrote that every organ and cavity had to be examined, because ‘even although the apparent cause of death has been found in one of them, since evidence contributory to the cause of death may be found in one or more of the others’.³⁴ Likewise, Douglas Kerr, who became the Edinburgh police surgeon upon

³⁰ Douglas JA Kerr, *Forensic medicine: a text-book for students and a guide for the practitioner* (London: A & C Black, 1936), 45-54.

³¹ Glaister, *Medical jurisprudence and toxicology* (1915), 35.

³² Smith, *Forensic medicine* (1925), 81.

³³ *Ibid.*, 33.

³⁴ Glaister, *Medical jurisprudence and toxicology* (1915), 36.

Littlejohn's death in 1927, reminded his readers of the importance of dissecting the head:

In many cases on making an internal examination, disease is found which is sufficient to account for death, but frequently in such cases on opening the skull and examining the brain the real cause of death is discovered, and however obvious the cause of death may appear, a complete examination must always be made.³⁵

However, a slapdash approach could also lead to embarrassment in the courtroom, or, even worse, prosecution. Smith stated specifically that the viscera were to be examined in every case, presumably to rule out poisoning, even if a sufficient cause of death was located, 'otherwise if any important organ is not examined, questions about it may be raised in the subsequent trial'.³⁶ Glaister suggested that an incomplete dissection, combined with poor courtroom technique, could lead to prosecution:

Inadvertent omission of a complete examination will tend to invalidate the report, or even may tempt a witness, while closely pressed by cross-examining counsel, to make statements which a re-examination of the body will disprove, and thus, very properly, make him the victim of a charge of perjury.

Glaister then went on to refer to such a case (without identifying it) in which the initial cause of death had been listed as 'failure of the heart's action, due to shock'. The expert's evidence was deemed unsatisfactory, and a second examination carried out, after which the unfortunate medical witness was forced 'to admit that in the first examination he had omitted to observe a dislocation of the first and second vertebrae with fracture of the odontoid process and rupture of the lateral ligaments'.³⁷ In other words, he had overlooked a serious injury.

³⁵ Kerr, *Forensic medicine* (1936), 23.

³⁶ Smith, *Forensic medicine* (1925), 33.

³⁷ Glaister, *Medical jurisprudence and toxicology* (1915), 36.

In order to avoid missing anything, Smith advised that examiners follow a routine, although he did not specify a particular order in which to examine the body's cavities.³⁸ Glaister noted that some debate existed as to whether the chest and abdomen should be opened only after the head had been examined, or not. Examining the head first allowed the assessment of the blood circulation in the meninges and brain before it was drained away by the severing of blood vessels in the chest, although Glaister stated that this could be avoided if the chest and abdominal cavities were exposed, but not cut into, and then the head opened:

The examiner may, thereby, by palpation, form some opinion of the amount of blood contained in the respective cavities of the heart, and observe, alongside of this, the blood-condition of the brain-membranes and of the brain itself, after removal of the membranes.³⁹

Regarding the examination of newborn children, there was consensus about which part of the body should be examined initially. Littlejohn recommended examining the head first, to allow an examiner to inspect the skull contents before blood drained away during the examination of the chest, 'and also because he will be better able to interpret appearances in the lungs when they are examined'.⁴⁰ Likewise, writing about the investigation of potential infanticides, Smith put the examination of the head first, noting any bleeding about the scalp, meninges, and brain.⁴¹

Preventing error during the autopsy

Throughout the examination, the doctor inspected organs and cavities for signs of disease, injury, or abnormality which could have led to death, or which could furnish clues about the precise manner of death. Such details might have been of importance in a future court case, and could ultimately lead to the execution of an accused person. It was thus paramount that potential sources of error were minimized. Burney has noted that the ability to 'maintain the integrity of death

³⁸ Smith, *Forensic medicine* (1925), 33.

³⁹ Glaister, *Medical jurisprudence and toxicology* (1915), 36-7.

⁴⁰ Henry Harvey Littlejohn, "Respiration and the proof of live-birth," *Transactions of the Medico-Legal Society* 16 (1921-2): 88.

⁴¹ Smith, *Forensic medicine* (1925), 264.

as displayed on and in the body even as [the dissector] cut, sawed and hammered' was a prized skill, the mark of a true expert.⁴² The Scottish textbook accounts of the performance of a post mortem emphasized, at various stages, the importance of ensuring that anything of potential evidential value was not damaged or destroyed. Observations about the state of the corpse were to be made and recorded in a certain order, since incisions, which might obscure other pieces of evidence, were irreversible. For example, upon opening the abdomen, Smith reminded the examiner to note its condition and the presence of any perforations, blood or other fluids, before doing anything else:

If this precaution is not observed, the examiner is frequently in doubt as to whether any blood or damage to organs found at a later stage is a result of the opening of the body or whether it had previously existed.⁴³

Other precautions were taken in order to prevent accidental damage to significant features during dissection, such as the course taken by a stabbing weapon through the body. It was critical that, when a wound lay in the path of a normal incision, the incision was diverted, 'to enable the wound or wounds to be examined in their entirety with respect to extent of penetration'.⁴⁴ Additionally, Smith and Kerr both proscribed the use of a chisel to assist opening the skull, since it could cause a fracture, or exacerbate any existing ones. Kerr noted that the chisel was frequently used in civil cases, although it is not clear whether this earned his disapprobation or not.⁴⁵ Regarding the examination of wounds, Smith warned against the temptation to evaluate the likelihood of a particular weapon, for example, a blade, having caused a wound by fitting it into the wound, 'for by this means the wound may be enlarged or deepened and the knife or other weapon become soiled with blood, thus destroying material evidence'.⁴⁶

Another hazard was the potential contamination of samples taken at autopsy for further analysis, for example digestive organs and their contents for

⁴² Burney, *Bodies of evidence* (2000), 121.

⁴³ Smith, *Forensic medicine* (1925), 33-4.

⁴⁴ Glaister, *Medical jurisprudence and toxicology* (1915), 35.

⁴⁵ Smith, *Forensic medicine* (1925), 35; Kerr, *Forensic medicine* (1936), 24.

⁴⁶ Smith, *Forensic medicine* (1925), 81.

toxicological testing when poisoning was suspected. The presence of foreign chemicals could distort results. Thus, further precautions were enacted to minimize this risk. All instruments and receptacles had to be clean. The use of preservatives for organs was, at the very least, frowned upon. Kerr was unequivocal. Even in cases where decomposition had started, and the samples were to be held for a considerable time, chemical preservatives were not to be used, since they would ‘complicate the analysis’.⁴⁷ Smith agreed that under normal circumstances, preservatives were unnecessary and inadvisable. Nevertheless, in hot climates, the addition of alcohol was acceptable, especially if the samples had to be transported a considerable distance, in order to mitigate the effects of decomposition. In such circumstances, a sample of the alcohol was to be sent alongside the tissue sample to attest to the purity of the alcohol to demonstrate that it was not contaminated with poison.⁴⁸

Contamination could also come from different parts of the dissected body. For instance, if the stomach or intestinal contents leaked into the bowel or the alimentary canal, this could be misleading, since the relative amounts of poison in these organs provided some indication of the time since ingestion. Thus, the stomach, before being removed for close inspection, was, according to Smith, to be ‘doubly ligatured at each end and divided between the ligatures’. He stipulated that coloured string not be used for this purpose, since it might contain traces of metallic poison which could interfere with toxicological tests.⁴⁹

The solemnity of the medico-legalist’s duty weighed heavily. The practitioner always had to have an eye to a future courtroom appearance. Thus, the examination had to be thorough, to avoid a charge of perjury, and careful, to avoid the loss of vital evidence. This juridical purpose was made even clearer by the textbook instructions for completing medical reports, which made specific references to non-medical audiences, who would appreciate brevity and straightforwardness, for which excessive detail and jargon would be a

⁴⁷ Kerr, *Forensic medicine* (1936), 25.

⁴⁸ Smith, *Forensic medicine* (1925), 36.

⁴⁹ *Ibid.*, 35-6.

source of confusion.⁵⁰ Conciseness and clarity were also important traits for the expert witness in the courtroom.⁵¹

Post-mortem inscription

As shown in the above section, the medico-legal autopsy generated vital, not to mention fragile, information for the death investigation. Its participants appreciated the seriousness of the exercise, on which an accused person's life could hang. Despite its importance, the autopsy as a physical event was inaccessible to the court, or indeed, to any other experts who had an interest in the procedure, such as those hired by the defence. It could not be reproduced because, in its performance, the body at the moment of death or discovery was destroyed. While, in some cases, samples taken at the autopsy could be preserved for future reference, the major solution to this problem was the production of a written report describing the observations, findings and opinions of the doctors who had carried out the original examination. Scottish criminal procedure, as we have seen, mandated the production of a written report for every post-mortem examination. This section of the chapter will argue that, as well as constituting a record of the forensic encounter with the body and a means of communicating medical findings of significance to the court, the medical report facilitated communication between experts in different locations, allowing those in centres of expertise, namely the university departments of forensic medicine, to participate in post-mortem processes in peripheries without actually being at the autopsy. Using the observations made in their colleagues' reports, they were able to form opinions of their own about the case, which they themselves would report to the authorities and the court. This utilization of the report also allowed communication, not just over distance, but also over time. Experts who had not been involved in an original death investigation could provide opinion in subsequent civil actions based on their perusal of another doctor's report.

Of course, any study of the medical report must acknowledge its limitations as a source. The report is not a transparent account of an autopsy's

⁵⁰ Glaister, *Medical jurisprudence and toxicology* (1915), 38; Kerr, *Forensic medicine* (1936), 26.

⁵¹ Smith, *Forensic medicine* (1925), 5-6.

performance. As well as omitting much of the procedural detail of the examination, autopsy reports, Timmermans argues, represent a reification of the post-mortem examination. The clean, tightly argued document obscures the various uncertainties with which pathologists are presented during the dissection.⁵² The same issue applies in the early-twentieth century. Both Smith and Glaister included sections about the report which emphasized the need for careful writing. Smith stated that ‘the same care should be taken in connection with the report as is advised in connection with the giving of oral evidence’.⁵³ Nevertheless, as will be made clear, other practitioners read the reports critically, and were willing to challenge the interpretations made by the authors.

The report was expected to conform to a specific structure. A preamble containing background information about the identity of the deceased and the presence of witnesses was followed by the main part of the report, containing an account of the internal and external examination of the body. Precision was very important for this section. Smith recommended that, although every part of the body should be covered here, ‘the system or part affected should be given prominence and treated first’.⁵⁴ This may have been in order to provide rhetorical support to the final section, the conclusions and deductions. This being the most vital part of the exercise, full justification was needed, as Glaister made clear:

The opinion expressed by the examiners in their report must be founded solely on the facts comprehended within the report, and not upon facts which are not specified in detail in the description of the organs as found.⁵⁵

Glaister also emphasized the importance of concise, lucid writing and the avoidance of jargon, because the intended audience would include jurors and lawyers, rather than just fellow doctors. Glaister’s account is unambiguous about the persuasive purpose of the document, for which the correct style was important:

⁵² Timmermans, *Postmortem* (2006), 63-9, 294 n. 59.

⁵³ Smith, *Forensic medicine* (1925), 4.

⁵⁴ *Ibid.*

⁵⁵ Glaister, *Medical jurisprudence and toxicology* (1915), 38.

This conciseness, brevity, and clearness of language are of greatest value in the statement of opinion, for, otherwise, the issues become confused, and the report will probably give rise to much unnecessary dubiety, and, perhaps, cross-examination.⁵⁶

Thus, deflecting scepticism and scrutiny was a primary consideration when writing the report.

Of course, the report's argumentative purpose existed alongside its existence as a means of communicating observations made during the examination. The inclusion of comprehensive observations allowed experts who had not been able to attend the original autopsy to give an opinion. There could be a number of reasons why a forensic specialist did not attend an autopsy. These could range from the logistical impossibility of getting to a body in time from the city, to being consulted a significant length of time after the original autopsy had taken place, for example by the Crown seeking a second opinion, by a prisoner's defence, or in a civil action years after a death.

While, in some cases, an expert had the opportunity to examine a body via exhumation, he would have been obliged to provide an earlier opinion as to the likely cause of death, in order to inform the decision as to whether an exhumation was necessary. If there had been an autopsy prior to interment, such an opinion could be formed with reference to a report written by another doctor. The investigation into the death of a woman in Biggar, South Lanarkshire, in 1921 provides an example of this. The case concerned the death of Mrs MacQ[-], who had died as a result of multiple cut wounds. The conclusion of an initial post mortem by one Dr Marshall was that the woman had committed suicide. She was then buried. However, Harvey Littlejohn, Regius Professor of Forensic Medicine at the University of Edinburgh, was asked by the Crown Office to review the post-mortem report and other documents in the case. In a letter to the Crown Agent, the Crown Office's chief legal adviser, Littlejohn advised an exhumation. He justified his opinion based on the documents which he had been sent, and set out three reasons for his decision. The second and third concerned the general circumstances of the case,

⁵⁶ Ibid.

including the suspicious behaviour of another member of the household. However, Littlejohn's primary point concerned Mrs MacQ[-]'s body, and her wounding. For information on this, he relied on Marshall's report.

Although he disagreed with Marshall's conclusions, Littlejohn utilized his description of the character of the woman's injuries:

In the report of Dr Marshall at least ten separate injuries of a more or less severe nature are enumerated. Some of these are comparatively slight, such as the bruise on the right side of the face and abrasions and bruises on the front of the neck and shoulder, but the others are incised wounds, varying in length from one to six inches, and embrace the scalp, the face and the neck. The wound on the right side of the neck is consistent with self-infliction, but the other wounds, more especially the wound on the scalp behind the left ear which passed down to the bone, and that on the cheek which penetrated the mouth, are inconsistent with self infliction.

In Littlejohn's opinion, these injuries were more likely to have been the result of 'a homicidal attack with a sharp instrument, such as a razor'.⁵⁷

This example demonstrates the way in which the structured post-mortem report worked as a means of communication between medical witnesses. Littlejohn had not attended the original autopsy. However, the detail provided in Marshall's account of his examinations allowed Littlejohn to form a view about how Mrs MacQ[-] had died, albeit one that dissented from the original medical opinion. The report allowed Littlejohn's experience and expertise to be brought to bear beyond his own physical geographical confines into a more provincial area.

Nevertheless, the importance of the report should not be overstated in this case. Although it allowed Littlejohn to form his opinion, this opinion was merely a preliminary one. The information from Marshall's report did not

⁵⁷ Letter from Harvey Littlejohn to the Crown Agent, 30 September 1921, Post-mortem notebooks of Professor Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, Vol. XIII (April 1919-August 1923), p. 77.

satisfy him fully. The previous doctor may have missed certain things; thus an exhumation and second autopsy were necessary:

I am of opinion that an exhumation of the body would enable a complete examination to be made, and that although decomposition may be expected to have advanced considerably, yet it may still be possible to make out whether there are injuries other than those referred to by Dr Marshall, and whether Mrs MacQ[-] suffered from disease of any of her important organs.⁵⁸

In this case, while the report did give Littlejohn an important view of the original post mortem, this glimpse had limitations.

Exhumation was not considered on every occasion. Thus, second-round medical investigations were sometimes based wholly on written representations of the body. In civil actions linked to a death, medical opinion might be sought and given some time after the autopsy held for the procurator fiscal. For example, Sydney Smith provided medical evidence in two civil actions, *Lafferty vs. Bryson (Motors) Ltd.* in 1934 and *Farrell vs. Bryson (Motors) Ltd.* in 1935, which both related to the same 1933 Glasgow road accident, in which a lorry driver had died at the wheel, and his vehicle swerved, hitting people and property. In the two court actions, people injured in the incident sued the late driver's employers, arguing that the accident had been caused by the driver's negligence. The defenders, Bryson Ltd., argued that their driver had suffered from heart failure, which had caused him to lose control of the vehicle; they were not liable, because the accident could not have been prevented.⁵⁹ Thus, the medical evidence was crucial to the outcome of the case. If the death had been due to natural causes, Bryson's would not be liable; if death had been due to trauma, they could be.

John Glaister Jr., who succeeded his father as Regius professor at Glasgow in 1931, had performed a post mortem on the driver, William Cruickshank, for the fatal accident inquiry into the incident. He suggested that

⁵⁸ Ibid., p 78.

⁵⁹ In Scottish civil trials, the plaintiff is referred to as the 'pursuer', and the defendant the 'defender'.

Cruickshank had suffered a spontaneous, and fatal, rupture of the aorta, causing him to swerve, and that trauma injuries were sustained at, or just after, death. Smith was instructed to make reports on Cruickshank's death by the pursuers of the two actions, in 1934 and 1935. His findings were based on information in Glaister's report, eyewitness accounts, and his own medical knowledge. He dissented from Glaister regarding the rupture, which he thought had been brought about by trauma from the collision, rather than arising spontaneously. Witnesses had observed signs of life from Cruickshank after the impact, and who may have swerved to avoid children who were in his vehicle's path. Indeed, Smith wrote to the lawyers for the pursuers in the *Lafferty* case asking whether witnesses had noticed whether Cruickshank had been sitting upright during the swerve, or whether he had slumped, to add further to his theory that the rupture was due to the trauma. Medically, Smith thought spontaneous rupture unlikely, because the rupture was so complete. This could only really, in his view, be attributed to trauma. 'With such a history [of trauma] it seems to me to be most improper to suggest that the rupture must be spontaneous,' Smith wrote.⁶⁰ He had found Glaister's medical interpretation of the incident unconvincing.

All of Smith's information came from indirect evidence, which he stated at the beginning of his reports. He had not examined the body itself. This further illustrates the important role of the original post-mortem report, in this case compiled by Glaister. It represented a means of communication between the doctors who conducted the autopsy and two sets of people: lawyers and other courtroom actors, who would make decisions based on the report's contents; and other doctors, who may well have possessed a higher level of forensic medical expertise and experience than the author (although in this case they were more equally matched). Written concisely, the report ideally contained enough crucial information to allow another doctor to produce his own opinion based on it, as if he had examined the body himself. As in the previous case, an important distinction was made between observations and

⁶⁰ Letter from Sydney Smith to Ross & Ross SSC, 18 October 1934, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2753; Sydney Smith's report on death of William Cruickshank, 7 March 1935, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2753.

opinions contained in the report, which was crucial for the purposes of forming the second-round opinion. In his interpretation of Glaister's original examination of Cruickshank's body, Smith demarcated the Glasgow professor's observations and his interpretations. Accepting the competence of Glaister's observations, such as the complete nature of the rupture, the Edinburgh doctor interpreted them differently, giving a dissenting opinion.

Nevertheless, whilst the post-mortem report was generally important, it was not used in isolation. This can be seen in the MacQ[-] case, where other sources of information, namely about the suspicious behaviour of other householders, played an important role. While they did not contribute to Littlejohn's 'view' of the body, they did inform his recommendation that Mrs MacQ[-]'s remains be exhumed. Other cases also demonstrate the use of a range of documents and images beyond the post-mortem report. For example, in 1939, Sydney Smith was asked by the Crown to give a second opinion about the death of a man after a road accident in rural Ayrshire the previous year. The victim had been struck by a vehicle, and then dragged along the road. He died the next day in the Kilmarnock Infirmary. The driver was charged with driving in a 'culpable and reckless manner'.⁶¹ In order to form his opinion, Smith was supplied, not just with the post-mortem report, but also with precognitions and photographs. This allowed him to produce drawings detailing the positions of the major injuries, as well as an opinion, in which he agreed with the original post-mortem findings, arguing that had the deceased not been dragged along after being hit, 'his chances of surviving would have been good'.⁶² Thus, in some instances the post-mortem report was not the sole conduit for post-mortem appearances, but was digested in tandem with other documents and photographs.

Although not necessarily utilized in isolation, the post-mortem report was an important means of communicating vital information observed by the doctor performing an autopsy to a forensic specialist, allowing the latter expert to employ his experience to opine on a given case without having attended the

⁶¹ "Dying man in lane," *Scotsman*, 12 April 1939, 8.

⁶² Report, 'Death of J[-] G[-] W[[-]', 3 March 1939, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2757.

post mortem. Thus, the geographical reach of an expert witness's knowledge and skill was expanded, creating a network of expertise which allowed peripheries to benefit from the facilities of the centres.

Professional hierarchies

The potential offered by this sort of remote witnessing reveals a hierarchy of expertise within the practice of forensic medicine in Scotland. Initial work was performed regionally by police surgeons, who would often be general practitioners. Further, more advanced work could then be performed in the centres of Edinburgh and Glasgow, facilitated by medical reports and by the dispatch of relevant samples. Indeed, this hierarchy reflects the structure of the prosecutorial system described earlier in the chapter, in which regional procurators fiscal would report to their superiors in Edinburgh, who would then make decisions in major cases as to whether to prosecute. The proximity of these decision makers in Edinburgh, such as the Crown Agent, to the forensic medicine department at the university may have encouraged this. Thus, in the MacQ[-] case, the Crown Agent asked Littlejohn to review the medical evidence.

The hierarchy that existed can be illustrated by a case of murder from Dumfries in 1933. John Maxwell Muir was accused of murdering his wife, Lena. The killing was the culmination of an abusive marriage, according to the late woman's relatives. The case demonstrates medical participation at both a local and national level, and overlaps between the purviews of the two sets of experts, hinting at a hierarchy of expertise in which the opinion of a more experienced witness was, from the Crown's point of view, desirable.

The post-mortem examination on Lena Muir was performed by two local doctors, the Dumfries police surgeon, John Donnan, and an associate, Dr Arthur Hunter.⁶³ In addition to this examination, a number of items relating to the case were sent to the forensic medicine department at the University of Edinburgh, where Sydney Smith examined them. Some of the items were pieces of physical evidence from the scene of the crime, such as linoleum

⁶³ Joint medical report of John Macfarlane Donnan and Arthur Joseph Gordon Hunter (Production no. 2), 23 January 1933, Trial papers in case of John Maxwell Muir, NRS JC26/1933/98.

flooring, the axe alleged to be the murder weapon and items of clothing worn by the accused and the deceased. These items were subjected to a number of tests the facilities for which Dumfries apparently lacked, such as blood grouping tests, which were carried out to determine whether blood on the coat of the accused had come from him or the victim. However, the work of Smith and the Dumfries doctors overlapped somewhat when Smith was asked to give his opinion about sections of the victim's skull and scalp, which had been removed at autopsy. In his report, he described the wounds present on the samples, and speculated as to whether the axe could have caused them:

The Skull shows comminution of bone over the whole of the right side and back of the head with fissured fractures running to the left side. Evidence of separate blows can be seen at the back of the head, the front of the head, and the top of the head, all on the right side, and correspond to the injuries of the scalp which have already been described. The injuries of scalp and skull were caused by several severe blows from an instrument of [a] fairly heavy nature which has a cutting and also a blunt surface. The axe sent to me for examination (Label I) could cause all the injuries found.⁶⁴

By describing the wounds and giving an opinion as to what might have produced them, Smith was reproducing work which would have been done in Dumfries at the post mortem. During the post mortem Donnan and Hunter had examined and described the wound, and their testimonies in court make it clear they had examined the axe and considered whether it had caused the injuries, although they did not refer to the axe itself in their joint report on the post mortem. During Muir's trial, Smith and Donnan were both questioned about the level of force which would have been required to cause the injuries suffered by his wife. They were in agreement that a moderate level of force had been used since, despite considerable wounding, the damage to the brain had been more minimal. As Smith testified:

⁶⁴ Report by Sydney Smith (Production no. 3) on Productions nos. 33 & 34 in case of John Maxwell Muir, 27 February 1933, Trial papers in case of John Maxwell Muir, NRS JC26/1933/98.

The first blow that was struck might have been used with considerable violence, but, if the skull was once broken, I think the other blows, if any great violence had been used, would have gone right into the brain, but the brain was not pulped up, so that I think they must have been of average violence.⁶⁵

The reason for Smith's scrutiny of the skull and scalp fragments is not specified in the documents; however, it is most likely to have been to add further corroboration to the post-mortem findings. Given the serious nature of the case, the Crown wanted the opinion of a more specialized forensic expert than the doctors in Dumfries, who would have had much less experience of violent crime than Smith, who had practised in Egypt during a volatile time in that country's history. From the Crown's point of view, Smith, a prominent figure, would have been a highly credible witness. This suggests the existence of a hierarchy of the expertise called upon by the Crown.

The hierarchy is further confirmed by the broad range of expertise which Smith displayed in this case. Not only was he able to comment on matters relating to the physical body, in the form of the skull and scalp samples, but also to employ techniques of the laboratory to help construct a narrative of what occurred in the Muir's home. This is illustrated by his interpretation of the piece of linoleum flooring, removed from the room in which Mrs Muir was allegedly attacked. The piece of flooring was heavily stained with blood, and was dented 'due to a blow from a rectangular object striking on the corner'.⁶⁶ Prompted by the prosecution advocate, he combined his medical findings with what he had observed on the linoleum to construct a narrative of the attack, which he relayed in court:

Q. From the indication you found on the linoleum, label no. 6, did you form the opinion that one blow at least had been struck whilst the victim was on the ground?

⁶⁵ Testimony of Sydney Smith, Report of proceedings at trial of John Maxwell Muir, 11 April 1933, in papers relating to Appeal against conviction of John Maxwell Muir, NRS JC34/1/135, pp. 149-50.

⁶⁶ Report by Sydney Smith (Production no. 4), 27 February 1933, Trial papers in case of John Maxwell Muir, NRS JC26/1933/98.

- A. I think it is quite probable three or four were struck whilst she was on the ground. I think probably the first blow knocked her down, and when she fell she probably fell forward on to the side of her face, owing to the incised wound over the left eye, and then three or four blows were struck on the right side.⁶⁷

This demonstrates the breadth of expertise and oversight which forensic specialists had. University-based medico-legists scrutinized not just the body, or parts of it, but material evidence from the scene of the crime, such as clothing and flooring samples. Information from the two sets of knowledge was integrated to create a whole. This relates to the theme of the next section, which explores the autopsy's links to other areas of forensic medicine and wider information, such as that gained from crime scenes.

The post mortem and other techniques

The Muir case demonstrates that the evidence from post-mortem examinations could be used alongside information from the examination of other sources to construct coherent accounts of deaths. This section will further examine this theme in two senses. The first concerns the post mortem and its relationship with other medico-legal techniques, such as laboratory-based blood tests, and alternatives to the view of the naked eye, such as microscopy and x-ray photography. The second pertains to the combining of post-mortem findings with circumstantial information, such as a patient's medical history and details of the body's surroundings, to come up with the cause of death.

The post mortem within forensic medicine

Medical and scientific techniques beyond the mortuary existed alongside the post mortem in two main capacities. One was assistive: to help the medical expert and the procurator fiscal determine the cause of death by providing information about the death which could not otherwise be demonstrated by the post mortem. This included tests for the presence of poisons in the viscera; a procedure the preparation for which was to be undertaken with great care, as detailed above. The second set of uses stood apart from the post mortem, not

⁶⁷ Testimony of Sydney Smith, Report of proceedings at trial of John Maxwell Muir, 11 April 1933, NRS JC34/1/135, p. 150.

having the same purpose, although they both helped investigators narrate an account of the death. An example of the second type would be in the investigation into the death of a child, Helen Priestly, murdered in Aberdeen in 1934. Bacteriological evidence and blood testing were used, linking the body to the home of the accused. This evidence was used, not to demonstrate how Helen died, but to show where she died, and to connect her death to a suspect.⁶⁸

Chemical and bacteriological tests, conducted in laboratories, were important in cases of suspected poisoning. In such cases, the precise cause of death could not always be demonstrated at autopsy; thus toxicological techniques were employed. Particularly in more rural areas, the doctors carrying out the post-mortem examinations did not have the facilities or expertise to perform tests on viscera to determine whether the cause of death had been poisoning. Samples would be taken at post-mortem and dispatched to an analyst. These were often sent to university forensic medicine departments, as case reports held in their archives make clear. The pathologists there would make a pathological examination of the organs, to determine whether there were any visible signs of poisoning or disease, and then pass the organs on to a chemical analyst. For example, in April 1922, a set of organs of a woman, B[-] R[-], were brought by the police in Hawick, in the Scottish Borders, to the forensic medicine department at Edinburgh for further examination and analysis after a post mortem at which the possibility of irritant poisoning was suggested, due to the late woman's symptoms:

The stomach and fluid present in the jar, the contents of the intestines, and the liver were all submitted separately to analysis in order to detect the presence of a metallic irritant such as arsenic, antimony or mercury, and an examination was further made for the presence of any foreign particles of an irritant character in the intestines. All tests proved negative and I am of opinion that no irritant poison was present.

⁶⁸ Sydney A Smith, "Studies in identification and reconstruction: no. 7," *Police Journal* 13, no. 3 (1940): 273-87. This case is discussed at some length in chapter 2.

The author of the report thought that it was more likely that bacterial poisoning had been the cause of death, although this could not be proven because of the putrefied stated of the organs.⁶⁹

In another case, from 1936, in which organs were also sent to Edinburgh, bacterial tests were carried out by the university's bacteriology department, but to no avail. Again, the issue was decomposition, which was unsurprising since they had been sent from Wigtownshire, in the far southwest of Scotland:

Dr Beattie of the Department of Bacteriology was called into consultation and cultures were made from the spleen and from the intestinal contents and agglutination reactions were carried out with serum removed from the viscera. The serum had undergone too much decomposition to give a satisfactory result, but it was tried against various groups of food poison organism without any positive result. The cultures taken from the spleen and intestinal contents gave an organism of the bacilli Morgan type which has been found in cases of food poisoning. It might be that this was due to food poisoning, but, on the other hand, this organism is also found in the intestines under normal conditions.

Aside from this, no specific cause of death was found.⁷⁰

The direct post-mortem appearances could also be augmented by enhanced forms of viewing, such as the use of microscopy and x-ray photography, which could provide information about specific parts of the body, which, alongside the gross pathology of the autopsy, could suggest a cause of death. For example, in a 1938-9 murder case, in which a man was accused of throttling his wife and pushing her into a canal, both microscopy and x-ray photography were used to clarify the cause of death, by demonstrating the

⁶⁹ Report on organs of B[-] R[-], 28 April 1922, Post-mortem notebooks of Professor Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, Vol. XIII (April 1919-August 1923), pp. 107-8.

⁷⁰ Report on Case of Mrs J[-] M[-] or B[-], 7 October 1936, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2755.

nature, and timing of various injuries. The hyoid bone, located in the neck and often fractured during strangulation, was x-rayed at the Royal Glasgow Cancer Hospital. It was fractured, and there was no evidence of union between the fragments, demonstrating that the break took place at or after death. As well as performing the post mortem, John Glaister Jr. and Dr Leslie Woodhouse Price, director of pathology at the Glasgow Royal Cancer Hospital and the Glasgow and West of Scotland Radium Institute, examined microscopically tissues taken from apparent injuries to the deceased's face, neck, and legs. They revealed haemorrhaging, showing that they had been inflicted during life. This cast doubt on the accused's defence that his victim had drowned after jumping into the canal of her own accord, the injuries having been caused by the boat hook used to recover her body from the water.⁷¹

This case illustrates, first, the use of technologies such as the x-ray and the microscope to enhance the post mortem, providing information not available to the naked eye; and second, cooperation between forensic practitioners and those based in clinical fields. It demonstrates a degree of willingness for one branch of pathology, forensic medicine, to embrace developments in another, histopathology. It is, however, difficult to assess the true nature of the relationship between the practitioners of forensic and clinical pathology on a case such as this, especially through the use of case reports only. Because they wrote a single report, for instance, dissent between the pathologists cannot be gauged, although dissent between different sets of experts does become visible in the examination of court records and precognitions. For example, Sydney Smith, who was also asked by the Crown to consult on the same 1938-9 case, reviewing the work of the others, stated in his precognition that he agreed for the most part with Glaister and Price, except for one matter:

This opinion is in agreement with that of Professor Glaister and Dr Woodhouse Price except that I consider sudden cardiac inhibition rather than cardiac failure to have been the proximate

⁷¹ Report on microscopic examination of tissues taken from the body of E[-] MacC[-] or H[-], 23 November 1938; Report on X-ray examination of hyoid bone taken from the body of E[-] MacC[-] or H[-], 22 November 1938, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2757.

cause of death, determined by the asphyxial process of strangulation or throttling, prior to, or at the time of, deceased's fall into the water.⁷²

Notwithstanding, the case further demonstrates the various networks in existence in medico-legal circles at the time, across medical and university institutions in Glasgow, and between Edinburgh and Glasgow. These links would have been facilitated by the centralized prosecutorial system, in which the Crown's legal advisers would seek further medical opinion where required.

Contexts and case histories

A final network was that which existed between the post mortem and the context in which the body was found, or the deceased's previous medical history. This was information which was not gained by viewing and dissecting the body, or by conducting a procedure in a laboratory, although it informed the medico-legal conclusions regarding the death nonetheless. The importance of such factors was emphasized by the authorities on post-mortem practice, the textbook authors, who recommended that the expert visit the location where the body was discovered, as well as to take into account the patient's medical history, and their immediate physical condition prior to death:

Without such a history a pathologist might attribute death to heart disease if a chronic cardiac lesion were found, whereas the ante-mortem symptoms might suggest the presence of alkaloidal poisoning.⁷³

Background information could thus help the examiner to interpret ambiguities and potentially uncover evidence of wrongdoing.

Prior medical case history was held to be particularly important in the investigation of the deaths of anaesthetized surgical patients. These cases provide an insight into the ways in which medico-legal experts incorporated evidence from sources other than the post mortem, such as the deceased's medical history. This was especially important in cases in which the

⁷² Precognition of Sydney Smith in case against C[-] C[-] H[-], 10 December 1938, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2757.

⁷³ Kerr, *Forensic medicine* (1936), 22-3.

information that could be derived from the autopsy was limited, which happened to be a characteristic of chloroform poisoning.⁷⁴ Anaesthetic cases can therefore illustrate a form of the relationship between the background medical history and the post-mortem dissection in which one source of information, the patient's history, sometimes took precedence the other, the post-mortem appearances. These cases are also notable because of the role of the forensic medical expert in these cases, which was akin to that of detective. In addition to examining the body and reading the written report of the doctor attending the deceased patient, the expert might interview those concerned with the case, including surgeons and anaesthetists, in order to obtain the medical history, and assess the treatment the deceased had received.

Deaths under anaesthetic were of particular concern in the late-nineteenth and early-twentieth centuries.⁷⁵ In Scotland, all such deaths were reported to the procurator fiscal, who instructed a medico-legal expert to investigate.⁷⁶ Experts applied their knowledge of medicine to the problem, including ideas of best practice in anaesthesia, the dangers of certain drugs, such as cocaine (applied medically), and safer alternatives. They might make various recommendations, both to the Crown and, sometimes, to professional bodies, such as the medical and surgical royal colleges. Sometimes, as is shown below, reports would criticize the conduct of the medical personnel who treated the deceased and administered the anaesthetic.

The importance of the background information gained by interviewing staff and reading the patient's history was reflected in the structure of the medico-legal reports, in the treatment the patient had received prior to death was often described in greater detail than the medico-legal post-mortem examination. This suggests that a full post mortem was not always carried out. One example of this sort of report relates to the enquiries made by Littlejohn into the death of J[-] McL[-] at Edinburgh in 1920. McL[-] had been admitted to the Royal Infirmary after having seriously injured his legs falling out of a train on the Forth Bridge. Upon admission, 'it was found that there was

⁷⁴ Smith, *Forensic medicine* (1925), 378.

⁷⁵ Burney, *Bodies of evidence* (2000), 137-41.

⁷⁶ Glaister, *Medical jurisprudence and toxicology* (1915), 724.

compound fracture of both legs, and in addition the left foot was badly crushed', and it was decided that immediate amputation was required. The anaesthetic was delivered by 'a final year medical student who had frequently administered anaesthetics before', under the surgeons' supervision, a practice which was not unusual. McL[-] died at the end of the operation, and Littlejohn was called to give his opinion as to the cause of death:

The operation was an emergency one, necessary in order to give the patient a chance of life, and I am of opinion that death was due chiefly to the shock of the injuries received and loss of blood, and that the anaesthetic participated only slightly if at all in the fatal issue.

He also gave an assessment of the treatment received:

All due precautions appear to have been exercised in the treatment of the patient and in the administration of the anaesthetic.⁷⁷

The lack of a post mortem in this case may have been because the cause of death was considered to be obvious. Also, while McL[-] died on 4th December, the investigation was not begun until 28th December. There is no reason for this given in Littlejohn's notebooks. By this time, the body may have been unavailable. There may also have been a delay in the procurator fiscal's order to investigate.

In some cases, while an external examination was carried out, an internal one was not. In others, only a partial internal examination was performed. These actions might follow an interview with the attending doctors.⁷⁸ This might suggest that the verbal evidence of doctors was held at a level of esteem which obviated a full autopsy, and was understood to provide sufficient background knowledge to allow the report into the case to be completed.

⁷⁷ Post-mortem notebooks of Professor Henry Harvey Littlejohn, report on death of J[-] McL[-], 29 December 1920, EUL SC, IN1/ACU/F1/2, Vol. XIII (April 1919-August 1923), p. 67.

⁷⁸ Report on death of baby J[-] M[-], 24 March 1932, Records of the Department of Forensic Medicine and Science, GUA,FM/2C/1; Report on case of J[-] M[-], aged 71, 12 December, 1933, Records of the Department of Forensic Medicine and Science, GUA, FM/2C/1

Some anaesthetic cases, however, did result in a full autopsy, and prompted criticism of the hospital staff. In the case of J[-] C[-], whose death was probed by Littlejohn in 1922, this criticism was prompted by information uncovered during the investigation into the patient's background, rather than the post-mortem appearances. C[-] had come to the Royal Infirmary of Edinburgh regarding 'a simple tumour in the neck'. The two resident house surgeons decided to remove it and administered a general anaesthetic, supposedly at the patient's request:

[The patient] struggled violently under chloroform and before any operative interference had commenced, his breathing stopped and he died, notwithstanding all efforts to reanimate him.

The post-mortem examination did not reveal any reason why the patient should have reacted adversely to chloroform, although the opinion as to the cause of death was that the toxic action of the anaesthetic was responsible. After obtaining the history of the case, Littlejohn criticized the actions of the two doctors who treated the deceased. He argued that they had given C[-] a general anaesthetic without having sufficient information beyond what he had told them verbally:

The deceased might have had an overloaded stomach in the present case, or have been suffering from some condition of the heart, lungs or kidneys which would have given occasion for special care.

They had not performed the necessary examination to determine these points. Littlejohn stated that they ought not to have immediately anaesthetized him and operated, since it was not an emergency, but given him 'directions in regard to food, etc., and to appear on a subsequent date for operation'. He did, however, add a qualification to this point:

In this connection it is only fair to state that the post-mortem did not disclose any serious pathological condition, and nothing

except possibly some albumen in the urine, which could have been detected by an examination of the patient during life.

Littlejohn's second criticism concerned the choice of a general rather than a local anaesthetic, which would have been sufficient and 'devoid of all risk to life'. Littlejohn believed that this decision resulted in C[-]'s death.⁷⁹ It can thus be seen that in this case, in which the post-mortem examination was not particularly informative, Littlejohn's investigations into the background of the case enabled him to complete the task assigned to him and determine whether C[-]'s death had been the result of medical negligence.

The investigations into anaesthetic deaths demonstrate the limitations of the post-mortem examination. In many circumstances, it could only provide some of the information required to determine why a person had died. Analysis of the investigation of some of the deaths under anaesthetic demonstrates that experts, at times, placed more reliance upon background medical history, through interviews with the doctors concerned, than post-mortem appearances when giving an opinion as to the cause of death. The limitations of the autopsy were thus recognized.

Conclusions

This chapter has explored the post-mortem examination, as practised in Scotland between 1914 and 1939, both in terms of its individual characteristics, and in the wider contexts of forensic medicine and the investigation of deaths as a whole. Due to the nature of much of the source material, access to the precise workings of the autopsy is hard to achieve in practice. Much of the descriptive section of the chapter outlining the performance of the post mortem is based upon the idealized accounts of the exercise found in textbooks. Although this category of source material has clear limitations, it is used with clear justification; it illustrates the concerns present when dissecting a body with medico-legal intent. These concerns included the prevention of decontamination, which could invalidate further tests; as well as the assurance

⁷⁹ Report on death of J[-] C[-], 11 April 1922, Post-mortem notebooks of Professor Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, Vol. XIII (April 1919-August 1923), pp. 101-2.

of a thorough examination, since anything missing in a report might be challenged, at a later trial, by hostile parties in the courtroom.

Forensic medicine existed as part of a highly institutionalized and centralized system of death investigation, in which decision-making was in the hands of legally trained officials, who referred back to their headquarters in Edinburgh, the Crown Office, rather than by laypeople, as in England. Just as prosecutors' decisions about difficult legal questions were referred to the Crown Agent in Edinburgh, so complex medico-legal queries were referred to university experts in cities, such as Littlejohn, Smith and the Glaisters. Samples taken at autopsy, for example fragments of skull and scalp in the 1933 Dumfries case, could be sent for examination by an expert in Edinburgh or Glasgow, which allowed an experienced expert to give an opinion when he had not been able to attend the autopsy. However, this long-distance exchange of information and expertise was really facilitated by the use of written post-mortem reports, which contained sufficient observations for an expert at a remove to give a useful opinion.

Finally, the chapter has shown the post-mortem examination in the wider context of forensic medical techniques. There were clear limits to what could be divined from post-mortem appearances; thus, determinations as to the cause of death were made with reference to additional sources of information. These included other forensic medical techniques, such as toxicology; and wider contextual information, for example details of a deceased person's medical history. While forensic experts might have performed some of the additional laboratory testing themselves, the collection of much of the information from beyond the mortuary depended on communication with and links to other parts of the medical and scientific professions. For example, some laboratory tests on the samples harvested at autopsy would be carried out by bacteriologists, who did not work exclusively on medico-legal work. Additionally, background medical history, which was important in cases of death under anaesthetic, for example, was often obtained via interviews with the medical staff responsible for the treatment of the deceased person.

The theme of networks of different techniques, disciplines and professions, which was of importance in relation to the post mortem, resonates throughout the thesis. First, some of the techniques that are detailed in the following chapters, such as the determination of blood types, the analysis of gunshot wounds and the use of photography, enjoyed a degree of involvement in the mortuary. Second, the performance of these techniques also depended on links between different professions, trades and offices. For example, the analysis of gunshot wounds demanded the collaboration of medical witnesses and gunsmiths. Similarly, the space of photography in forensic activities was occupied and shared both by medical experts and specialist police officers, among others. This chapter, therefore, has introduced one of the central themes of the thesis: connection.

Chapter 2: The medico-legal laboratory

The post mortem, explored in the previous chapter, was primarily concerned with one area, the human corpse. However, over the course of the early- to mid-twentieth century, criminal investigation was increasingly concerned with the analysis of the crime scene and traces of the crime left therein. Forensic medicine was no exception. While the scrutiny of bloodstains and other marks was not wholly novel, as shown by nineteenth-century texts on medical jurisprudence, during the later period there was a growth of both interest and available facilities. These changes are particularly visible in the work of the specialists in forensic medicine based at Edinburgh and Glasgow universities, as this chapter will show. Both Sydney Smith and John Glaister Jr. undertook research projects in this area, on the identification of bloodstains and the classification of hairs and fibres. In 1931 the two collaborated on a book, *Recent advances in forensic medicine*, which described novel developments in the forensic laboratory. In addition, much of the casework undertaken in the two departments entailed the examination of items recovered from crime scenes and pieces of relevant clothing for traces of blood, semen and other material which could aid investigations.

The growth of traces and the crime scene as fields of interest for criminal investigation have been identified by a number of historians. In their history of forensic medicine at Glasgow University, Anne Crowther and Brenda White note different interests of the elder and younger Glaisters. While John Glaister Sr. is portrayed as an all-rounder in a traditional sense, his son was of a much more scientific bent.¹ The place of the crime scene has also been discussed outside of the medical context. For example, Ian Burney and Neil Pemberton discuss the work of Hans Gross, a late nineteenth-century jurist who wrote an influential work about the role of the criminal investigator, which included a detailed section on how he ought to approach the crime scene. The importance of detailed recording of the site and the preservation of evidence was emphasized, as was the necessity of the right psychological demeanour on the part of the investigator, to prevent unhelpful prejudgements about a crime

¹ Crowther and White, *On soul and conscience* (1988), 54.

before all the available evidence had been considered.²

The importance of trace evidence was reflected in some of the popular literature of the time. For example, during the late 1920s and early 1930s, Harry Ashton-Wolfe, who had worked as an investigator at the Marseilles Scientific Police Laboratories and studied with Edmond Locard at his pioneering police laboratory at Lyon, wrote a series of books and *Illustrated London News* articles about science and the detection of crime. He included accounts of the importance of traces, such as footprints, and the analysis of sawdust and minute fibres, which linked criminals and their crime scenes. He marvelled at the potential for solving crime which science offered. In Ashton-Wolfe's view, it would soon render the system of spying and maintaining criminal contacts, a practice he regarded as degrading and corrupting, obsolete. Instead, the power of science would be such that crime without detection would become all but impossible, compelling miscreants to seek honest employment.³

Despite the possibilities suggested by Ashton-Wolfe, the road to a system of scientific policing and criminal investigation was far from smooth. Norman Ambage's account of the development of the Home Office Forensic Science Service shows that, in the pre-war period, the use of science in the detection of crime was very uneven across England and Wales. While some areas with enthusiastic Chief Constables, such as Nottingham and Cardiff, used police laboratories, others did not. Home Office officials encountered a great deal of scepticism about their usefulness among detectives, who preferred to rely upon more traditional methods. Systematic use of scientific evidence, particularly for everyday crimes such as burglary, needed to be prompted from the centre by Home Office civil servants.⁴

In Scotland, trace evidence, from semen stains on clothing, bloodstains on floors and fragments of paint from vehicles involved in collisions, was regularly collected and sent to university forensic medicine departments for

² Ian A Burney and Neil Pemberton, "Making space for criminalistics: Hans Gross and *fin-de-siècle* CSI," *Studies in History and Philosophy of Biological and Biomedical Sciences* (2012): <http://dx.doi.org/10.1016/j.shpsc.2012.09.002>.

³ H. Ashton-Wolfe, "The scientific side of the detection of crime: no. i - the evolution of criminal investigation," *Illustrated London News*, 23 June 1928, 1162, 1196.

⁴ Norman A Ambage, "The origins and development of the Home Office Forensic Science Service 1931-1967" (Lancaster University, 1987), 39-42, 309-10.

analysis. The importance of this work can be seen in the cases cited in this chapter. For example, the prosecution of Jeannie Donald for the murder of Helen Priestly in Aberdeen in 1934 relied almost entirely upon trace evidence, found in Donald's house, linked to the body. This was necessary because there were no eyewitnesses to the crime. This case will be used to provide a frame for the analysis of the development of medico-legal techniques for the analysis of traces.

In this chapter I examine several aspects of the theme of the laboratory in forensic medicine. I begin by outlining the institutional context of the Scottish laboratory work, namely the forensic medicine departments in Edinburgh and Glasgow universities, which provided facilities for casework and research. Second, I explore the development of three different types of laboratory work, the analysis of semen stains, blood and hair and fibre. These are shown in the context of the Donald case, in order to better demonstrate how these techniques were utilized. In the final section of the chapter, I examine some of the ways in which evidence derived from laboratory work was challenged in court. In particular, I focus on challenges based on adherence to accepted standards and protocols. This has been a theme in studies of forensic laboratories from a number of contexts, and can be seen to apply to the context of Scotland in the period covered by this thesis.

The Institutions

In this section I provide a brief account of the two institutions which form part of this case study, the forensic medicine departments at Edinburgh and Glasgow universities. In particular I focus upon their laboratory activities, detailing, first, their facilities, and second the practices which took place within. The rivalry and collaboration of the two departments is also considered.

Edinburgh

Writing retrospectively about his return to Scotland in the spring of 1928, Sydney Smith painted an inauspicious portrait of the state of laboratory forensics in Edinburgh at that time. Initially describing his new workplace as 'an apparently moribund department', he went on to state that the new facilities did not compare favourably to what he had had access to in Cairo. He found

that ‘there was nothing like the number or variety of cases that I had been used to in Cairo, nor the staff or equipment to cope with them if there had been’.⁵ Nevertheless, although the facilities might not have been as sophisticated as in Egypt, analysis of a number of sources can demonstrate that laboratory techniques were in use, to a very significant degree, in Edinburgh throughout the period under study.

The first set of sources for this is the publication record of members of the department. The techniques used to analyse bloodstains in the period before the First World War are exemplified by an article by Harvey Littlejohn in the *Transactions of the Medico-Legal Society*, published in the 1912-13 edition. He detailed the best chemical tests to be used to demonstrate the presence of blood, as well as noting the usefulness of spectroscopy for this purpose. One of the main thrusts of the article was that he and his researchers had managed to get positive results from samples from which other written authorities thought results could not be obtained. He also showcased further work on spectroscopy by Sydney Smith, who was at that time his assistant in the department.⁶ The research on this topic was further elaborated the next year, when Smith produced his MD thesis, the object of which was to ‘formulate a series of tests which will be absolutely conclusive in every case, to simplify and improve the technique of such examination so that all the tests can be applied to one minute fragment, and to render the solution of the stain, which is always tiresome and often impracticable, quite unnecessary’. According to the introduction to the thesis, Smith’s research was being carried out because of inadequate coverage of the essential crystallization and spectroscopic tests in the textbook literature.⁷

The article and thesis demonstrate, first, that chemical and spectroscopic equipment was available at the Edinburgh department, and second, that research into improving laboratory techniques was going on at the time at the university. Indeed, when the research by Littlejohn and Smith was presented to the Medico-Legal Society in March 1913, one of the audience members, Dr FJ Smith, opined that ‘the tests described by Professor Littlejohn were, from a

⁵ Sydney A Smith, *Mostly murder* (London: Harrap, 1959), 148, 150.

⁶ Henry Harvey Littlejohn, "The examination of minute traces of blood for medico-legal purposes," *Transactions of the Medico-Legal Society* 10 (1912-13): 139-41.

⁷ Smith, "The examination of blood stains," 3-4.

strictly technical point of view, extremely important and in some respects at least novel'. He went on, however, to question the value of very sensitive tests for blood, since very small traces of blood on clothing often had an innocent explanation.⁸

The work of the Edinburgh forensic laboratory at this time can also be seen in some of the case records held by the university archives, the second set of sources used in this section. For this period, they include the post-mortem notes of Harvey Littlejohn, who, as the city's police surgeon, undertook a significant amount of routine medico-legal work. The notes reveal that laboratory techniques were used both as an adjunct to the post-mortem examination, adding additional information about the cause of death, and in order to provide information about other crimes, for example indecent assaults, where a death had not necessarily taken place. An example of the first category can be found in Littlejohn's notes on the death of a woman in February 1913. In addition to a post-mortem examination, laboratory tests were carried out which confirmed that death had been caused by carbon monoxide poisoning. The notebook reads: 'On testing the blood with tanning solution, it gave a very characteristic reaction. The spectroscopic test was also positive and distinct.'⁹ In cases of suspected poisoning, chemical tests on material relating to the case, for example bottles found next to a body or on in possession of an accused person, were sometimes carried out. In April 1910 Littlejohn carried out chemical tests on a bottle found in the possession of a man to establish whether it had contained tincture of opium or laudanum.¹⁰ Organs taken during the autopsy, either by Littlejohn or another doctor if the case was from outside Edinburgh, could also be subjected to toxicological analysis at the university. In June 1911 a set of internal organs was sent from Arran to Edinburgh, where they were subjected to preliminary and detailed tests for arsenic, which was detected in the stomach, liver and the large intestine.¹¹ Finally, other

⁸ Littlejohn, "The examination of minute traces of blood," 141-2. FJ Smith was, at the time, the editor of Taylor's *Principles and practice of medical jurisprudence*.

⁹ Report on death of E[-] M[-], February 1913, Post-mortem case books of Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, vol. X (July 1912-October 1913), pp. 79-80.

¹⁰ Report on case of H[-] R[-] McG[-], 13 May 1910, Post-mortem notebooks of Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, vol. VIII (January 1910-May 1911), p. 53.

¹¹ Report on case of G[-] G[-], 19 June 1911, Post-mortem notebooks of Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, vol. IX (April 1911-July 1912), pp. 21-3.

productions could be examined in the laboratory for bodily traces, for example after sexual assaults. For instance, in 1915, various items of clothing were examined microscopically for traces of semen.¹²

In 1914 Smith, who seems to have been the driving force in much of the research, left Edinburgh, first to work in his native New Zealand as Medical Officer of Health for Otago, and then on to Cairo, where he was both professor of forensic medicine at the university, and the chief medico-legal expert to the government. During this time he and his subordinates there were active in laboratory research, particularly in the field of research into firearm identification, as shown by his work on the assassination of Sir Lee Stack, and his personal archive, held at the Royal College of Physicians of Edinburgh.¹³ He returned to Scotland in 1928, after Littlejohn's death the previous year. Although the laboratory he inherited in Edinburgh was not as well favoured as that of the institute in Egypt, work for major criminal investigations was carried out there. For example, a significant amount of the laboratory work for the Aberdeen Donald case, overseen by Smith, was carried out there. It is notable that, unlike his predecessor, Smith was not appointed police surgeon to the City of Edinburgh, a post which went, instead, to Douglas Kerr, who had been Littlejohn's assistant.¹⁴ This meant that Smith carried out much less routine post-mortem work, giving him more time to devote to the laboratory, teaching and other university duties. Presenting the department in his memoir, he puts laboratory work in the foreground:

There were numbers of interesting cases, and I developed the laboratory side of the work on the lines of my section in Cairo. This proved very successful as a help with the investigation of all types of police work, including house-breaking, safe-breaking, and forgery, for example, as well as cases of unnatural death. ... Officers of the CID were always welcome to visit the laboratory, talk over their cases, and have all the help I could

¹² Report on case of J[-] M[-] 29 April 1915, Post-mortem notebooks of Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/2, vol. XII (March 1915-March 1919), p. 5.

¹³ Sydney A Smith, "The identification of firearms and projectiles: as illustrated by the case of the murder of Sir Lee Stack Pasha," *British Medical Journal* 1, no. 3392 (1926): 8-10. Egyptian case files of Sir Sydney Smith, RCPE SMS/4.

¹⁴ "Edinburgh town council," *Scotsman*, 6 April 1928, 13.

give them in their investigations, official or otherwise.¹⁵

The case records held by the university from the time of Smith's tenure show a wide variety of methods employed to assist the investigation of crime.

These records also show that by no means all of the laboratory work carried out for forensic purposes was done within the forensic medicine laboratory. Cooperation was sought from other parts of the university. In the Donald case, bacteriological work was carried out by Thomas Mackie, an Edinburgh professor of bacteriology.¹⁶ Toxicological work, particularly the testing of the viscera of suspected poisoning victims, was often carried out by Smith alongside CP Stewart, a professor of chemistry.¹⁷ There was also, in later years, cooperation with members of the Clinical Laboratory of the Royal Infirmary of Edinburgh, for example for the testing for blood alcohol.¹⁸

Glasgow

The histories of forensic medicine at Edinburgh and Glasgow Universities mirror each other in several ways, not least in the fact that the memoirs of John Glaister Jr., who was Smith's successor in Egypt and, later, his counterpart professor in Glasgow, also contain reflections on the forensic laboratory. Glaister's account of the role of the laboratory, and his in particular, is, if anything, more extensive than Smith's. He describes the advanced state of the laboratory at the time of composition of his book, *Final Diagnosis*, while he was Professor Emeritus, after his retirement in 1962.¹⁹ The picture he painted was of a laboratory with the very latest apparatus, such as the neutron activation analysis machine, described in awed, loving detail. Glaister also detailed some of the facilities for investigating bloodstains, still one of the most common tasks for forensic medicine, which included an extensive reference collection of stained items of different ages, for the purposes of comparison. There was also a large selection of microscopes and specialist photographic

¹⁵ Smith, *Mostly murder* (1959), 150.

¹⁶ John G Wilson, ed. *The trial of Jeannie Donald*, Notable British Trials (Edinburgh: Hodge, 1953), 219-23. The transcript of this trial is missing from the National Records of Scotland, although it appears in the catalogue at NRS JC36/82.

¹⁷ For example: Report on case of M[-] I[-], 20 February 1939, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS 2759.

¹⁸ Report on blood alcohol, case of E[-] D[-], 22 April 1943, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS 2761.

¹⁹ "Obituary - Professor J Glaister," *Times*, 7 October 1971, 16.

equipment and lighting, including some experimental stereoscopic apparatus for compiling three-dimensional images of crime scenes.²⁰

Just as the laboratory was central to Glasgow forensic medicine in the 1960s, it also occupied a prominent place in the first half of the century. During this period members of the department carried out a number of research projects. In the 1920s, John Glaister Jr. performed a five-year study on the examination of bloodstains, including extensive scrutiny of the precipitin test, in which several thousand procedures were carried out, and the Kastle-Meyer test for the presence of blood.²¹ He assessed the reliability of the precipitin test after samples had been exposed to a wide variety of conditions, for example significant variations in temperature. He found that, unless the blood serum had been destroyed, the samples were remarkably resilient and the test could be performed.²² During the same period he also undertook research on the identifying characteristics of different hairs and fibres, which eventually led to the publication of a monograph on the subject during his tenure in Egypt.²³ Other research at Glasgow included Frank Martin's work on the use of ultraviolet light, which was the subject of his MD thesis and reports which appeared in the *Police Journal* and *British Medical Journal* in 1934.²⁴

The facilities available at the Glasgow department were quite extensive at this time. One of the major sources for this is an article written by John Glaister Sr. for the Rockefeller Foundation in 1928, describing the department. Part of a series entitled *Methods and Problems of Medical Education* (a similar piece was written by Littlejohn showcasing the facilities in Edinburgh), this was primarily about the resources available for teaching; however, it does

²⁰ John Glaister, Jr., *Final diagnosis* (London: Hutchinson, 1964), 190-203.

²¹ John Glaister, Jr., "The Kastle-Meyer test for the detection of blood: considered from the medico-legal aspect," *British Medical Journal* 1, no. 3406 (1926): 650-2.

²² John Glaister, Jr., "The results of experimental work upon the serological or precipitin test for the detection of blood, considered from the medico-legal aspect," *Transactions of the Medico-Legal Society* 21 (1926-7): 18.

²³ John Glaister, Jr., "Some results of recent medico-legal research in the examination of bloodstains and hairs," *Police Journal* 1, no. 1 (1928): 62-77; John Glaister, Jr., *A study of hairs and wools belonging to the mammalian group of animals, including a special study of human hair, considered from the medico-legal aspect* (Cairo: MISR Press, 1931).

²⁴ Frank W Martin, "Ultra violet light in medico-legal aspect of criminal investigations" (University of Glasgow, 1933). (Currently missing from University of Glasgow Library). Frank W Martin, "Ultra-violet rays in criminal investigation," *Police Journal* 7, no. 4 (1934): 431-7; Frank W Martin, "Ultra-violet rays and seminal stains," *British Medical Journal* 1, no. 3809 (1934): 37-8.

provide an insight into the facilities possessed by the department for medico-legal and research purposes. The accommodation which the department occupied at this time had been inaugurated in 1907, after they had moved out of previous, cramped accommodation.

From 1907, they possessed a laboratory which was exclusively for medico-legal work. This laboratory featured various facilities, including specially designed taps, gas and electricity supplies, a fume cupboard, and an area devoted to microscopy and spectroscopy. There was also an office for the professor, a special balance room for the purposes of weighing material, a chemical laboratory and a bacteriological laboratory, although this seems to have been shared with the public health department. Finally, there was a substantial museum and library, which included the many specimens which had been collected during the elder Glaister's years of practice.²⁵

The two universities

The rivalry between the inhabitants of Edinburgh and Glasgow is a familiar trope in the British popular mind. While this, on its own, would be insufficient grounds for assuming friction between practitioners of forensic medicine at the two universities, there are other factors which make the suggestion of such a hypothesis more reasonable. First, it was not uncommon for experts from Edinburgh and Glasgow universities to be called as witnesses by opposing sides in criminal trials, a process in which they would cast doubt on each other's testimony. However, the level of tension and resentment created is difficult to gauge. Much of the criticism was indirect, for example describing a method which happened to be more rigorous than the other expert's, or via innuendo. Direct, open criticism of the other expert was problematic, as shown by an answer given by Sydney Smith when he was asked to comment on whether the conclusions of the Glasgow doctors, in this case the elder Glaister and John Anderson, a senior pathologist, could be accepted 'with confidence':

I personally, I think, am not competent to give any opinion on that – I am hardly to be expected to pass an opinion on any other person.

²⁵ John Glaister, Sr., "Forensic Medicine Department University of Glasgow," *Methods and Problems of Medical Education* (1928): 1-11.

Intervening, the judge made it clear that he considered this to be a fair answer, endorsing a convention of professional courtesy.²⁶

On the other hand, experts from the two cities cooperated on certain complicated cases, for example, the trials of John Donald Merrett, Buck Ruxton, and Jeannie Donald. However, it has been suggested that this may have been the arena for further expressions of rivalry, as experts vied to emphasize their own contributions to such cases. Crowther and White have pointed out that in cases where Smith and the younger Glaister collaborated, they only fleetingly, if at all, referred to the other's efforts in their respective memoirs.²⁷

Another potential source of rivalry was the competition between textbooks from the two stables, namely Smith's *Forensic medicine*, first published in 1925, and the elder Glaister's *Medical jurisprudence and toxicology*, first published in 1902, with successive editions edited by himself and, from 1931, his son. The marketplace was crowded, potentially stoking rivalries. However, relations between Smith and the younger Glaister were sufficiently cordial for them to jointly author two editions of *Recent advances in forensic medicine* in 1931 and 1939.

Development of analytical techniques

Although the medico-legists of Edinburgh and Glasgow undertook a number of important research projects, they did not work in a technological vacuum. During the first five decades of the century, significant developments took place regarding the scope and application of laboratory techniques, both biochemical and otherwise, which could be marshalled within forensic medicine. Many of the developments originated outside the field of forensics, but were assessed and refined for medico-legal purposes. John Glaister Jr.'s research on the precipitin test was an example of this. In this section I outline the development of the techniques used to analyse the samples which commonly came before the medico-legist, namely semen, blood and hair, and place their use within the context of the Donald case.

²⁶ Testimony of Sydney Smith, Transcript of trial of Robert Swift Willox, contained in papers pertaining to an appeal by Robert Swift Willox against conviction for the crime of uttering, robbery, murder at 79 Grove Street, Glasgow, 28 December 1929, NRS JC34/1/66, p. 335.

²⁷ Crowther and White, *On soul and conscience* (1988), 86.

The Donald case itself was notorious, and received extensive media attention, both at the time and in retrospect. In 1934 a small girl in Aberdeen, Helen Priestly, had been sent out by her mother to buy a loaf of bread. When she did not return, her mother became worried, and a police investigation was launched, with extensive searches made of the local area. Early the next morning, one of the Priestlys' neighbours in the tenement where they lived discovered Helen's body in a sack in a vestibule in a communal area of the ground floor of the building. Witness testimony established that the body had not been there a few hours previously. Because the street outside had been busy, due to the on-going search for the child, and because there were no footprints in the muddy ground behind the tenement building, it was deemed infeasible for the killer to have returned from outside to dump the body. Thus suspicion fell upon the occupants of the tenement. The only one without an alibi was Jeannie Donald, one of the Priestlys' downstairs neighbours. It was suggested that Mrs Donald had murdered the girl, then concealed the body in her flat until dumping it in the communal vestibule that afternoon. Thus, an effort was made to connect the Donald home and the girl's body using trace evidence. In the end, this was successful, the jury feeling that the evidence was strong enough to convict Mrs Donald. She was sentenced to death, although this was later commuted to imprisonment.²⁸

Semen

The identification of semen from pieces of material evidence, such as clothing and furnishings, and bodies was a very common task in forensic medicine throughout the period. This evidence was sought in relation to cases of sexual assault and rape. Like many of the other techniques which will be explored in this chapter, the examination and testing of items for the presence of semen played an important role in the Donald case. The testing of the body and various stained items for the presence of semen in the early stages of the investigation, alongside the results of the post-mortem examination, helped to determine decisively the direction of the murder inquiry. Because the child had sustained severe injuries to her vagina, the possibility was initially raised that

²⁸ Smith, "Studies in identification and reconstruction: no. 7," 279-87; Wilson, *The trial of Jeannie Donald*.

she had been raped by a man. However, the absence of any semen, along with the injuries' direction, which suggested that they had not been caused by a penis, allowed investigators to rule out rape as a motive.²⁹ Consequently, the possibility that the perpetrator had been female was admitted. Thus, the case is an example of the importance of negative, as well as positive, results of laboratory tests.

Unlike the history of bloodstain analysis for this period, discussed below, there was no major conceptual shift in the precise identification of semen on a par with, for example, the development of the precipitin test. Throughout the period, the sole criterion for the positive identification of semen was the microscopic discovery of spermatozoa. This had been the case since the nineteenth century. The 1894 edition of Taylor's *Principles and practice of medical jurisprudence* stated that 'the discovery of one distinct and entire spermatozoon is quite sufficient to justify a medical opinion of the spermatic nature of the stain', but that 'there are no chemical tests on which we can safely rely for the detection of spermatic stains'.³⁰

In terms of positive proof of semen, the principle remained the same towards the end of the 1930s, as can be seen from Kerr's *Forensic medicine*, in which the author is unequivocal:

The slide will show many objects which resemble spermatozoa and probably are spermatozoa, but the only proof is to find clear and indisputable spermatozoa.³¹

A microscope was essential, although there were some minor points of disagreement between authors on matters such as the best type of lens to use. Sydney Smith suggested that an oil-immersion lens could be used, while Kerr stated that although 'some observers' offered this as a possible approach, 'we do not recommend this method'.³²

Smith and Kerr also disagreed on a more fundamental point, namely

²⁹ Wilson, *The trial of Jeannie Donald*, 194.

³⁰ Alfred Swaine Taylor, *The principles and practice of medical jurisprudence*, ed. Thomas Stevenson, 4th ed., 2 vols., vol. 2 (London: J & A Churchill, 1894), 461, 465.

³¹ Kerr, *Forensic medicine* (1936), 169.

³² Smith, *Forensic medicine* (1925), 232-3; Kerr, *Forensic medicine* (1936), 169.

the status of partial spermatozoa, and whether they constituted proof of seminal origin. This was important because excessive handling of the item under examination could result in the separation of the heads and tails of any spermatozoa. Both authors acknowledged this to be a significant complication. According to Smith, even if this occurred, the prospect of positive identification could still be salvaged, albeit with the help of an expert:

If only disconnected heads and tails are found, as is sometimes the case in stains that have been roughly handled, a definite opinion as to the presence of spermatozoa can be given only by an expert.

In the examination of more straightforward samples, those less experienced were not precluded from examining, but they ‘should always have a slide of genuine spermatozoa for comparison’.³³ Kerr, on the other hand, did not accept that a positive conclusion could be drawn from the presence of incomplete spermatozoa. ‘A complete spermatozoon is necessary before a positive result can be given,’ he wrote, ‘and it may require continued focussing to obtain this, as the heads and tails frequently lie in different planes.’³⁴

Although the presence of semen could only be confirmed using a microscope, the practicalities of checking garments and other pieces of evidence meant that preliminary tests were required, since stains were not always visible to the naked eye, and examining every item in a case microscopically would be impractical. This passage from John Glaister Sr.’s textbook demonstrates some of the difficulties:

From a long experience of this work, we are able to state that it is not so easy a matter as the student may imagine from the ordinary accounts in books. In the first place, the underclothing of those ordinarily so assaulted is by no means characterised by its cleanliness, and indeed very often bears traces of dirty habits; consequently the examiner may expect to see a considerable variety of stains, both of size and of composition, ranging in

³³ Smith, *Forensic medicine* (1925), 233.

³⁴ Kerr, *Forensic medicine* (1936), 170.

colour from red, brown, yellowish, to a grey.³⁵

Several preliminary methods were available. The main chemical test was the Florence test, developed in 1896, which depended on the formation of characteristic crystals when iodine reacted with choline, a constituent of spermatic fluid. Although many human tissues contained choline, spermatic fluid contained particularly high levels. Thus, if a sample of the stain, dissolved, gave a positive result, it was highly suggestive of the presence of semen, justifying microscopic investigation.

Experts showed a significant level of confidence in the Florence reaction as an indicator of the presence of semen. Glaister wrote that the presence of ‘crystals of cholin [*sic*] or lecithin in a suspicious stain is almost characteristic of human semen, apart from the discovery of spermatozoa’, although he noted that more research would be required before a positive Florence result could be taken to be positive proof of the presence of semen.³⁶ Douglas Kerr wrote that although a positive result was ‘no proof that the stain is seminal’, it was ‘so suggestive that the search for spermatozoa should be continued’.³⁷ Sydney Smith was even more vociferous in his confidence, having ‘never yet failed to find spermatozoa in a specimen in which the Florence was positive’.³⁸

This exuberance was tempered somewhat by a 1940 study into the efficacy of the Florence test by Gilbert Forbes, a lecturer in Forensic Medicine at the University of Sheffield. He found that the test was ‘one on which no definite conclusions can be based’. A negative reaction did not mean that no spermatozoa were present:

The spermatic fluid of the individual may have a very low choline content and therefore may not be capable of reacting at all though sperm are present in abundance. On the other hand the stain extract may be over dilute, or lastly the stain may not contain seminal fluid.

³⁵ Glaister, *Medical jurisprudence and toxicology* (1915), 491.

³⁶ *Ibid.*, 495.

³⁷ Kerr, *Forensic medicine* (1936), 170.

³⁸ Smith, *Forensic medicine* (1925), 232.

Second, a positive reaction did not mean that further examination would reveal the gold standard of the microscopic spermatozoon, since the reaction depended upon chemicals found in the fluid portion of the ejaculate, rather than the crucial cells themselves. Also, 'if the case is one in where the possibility of tissue extracts being present cannot be excluded, then a positive result might be due to that fallacy'. Thus, the Florence test remained a preliminary test.³⁹

Another very important preliminary test for the presence of seminal stains emerged in the 1930s: the examination of artefacts under ultra-violet light. The medico-legal uses of ultra-violet light were the subject of the 1933 Glasgow thesis of Frank Martin. Semen stains fluoresced under ultra-violet light, allowing them to be rapidly identified and subjected to microscopic examination. Martin published his output in the *Police Journal*, and the *British Medical Journal*. In both of these articles, he emphasized that the use of ultra-violet light opened up new avenues of investigation in semen detection, since it expanded the medico-legist's vision:

Seminal stains ... are not always visible to the naked eye, and it is in such cases that filtered ultra-violet light has an application of great value, since without the fluorescence test such stains would be missed by the most careful investigator, because he has no other means than filtered ultra-violet light to aid him.⁴⁰

In the past it has been necessary to trust to a laborious tactile examination if the material were of a dark-coloured coarse texture.⁴¹

Types of material evidence which had hitherto been too difficult or unwieldy to examine for stains could now be practicably inspected, such as 'floor rugs, which were almost impossible to tackle without the assistance of these rays'.⁴²

³⁹ Gilbert Forbes, "The scope and fallacies of the Florence reaction for seminal stains," *Police Journal* 13, no. 2 (1940): 170.

⁴⁰ Martin, "Ultra-violet rays in criminal investigation," 433.

⁴¹ Martin, "Ultra-violet rays and seminal stains," 38.

⁴² *Ibid.*

The method was soon co-opted into the textbook literature.⁴³

Incidentally, Martin's reflection on the alternative method of finding invisible stains, by touch, invites the observation that a wide range of human senses were employed in the examination of stains. First, of course, there was the naked human eye, which could detect the stains' 'greyish-white appearance'.⁴⁴ As we have seen, this vision could be enhanced, originally with the microscope, which would reveal the individual spermatozoa, and later with the ultra-violet lamp, which revealed fluorescent stains.

As well as sight, some texts also cited smell, such as the 1891 edition of Taylor's *Manual of medical jurisprudence*:

By the action of warm water, the stained linen, even though it may have been kept dry for a considerable period, has been observed to evolve the peculiar faint odour of the spermatic secretion.⁴⁵

This was not considered by the elder Glaister to be especially useful, since his experiments in this regard had been inconclusive. Even if they were reliable, they would be, in his view, superfluous 'when a microscope is at hand, for if the quantity of semen be sufficient to make any response to the tests named—and that, in our experience, is rare—there will be more than enough for the convincing proof of the microscope'.⁴⁶

Finally, many of the authors wrote about the sense of touch, looking for the characteristic stiffening of the fabric which indicated a stain of interest, as Smith described: 'On passing the fingers over the clothes stiffened areas due to such discharges may be felt.'⁴⁷ The use of touch was not necessarily obviated by the advent of the ultra-violet lamp, as can be seen from Douglas Kerr, who positioned them as alternatives:

⁴³ Kerr, *Forensic medicine* (1936), 169; Sydney A Smith, *Forensic medicine: a text-book for students and practitioners*, 8th ed. (London: J & A Churchill, 1943), 308.

⁴⁴ Glaister, *Medical jurisprudence and toxicology* (1915), 492.

⁴⁵ Alfred Swaine Taylor, *A manual of medical jurisprudence*, ed. Thomas Stevenson, 12th ed. (London: J & A Churchill, 1891), 716-7.

⁴⁶ Glaister, *Medical jurisprudence and toxicology* (1915), 492.

⁴⁷ Smith, *Forensic medicine* (1925), 231.

The appropriate area for examination may be found by the use of ultra-violet light; or by allowing the fabric to slide gently over the tips of the fingers, when a slight stiffening may be noticed.⁴⁸

With the exception of the Florence test and the identification of spermatic odour, the means of detecting and declaring seminal stains described above were all used in the Donald case in some form, from the identification of ‘stiffened’ material to the use of ultra-violet light. When they performed the post-mortem examination, the professor of pathology, Theodore Shennan, and the police surgeon, Robert Richards, used the naked eye to examine for stains on the body. They found a ‘glistening dried smear’. They examined material from this microscopically, but did not find any individual spermatozoa, which would have been necessary for the stain to have been declared to be seminal. Instead, the stain was found to contain yeast forms, which were suggestive of vomit.⁴⁹

Shennan and Richards also examined the girl’s clothing for the presence of seminal traces. For this, they initially used the ‘light of a mercury vapour lamp’, a source of ultra-violet light, ‘by which it is claimed that seminal stains can be distinguished from others’, such as blood and vomit. There was no fluorescence to suggest the presence of semen. However, they also examined, microscopically, ‘washings’ from various markings on the clothes and a ‘stiffened stained area’ of the fabric. No traces of spermatozoa were found.⁵⁰

Mrs Donald’s defence advocate, DP Blades, tried to challenge the significance of the failure to locate any spermatozoa, which, he argued, did not mean that rape had not taken place. He quoted Taylor:

‘It must be most emphatically stated that the non-discovery of spermatozoa in a given stain does not prove that the stain is not seminal.’ Do you agree with that?

⁴⁸ Kerr, *Forensic medicine* (1936), 169.

⁴⁹ Joint medical report by Thomas Shennan and Robert Richards (Production no. 7), 23 April 1934, Trial papers relating to Jeannie Donald, NRS JC26/1934/72. Wilson, *The trial of Jeannie Donald*, 201.

⁵⁰ Joint medical report by Thomas Shennan and Robert Richards (Production no. 8), 24 April 1934, NRS JC26/1934/72.

He also attempted to suggest to Shennan that the presence of urine, faeces and mucus might have 'caused a disintegration of the spermatozoa so that they were not found'. Shennan stated that he did not believe that such a phenomenon would take place so quickly. Admitting that he could not completely exclude the possibility of rape, he argued that the evidence from the autopsy suggested that a rape had not taken place.⁵¹

Overall, the testing of the body and clothing in the case for semen played a very important part in the case, despite the negative result. A positive result, which, according to Shennan, would be conclusive if only a single spermatozoon was found, would have undermined the whole prosecution, since it would have pointed to a male perpetrator.

Blood

The testing of blood samples and bloodstains also played a central role in the Donald investigation. The tests included ones to determine whether a stain was composed of blood, whether blood was human in origin and to which blood group a sample belonged. The tests to identify a stain as blood can be further divided into preliminary tests and confirmatory tests. A positive result in a preliminary test suggested that a stain could be blood, whereas a negative result meant that it definitely was not blood. A positive result in a confirmatory test, such as the haemin crystal test, was a definite indication of the presence of blood.

As well as demonstrating the circumstances under which blood testing was used, examining these techniques in the context of the Donald case raises a number of interesting issues about their employment. First, it shows the necessity of corroboration before a conclusion could be reached. Richards's sighting of blood cells under the microscope was not enough to declare definitively that a stain in the Donald home was blood. Further chemical testing was required. Second, the limits of blood grouping in particular and forensic data in general can be seen. A match between the dead girl's blood group and the group of some blood on a cloth from the Donalds' house did not necessarily allow conclusions to be drawn.

⁵¹ Wilson, *The trial of Jeannie Donald*, 201-2.

During the nineteenth century, a number of tests had emerged which could differentiate between blood and other stains, such as mud. By the 1860s, these were reasonably well established, as can be seen from the 1866 edition of Taylor's *Manual of medical jurisprudence*. Taylor set out a range of methods for the detection of blood, including chemical tests for haematin, a derivative of the blood pigment haemoglobin; a method for bringing about haematin crystals; spectroscopy; and the use of the microscope. The chemical test for haematin involved dissolving the stain, adding ammonia, and boiling, which led to a characteristic loss of colour, and the formation of a precipitate, which was insoluble in water, but soluble in boiling caustic potash.⁵² Taylor also illustrated a method of deriving crystals of haematin, a method which 'has been, of late years, suggested by some German medical jurists', Lehmann and Kunze.⁵³

Taylor also regarded the use of spectroscopy, the observation of a characteristic spectrum of light when passed through a solution of blood, favourably. He wrote, 'When a sufficient quantity of colouring matter can be procured for an experiment of this nature, the characters of blood may be determined with equal if not greater certainty by a microscopical and chemical analysis.'⁵⁴ However, Taylor was of the opinion that none of the above methods could be used to determine whether the blood had been shed by a human or an animal.

Many of the tests for detecting blood espoused by Glaister were of a similar character to those of Taylor, albeit somewhat refined. Crystallization tests were still important, as was spectroscopy, which Glaister considered to be 'the most reliable test for blood, as it is capable of detecting the [thousandth] part of a grain of haemoglobin'.⁵⁵ Spectroscopy was not just useful for the identification of suspicious stains. It could also be used to detect certain poisonous gases in the blood, such as carbon monoxide, and thus reveal the

⁵² Alfred Swaine Taylor, *A manual of medical jurisprudence*, 8th ed. (London: J Churchill, 1866), 218.

⁵³ *Ibid.*, 229-30.

⁵⁴ *Ibid.*, 231.

⁵⁵ Glaister, *Medical jurisprudence and toxicology* (1915), 376.

cause of death.⁵⁶

Such was spectroscopy's utility that Sydney Smith made a study of it part of his 1914 MD thesis on the forensic examination of bloodstains. His object was to develop a procedure which would allow the analyst to perform a number of different tests on one sample, rendering dissolving the stain unnecessary. He also wished to better clarify the procedures, both of the standard crystallization tests, and spectroscopic analysis, since he regarded current textbook literature to be unclear and prone to error.⁵⁷ Smith, like Glaister, fully endorsed the spectroscopic test, which he found to be more sensitive than the crystallization test. He was able to obtain positive spectrum results with samples which did not give a clear result with the crystallization tests.⁵⁸

Of course, the employment of crystallization tests and spectroscopy could be time consuming, and it was not feasible to perform them on every reddish-brown stain found by the examiner. To address this problem, a series of preliminary tests were available which could decisively rule out the presence of blood if a negative result was obtained. These could be deployed rapidly, allowing examiners to sift a large number of stained items and identify those which would bear further examination using one of the more specific methods outlined above. One such preliminary test, employed at various points during the Donald investigation, was the benzidine test. This entailed the application of benzidine, a crystalline base dissolved in acetic acid, to the stain. If blood was present, a blue salt would form. While a positive result might also be obtained from other substances, such as other bodily and plant secretions, a negative result meant that blood definitely was not present. As with other laboratory tests, an experimental control was required. Smith stipulated that 'known blood stains should always be at hand' for this purpose.⁵⁹

In the Donald case, the benzidine test was first applied by Shennan and Dr George Duncan, of the Aberdeen Royal Infirmary, directly to a stain on a

⁵⁶ Ibid., 378-80; Douglas JA Kerr, "Carbon monoxide poisoning: its increasing medico-legal importance," *Transactions of the Medico-Legal Society* 21 (1926-7): 25-6.

⁵⁷ Smith, "The examination of blood stains," 3-4.

⁵⁸ Ibid., 28.

⁵⁹ Smith, *Forensic medicine* (1925), 155-6.

section of the floor in the Donalds' house. The test produced a negative result, as did the other preliminary tests which were attempted. In addition, scrapings from the floor were taken and examined under a microscope. Again, however, there was no trace of blood.⁶⁰ This episode illustrates the utility of the test when potential crime scenes were being investigated, in that it could be performed *in situ*.

The test was also used to filter the large number of items which were seized from the Donald home, to determine whether they might have been contaminated with blood and, by extension, have been in contact with the dead girl. Items which produced a positive result were then subjected to further tests to confirm whether blood was definitely present and, if the sample was sufficient, determine the species and blood group.⁶¹ Because the child had been killed elsewhere and then placed in the stairwell, the parts of the Donalds' house, the supposed crime scene, which were likely to yield evidence were not immediately clear to investigators. The use of rapid, preliminary tests helped to focus the authorities' attention on objects, such as the washing cloths discussed below, which could help form an account of what had happened.

While the ability to identify blood was important, its value would be limited if animal and human blood could not be distinguished. For example, even if a suspect in a violent crime was found to have blood on their clothing, unless it could be shown to be human in origin, the defence could argue that they came from an agricultural activity, such as slaughtering chickens. Across Europe and America, medical and scientific witnesses had been trying to solve this problem since the nineteenth century. It was known that the sizes of the red blood cells of different mammals varied. Thus, the microscope held a potential solution to the problem.

The 1866 edition of Taylor's *Manual of medical jurisprudence* considered the potential of the microscope. He argued that the diameter of blood corpuscles of different species did indeed vary in terms of their average size, and listed some of these averages. If the samples were recent and had not

⁶⁰ Joint medical report of Thomas Shennan and GM Duncan, 26 April 1934, NRS JC26/1934/72.

⁶¹ Medical report of Sydney Smith, [undated, 1934], NRS JC26/1934/72.

been allowed to dry, it might be possible, Taylor argued, to differentiate between the blood of a human and a sheep or goat, since the sizes of the different red blood cells were sufficiently distinct. Nevertheless, this method could not be relied upon to distinguish other animals, and was not suitable for analysing dried blood. Thus, in the end, any declaration on this matter would be purely speculative.⁶²

Nevertheless, not all nineteenth-century expert witnesses were as conservative as Taylor, as Tal Golan has demonstrated in a study of the analysis of bloodstains in the late nineteenth-century United States. The central issue was again whether a bloodstain was human or animal. Unlike Taylor, some microscopists claimed that it was indeed possible to determine decisively whether a stain was human or otherwise by measuring the diameter of the corpuscle under high magnification. Golan charts an intense debate between experts, in the scientific arena, as to how far this could be achieved, especially since measurements of the same cells sometimes varied between experts. Nevertheless, he shows that this scientific debate at meetings of microscope societies and on the pages of journals was not reflected in the courtroom:

In spite of the deep and lingering scientific disagreement, legal convention remained unwavering throughout the second half of the nineteenth century that the micrometric blood test, ‘although not infallibly correct, is worthy of the greatest consideration by court and jury as being the best of opinion evidence.’

Golan suggests that the reason for this sidestepping of the debate was one of expediency, when other evidence of guilt might be lacking.⁶³

Scottish textbooks from the early-twentieth century agreed with Taylor, and the authors did not consider the microscope to be reliable for the differentiation of species. While Glaister, for example, acknowledged that the size of the red blood cells of different mammals did vary in principal, this was not decisive enough for medico-legal purposes. The expert could only state that the corpuscles ‘either conform to the characters of mammalian blood, or that

⁶² Taylor, *A manual of medical jurisprudence* (1866), 228-9.

⁶³ Golan, *Laws of men and laws of nature* (2004), 173.

they do not.⁶⁴ Nevertheless, Glaister, like Taylor, did consider microscopic analysis to be reliable for the confirmation of the presence of blood, if blood cells could be identified.

The use of the microscope for the identification of species was, therefore, highly problematic. However, in 1897 a researcher in Vienna, Rudolph Krauss, made a discovery which would allow experts to differentiate biochemically between species, using serum, a species-specific constituent of blood. He found that when a specific antibacterial serum was added to a culture of the corresponding bacterium, a precipitate was produced. Other researchers soon demonstrated that this principle applied to other species. By the end of the first decade of the twentieth century, this precipitin test, as it was known, was required by the Prussian Ministry of Justice for the identification of human blood.⁶⁵ Adoption in British jurisdictions was slower. In 1911, William Smith, the principal of the Royal Institute of Public Health, made a presentation to members of the Medico-Legal Society in London, in which he outlined the technique and its history, and performed a demonstration. He stated that his establishment was carrying out research into the technique, and had set up a specialist laboratory for that end, as well as to begin using the test in practical applications.⁶⁶ Reminiscing in 1927, the eminent London medico-legist William Willcox stated that Home Office analysts had been using the test since 1908, and described an instance from 1912 in which he had used the test when investigating a case of horse maiming, to determine whether blood stains were human or horse in origin.⁶⁷

In the 1910 edition of his textbook, John Glaister Sr. gave an outline of the test, but did not indicate whether he had applied it to a criminal case, although he did state that it had been in use in German courts for over eight years.⁶⁸ It is hard to gauge whether he was enthusiastic about the prospect of using this test in medico-legal work, since the description was somewhat set

⁶⁴ Glaister, *Medical jurisprudence and toxicology* (1915), 382.

⁶⁵ William R Smith, "Blood tests," *Transactions of the Medico-Legal Society* 8 (1910-11): 155.

⁶⁶ *Ibid.*, 162.

⁶⁷ William Willcox, "Recent advances in toxicology and forensic medicine," *Transactions of the Medico-Legal Society* 22 (1927-8): 11-12.

⁶⁸ John Glaister, Sr., *A text-book of medical jurisprudence and toxicology*, 2nd ed. (Edinburgh: E & S Livingstone, 1910), 356-9.

apart from the rest of the section on the analysis of bloodstains. It may be that in 1910 he was exhibiting caution, since it was a guiding principle of forensic medicine that new scientific developments should not be hastily adopted at the expense of justice.⁶⁹ Nevertheless, Glaister's coverage of the test changed little over successive editions, a fact for which he was criticized in the *Glasgow Medical Journal's* review of his 1921 fourth edition.⁷⁰

By the 1920s, the precipitin test was routinely practised in Scotland and elsewhere. Nevertheless, there was a difficulty which complicated the decision to apply the test. Human antiserum, which was required to test samples of blood for human origin, was not always readily available. Glasgow University relied, in the 1920s, on a supplier in Dresden. When supplies ran out in November 1924, tests on productions in the case of Alexander Bickerstaff, accused of murder, were delayed until the following February.⁷¹ Other laboratories in Britain had similar problems. At a meeting of the Medico-Legal Society in 1925, Godfrey Carter of Sheffield University stated that he was unable to perform the precipitin test because his university did not manufacture antiserum, and none of the London hospitals to which he wrote were able to provide him with any. Thus, a number of weapons could not be examined for human bloodstains.⁷²

By the 1930s, a new technique for analysing blood had begun to emerge, blood grouping, in which the blood of each member of the human population could be seen to fall into one of four categories. Blood groups had been known about since the beginning of the century, but the practical possibility of applying them to the forensic context had only been recently acknowledged in Britain, although it had been adopted earlier on the continent. In 1931, when Smith and the John Glaister Jr. collaborated on *Recent advances in forensic medicine*, it had still to gain acceptance in court, although the

⁶⁹ Willcox, "Recent advances in toxicology and forensic medicine," 1-2; Kerr, *Forensic medicine* (1936), 85.

⁷⁰ "John Glaister, A text-book of medical jurisprudence and toxicology," *Glasgow Medical Journal* 98, no. 4 (1922): 284-5.

⁷¹ Transcript of the trial of Alexander Bickerstaff for indecent assault and murder, High Court, Edinburgh, 18 January 1926, NRS JC36/50/8, pp. 281-2.

⁷² "The proposed formation of a medico-legal institute: being minutes of a meeting of the Medico-Legal Society," *Transactions of the Medico-Legal Society* 19 (1924-5): 155-6.

authors were optimistic about its prospects:

Despite the amount of work already undertaken regarding the medico-legal application of blood-grouping tests, it is more or less generally accepted that further results must be obtained in order to endorse their reliability and specificity, before courts of law are likely to accept inferences and findings based upon them. The present results are such, however, that there is every justification in treating the subject in extended form, since the principles and technique of blood-grouping are almost certain to be inevitable essentials in routine medico-legal practice in Britain in the very near future.⁷³

This was correct. In 1932, at the Old Bailey in London, Maurice Freedman was convicted of the murder of typist Annette Friedson, partly on the basis of blood-grouping evidence, after blood found on a razor hastily disposed of by Freedman was found to be of the same rare AB type as the victim's. This instance was notable because the blood group was used to 'rule-in' a link between a sample and an individual, rather than 'rule-out' such a connection, which was the more common application of blood grouping. This was possible in the Freedman case because, first, the AB group only occurred in three per cent of people in England, and second, there was other compelling evidence against the accused. As a commentator in the *Police Journal* wrote, 'when the blood in question belongs (as it usually will) to Group O or Group A, each of which includes nearly half the human race, the element of excitement and moral certainty disappears.'⁷⁴

There were also, at this time, attempts to use blood grouping in civil cases in which a child's paternity was disputed. From the point of view of the 'father', if his blood type was incompatible with the child's, another man was responsible for the offspring. Interestingly, Shari Rudavsky has shown that American family courts in the 1930s could be reluctant to accept the results of blood-grouping tests which showed that the mother's husband was not the

⁷³ Sydney A Smith and John Glaister, Jr., *Recent advances in forensic medicine*, 1st ed. (London: J & A Churchill, 1931), 136-7.

⁷⁴ DH Kitchin, "Blood tests: the four blood groups," *Police Journal* 6, no. 1 (1933): 51, 58.

father of her child. She argues that the conception of fatherhood went beyond the genetic, this being partly born of a desire to protect the taxpayer from having to provide for the child's upkeep, as well as a desire not to 'bastardize' children.⁷⁵ I have not found evidence of this having been the case in Scotland. However, in 1932, blood grouping was still not part of the Scottish legal mainstream, as revealed by correspondence between Sydney Smith and a provincial solicitor. The case was one of a mother seeking aliment for her child from the man she believed to be the child's father. She made a request that he take a test to determine his and the child's blood groups and thus to narrow down the likelihood of his being the child's father. Before consenting, the defender's solicitor sought advice from Smith, since 'so little appears to be known of this test that we have been unable to lay our hands on any book which deals with it.'⁷⁶ Smith replied that 'the test has been used in thousands of cases on the Continent, but it has never been before the Courts in Scotland.' There had, however, he continued, been cases where the test had come close to being employed, but for the agreement of the opposing side: 'I had a case a short time ago in which the Defender was grouped by me but the Complainant refused to be examined and this objection was upheld by the Court.'⁷⁷ Eventually, blood-grouping tests were attempted, but the blood samples from the three parties (mother, child and alleged father) had deteriorated whilst being transported to Edinburgh, and so results could not be obtained. The mother refused to consent to another sample being taken from the child, because the child's health had suffered after the first.⁷⁸ Nevertheless, as time went on, the procedure was used more frequently both in civil and criminal cases.

Indeed, blood grouping was used during the Donald investigation. It was employed as part of the attempts to provide a link between the girl's body and the Donald's house. Blood samples were taken from Helen Priestly's body

⁷⁵ Shari Rudavsky, "Blood will tell: the role of science and culture in twentieth-century paternity disputes" (University of Pennsylvania, 1996), 103-5; Shari Rudavsky, "Separating spheres: legal ideology v. paternity testing in divorce cases," *Science in Context* 12, no. 1 (1999): 123-38.

⁷⁶ Letter from L[-] Solicitors to Sydney Smith, 4 October 1932, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2758.

⁷⁷ Letter from Sydney Smith to L[-] Solicitors, 7 October 1932, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2758.

⁷⁸ Letter from D[-] & H[-] Solicitors (for the pursuer) to Sydney Smith, 18 March 1933, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2758.

whilst it was in the Aberdeen police mortuary. Two sets of tests were carried out to determine the group, the first by Shennan at Aberdeen University's pathology department, and the second by Duncan at the infirmary, for corroboration. Both found the blood samples to be group O.⁷⁹ Blood-group testing was also carried out by Smith for various blood-stained items taken in evidence from the Donald's house. As Smith explained in his testimony, a satisfactory result with this test was not always possible, because there might not be a sufficiently large sample. However, traces of group O albumin (a constituent of blood), the same as that of the dead girl, were found on a washing cloth taken from the house.⁸⁰ While the same sample did not give a positive confirmatory test for haemoglobin, which would prove it had been blood, Smith stated in his testimony that blood was the most likely source of the albumin.

This was not, however, a conclusive link between the Donald house and the girl's body. First, according to the expert witnesses, between forty and fifty per cent of the population shared Helen's blood group. The group O albumin did not necessarily belong to her. Second, none of the Donald family had provided a blood sample which could be grouped. Thus, even the house's occupants could not be ruled out as the source of the albumin. Smith admitted to the judge that 'there is not much in the [blood] group, because we do not know the group of anybody in the house'.⁸¹ Here the limitations of the technique are shown to be twofold. First, the episode demonstrates how the non-cooperation of a suspect could limit the efficacy of a forensic technique. Second, it shows that because people's blood groups were not unique, they could not be used in a manner akin to fingerprinting. Indeed, as seen with paternity testing, blood grouping was more effective as a means of ruling people out as the source of a particular blood sample, rather than the opposite. In this way, a parallel can be drawn with the use of preliminary blood tests, which could rule out blood as the constituent of a stain, but not prove that it was.

⁷⁹ Medical report of Theodore Shennan, 23 April 1934; Medical report of GM Duncan, 23 April 1934, NRS JC26/1934/72.

⁸⁰ Medical report of Sydney Smith, 1934, NRS JC26/1934/72.

⁸¹ Wilson, *The trial of Jeannie Donald*, 246.

A range of testing was carried out on blood and bloodstains in the Donald case. The larger portion of this testing was carried out by Smith at his laboratory at Edinburgh University. As stated above, there were four levels of test. The first represented the preliminary tests, such as the benzidine test. The second was made up of the confirmatory tests, to determine that a sample was indeed blood. These were based upon detecting the pigment, haemoglobin, contained in the blood. Third, if blood was detected, an attempt would be made to determine the species from which it originated, using the precipitin test. Finally, if the blood was human, an attempt would be made to determine the blood group.

The actual performance of these tests during the investigation illustrates some of the practical difficulties faced by medico-legists in case-based, rather than experimental, work. For each sample, not every level of testing yielded a conclusive result or could be carried out, as Smith explained in court. The Lord Advocate asked him ‘why it is that sometimes your tests lead to a fuller result than they do on other occasions’. Smith explained that there might not be a sufficient amount of each substance being tested for in the sample, whether pigment, specific albumin for the precipitin test or specific agglutinins for blood grouping. For example, regarding confirmation that a stain was blood, he stated, ‘You may get a successful benzidine test and yet get no confirmation because there is not sufficient material there, although it may very well have been blood.’⁸²

One instance of blood testing in the Donald case raises particularly interesting questions about whether the results of chemical tests held a privileged position over visual microscopic findings, as well as the necessity of corroboration. Just after midnight on 26th April, during their initial search of the Donald house, police called Robert Richards, the police surgeon, to test a stain which they suspected to be blood. Richards took a scraping and examined it under the microscope. He saw ‘small round cells of a yellow colour’ which ‘closely resembl[ed] mammalian red blood cells’. He verbally declared to the police that the stain was blood. Jeannie Donald and her husband were arrested.

⁸² Ibid., 232-3.

Later that day, however, Richards performed a guaiac test, a preliminary test used for ruling out samples. This proved negative. In his report, Richards was unequivocal about what this meant. He wrote, ‘As this test proved definitely negative I conclude that the stain is definitely *not* caused by blood.’⁸³ Interestingly, although he communicated his change of opinion to the authorities, the Donalds were not released.

The lack of ambiguity about Richards’s final report represents an interesting tension between two forms of evidence, visual and chemical. According to textbook accounts, both represented a degree of certainty and conclusiveness. A negative preliminary test was held to be decisive, as we have seen. Yet, the identification of blood cells under the microscope could also be considered positive proof of the presence of blood. Douglas Kerr, albeit writing in the years after the Donald case, wrote that ‘the finding of blood corpuscles is an absolute proof of the presence of blood’. It might seem that an impasse was reached. Richards chose to fall on the side of caution. This may have been because of the caveats to the discovery of blood cells under the microscope as confirmation that a stain was blood. Kerr added:

In stains where the blood has dried or perhaps has been subjected to alternate wetting and drying, the corpuscles are apt to be considerably distorted, and there are also many other debris which may resemble these distorted corpuscles. Considerable care should be taken before forming a conclusion that corpuscles are present.⁸⁴

Richards’s examination of the stain took place several days after the ‘blood’ had supposedly been shed, and thus any blood would have dried and perhaps distorted. As Kerr argued, this opened the scope for confusion. Seen in this context, and of course married with the negative chemical test, the microscopic result could be open to re-evaluation.

However, Richards’s outright rejection of his original opinion also suggests that there was an underlying principle, that of corroboration, which

⁸³ Medical report of Robert Richards, 26 April 1934, NRS JC26/1934/72.

⁸⁴ Kerr, *Forensic medicine* (1936), 80.

guided his decision. He alluded to this during his cross-examination by Donald's defence. He said, 'I ascertained that it was certainly not sufficient and without corroboration could not be called blood.'⁸⁵ His earlier verbal statement to police notwithstanding, blood was not blood unless it could be demonstrated twice. This was in contrast to some of the statements made about what constituted satisfactory proof of the presence of semen. There, microscopic evidence was considered to offer a much surer level of proof than chemical tests, which were prone to give false positives when exposed to other substances. During his cross-examination, Shennan stated that even a very small number of spermatozoa could offer compelling evidence of a crime having taken place. When Blades put it to him that an absence of seminal stains did not necessarily mean that rape had not occurred, Shennan answered, 'No. If you find one spermatozoon then it is conclusive.'⁸⁶

Hair and fibre

Blood was not the only trace for which attempts were made to identify conclusively. The notion that the hairs of different mammals and, indeed, different human races could be distinguished was in place before the beginning of the twentieth century. This was recognized by the authors of some of the earlier textbooks on forensic medicine, although they did not go into a great amount of detail. For example, the 1891 edition of Taylor's *Manual of medical jurisprudence* contained the following passage, relating to the analysis of hairs which might have adhered to a weapon:

The main questions may be, in such a case, whether the hair is that of a human being or of an animal, and whether the fibres correspond in their nature, form, and colour to articles of dress on the deceased or the accused.⁸⁷

However, the author did not go into detail as to what examiners should look for when scrutinizing hairs and fibres, although he did state that a 'powerful lens' should be used. Neither did he make any attempt to describe the general anatomy of hairs, nor how hairs of different species might be differentiated.

⁸⁵ Wilson, *The trial of Jeannie Donald*, 212.

⁸⁶ *Ibid.*, 201.

⁸⁷ Taylor, *A manual of medical jurisprudence* (1891), 265.

Nevertheless, he cited several cases in which the identification of hairs proved central to prosecutions. For example, in an 1877 Irish case, a man was convicted of murder after hairs found clenched in the deceased's hands 'were compared with a like number of the prisoner's hair, [and] they were found to correspond'.⁸⁸ He also cites an even earlier case in which evidence from the observation of hair proved crucial to a suit for adultery:

In *Stothard v. Aldridge* (Bail Ct., Jan. 1856), the plaintiff sued the defendant for damages for the seduction of his wife. The defendant was a man of colour, and the child born of the alleged adulterous intercourse was proved by the medical witness to have been coloured and with woolly hair. The husband and wife were both light. This peculiarity fixed the paternity of the child on the black defendant.⁸⁹

The author did not state what the scope of the medical witness's investigation was, whether he had made a close, microscopic examination and comparison of the baby's hair and that of the two potential fathers, or whether the hair and the skin colour of the child were, after a more cursory investigation, thought to resemble the mother's paramour more than her husband. Whichever it was, the case demonstrates that hair-type was seen to be characteristic and heritable.

John Glaister Sr.'s 1910 textbook contained slightly more extensive information about evidence to be gleaned from hairs, although it was not nearly as extensive as some later works. Like Taylor, he did not describe hair anatomically. He did, however, situate hair, and its appearance, as being central to identity. He suggested, for example, that someone trying to conceal their identity might attempt to change the colour of their hair. He set out a clear protocol for examining a person to determine whether they had dyed their hair:

1. Observe whether there are parts of the hair of a different colour from the rest—due to want of uniformity of application—a very likely occurrence where the individual himself does the work;

⁸⁸ *Ibid.*, 266.

⁸⁹ *Ibid.*, 662.

2. Observe whether the scalp be of its natural colour or not—since the scalp is apt to be dyed also;
3. Note the appearance and texture of the hair itself. The hair if coloured black by dye, has lost its glossiness; it is a dull, lustreless black. The texture is roughened, the hair feels coarser. If bleached, there is likewise loss of lustre, and the hair is brittle;
4. Compare the hair of the head with that of other parts of the body, since the person who dyes his hair for avoidance of identity will usually confine his attention to dyeing those parts seen by the public;
5. If in doubt, shave the hair, or cut it close, and observe, while the person is in custody, the colour of the new growth;
6. Subject the hair to chemical analysis.⁹⁰

Just as in the paternity case cited in Taylor, this protocol of Glaister's shows the importance of hair as analysed in its own context.

Nevertheless, much of the analysis of hair was of orphan hairs divorced from the body from which they came. Glaister cites a case from 1899, in which he testified for the defence. The case was one of murder, in Dunoon, Argyll. Some hairs had been found in bloodstains, and on a bar of soap in the house of the deceased. The question to be answered was how the hairs had got there, and whether they had been wrenched from the scalp of an assailant during a struggle. Glaister was able, however, to demonstrate that this had not been what had happened:

Microscopic examination showed that they all evidently belonged to an aged person and that the bulbs were in a condition of atrophy and fatty degeneration, thus likely to be shed naturally, and none showed the appearance of having been forcibly pulled from the scalp.⁹¹

⁹⁰ Glaister, *Medical jurisprudence and toxicology* (1910), 96.

⁹¹ *Ibid.*, 285.

In this case, a verdict of Not Proven was returned. This illustrates several things. First, by the end of the nineteenth century experts had knowledge of how hairs and their roots deteriorated over time, leading to moulting. Second, they were using microscopes to look at them. Third, evidence from hairs found at a scene was being used to help construct a narrative account of a violent crime.

This theme of hair contributing to knowledge about the character of an incident continued in later editions of Glaister's book, in which he demonstrated the importance of the microscopic examination of hairs found in wounds, which could give an indication of the type of weapon used. The damage caused to hairs by sharp and blunt instruments was different. Thus the smallest details could provide answers in complex cases. However, beyond the testing for dyeing, even the 1921 edition of Glaister's textbook did not promote the analysis of hair in identification.

Sydney Smith's textbook, first published in 1925, contained more on the use of hairs for the purposes of identification. Smith included details of the anatomical structure of hairs, as well as a very brief description of the general characteristics of some of the most commonly encountered mammalian hairs, including those of the human, the goat, the camel, the cow, the rat and the rabbit. He also included a number of illustrations. For example, one set showed human hair which had been pulled out and hair which had fallen out. While many of the principles and possibilities expressed here were hinted at in the earlier works by Glaister Sr. and Taylor, Smith expressed them in a clear and instructive fashion and dedicated a specific section to them.⁹²

The analysis of hairs was soon to be put on a more systematic foundation. John Glaister Jr. undertook a major research project on the use of hairs and fibres in identification. His object was to help provide answers to some of the most frequent hair-related questions faced by medico-legists. The research focussed on two questions. The first was whether the 'hairs of animals belonging to the same zoological order, sub-order, or family, revealed characteristics so similar that they could be depended upon for the

⁹² Smith, *Forensic medicine* (1925), 68-73.

identification of the animal order, sub-order, or family to which the hair belonged'. The second was 'whether there were any specific differences [between human hairs] with regard to (1) sex, (2) the age of the subject, (3) the site on the body from which they were taken, and (4) the colour'.⁹³ Central to Glaister's method was the taking of transverse sections of hairs, which significantly aided differentiation, and the taking of photomicrographs, images taken at a very high magnification. Glaister considered this to be superior to a mere enlargement of a photograph of a hair, which resulted in an image different to what one would see if looking directly down a microscope. The project aimed to provide a guide to the hairs of a very wide variety of animals, for the purposes of producing a reference work for the expert to compare with crime-scene samples which came his way. This was largely in response to sections of textbooks which suggested that the reader would benefit from a 'personal study' of hairs, comments which Glaister deemed to be unhelpful and impractical.⁹⁴

The image was of central importance to imparting information about a hair:

It was thought important to collect a complete zoological series of micro-photographs of the hairs of different animals, and to form a photographic atlas, since the only certain method of recognition of specific hairs is by means of careful comparison with other fibres known to be genuine. It is not possible to convey any reliable impression of the appearances of hairs by means of a written description, as this can only be learned by direct observation of fibres of known origin.⁹⁵

As a result of his work, reported to the Medico-Legal Society in 1928 and detailed in a 1931 monograph, Glaister was able to set out a clear framework for the examination of hairs of interest, establishing which dimensions and characteristics of the hair should be noted to allow meaningful

⁹³ John Glaister, Sr. and John Glaister, Jr., *A text-book of medical jurisprudence and toxicology*, 5th ed. (Edinburgh: E & S Livingstone, 1931), 423.

⁹⁴ Glaister, *Study of hairs and wools* (1931), 7.

⁹⁵ John Glaister, Jr., "Hair; considered medico-legally," *Transactions of the Medico-Legal Society* 22 (1927-8): 93.

comparison. These included colour, length, and breadth, the states of the tip and base, and certain internal characteristics, such as the presence of a cuticle, cortex and medulla. The appearance of a transverse section of the hair was also to be noted.⁹⁶ In his view, it was possible for the examiner to determine a number of things from the examination of the hair, namely whether it came from a human or another mammal, whether the hair had been dyed, the manner in which it had been removed from the body, and, in some cases, the part of the body from which it came, the approximate age of the individual (whether young child, adolescent, adult, or aged, as long as there were a sufficient number of hairs from the individual), and the sex of the subject.⁹⁷

Despite the possibilities offered by the forensic study of hair at this time, experts recommended caution regarding the conclusions which could be drawn as to a subject's identity. Hair could not confirm identity absolutely. Smith was unequivocal in this regard:

If a definite answer is required as to whether a certain sample of hair is that of a certain individual, the investigator is strongly advised to refuse to go further than to state that the hairs are similar. No one, whatever his experience, is entitled to give a categorically positive answer even when the presence of some disease renders the question much more certain.⁹⁸

Smith and Glaister exhibited this caution in their work on the Donald case. One of the major aspects of the case, in terms of the medical evidence presented at the trial, was the comparison of a number of hairs found in the house of the accused, and those found in a sack in which the victim's body was discovered. Glaister, along with Smith, who corroborated the findings, carried out the investigations on the various hairs found at the scene. Significant results were obtained from hairs obtained from the sack, hairs found among other debris in the fireplace and hairs found in a bucket under the sink. These hairs were compared with hairs extracted from the child's body, and, because Mrs Donald did not allow hairs to be sampled from her own head, hairs taken from

⁹⁶ Glaister and Glaister, *Medical jurisprudence and toxicology* (1931), 424.

⁹⁷ Glaister, "Hair; considered medico-legally," 101-2.

⁹⁸ Smith, *Forensic medicine* (1925), 69.

a hairbrush she had used in prison.

Glaister concluded that, first, some hairs from the fireplace debris were ‘identical in character’ with some of those of the accused, while others were ‘identical in character’ with certain of those of the deceased. Second, he found that some hairs from the sack were ‘identical in character’ with some of those of the accused. The third finding was, however, problematic for the prosecution:

A hair found in the bucket under the sink, No. 43, was similar in all respects to certain of the hairs from the head of the deceased child, but since a hair showing similar characters was obtained from the brush taken from the house of the accused, no significance can be attached to the similarity.⁹⁹

In other words, the hair found in the bucket could have come either from the dead girl or one of the occupants of the Donald house, whoever had used the hairbrush.

Throughout his testimony, Glaister stopped short of saying that specific people had shed specific hairs found at the various loci. This was because, as seen in the third hair comparison, different people could have very similar, if not identical, hairs. The main similarity between the hairs of Mrs Donald and those found on the sack was an ‘irregularity in the bulging of the lumen’. At the end of his testimony, he was asked by the judge, ‘May you not get that in a considerable number of people?’ Glaister answered, ‘It might be so, but I have not come across it to a great extent and I consider it exceptional rather than the rule. I simply say that there is a striking similarity, but I would not care to put it further than that in a case of this character.’¹⁰⁰

The inclusion of this caveat was characteristic of much of the expert testimony in this case. Smith, who also examined the hairs for the purposes of

⁹⁹ Wilson, *The trial of Jeannie Donald*, 296. Curiously, Smith did not mention Glaister’s involvement in the investigation in either his account of the case for the *Police Journal* or his memoir. Smith, “Studies in identification and reconstruction: no. 7.”; Smith, *Mostly murder* (1959). According to Crowther and White, ‘the two experts virtually ignored each other’s existence in their autobiographies, even though they confronted, or assisted each other for several decades.’ Crowther and White, *On soul and conscience* (1988), 86.

¹⁰⁰ Wilson, *The trial of Jeannie Donald*, 219.

corroboration (the wordings of his and Glaister's reports were identical), stated in his testimony, 'It cannot possibly be conclusive because you cannot say you are not likely to get hair of that kind in any other person'. He did, however, point out that the girl did not have any hairs of the same character as Mrs Donald, which was highly suggestive.¹⁰¹

Overall, it can be seen from the way in which the experts, especially Glaister, presented their evidence, that they imposed clear limits on the interpretation of their evidence. This is not to suggest that they did not have confidence in their results and their procedures: they were decisive about the results of their findings. For example, Sydney Smith refused to yield to the defence counsel when he suggested that the results of one of his tests for human blood would have been negated by the possible presence of soap.¹⁰² Of another test, he was willing to be decisive about the result, insisting, 'The blood was there, and I tell you it was there, and I say nothing more about it.'¹⁰³

Neither was it the case that the experts thought that their results were insignificant. Rather, it seems that the care they took not to 'over-declare' was part of a wider strategy of appearing careful and considered in their work. For example, they highlighted steps taken to ensure errors were not made, such as checking for alkalinity in blood tests, which could skew the results. They also volunteered information about the limitations of one set of tests, before pointing out that they had addressed a shortcoming by carrying out another test, for example Smith stated that, '[The benzidine test] is rigidly a preliminary test. We require a further corroborative test.' Needless to say, such corroborative tests were carried out.¹⁰⁴

When it came to laboratory work, such a balanced approach was held to be an ideal trait for the medical jurist. Willcox, in an address to the Medico-Legal Society in 1927, stated that it was important that laboratory techniques were reliable for forensic work, and that new technologies should not be hastily adopted. 'It is a cardinal principle', he said, 'that under no consideration

¹⁰¹ Ibid., 231.

¹⁰² Ibid., 242.

¹⁰³ Ibid., 241.

¹⁰⁴ Ibid., 228.

whatever should there be a risk of any possible inaccuracy in the results attained by scientific aspects and also from its legal bearings.¹⁰⁵

This attitude towards forensic medicine is interesting, especially when considered in the light of the historiography of forensic science. For example, Simon Cole argues that latent fingerprint examiners also adopted a conscious strategy of not over-declaring, in order to enhance the credibility and standing of their discipline and expertise. Examiners who found matches between samples which others would see as controversial would be ostracized.¹⁰⁶ However, the case of fingerprint experts is of a quite different character to mine. While fingerprint examiners argued that a definite source of identification existed in the fingerprint, Smith and Glaister argued the opposite, that matching hairs, whilst being highly suggestive, could not offer absolute proof of identity.

Others have identified a similar cautious approach in contemporary forensic medicine. Gethin Rees has argued that medical experts in modern rape cases are reluctant to draw too broad a conclusion from their examinations of parties involved, for fear of getting things wrong and bringing disapprobation on themselves and their profession. Thus, they are very reluctant to give a positive answer when asked by the authorities whether rape has occurred.¹⁰⁷ This is perhaps more analogous to what I have shown for the Donald case, although Rees argues that this has led to acquittals in rape trials, while Jeannie Donald was convicted.

Nevertheless, the cautious approach contrasts with some of the portrayals of forensic medical experts of the time. For example, many were condemned for being impetuous, and thus putting justice in jeopardy. Bernard Spilsbury, the epitome of the celebrity pathologist, was a frequent target for such criticism, both at the time, in correspondence between defence lawyers

¹⁰⁵ Willcox, "Recent advances in toxicology and forensic medicine," 1-2.

¹⁰⁶ Cole, *Suspect identities* (2001), 199-205.

¹⁰⁷ Gethin Rees, "It is not for me to say whether consent was given or not': forensic medical examiners' construction of 'neutral reports' in rape cases," *Social & Legal Studies* 19, no. 3 (2010): 371-86.

and experts, and in memoirs, for example those of Sydney Smith.¹⁰⁸ Of course, the existence of such criticism rather suggests the existence of the cautious and balanced ideal.

Protocols and challenges

Of course, caution in the witness box had to be coupled with caution in the laboratory. The previous chapter raised the importance of the avoidance of error in the medico-legal post-mortem room. This was also a major priority in the forensic laboratory. To this end, controls and other standards were adopted and incorporated into the experimental protocols contained in textbooks and relayed in court. They were also part of the means by which expert evidence was challenged in court. Hostile advocates and their experts aimed to show that witnesses had not adhered to necessary experimental protocols during the production of their evidence. However, as this section will demonstrate, the level of compliance with an operating procedure was not the only standard by which laboratory expert evidence was evaluated in the courtroom. Challengers also raised the possibility of mistakes made by someone other than the witness, as well as by contrasting the witness's evidence with a higher authority, such as a textbook or a more eminent witness.

The place of controls and protocols in relation to forensic evidence has been of significant interest in the historical and sociological literature surrounding forensic science. This has been particularly true in the wake of the advent of forensic DNA profiling, which emerged in the late-twentieth century. This literature has focused on areas including the practical and administrative contingencies adopted when a technique is used in a forensic rather than a biomedical or research context, as well as the means by which evidence was deconstructed in court. In their study of the use of the polymerase chain

¹⁰⁸ One example of this can be found in a letter, dated 8 January 1935, from Smith to the solicitors for the defence in *R. v. Harvey*, 1935, for which Spilsbury was the prosecution expert. In the letter Smith gives his opinion on Spilsbury's report:

Spilsbury goes on to say on page 3, 'the posture of the body with arms and legs bent suggests that he probably recovered consciousness at any rate partly for a time and moved his arms and legs. [...]' The position shown by the photographs is such as one might find in any person who has died, and gives no indication whatsoever that consciousness returned after the injury. This statement of Spilsbury's borders on the ridiculous.

Letter from Sydney Smith to Philip Conway, Thomas & Co., 8 January 1935, Smith (Sir Sydney) Papers and photographs on forensic medicine, EUL SC, MS. 2753.

reaction in different contexts, Kathleen Jordan and Michael Lynch demonstrate that although the PCR technique was marketed by the vendors of its reagents and apparatus as a standardized technique with many applications, its users adapted the technique and its protocols contingent to their own context. As well as economic contingencies, such as substituting an expensive licensed reagent with a cheaper generic one, adaptations are also made to reflect the purchasing laboratory's specific purpose. For example, forensic laboratories add to the original protocols to further guard against contamination and other errors:

As PCR is progressively assimilated into the legal system, it changes into a police method and legally defined source of evidence, and along with this comes an entire territory of criminological protocols: modes of inspection and collection, chains of custody, relevant precedents, and perhaps novel methods of concealment and evasion.¹⁰⁹

Contingencies of this sort, including those of an administrative character, were also employed in the early twentieth-century medico-legal laboratory in Scotland, and the criminal justice system in which it was located. For instance, the chain of custody was clearly manifested; receipts were issued for every transaction of evidence, and those who had handled or transported it testified to this in court. Every piece of evidence was numbered, and laboratory results recorded in reports, rather than merely stated by the witness in the witness box. In terms of the adaptation of biomedical techniques to the forensic context, both Smith and the younger Glaister, among others, performed research with the object of better adapting techniques to medico-legal use, including facilitating the analysis of difficult samples, such as very old bloodstains. The necessity of higher standards in medico-legal work was widely acknowledged within the discipline, as comments cautioning against the impetuous uptake of novel, inadequately tested techniques show.

The accounts of laboratory techniques contained in textbooks communicated the need for the incorporation of rigorous controls and the strict

¹⁰⁹ Jordan and Lynch, "The dissemination, standardization and routinization of a molecular biological technique," 794.

adherence to necessary procedures. This was necessarily accompanied by extensive experience in the performance of the technique itself, as Smith and Glaister made clear in their 1931 co-authored *Recent advances in forensic medicine*:

Numerous controls are necessary if fallacy is to be avoided. It will therefore be evident that the performance of the test cannot be undertaken lightly or by one without considerable experience in the many points of technique which may arise.¹¹⁰

In their discussions of the techniques themselves, Smith and Glaister specified the various controls necessary for the tests to satisfy the rigours of the courtroom.

Given the importance of well-designed and well-executed laboratory protocols, incorporating controls, to forensic science and medicine, it is unsurprising that they could provide an avenue for hostile counsel who wished to deconstruct the evidence within a trial. Lynch cites the defence team's treatment of DNA evidence at the trial of OJ Simpson as an example of this. He likens their scrutiny of the individual steps involved in the process, which was an attempt to deconstruct it, to the work of sociologists of science. In their cross-examination of laboratory witnesses, Simpson's defence lawyers seized on any potential deviations from protocols, for example those designed to guard against contamination, using them to discredit the evidence as a whole.¹¹¹

In other contexts, opposing lawyers have used the suggestion that one expert's set of protocols was insufficient, because they failed to use enough samples, for example. Timmermans has argued that the calling of an expert witness for the defence facilitates this. The defence expert can suggest that a higher standard of proof, greater sampling or greater care are required for the experimental evidence to be reliable. If the original expert's procedures did not meet this standard, their value is cast into doubt, and the credibility of the new

¹¹⁰ Smith and Glaister, *Recent advances in forensic medicine* (1931), 102.

¹¹¹ Lynch, "The discursive production of uncertainty," 830-3, 845-52.

expert, who is seen to be more careful and considered, increased.¹¹²

The approach can be seen in early twentieth-century Scotland in relation to the testing of bloodstains for species. There, procedural criticisms were largely founded on a failure to guard against false positive results. Thus, if a precipitin test was carried out, and an ostensibly positive result for human blood obtained, a critic may have argued that the result was attributable to another factor, such as the presence of a contaminant, or because the material under test was known to sometimes give erroneous positive precipitin results.

During the trial of Robert Willox for the murder of his father in Glasgow in 1929, the precipitin test was used to help determine the human origin of bloodstains on the clothing of the accused. The tests had been carried out at Glasgow University by John Glaister Sr. Two controls were associated with the precipitin test. The first was to add the testing solution, containing the antiserum, to a solution which did not contain blood, as well as to the blood sample to be tested. This was to ensure that any reaction obtained when the antiserum and blood were mixed was due to the presence of blood, and not anything else. Glaister had observed this control. A second control was to add antisera of two or more species other than that of humans to the sample, in order to demonstrate that a positive reaction was specific to humans only. Willox's defence advocate, AC Black, asked Glaister about this point:

Q. I suppose it is essential to test the strained extract against two or more anti-sera in order to make certain that there is not some substance in the strain which will cause precipitation with your anti-sera?

A. I am not aware of any such substance, but I know the serum will sometimes behave in a curious way.

Glaister then skirted the issue of the number of antisera, by describing his use of a solution containing no blood as a control. He was again asked about antisera, and he revealed that the antiserum of an ox had been used, although he described this as 'not essential'. He was asked to elaborate, which he did:

¹¹² Timmermans, *Postmortem* (2006), 131-3.

You do not require to use anti-anything else. If you have your clear solution of sodium chloride to which you have added what I said, and add to it the same amount of anti-human serum, and if you get a reaction within 10 or 20 minutes, you know it can be nothing else but human serum. It is only when you have found no reaction taking place that you test the other anti-sera against the solution. In this case the reaction came on in ten minutes.

Glaister had used one other antiserum, that of the ox, but did not regard this as important or necessary when a positive result for humans was obtained.¹¹³

Glaister's attitude differed from that of Sydney Smith, who was called by the defence. When questioned by Black, he argued that the use of several antisera was necessary:

Q. Now, tell me, in your opinion is it essential to use two or more different anti-sera?

A. Two or more – at least three, I think should be used in every case, without any exception whatsoever.

Q. Will you tell me why?

A. Because you apply certain checks to show that your antiserum is specific, but you must show in the extracts you take from the stain that there is nothing in them that is going to form a precipitate for albumin itself. It is quite possible to get cloth, or wood, or metal something to throw down a precipitate for every anti-serum you use. In this case – you are unable to give any opinion as to the cause of the blood.¹¹⁴

Thus, the defence were able to project a contrasting picture of the attitudes of the two experts. The careful, systematic approach of their witness, Smith, was juxtaposed with the potentially lackadaisical position of Glaister for the

¹¹³ Testimony of John Glaister Sr., Notes of evidence, NRS JC34/1/66, pp. 235-6.

¹¹⁴ Testimony of Sydney Smith, Notes of evidence, NRS JC34/1/66, pp. 314-15.

prosecution.

Black drove home the point about Glaister's less than thorough approach to the analysis of samples by ascertaining, and then highlighting, the fact that the doctor had not tested any unstained portion of the garment, 'to endeavour whether it was free from any chemical ingredient which would cause precipitation.' Black therefore introduced a further source of uncertainty in the jury's mind about the scientific tests in the case. This was a source of some resentment for Glaister:

We have gone over this test for two years in my laboratory and I do not give way to anybody regarding my knowledge of this test, and I have published a good deal about this test, and I do not want to have a red herring trailed over every substance.¹¹⁵

Smith raised the risk of false positives in another case in which he acted for the defence. During the 1931 trial of Colin MacMillan for the murder of Donald Black at Kilmacolm, the prosecution witnesses cited positive tests for human bloodstains on the shoes of the accused. Smith's testimony cast doubt on this finding. His examination of the shoes had yielded no sign of any blood. He suggested that the results of the precipitin tests, which John Glaister Sr. and his colleague Frank Martin had carried out, had been compromised:

There was a difficulty, [Smith] said, in carrying out an examination of that description, as in the precipitate test a danger of interference from the tannin in the leather existed, and a stain on the leather always worried them unless it was possible to get it off the surface without any leather.¹¹⁶

This was a similar concern to that which was raised by Smith in the Willox case, in which he suggested that certain materials could 'throw down a precipitate for every anti-serum you use'.¹¹⁷

Not all challenges to the validity of laboratory results were based on the

¹¹⁵ Testimony of John Glaister Sr., Notes of evidence, NRS JC36/1/66, p. 237.

¹¹⁶ "Doctors disagree - conflicting evidence in Kilmacolm case," *Scotsman*, 18 September 1931, 11. Smith's testimony was paraphrased by the *Scotsman*'s reporter.

¹¹⁷ Testimony of Sydney Smith, Notes of evidence, NRS JC34/1/66, p. 314.

question of protocols. Some were based on the person of the witness him- or herself. Counsel could raise questions relating to the expert's partiality and relative eminence. The question of partiality has been a key concern within forensic science and medicine over time, having been identified as such by various historians. For example, during the late-nineteenth century, debates raged within the scientific community about whether scientists hired by different sides in legal proceedings should be neutral reporters of facts to the court, or partisan advocates.¹¹⁸ During the 1856 trial of William Palmer, the prosecution and the defence portrayed each other's experts as being biased. For example, the defence accused the prosecution's main expert, the toxicologist Alfred Swaine Taylor, of having been compromised by his earlier involvement in the case, which obliged him to stick to a previous pronouncement to avoid losing face.¹¹⁹ Questions of partiality and its undue influence on laboratory results were also of concern during the establishment of the Home Office Forensic Science Service laboratories in the mid-twentieth century in England and Wales, as Norman Ambage has demonstrated. In this case, the issue concerned institutional affiliation; it was believed that laboratories that were independent of the police would be less susceptible to any attempts to illicitly manipulate findings to suit the purposes of an investigation or prosecution. In particular, professional societies saw this as a problem. This was one of the reasons why laboratories were under the auspices of the Home Office rather than individual police forces.¹²⁰ Accusations of partiality do not appear to have been regularly levelled at medico-legists in Scotland during the period of study. However, in their textbooks and their memoirs, they emphasized the importance of their status as impartial experts, working in the relatively independent context of the university.

The Palmer case also raised another issue which could be used to challenge witnesses, their relative prestige. In his cross-examination of Taylor, the defence barrister, Serjeant Shee, used the toxicological witness's considerable reputation against him. He suggested that Taylor's eminence and

¹¹⁸ Hamlin, "Scientific method and expert witnessing: Victorian perspectives on a modern problem," 493.

¹¹⁹ Burney, "A poisoning of no substance: the trials of medico-legal proof in mid-Victorian England," 80-1.

¹²⁰ Ambage, "Origins and development of the Home Office Forensic Science Service," 122-5.

professional position had acted as a smokescreen for his deficient evidence. Burney writes, 'Deference to institutionalized metropolitan medicine, according to Shee, explained why Taylor's "audacious" charge at the Talbot Arms [the inquest location] had swayed the inquest jury.'¹²¹ This instance, highlighted by Burney, demonstrates that reputation was a tool which could be manipulated in court for adversarial purposes. In this case, Shee portrayed it as a potential hazard which might cloud the court's judgement. In other episodes, the strength of a reputation could be used to undermine the evidence of someone else. An example of this from twentieth-century Scotland can be seen in the cross-examination of a medical witness who had performed some tests on bloodstains in a 1934 Inverness murder trial.

Two doctors in Inverness, Mitchell and Bannerman, as well as performing the post-mortem, had performed some tests on various items of clothing of the accused and the victim. Using a preliminary benzidine test on a stain, followed up by a microscopic examination, they had identified dried blood. Lacking the facilities for more elaborate tests, the items were sent on to Edinburgh for further testing at the university. However, Smith, who carried out the Edinburgh tests, did not find bloodstains on the piece of clothing where Mitchell and Bannerman had found some. The defence advocate, JR Wardlaw Burnet, made much of this discrepancy between the findings of the Crown's experts. In his cross-examination of Mitchell, he exploited both the relative poverty of the Inverness doctors' facilities and, by implication, Smith's greater reputation, to cast doubt on Mitchell and Bannerman's findings, which were disadvantageous to his client. Burnet first forced Mitchell to admit that his tests 'were not the most complete and exhaustive tests which modern science knows how to apply in these cases'.¹²² By contrast, he later asked Smith, 'I need hardly ask you, but did you apply all the most modern and up-to-date tests to make certain?' Smith replied that he and his colleagues had indeed taken 'a very long time over it'.¹²³

¹²¹ Burney, "A poisoning of no substance: the trials of medico-legal proof in mid-Victorian England," 81.

¹²² Testimony of Dr Mitchell, Transcript of the trial of John McPhee, 18 December 1934, NRS JC36/85, p. 477.

¹²³ Testimony of Sydney Smith, NRS JC36/85, p. 554.

During the cross-examination of Mitchell, his and Smith's findings were explicitly contrasted. Mitchell admitted, 'Professor Smith is a bigger man than I am on that subject.' However, he did not recant his finding of blood. Burnet asked whether he thought that Smith had been mistaken in his findings, using the phrase 'venture to say he was wrong', as if to suggest a certain audacity would be attached to such a judgement. Mitchell did not feel able to answer in the affirmative. Instead, he weakly stated that he and Smith had not examined the exact same piece of fabric, since he had had to remove a small portion for his testing.¹²⁴ While Burnet did not explicitly compare Mitchell and Smith's reputations (although Mitchell did), an implicit comparison is clear, especially in the wake of the questions about the narrow range of testing Mitchell and Bannerman had been able to conduct. In this set of exchanges, Burnet had exploited both institutional and personal prestige to challenge laboratory evidence. He juxtaposed the favourable, in his view, findings of the eminent professor in a university with fine laboratory facilities and the findings of two provincial doctors with limited capabilities, casting doubt on the latter.

Conclusions

Many of the changes which can be observed regarding the use of the laboratory in forensic medicine were evolutionary rather than revolutionary. These include the gradual development of a system to analyse hairs found at crime scenes, and the refinement of chemical and spectroscopic techniques to distinguish blood from other substances. Other developments led to more abrupt changes, such as the introduction of the precipitin test, and the blood grouping soon afterwards, which significantly expanded the amount of information which could be gleaned from a sample, information which could then be applied to a criminal investigation, and later a prosecution.

Much of the research work carried out in the forensic medicine departments in Edinburgh and Glasgow was focussed on assessing and refining techniques, and optimizing them for the forensic arena. This was then fed into successful textbooks, which helped to cement the wider reputations of the

¹²⁴ Testimony of Dr Mitchell, NRS JC36/85, pp. 477-8.

authors, along with their performances in the courtroom. These reputations were an important part of the experts' identities, which helped them to persuade others, namely judges and jurors, to come round to their viewpoint.

Given the adversarial nature of the criminal trial, expert witnesses could be vigorously challenged when they presented their laboratory findings to the court. As well as being met with probing questions from opposing counsel, in some (but by no means all) cases prosecution expertise was countered by evidence from expert witnesses of equal standing hired by the defence, whose evidence could offer a very different interpretation, or even question the Crown expert's competence. Challenges could be based upon a perceived failure to incorporate adequate experimental controls, or to anticipate sources of false positives. Likewise, as shown by the trial of John McPhee, an expert's laboratory findings could be cast into doubt if they differed from those of a different expert, especially if the other expert had a greater reputation and access to more advanced technology.

Chapter 3: Cooperation and the challenge of replication: the medico-legal investigation of shootings.

The scientific investigation of firearms incidents provides one of the most enduring visual images of forensic science and medicine as a whole. During the period under study in this thesis, there were a number of very prominent shooting cases which hinged on expert evidence of this kind, both in Scotland, with the Merrett case which will be discussed later in the chapter, and further afield, such as the investigation into a series of political assassinations in 1920s Egypt during its gradual transition from British colony to independent republic. While in recent years a number of forensic techniques, such as latent fingerprint examination and DNA-based identification, have been the subject of historical studies, there has been surprisingly little work done on the history of the scientific side of the investigation into firearms incidents. A number of popular histories touching upon this area were produced during the 1960s, such as Macdonald Hastings's biography of Robert Churchill, a well-known gunsmith-cum-forensic expert, and Jürgen Thorwald's history of forensic science, *The marks of Cain*.¹ These works, in particular Thorwald's, portray the investigation of shootings as being made up of fairly isolated examples of unsystematic, not to mention dubious, ingenuity, until the early years of the twentieth century, when figures such as Calvin Goddard and Charles Waite in America, Sydney Smith in Egypt and, latterly, Scotland and Harry Söderman in Sweden, among others, began to invest time and effort into placing ballistics on a more sound footing. Thorwald suggests that the impetus for Waite and Goddard in particular was an effort to defeat those who professed to be experts in firearms, but were in fact charlatans. Despairing at the number of miscarriages of justice which were taking place, Waite, a lawyer, and Goddard, a doctor, set up their Firearms Identification Bureau in New York.²

Books such as Thorwald's and Hastings's have tended to focus on the development of identification techniques, in other words, linking a fired bullet

¹ Macdonald Hastings, *The other Mr Churchill: a lifetime of shooting and murder* (London: Harrap, 1963).

² Jürgen Thorwald, *The marks of Cain*, trans. Richard Winston and Clara Winston (London: Thames and Hudson, 1965), 166, 174-5.

or discarded cartridge case to a particular weapon, rather than the medical side of things, on which I will focus here. The study of the place of the investigation of gunshot wounds is worthwhile because it illuminates a number of significant aspects of forensic medicine and its relations with surrounding disciplines and institutions. It illustrates part of the wide scope of forensic medical practice during the period under study, which can be seen to have broadened to a degree as the medical gaze moved to encompass a view that took in more than just the wound. The investigation of shootings was also a prominent site for the cooperation and collaboration between forensic medicine and other disciplines, in this case the trade of gunmaking. In particular, it reveals the potentially porous boundaries between the two disciplines, which allowed gunsmiths to give opinions about what might seem to be more properly the domain of the medico-legalist, and vice versa. Finally, the importance of experimental work in these cases allows us to see how this was presented and challenged in court.

This chapter follows the changing face of the medical investigation of shootings, from the wound-centred explorations of the eminent Victorian medical jurist and toxicologist Alfred Swaine Taylor, to investigations with a wider scope which were being advocated in the 1920s by practitioners such as Sydney Smith, among others, in which experimentation was highlighted as being a crucial part of day-to-day casework. I will finish by relating this emphasis on experimentation to an Edinburgh shooting case from the 1920s, in which the disputed results of experimentation led to an indecisive verdict. Although such a survey begins with a point in time earlier than the thesis's main chronological scope, it usefully illustrates the way in which some of the central techniques and principles of the discipline had earlier origins which were gradually refined as time passed. This provides a fuller context to the character of the discipline in the early- and mid- twentieth century.

The scientific and medical investigation of shootings has a number of facets, from the post-mortem investigation into firearms wounds, which has always tended to be carried out by a doctor, to the physical identification of guns, bullets, and cartridge cases, which has, over time, drawn on various medical and non-medical technical experts. The changing dynamics of the gunshot expertise pool raise interesting issues that can be related to the wider

historiography of science and medicine as applied to law. Debates over the professional identity of the expert, and thus their suitability to testify, have been a key focus of much of the recent work on the history of forensic expertise. As noted in chapter 1, Ian Burney has explored nineteenth-century questions surrounding medical experts at the inquest, which, among other things, centred on whether the primary medical authority should be the doctor who attended the deceased, or a specialist in post-mortem matters.³ Tal Golan has charted the growth of non-medical scientific expertise in the nineteenth century, which saw substantial debates about the requirements for the ideal expert witness, as well as concerns about charlatanism.⁴

The study of the history of forensic firearms investigation also raises questions about the nature of evidence presented to juries, and used by practitioners to come to decisions about how to interpret certain results. Also, while some sites of expert scrutiny changed over time, others remained the same. For instance, during the nineteenth century, the medical expert's gaze tended to fall, in the main, on the gunshot wound itself. This changed during the twentieth century as the examination of external sites, such as the crime scene, became more systematic, and new technologies were brought into play. More attention was paid to guns and projectiles, although textbook authors and practitioners, in their reports and their testimony, continued to foreground the wound. Such a pattern in the changes of expert perspectives invites parallels with those originally identified in clinical medicine by Nicholas Jewson, in which practitioners shifted their gaze from the patient as an individual to a wider disease entity, driven by an anatomical and, later, biochemical view.⁵

Shooting investigations – an overview

Victorian Investigations

Changes can very definitely be discerned when a survey of a century of textbook literature on the subject is carried out, although essential continuities do remain. Concerns about the nature, and hence the investigation of gunshot

³ Burney, *Bodies of evidence* (2000), 107-36.

⁴ Golan, *Laws of men and laws of nature* (2004), 134-40.

⁵ ND Jewson, "The disappearance of the sick-man from medical cosmology, 1770-1870," *Sociology* 10, no. 2 (1976): 225-44.

wounds have been a constant feature of textbooks of forensic medicine. For example, the 1844 edition of Alfred Swaine Taylor's *Manual of medical jurisprudence* contains a sizeable section entitled 'Gun-shot wounds'.⁶ Taylor was one of the most important, and most prominent, authorities on forensic medicine of the Victorian period. Many of his writings remained in print, under successive editors, well into the twentieth century. As the title of the chapter suggests, the wound itself occupied a central conceptual position; the greatest amount of information about the crime could be learned from the wound. In particular, the wound could tell the investigator from what distance, and from what angle, the shot was fired at the body. When describing this, Taylor employed a cause and effect model; he related post-mortem appearances to specific characteristics of gunfire, a technique which was still employed almost a century later by authors such as Sydney Smith. The following passage on near discharges is illustrative of this:

The edges of the aperture of entrance appear blackened, as if they had been burnt, arising from the heat and flame of the gunpowder at the moment of explosion. The skin is often ecchymosed, and is much blackened by the discharge, and sometimes ignited by the flame. If the muzzle of the piece was not in immediate contact with the part struck, the wound is rounded; but if there has been direct contact, the skin, besides being burnt, is torn and much lacerated.⁷

The 1844 edition was an early outlet for the idea that the extent of blackening of a wound was a valuable indicator of the distance from which the weapon was fired. Over time, Taylor added further detail to later editions of his textbook. For example, by the 1866 edition, he was citing experiments carried out in the 1830s by a French medical jurist named Dr Lachèse, who fired at human cadavers from various distances, noting the changing wound characteristics. Lachèse's experiments took into account the effect on the wound of different types of projectile. For example, he noted the effects when

⁶ Alfred Swaine Taylor, *A manual of medical jurisprudence*, 1st ed. (London: J Churchill, 1844), 408-22.

⁷ *Ibid.*, 409-10.

lead shot was used instead of a solid bullet, stating that ‘in order to produce with small-shot, [*sic*] a round opening somewhat resembling that produced by a bullet, the discharge should take place point-blank at the distance of about ten or twelve inches from the surface of the body’.⁸ It is not clear, however, whether Taylor and, by extension, Lachèse, intended that their readers carry out similar experiments on their own cases, as later authors specified they ought.

The importance of wound analysis in shooting cases can be demonstrated by the esteem with which it was held by the judiciary. For example, Taylor cited the 1839 case *Queen v. Cottrell*, in which wound evidence was ruled by the judge to be sufficiently accurate and reliable to demonstrate the fact of a gunshot on its own. Despite the failure, upon dissection, to find any shot or other projectiles, ‘the circumstances were sufficient to warrant the jury in inferring that the deceased had been struck by some substance from the gun, which caused his death; and it was not necessary to prove whether this had been done by leaden shot or pellets’. It should be noted that this ruling was in response to an objection from the defence counsel over whether shooting could be proven without the discovery of a bullet, which may indicate that, at this stage, such expert opinion still represented a troubling of the boundaries of medical science.⁹

In this regard, Taylor still acknowledged that it was possible to misread wounds, especially as regards firing distances:

It has been said, that when a bullet is fired near, it commonly traverses; and therefore it has been rather hastily assumed, that where there is only one external wound, and the bullet has lodged, this is proof that the piece has been fired from a distance. This inference is, however, erroneous. A bullet may be fired close to the person, and yet not traverse the body, either from its impulsive force not being sufficiently great, or from its meeting with resistance in the body. Many cases might be cited to show, that in near wounds produced by suicides and

⁸ Taylor, *A manual of medical jurisprudence* (1866), 292.

⁹ Taylor, *A manual of medical jurisprudence* (1844), 413.

murderers, the bullets have not always traversed the body. In suicide, when the piece is discharged into the mouth, the projectile often lodges in some part of the cranium.¹⁰

This emphasized the importance of taking into account powder blackening of the wound when making assessments, along with other relevant factors.

While the bulk of Taylor's account was taken up with the medical or post-mortem examination of wounds, he did cast his view on matters concerning the weapon and projectiles in their own rights. For example, he cited a case from 1813 in which a shooting case was cracked when the bullet found in a fatal gunshot wound was linked to both the weapon and ammunition cache of a suspect:

The bullet extracted from the wound was found to have been discharged from a pistol with a screw barrel. A weapon of this kind was found on the prisoner, as well as a bullet, which had evidently been cast in the same mould as that taken from the body of the deceased.¹¹

The type of bullet and gun identification cited by Taylor was similar in principle to that being carried out in the early twentieth century, discussed below, in that markings left on the projectile by the weapon were identified as having been left by a specific category of gun. However, Taylor does not include anything like the systematic rules for identification of projectiles found in later works, particularly those from the 1920s, and this seems to be an isolated example.

There are, however, slightly more concrete examples of the author expounding on non-medical matters. For example, at one point he considered the analysis of the scene of crime, as separate from the body. In fact, the case cited as an illustration of this did not contain a body, but was rather an incident of vandalism:

¹⁰ Ibid., 412.

¹¹ Ibid., 410.

If we can at any time discover two fixed points where the ball has touched a building, without being reflected, it will be easy to determine the situation from which the piece was discharged. A singular example of this kind is stated by Mr Watson to have occurred at Ayr in 1831. Several shots had been maliciously fired into a church. Some of the bullets traversed a window, making holes in the glass, and struck against a wall on the other side of the church – a fact plainly indicated by the marks that they left. A straight line carried from those two points, reached a window on the opposite side of the street, from which it was afterwards ascertained the bullets had been fired.¹²

A final area of non-medical analysis, suggested by Taylor, reflects his interest in forensic chemistry; he is best remembered today for his toxicological work, both on paper and in the witness box. In this instance, he related the fact that French medical jurists had attempted to determine the length of the interval between a gun having been fired and its being discovered beside a dead body. Unlike the above example of the determination of the direction of fire of the shot, which he describes as being ‘easy’, Taylor was much less confident about the possibility of reaching this objective. He did, however, set out the possible principles by which this could be determined:

A quantity of sulphuret of potassium, mixed with charcoal, is left adhering about the barrel of the piece, when recently discharged; and this is indicated by its forming a strong alkaline solution, with water, evolving an odour of sulphuretted hydrogen, and giving a deep black precipitate with acetate of lead. After some hours or days, according to the exposure of air and moisture, the saline residue becomes converted to sulphate of potash, forming a neutral solution with water, and giving a white precipitate with nitrate of lead. If the piece has not been

¹² Ibid., 415.

discharged for a considerable time, oxide of iron with traces of sulphate may be found.¹³

Nevertheless, Taylor did not suggest that a timeline of decomposition could be extracted from this. Indeed, over the following decades a method for inferring this chronology did not emerge; at a 1907 meeting of the Medico-Legal Society, William Willcox, a notable London medico-legalist and toxicologist, then the Senior Scientific Analyst to the Home Office, stated that:

This question can only be answered very guardedly—*e.g.*, the presence of black dirt in the barrel means discharge of the gun since it was last cleaned, but does not imply recent discharge. There is no certain test for this.¹⁴

The principles and practice of medical jurisprudence, another textbook by Taylor, first published in 1865, included a number of illustrative examples in the section on the analysis of ‘Foreign substances in wounds’, which was almost wholly related to the circumstances of gunshot wounds, although the chapter of which it was a part embraced a wider range of injury types. For example, the author cited two cases from 1857 and 1860, in which the paper wadding which accompanied the shot in the barrel was found in or around the wound, proving invaluable to the investigation. For example, during the investigation of the 1860 shooting of a police officer in Lincoln, ‘some paper-wadding [was] picked up on the spot where the deceased fell; and a gun which had one barrel loaded and one empty from a recent discharge was found in the prisoner’s house within twenty-four hours of the murder’:

The wadding in the loaded barrel consisted of a fragment of *The Times* newspaper of the 27th of March 1854, and the charred and sulphurous pieces of wadding picked up on the spot were proved

¹³ *Ibid.*, 422.

¹⁴ WH Willcox, "The medico-legal importance of wounds produced by firearms," *Transactions of the Medico-Legal Society* 5 (1907-8): 15. The paper was originally given as a lecture to the Medico-Legal Society in October 1907.

by the publisher of the journal, who was summoned to the trial, to have formed a portion of the same impression.¹⁵

While subsequent editors over the decades chose to preserve this section on wadding (material used to secure the shot in the barrel), it is an indication of the move away from homemade cartridges over time that these editors chose to point out that such cases involving wadding were increasingly unusual.

This first edition of Taylor's *Principles and practice* contained more on the analysis of projectiles than did his earlier writings, which did not address the issue. The section on foreign bodies in the wound began with a reminder to preserve all samples of projectiles found in the wounds, or about the scene. Some exemplary analyses from past cases were included. These examinations of projectiles were fairly superficial, and, in most instances, used in tandem with other pieces of evidence. For example, in 1849, projectiles taken from two murder victims 'consisted [in both cases] of irregular pieces of lead ... described by the medical witness as being angular, and quite unlike the shot used in killing game.' The conclusion drawn from this was, as the judge pointed out, that 'the two acts of murder were committed by the same person, or by this person acting in concert with others.' The second case cited by Taylor, from 1854, involved the comparison of shot found in a wound with that found in the possession of the accused, the two samples of which were 'of the same sizes'. Again, there is a reminder of the importance of preserving such samples. Another example demonstrates the use of these principles in the exoneration of suspects. In a shooting case which lasted several months from 1859 to 1860, it was only when the victim died, seven months after being shot, that the projectile was extracted, and shown to have been too large to have fitted into the barrel of the accused's weapon. Finally, the author briefly advocates the chemical analysis of bullets, in order to determine their metallic composition, as well as the manufacturing process, which seems to have been well understood:

¹⁵ Alfred Swaine Taylor, *The principles and practice of medical jurisprudence* (London: J & A Churchill, 1865), 432-3.

Cast bullets are commonly found to have a void space in the interior when cut through the centre, owing to the exterior cooling more rapidly than the interior, and to the greater bulk of the metal when in a liquid state. In large bullets this cavity is frequently of the size of a barleycorn. Bullets obtained by compression have no such space, and are of greater specific gravity.¹⁶

Notwithstanding these examples, the section on the examination of foreign bodies in wounds was, as a whole, short, only running to about one-and-a-quarter pages, and lacked any detailed instructions as to how to carry out such investigations. Even the section on the chemical analysis of bullets, while well informed, is only a paragraph in length. The systematic analysis of projectiles and other paraphernalia in the investigation of shootings did not emerge until the early-twentieth century, as will be made clear below.

The experiences of the Boer War and Edwardian Forensics

Through the rest of the nineteenth century, taking the various editions of Taylor as a point of reference, there do not seem to have been any particularly groundbreaking changes in technique or approach. By the turn of the century, however, an acceleration in both research and sophistication of understanding took place. The experiences of the Second Boer War of 1899-1902 led to a number of research projects into wounding, as well as an increase in the number of gunshot wounds, which had been suffered by soldiers, seen by the medical profession. For example, an 1899 study in *The Lancet* carried out by two doctors, Arthur Keith and Hugh Rigby, represented a very systematic attempt to understand the destructive effects of a number of different kinds of bullets at various distances, including expanding, or 'Dum-dum' rounds, which had been condemned as inhumane by European experts. Keith and Rigby wrote, 'Nothing gave us greater satisfaction than to learn that neither our Mark IV nor our Dum-dum bullet were to be used in South Africa.'¹⁷ They fired a number of different types of round into a range of targets, from ones

¹⁶ Ibid.

¹⁷ Arthur Keith and Hugh M Rigby, "Modern military bullets: a study of their destructive effects," *The Lancet* 154, no. 3979 (1899): 1499.

constructed from soap to human skulls and cadavers, and noted their effects. The researchers in this instance were not working within a forensic context to improve the methods of detection, but in order to improve bullet design. This is made clear in the penultimate sentence of their *Lancet* report:

Bullets are meant to kill; when they fail and only wound, it is better that they should produce an effect to sufficiently disable without causing permanent damage, but unfortunately no modern bullet has yet attained to such perfection.¹⁸

Despite their military ends, their work was influential within the forensic sphere and was cited in the 1905 edition of Taylor's *Principles and practice*, which was now edited by Frederick J Smith, a lecturer in medical jurisprudence at the London Hospital. The 1905 edition of Taylor marked a significant step up from earlier editions, representing a more scientifically informed approach. Concepts such as projectile motion, air pressure and displacement were taken into account to a much greater degree than before in the explanations of different shapes of gunshot wound. Regarding the perennially important question of the distance from which a shot had been fired, the shape of the wound and the extent of any burning were still important. While the textbook's advice was based on the same principles, it was better informed. Its editor, Smith, had carried out a number of experiments of his own which addressed the issue of burning:

As regards the actual distance at which burning of the wound or clothes may occur, the editor, from a few slight experiments he has made, holds a very strong view that it is impossible to lay down any rules; with an ordinary cartridge loaded with shot, he could never succeed in causing actual fire (smouldering or flame) neither in paper nor cloth, but he has succeeded at distances not exceeding six inches, when the shot was omitted. The facts in any given case can only be determined with experiments with the actual weapon used, and loaded as nearly

¹⁸ *Ibid.*, 1506.

as possible in the same manner as it was when used for the purposes which are being investigated.¹⁹

This reflected an experimental culture that seems to have existed at the time in firearms investigation in Britain. As shown below by the reaction to Willcox's 1907 address to the Medico-Legal Society, the onus, by this time, was on the practitioner to carry out incident-specific investigations.

The 1905 edition of Taylor's *Principles* also reflected developments in clinical medicine, in particular bacteriology, which earlier editions did not:

The victim is exposed to the risk of infection by septic or pyaemic or special microbes (tetanus, erysipelas, etc.). The risk is greater because gunshot wounds are of the nature of punctured and bruised wounds, which cannot so effectively be cleansed as simple incised wounds.²⁰

This knowledge may also have been informed by the military and humanitarian disaster of the Boer War, which saw huge numbers of soldiers die from wound infections.

The new themes of the 1905 edition of Taylor were reflected in the work of other authorities on forensic medicine. For example, Willcox conducted research into weapons and projectiles from a medico-legal point of view. The sections on wounding in his 1907 address to the Medico-Legal Society and subsequent article were arranged primarily according to the type of weapon from which the offending projectiles had been fired, whether they were pistols, rifles, or sporting guns, showing that weapon and wound were conceptualized together. Both Willcox and Taylor (in his posthumous 1905 incarnation) appeared to advocate a more detailed reading of the bullet than can be found in work from earlier decades, in terms of its weight and dimensions, which would indicate the type of weapon from which it was fired, and in terms of any distortion which it had suffered, since 'if fired at a near distance, and if

¹⁹ Alfred Swaine Taylor, *The principles and practice of medical jurisprudence*, ed. Frederick J Smith, 5th ed., vol. 1 (London: J & A Churchill, 1905), 558.

²⁰ *Ibid.*, 553.

bone is struck, then the bullet will be much misshapen'.²¹ Unlike later authors, however, neither stated that the weapon would leave specific identification markers on the projectile, such as a particular pattern of grooves and lands from the rifling in the barrel.

In terms of his analysis of the wound as a concept, Willcox was, in principle, on the same plane as the new editor of Taylor, Frederick Smith. He also noted that the shape of the wound and the extent of blackening and scorching would change with distance. Willcox had carried out his own systematic experiments with different types of guns to come up with some general rules of thumb. He fired at a number of targets, including card, leather and cloth, as well as fresh human skin. By this time, as I have suggested above, it was normal for a pathologist to carry out experiments such as those described by Willcox in his paper to assess the distance from which a shot had been fired at a wound. In the discussions after the presentation, reproduced in the printed version of the paper, Harvey Littlejohn stated that Willcox had illustrated the necessity of carrying out such experiments. He did, however, criticize the speaker's presentation of data for the likely distance of discharge for various pistols, stating that:

General experiments were of little value. In any given case, before a definite conclusion could be arrived at, experiments must be made with the particular weapon, and under the same conditions as regards the charge of powder and shot.²²

This suggests that there was a certain familiarity with the methods among the audience, and perhaps the wider profession.

Like Taylor, Willcox also emphasized the importance of the location and direction of the wound in terms of determining whether a gunshot wound was accidental, suicidal, or murderous. Indeed, it is clear from contemporary post-mortem reports that this principle was used extensively in practice. For example, in an 1897 case in Fife, in which a man, George Whyte, stood

²¹ Willcox, "The medico-legal importance of wounds produced by firearms," 11.

²² *Ibid.*, 18. The points made in the discussion were paraphrased for inclusion in the *Transactions*, and the comments were recorded in the third person.

accused of shooting his neighbour's wife, the defence alleged that the victim's injuries were inflicted in self-defence, after a struggle. The pathologist involved in the case, Henry Duncan Littlejohn (father of Harvey), determined that 'the injuries to the deceased from their position and appearance could not have been inflicted or caused in the course of a struggle'.²³

Thus, when the state of firearms investigation from the mid-nineteenth century to the early years of the twentieth is taken into consideration, the story would seem to be one of substantial continuities. While there can be seen to have been some progress, for example a much more nuanced approach to projectile analysis by the 1900s, as well as greater evidence of routine experimentation on the part of the pathologist, there does not seem to have been a profound shift in focus. The main site of analysis for Willcox and Frederick Smith was still the wound, as it had been for Taylor in 1844.

In terms of the writings of some British authors on forensic medicine, this remained the case into the 1920s. The section on firearms in John Glaister Sr.'s textbook was, by the 1921 edition, still part of the wounds chapter, as it had been in the 1910 edition (and was in the 1931 edition). In fact, calling it a 'section' would be somewhat misleading. There were, in one section, detailed descriptions of the general characteristics of five different types of wound, one of which was the gunshot wound. There was also a section entitled 'Data from which the kind of instrument used may be inferred from the nature of the wound', in which the information it contains is categorized according to the shape of the wound. For example, one section opened with the following:

Wounds with sharply-defined edges—clean cut—are, in the bulk of cases, the result of forcible contact with a sharp instrument.

Another began:

Wounds with ill-defined, irregular, or ragged edges, which may be connected by bridges of connective tissue or nerve-filaments, are always caused by forcible contact with a blunt instrument.

²³ Notes on case of George Whyte (Falkland shooting case), Post-mortem case books of Sir Henry Harvey Littlejohn, EUL SC, EUA IN1/1/ACU/F1/2, vol. VII (i), p. 43.

The section that contained information about whether the wound was caused by a gunshot was quite short, and conflated a number of wound-causing possibilities:

Wounds which are circular, slit-like, or triangular in shape, and to which on other parts of the body in a more or less direct line other similar wounds correspond, may usually be reckoned as having been produced by traversing missiles. Single wounds of this character may either be due to a missile which has entered the body and is retained therein, or to such an instrument as a pointed piece of stick or a butcher's steel.²⁴

Of course, this was not the only part of Glaister's book that dealt with gunshot wounds; however, the nature of these sections demonstrates the highly wound-centred approach of Glaister in his writing. There was no section on interpreting the bullet, or other physical evidence, beyond the post mortem. Indeed, the analysis offered by Glaister was very post-mortem centred. The bulk of the chapter on wounds was taken up with descriptions of cases; the key element of most of these accounts was the post-mortem examination, which was recounted in great detail. For example, in one case, the shooting of a girl from 1904, the greatest part of the narrative was Glaister's detailed account of the determination of the internal route of the bullet from the post-mortem examination.²⁵

The 1920s: towards an object-oriented approach

Glaister's account of forensic firearms investigation was, more than all of the other pathologists whose writings I have examined, from all of the time periods, the most anatomical in its conception.²⁶ This was in contrast to the work of Sydney Smith, the first edition of whose textbook was published in 1925, only four years after the publication of the edition of Glaister to which I have referred. Smith, both in his textbooks and journal articles, envisaged a very broad role for the forensic pathologist when it came to guns and gunshot

²⁴ John Glaister, Sr., *A text-book of medical jurisprudence and toxicology*, 4th ed. (Edinburgh: E & S Livingstone, 1921), 306-9.

²⁵ *Ibid.*, 301.

²⁶ *Ibid.*, 295-316.

wounds, which encompassed both medical and apparently non-medical elements. In the introductory section to the ‘Wounds from Firearms’ chapter in his 1925 textbook *Forensic Medicine*, he widens the sites of scrutiny beyond the wound:

Information ... may be obtained from the wounds in the body and the marks on the clothes, from foreign bodies embedded in the tissues, and from objects found at the scene of the crime.²⁷

Smith’s approach focused both on objects, such the projectile and the weapon, and the wound. To begin with, in an approach similar to that of Willcox, Smith foregrounded the type of weapon being fired as the main categorical criterion. There were sections on wounds from shotguns, handguns, and rifles. Smith also emphasized the physical process of the weapon’s firing, and the importance of this for medico-legal purposes:

Weapons which fire bullets as projectiles are rifled, that is to say the inside of the barrel is cut into bands and grooves which pass spirally along the barrel; the bullet in passing through the barrel is forced to rotate or spin, and this spin is kept up after discharge, increasing the accuracy of fire and penetration. The grooves thus cut into the bullet are of the utmost value in identifying the weapon used, as are various secondary markings such as scratches, etc., caused by slight irregularities in the surface of the barrel.²⁸

He also gave a significant amount of detail on how to read the wound itself. While these followed the same principles as earlier authors, concerning wound shape, direction, and the extent of any blackening, Smith related these characteristics to the peculiarities of the weapon and projectile to a greater extent than earlier authors.²⁹

What did represent a significant departure from earlier medico-legal approaches to shootings was Smith’s emphasis on the analysis of ‘non-medical’

²⁷ Smith, *Forensic medicine* (1925), 128.

²⁸ *Ibid.*

²⁹ *Ibid.*, 128-38.

evidence, such as of physical traces left at the crime scene, and detailed examination of weaponry. Smith seems to have been one of the earliest authors within British forensic medical circles to advocate the detailed examination of projectiles and cartridge cases with a view to linking them to a manufacturer, class of weapon, and specific gun, based on rifling markings, and other impressions left by the gun, as opposed to noting their size and weight. His 1925 textbook contains a separate chapter on just this one issue.³⁰ Another indication of the high status he afforded the practice of forensic medicine outside of the post-mortem theatre, especially in the investigation of firearms incidents, is the inaugural edition of *Recent advances in forensic medicine*, first published in 1931, which he co-edited with John Glaister Jr., his successor as Principal Medico-Legal Expert in Cairo. While not neglecting the investigation of firearm wounds, he did devote the greatest amount of space in the shooting-related sections of the book to laboratory-based investigations. For example, there were three consecutive chapters entitled ‘Identification of firearms’, ‘The examination of powders and powder residues’ and ‘The examination of the weapon’, which accounted for over a quarter of the whole book. The chapter named ‘The diagnosis of firearm injuries’, while it was the first chapter, had a much smaller proportion of the overall text.³¹

The character of much of Smith’s casework was also not overly body-centred. An examination of some of his reports into shooting cases he dealt with during his tenure in Egypt shows that he had significant, if not leading, involvement in investigations into the provenance of bullets and cartridge cases found at the scene of crimes, especially the many political assassinations which took place there at that time. The most notable case of this kind was the assassination in 1925 of the head of the Egyptian army in Sudan, Sir Lee Stack, who had been ambushed as he was chauffeured through Cairo. Smith and his team compared cartridge cases which had been found at the scene of the shooting to those which he recovered after firing test-shots through handguns which had been seized from suspects. He argued that markings left on both sets of cases by the guns’ firing mechanisms were identical, thus demonstrating that

³⁰ Ibid.

³¹ Smith and Glaister, *Recent advances in forensic medicine* (1931), 1-75.

they had been fired from the same weapons. As a result, the suspects in whose possession the guns had been found were implicated, and eventually convicted.³²

The extent to which Smith developed these techniques himself is debatable, although in his autobiography he did imply that he had arrived at the precise technique of pairing discarded cartridge cases with particular weapons independently, developing a makeshift comparison microscope which allowed him to look at two cases at once. In the United States and continental Europe, in the early part of the twentieth century, but particularly from the 1920s, extensive progress was being made in the area of bullet- and cartridge case-identification. For example, in New York in 1926, Calvin Goddard and Charles Waite established a specialist laboratory to investigate ballistics in a forensic context. Work was also being carried out in continental Europe, although when Goddard visited a number of sites in London, France and Germany, he determined that the technologies were not as advanced as they were in the United States.³³ In some cases, particularly in Europe, there were disputes about who the likely originators for certain techniques were. It would seem most likely that investigations as to the identification of projectiles originated from a number of loci, the labours from which grew side by side. As one contemporary commentator said of those who accused each other of plagiarizing each other's methods, 'they fail to remember that until recently there was little exchange of ideas in this field, and that it is possible for different investigators to discover the same methods independently'.³⁴

Much of the European and American work on ballistics was not carried out by medical practitioners, although it is clear that in some cases, there were attempts by the medical profession to exert control over this space. For example, one German forensic chemist, Dr B. Kraft, wrote in protest that:

³² Smith, "Identification of firearms and projectiles," 8-10; Smith, *Mostly murder* (1959), 98-111. Assassination of Sirdar, Case files of Sir Sydney Smith, RCPE SMS/3/71-5.

³³ Calvin Goddard, "Scientific crime detection laboratories in Europe: part I," *American Journal of Police Science* 1, no. 1 (1930): 21-2.

³⁴ B Kraft, "Critical review of forensic ballistics: part I," *American Journal of Police Science* 2, no. 1 (1931): 52-3.

Investigations of this kind must be carried on only by well-trained persons who deal primarily with questions of forensic chemistry, and criminal investigation. It is not advisable for physicians to conduct them; for they are usually over-burdened with other problems, and besides, except in the case of body wounds, ballistics has nothing to do with medicine.³⁵

In spite of Kraft's protestations, by this time pathologists were still heavily involved in the non-medical side of forensic gunshot analysis, a situation which was still the case by the end of the Second World War. For example, in his textbook, Sydney Smith advocated the use of chemical methods in the examination and analysis of suspicious weapons, for example to determine the type of powder that had been used.³⁶ He also argued that similar tests could be carried out on victims' clothing, again to determine the type of powder and cartridge used, hence bringing investigators a step closer to tracing the weapon used, and by extension the perpetrator.³⁷

By the 1930s and 1940s, pathologists in Scotland were employing a wide range of laboratory techniques, besides traditional post-mortem examinations, to investigate incidences of gun-crime. For example, in one 1941 case which took place in Falkirk, investigators pieced together bloodstains on curtains, and bullet fragments embedded in sections of plaster taken from the crime scene in order to determine the position of the victim when she had been shot.³⁸ In another from the same year, pathologists from Glasgow University visited a crime scene to examine gun-damaged and blood-stained furniture to a similar end, employing a wide range of tests.³⁹

Of course, much of this work was carried out in collaboration with other professionals and tradesmen, including public analysts and gunsmiths.

³⁵ B Kraft, "Critical review of forensic ballistics: part II," *American Journal of Police Science* 2, no. 2 (1931): 142.

³⁶ Smith, *Forensic medicine* (1925), 143-4.

³⁷ Sydney A Smith, "The investigation of firearm injuries," *Transactions of the Medico-Legal Society* 23 (1929): 98-9.

³⁸ Second joint report of John Glaister Jr. and AE Martin, case of A[-] P[-], 3 December 1941, GUA, Department of Forensic Medicine and Science, FM/2A/12J.

³⁹ Report on examination of Productions, case of J[-] S[-], 10 January 1941, GUA, Department of Forensic Medicine and Science, FM/2A/12B.

Nevertheless, it was still, by and large, forensic pathologists who oversaw and directed scientific investigations. Their involvement is attested by the fact that, for example, almost all of the reports from the Glasgow archive were countersigned by a doctor.

Over the century from the 1840s to the 1940s, the scope of the investigation of firearms injuries and incidents by pathologists widened, from a very wound-centred approach to one which took much greater notice of laboratory methods such as chemistry and spectroscopy, as well as of the bullet itself, and the story which it could tell. By the end of the period of study, pathologists were working closely with representatives of other disciplines, notably laboratory scientists and gunsmiths. The next section of the chapter takes as a case study the trial of Donald Merrett for the murder of his mother, Bertha, which took place in Edinburgh in 1927, which brings into focus the relationship between the different professional groups. The importance of carrying out experimental procedures, as opposed to mere post-mortem examinations, also appears to have become more prominent by the early 1900s and beyond especially in the case of assessing the significance of powder blackening. This change was more gradual than some others, as there were isolated research projects in the 1830s. However, by the early-twentieth century, experimentation in both the accounts of cases related within the textbooks, and in these textbooks' advice to practitioners, was being foregrounded to a greater degree. The Merrett case provides a useful example of such experimentation in action and under scrutiny in the courtroom, raising issues about experimental and evidentiary standards, as well as the role of experimentation when the body became unavailable.

The Merrett Case: a family tragedy

On the 17th March, 1926, Mrs Bertha Merrett was shot in the head at her home in Edinburgh's affluent West End. She was taken to the city's Royal Infirmary, where she died on the 1st April. A post-mortem examination was carried out that day by Harvey Littlejohn. He found that 'so far as the position of the wound is concerned the case is consistent with suicide.'⁴⁰ Mrs Merrett's body

⁴⁰ Report of Harvey Littlejohn, 5 April 1926, Trial papers of John Donald Merrett, NRS JC26/1927/27.

was then buried. The doctor's findings mirrored the opinions of the police, who did not suspect foul play. They found Mrs Merrett's seventeen-year-old son, Donald, who had been in the same room as his mother at the time of her injury, to be convincing when he said she had shot herself.

However, investigations into Mrs Merrett's death were soon reopened when it emerged that some of the signatures on her cheques, made out to her son, were forgeries. The question was now asked whether Donald could have pulled the trigger. This hinged on whether the shot had been fired from a distance from the wound greater than Mrs Merrett could have managed herself. To answer this, Littlejohn carried out a series of experiments, on his own on the 6th August and in conjunction with John Glaister Sr. of Glasgow on the 8th December, to measure the extent of powder blackening left on a target at various distances. Shots were fired from the pistol which had killed Mrs Merrett at cardboard targets and an amputated limb.⁴¹ The less blackening there was, the further away the shot had been fired, and the more likely it had been fired by someone else. At the initial post mortem, no blackening had been found on Mrs Merrett's wound, nor had any been noticed by the medical staff who had attended her in the hospital. Initially, this had not been regarded as necessarily suspicious; Littlejohn's initial report stated, rather, that 'there was nothing to indicate the distance at which the discharge of the weapon took place, whether from a few inches or a greater distance'.⁴² Now, however, the wound had to be read in a different light. Rather than being seen to be inconclusive, the post-mortem results were now indicative of a more distant shooter, in other words, the son, Donald Merrett.

The possibility was raised, however, that blackening had been present initially, but had been washed off by bleeding and the cleaning of the wound in hospital, and, despite the testimony of the hospital staff, had been missed. In order to test this hypothesis, Littlejohn's and Glaister's experiments included efforts to remove blackening from their test targets by rubbing with a sponge.

⁴¹ Report of Harvey Littlejohn, 13 January 1927; Report of John Glaister, 10 December 1926, Trial papers of John Donald Merrett, NRS JC26/1927/27.

⁴² Report of Harvey Littlejohn, 5 April 1926, Trial papers of John Donald Merrett, NRS JC26/1927/27.

They were unable to do so. Thus, the evidence was reappraised, and pointed towards murder; Merrett was charged.

Similar tests were carried out by the experts hired by the defence, the pathologist Bernard Spilsbury, and Robert Churchill, a gunsmith, both based in London. They conducted an initial set of tests in London (the date of which was not specified during the trial) and, on 30th January 1927, in Edinburgh with Merrett's gun in Littlejohn's presence. When it came to the trial in February, the prosecution and defence experts differed in their findings. The former stated that, in their experiments, the markings were not easily removed, whereas the latter found that they were. The prosecution concluded that the bleeding and washing would not have removed any blackening. Its attested absence meant that the shots had been fired from a distance, meaning that Mrs Merrett had been shot by someone else. The defence, on the other hand, argued that the blackening could have been washed away, and that therefore a self-inflicted shot at close range was possible. After six days of evidence, the jury returned its verdicts on 8th February. On the charge of forging his mother's signature on cheques, Merrett was found guilty. A verdict of not proven was returned for the murder charge.

A number of authors have already written about the Merrett case. These include historians and commentators contemporary to the events. The most thorough account from the period is William Roughead's introduction to the *Notable British Trials* series' edition of the court transcripts, published two years after the trial. This piece includes a substantial reconstruction of the events leading up to Mrs Merrett's shooting and death, as well as comments on specific elements of the trial. These include assessments of the performance of various witnesses and, what Roughead deemed to be the crucial element of the proceedings, the medical evidence.⁴³ The case also features in Anne Crowther and Brenda White's 1988 history of Glasgow University's forensic medicine department. Among other things, they use the case to introduce the issue of economic and working conditions for expert witnesses north and south of the border, highlighting issues of job security. For instance, while Glaister and

⁴³ William Roughead, ed. *Trial of John Donald Merrett*, *Notable British Trials* (Edinburgh: William Hodge, 1929), 1-45.

Littlejohn were employed as university professors, Spilsbury was a freelance operator. Also the standard fees for court appearances had to cover expensive laboratory work, meaning remuneration was thinly spread. Crowther and White also argue that this case was one of the last to hinge on the forceful personalities of the expert witnesses; both Spilsbury and Glaister were renowned for their rhetorical abilities. As time went on, however, medical and scientific teamwork became more and more crucial, as can be seen in the cross-border efforts in resolving the Ruxton murders in 1936.⁴⁴

While Crowther and White are right to highlight the undoubted importance of personalities, I have found that, as a case study, Merrett's trial has more to offer. First, it offers a reflection of one of the themes explored in the first chapter of the thesis, namely the importance of the transcription of the post mortem. Because most of the medico-legal work was carried out after Mrs Merrett's body had been buried, Littlejohn's initial report was of great importance, being the essential representation of the condition of the body and the wound at the time of death. Glaister and Spilsbury, who had not seen the body directly, relied upon it to help inform their conclusions. Of course, the fact that Mrs Merrett had resided in hospital for two weeks before her death meant that, at the time of her autopsy, the wound was not in the same condition as it had been when she was admitted. It would have been washed, removing blood and, the defence contended, powder blackening. Thus, the precognitions and testimony of the doctors and nurses at the infirmary as to the state of the wound at the time of Mrs Merrett's admission were also highly significant, and were used by the medico-legal witnesses. None of the hospital staff had observed any blackening.⁴⁵ This was favourable to the Crown's case, being indicative of a distant discharge. The defence, however, questioned the relevance of the hospital staff's representations of Mrs Merrett's wound. Spilsbury suggested that a combination of bleeding and movement could already have changed the appearance of the wound any before she arrived at the hospital.⁴⁶ Thus, signs of a near discharge might already have been obliterated.

⁴⁴ Crowther and White, *On soul and conscience* (1988), 64-7.

⁴⁵ Precognitions against John Donald Merrett, NRS AD15/27/1/1.

⁴⁶ Testimony of Bernard Spilsbury, Transcript of trial of John Donald Merrett, NRS, JC36/53, pp. 605-7.

Although not explicitly alluded to at the trial, there existed a tension between Mrs Merrett the patient and Mrs Merrett the crime scene artefact. As her wound was treated, evidence as to the presence or absence of powder blackening was lost, since it was not photographed. The case exemplifies the concept of the unstable body described by Burney and Pemberton in relation to an English case in which experts were confounded by the decomposition of a body between a first and second post mortem.⁴⁷ In the Merrett case, instability set in at an earlier stage.

The case is also of interest for two other reasons. First, it was a case in which medical and non-medical, non-academic experts worked together. The significant overlap and collaboration between them would suggest that, as far as this case was concerned, firearms investigation lay at the very border between medicine and forensic science. Thus, it will be of interest to explore whether the gunsmiths who gave evidence were in some way subordinate to the pathologists, and in what areas their knowledge took precedence over that of the medical expert. Second, it is a case in which quasi-medical laboratory experiments were used, and were the subject of fundamental disputes, particularly in relation to the adequate replication of the original circumstances of the alleged crime. Thus, the importance of such experimental standards will be examined.

Doctors and gunsmiths

In the Merrett case, both the prosecution and the defence called medical and non-medical experts. Some matters were quite clearly the domain of one or the other, a fact which was reflected by the witnesses called. A microscopist and a chartered accountant were the principal expert witnesses for the charge of forging Mrs Merrett's signature on her cheques.⁴⁸ A psychiatrist was called by the defence to comment on the likely reliability of the statements made by Mrs Merrett to her friends and the infirmary staff during her stay in hospital.⁴⁹ However, when it came to the question of the shooting incident, both

⁴⁷ Burney and Pemberton, "Bruised witness," 47-51.

⁴⁸ Indictment against John Donald Merrett, Trial papers of John Donald Merrett, NRS JC26/1927/27.

⁴⁹ List of witnesses for John Donald Merrett, Trial papers of John Donald Merrett, NRS JC26/1927/27.

pathologists and laymen gave expert evidence, leading to some degree of overlap. This section will compare the topics about which both types of expert were questioned by the prosecution and defence counsels, to determine the extent of the overlap of expertise.

Both sides called gunmakers as non-medical experts for the murder charge. The prosecution called Alan MacNaughton, who, we learn from his declaration at the start of his evidence, had a gunmaking business locally. His evidence included a basic description of how the gun in question functioned, including a statement, prompted by the defence advocate, on the likelihood of the weapon going off accidentally and the pressure required to pull the trigger. He also noted that the intended purpose of the short-barrelled pistol found at the scene of the shooting was self-defence, since its aim would be too poor for hunting or sport. Finally, he was asked whether he would expect the firing of the weapon, at a near distance, to result in blackening, and what the cause of such blackening would be. While he answered that blackening would be likely, he was not willing to state on the matter conclusively, because he had not carried out experiments of his own.⁵⁰

It is apparent, even from his opening statement testifying as to his occupation and expertise, that the evidence of the defence's ballistics expert, Robert Churchill, was of a very different character to that of MacNaughton. He made clear that, as well as being a London gunmaker, he had extensive experience of shooting cases, to which MacNaughton's entire testimony does not even allude. This experience appears to have been quite diverse, in terms of its disciplinary background. He stated that over the previous sixteen years he had been called upon by the English public prosecutor and police to give expert evidence, as well as having 'on some occasions' been called in to examine gunshot wounds at Charing Cross Hospital in London.⁵¹

Despite the fact that Churchill evidently had experience of criminal investigations that MacNaughton appears to have lacked, significant areas were covered by both of them in their testimony. For example, like MacNaughton,

⁵⁰ Testimony of Alan MacNaughton, NRS JC36/53, pp. 265-74.

⁵¹ Testimony of Robert Churchill, NRS JC36/53, p. 557.

Churchill commented on the likelihood of the weapon found next to Mrs Merrett being discharged accidentally, a question clearly within the expertise of both of them as gunmakers. They did, however, disagree fundamentally in their answers. MacNaughton argued that, as long as it was in good working order, the fact that the pistol was of cheap manufacture was not a relevant factor. Churchill, on the other hand, said of such pistols that ‘there is no reliance to be placed on them’.⁵²

Both gunsmiths were also questioned in court about the general nature of the blackening of the tissue surrounding the wound, as well as some discussions of the nature of the powder found in the cartridges. Again, however, the two differed in their opinions, especially regarding blackening. Churchill was able to discuss the ease with which he and Spilsbury had been able to wash the powder and smoke blackening from the samples of human skin, and pieces of card, at which they had fired. MacNaughton, on the other hand, could not be drawn on questions such as the distance from the muzzle of the gun at which blackening would no longer be perceived, because, unlike Churchill, he had not had the opportunity to carry out any experiments.

Another area of gunmaker expertise which Churchill referred to, but which his Scottish counterpart did not, related to his experience as a shooting instructor. He was asked about the position of the wound behind Mrs Merrett’s ear. The issue was whether it was likely that she had turned her head as she shot at herself. Churchill argued that this would be very likely. He said, ‘I teach shooting and I find women flinch from the discharge at first by closing their eyes and by turning the head away from the discharge.’⁵³ Thus, the position of her wound could have been a result of her flinching as she fired the weapon. Churchill’s insights into female behaviour continue, however, beyond the expected purview of the gunmaker. Relating to his experience of helping to investigate, while acknowledging to the cross-examining Lord Advocate that shooting was an unusual *modus operandi* for female suicides, he stated that he had helped investigate a case similar to this before, in which a woman shot herself behind the right ear, in the presence of her husband. According to

⁵² Testimony of Robert Churchill, NRS JC36/53, p. 576.

⁵³ Testimony of Robert Churchill, NRS JC36/53, p. 564.

Churchill, ‘no action was taken against the husband, who was asleep in a chair alongside’.⁵⁴

A final area of expertise into which Churchill, but not MacNaughton, stepped was even more medical in character. Churchill was asked to think about the wound itself, and the effects of the medical and nursing care given to Mrs Merrett upon her admission to the infirmary. The defence advocate, Craigie Aitchison, asked:

I want you to assume that the wound bled for a considerable time, that the wound became surrounded with blood, that right over the wound there was congealed or coagulated blood, and that a wet swab had to be applied by the surgeon who dressed the wound, with considerable pressure, to remove the blood. Assuming these conditions, would you expect to find any blackening at all?

The language used by Aitchison, using words and phrases such as ‘wound’, ‘swab’ and ‘coagulated blood’, invokes images which seem to belong to the medical context. By asking Churchill to extend his conclusions from the experiments performed with Spilsbury to include the bleeding wound, did Aitchison stretch the gunmaker’s remit into the medical space? That might seem to be the case. However, it is not clear how far Churchill was willing to follow Aitchison into medical territory. On the one hand, his answer was conclusive: ‘With these conditions it would be impossible to determine any blackness.’ On the other, when asked whether he had any doubts about this last answer, while he remained bullish, he did include a caveat: ‘Not a bit. Our experiments on skin were easily washed off, but, of course, we had no blood; we never used blood at all there.’⁵⁵

On balance, however, it seems likely that Churchill would have been reasonably comfortable in the, albeit limited, medical sphere of gunshot wounds. We have already seen that he had been called to attend shooting cases at Charing Cross Hospital. Also, he underwent precognition questioning from

⁵⁴ Testimony of Robert Churchill, NRS JC36/53, pp. 569-70.

⁵⁵ Testimony of Robert Churchill, NRS JC36/53, pp. 562-3.

Merrett's solicitors on 31st January. This is relevant for two reasons. First, it means that the defence advocate, whose side had employed Churchill, and for whose benefit precognition was carried out in the first place, would be well aware of where the limits of Churchill's expert knowledge were, and would know not to stray beyond them. Second, the written statement from the precognition hearing includes passages that betray Churchill's general familiarity with gunshot-wound characteristics. He stated, for example, that, 'A very close shot would cause a little destruction of tissue, whereas a distant wound is unaffected by the powder gases.'⁵⁶

So far we have seen that, while the prosecution's non-medical expert, Alan MacNaughton, did not stray into medical territory, Robert Churchill, the defence expert, was a lot closer to the wound as an investigative space. Nevertheless, this tells only one half of the story. There is also the question of the extent to which the medical witnesses addressed non-medical matters. This enquiry is not without precedent. For example, the year before this trial, Sydney Smith, then Principal Medico-Legal Expert to the Egyptian government, had published an article in the *British Medical Journal* on the identification of what particular weapon had ejected a particular cartridge case, an endeavour which was ostensibly non-medical, since it did not involve the examination of a human body.⁵⁷

An examination of some of the journal literature concerning both American and continental European practice shows that debates about the undesirability of a medical hegemony over all aspects of forensic evidence and analysis were on-going in the 1920s and 1930s. Chemists who involved themselves in forensic work seem to have been particularly vociferous in their criticism of what they saw as excessive medical involvement; under-specialization, by which pathologists overstretched themselves by taking in too many areas of expertise, could result in poor-quality testimony.⁵⁸ Recent work has been carried out on individual rivalries between non-medical scientists and doctors, for example between the Cairo public chemical examiner Alfred Lucas

⁵⁶ Precognition of Robert Churchill, 31 January 1927, NRS AD15/27/1/2.

⁵⁷ Smith, "Identification of firearms and projectiles," 8-10.

⁵⁸ Kraft, "Critical review of forensic ballistics: part II," 141-2.

and Smith, the forensic pathologist.⁵⁹ Lucas's own textbook, *Forensic chemistry*, criticized textbooks, such as the Austrian Hans Gross's seminal work on criminal investigation, which suggested that any doctor was capable of performing chemical analyses weapons, projectiles and propellants. He wrote, 'Although the testing of firearms like everything else is easy enough when one knows how to do it, nevertheless it should not be undertaken except by an experienced analyst.'⁶⁰ More generally, he implied that medico-legists were appropriating work which was not properly theirs:

Some of the subjects dealt with will be found described in books on Forensic Medicine. This, however, does not mean that these subjects are medical, for such is not the case.

He, on the other hand, was 'careful not to encroach upon the medical side of any subject'.⁶¹

The sections of textbooks of forensic medicine dealing with the examination of projectiles in depth included material on the chemical analysis of powder and projectiles. For example, Smith and John Glaister Jr.'s co-written *Recent advances in forensic medicine* contained outlines of chemical tests for various metals and explosives, including spectroscopic methods. While they suggested that more detailed instructions could be found in other works, they did not suggest that work should be delegated to chemical analysts.⁶² While medico-legists in Scotland did liaise with chemists in toxicological matters, I have not found any examples of chemists being called to perform analyses in shooting cases.

The theme of medical hegemony continues with regard to the Merrett case, where the evidence of the medical experts appeared to encroach into the province of the gunsmith and, perhaps, the chemical analyst. For example, Littlejohn gave the opinion that accidental discharge would be unlikely because

⁵⁹ Alison Adam, "Alfred Lucas and the development of forensic chemistry" (paper presented at Forensic Cultures in Interdisciplinary Perspective, University of Manchester, 11 June 2010).

⁶⁰ A Lucas, *Forensic chemistry* (London: Edward Arnold, 1921), 163.

⁶¹ *Ibid.*, v-vi.

⁶² Smith and Glaister, *Recent advances in forensic medicine* (1931), 54-7, 65-8, 71-3.

the revolver itself required a pull of 5 pounds.⁶³ This echoed a statement from MacNaughton's earlier testimony, in which he stated that he had tested the pull on the trigger, finding it to be 5 pounds and 9 ounces, which he stated was 'a fairly heavy pull for such a small pistol'.⁶⁴ Of course, it could be argued that when taken in context, this remark by Littlejohn can be seen to be just a part of a much more medical discussion, whether it would have been likely for Mrs Merrett to have been able to reach the area of her head in which she was shot. It would seem plausible that MacNaughton had provided Littlejohn with this information to allow the doctor to make his judgement about the possibility of an accidental discharge. In other areas, however, the pathologists can be seen to have been much more deliberate in their use of non-medical evidence, having produced it themselves. For example, Spilsbury stated that he tested the Edinburgh and London powder grains, in order, presumably, to demonstrate the applicability of his own tests. He produced a vial of powder from one of the cartridges from the London experiments:

A portion of the powder removed from one of the cartridges is shown in this bottle in which the scales of a steel grey colour can be seen, rectangular, and the same size taken from the cartridges we used in London. I have since compared these with the contents of one of the cartridges in the experiments here [in Edinburgh], and I found that they are practically identical.⁶⁵

This testing of the powders, which may or may not have been carried out with a microscope, would seem to relate to a similar issue which was brought up in the examination of Churchill by Aitchison. He, like Spilsbury, was asked about the powder:

Were your London experiments carried out with the same stuff, but was there a difference as regards the age of the stuff with the experiments you carried out in Edinburgh?

His answer was similar to Spilsbury's but appeared to carry greater caveats:

⁶³ Testimony of Harvey Littlejohn, NRS JC36/53, pp. 285-6.

⁶⁴ Testimony of Alan MacNaughton, NRS JC36/53, p. 266.

⁶⁵ Testimony of Bernard Spilsbury, NRS JC36/53, p. 594.

The powder is apparently similar, but gives different results. The London ammunition gives more tattooing, and the Edinburgh ammunition gives more smoke blackening.⁶⁶

The non-medical character of the examination of powder is made all the more clear when the division of labour on this matter by the prosecution is taken into account. When asked by Aitchison about the composition of the explosive in the cartridges, namely whether it was cordite or not, Littlejohn stated that he had not analysed it. The prosecution gunsmith, MacNaughton, on the other hand, had done so, ascertaining that each cartridge contained smokeless powder, 'exactly similar'.⁶⁷

While in the case of powder analysis Spilsbury can be seen to have involved himself in gunsmith activities more than the pathologists appearing for the prosecution, in other instances the prosecution's medical experts may have strayed into the dominion of the gunsmith. For example, there was some discussion between Littlejohn and Aitchison about the difference between powder and smoke blackening, in which Littlejohn suggested that Aitchison was mistakenly conflating the two. Nevertheless, when the full context of that encounter is taken into account, the medical involvement becomes more understandable, since the site of the disputed marking was the wound.

This discrepancy between the roles of the gunsmiths hired by the prosecution and defence is interesting, but difficult to interpret. It is certainly clear from the career of Robert Churchill, and indeed from that of his predecessor, his uncle, that gunsmiths had been giving evidence in criminal trials in London for some time, and taking more involved roles than MacNaughton did in this case.⁶⁸ It is a more complicated story when the broader Scottish situation is taken into account. A selection of cases from across Scotland shows that there was some variation in the division of labour between expert witnesses when gunsmiths were employed. In some cases there was clear demarcation of roles, in others gunsmiths appeared to comment on medical matters, and doctors on those of the gunmaker.

⁶⁶ Testimony of Robert Churchill, NRS JC36/53, pp. 577-8.

⁶⁷ Testimony of Alan MacNaughton, NRS JC36/53, p. 266.

⁶⁸ Hastings, *The other Mr Churchill* (1963).

In a West Lothian case from 1922, a gunsmith gave evidence as to the condition of a handgun associated with an attempted murder. In an incident dubbed the 'Winchburgh Poaching Affair' by the press, Patrick Hyland was accused of shooting at a gamekeeper and a police officer as he attempted to evade capture after an illicit snare-laying expedition. A revolver was recovered from the scene, although Hyland denied that it was his. Testimony relating to the gun itself was delivered by two witnesses. The first, Detective Sergeant Forbes Leslie, stated that when it was handed to him, he believed that a shot had recently been discharged, due to the presence of powder smoke in the barrel. A gunsmith also gave evidence, testifying that the gun was in poor condition:

John Pettigrew Anderson, a gunsmith, employed with John Dickson & Sons, Edinburgh, who tested the revolver with a cartridge, said that the weapon was a complete wreck. Pulling the trigger would not revolve the cylinder nor cock the hammer. The striker made no mark on the cartridge. He was sure that the revolver had at one time been loaded with ball, as blank cartridges were crimped. A fair revolver range was 25 yards.⁶⁹

In this case, the gunsmith's evidence did not go any further. Neither of the victims of the alleged offence was wounded, so no medical opinion was sought. While this case is not an example of the interaction between the testimonies of a gunsmith and a medical expert, it demonstrates what might be considered the normal scope of a gunsmith's evidence.

In the case of a fatal shooting in Kilmacolm, Renfrewshire in 1931, a gunsmith gave evidence about the identification of cartridge cases found by police and those discharged from a shotgun. AA Bryson, a gunsmith's salesman from Glasgow, carried out a series of firing tests, and determined that the gun's extractor made distinctive markings on the cases, which corresponded to those on the cases produced by the police. The site of the wounds remained the domain of the two Glasgow forensic specialists, Glaister and Frank Martin. They discovered one scorched, central wound, and twenty-seven smaller

⁶⁹ "Winchburgh poaching affair: Crown case fails," *Scotsman*, 27 September 1922, 7.

wounds surrounding it, and argued that the shot was fired from a short distance, nine to twelve feet, from the victim. In this trial the sole defence witness was Sydney Smith, who commented on both medical matters, and the question of the direction of fire. This latter point was based on markings on the walking stick of the victim.⁷⁰ In this case, the division of labour between the medical and non-medical witnesses was similar to that of the Crown in the Merrett trial, in that the question of distance, largely read from the wound, was a matter for medicine.

The role of Smith in this case is slightly more ambiguous. His testimony covered a slightly broader area, namely the state of the markings on the stick, which would not immediately be seen as medical, although they no doubt constituted wounds of a sort. This constitutes a possible encroachment into gunsmiths' expertise, particularly when other cases from this era are taken into consideration, in which gunsmiths did consider similar points to those raised by Smith in the Kilmacolm case. One such example can be found at the inquest of Edward George Welham in Dorset in October 1931, who was found shot in his office. A gunsmith gave evidence about some boards recovered from the scene which contained shot. Having carried out experiments, the gunsmith, Alan Jeffrey, testified as to the distance from which the shot had been fired, and the direction of flight of the projectiles.⁷¹

In the 1935 trial of John M'Guigan for the murder of Daniel Kerrigan, AE Martin, a Glasgow gunsmith, gave evidence apparently derived from the appearance of the wound, a task which in the Kilmacolm case had been left to doctors, but which in this case appears to have been shared across the boundary between medicine and skilled trade:

Mr Martin suggested that some 44 of the pellets that were in the cartridge which struck Kerrigan had passed without finding a target in his body. From the appearance of the shot as it took effect as disclosed in photographs he had formed the opinion that the shot struck Kerrigan from an oblique angle from the

⁷⁰ "Doctors disagree - conflicting evidence in Kilmacolm case," 11.

⁷¹ "Position of the gun," *Scotsman*, 27 October 1931, 6.

right. It had been fired from a point at the front of Kerrigan's right shoulder, more from the side than the front. He carried out certain tests to try to arrive at an approximate figure of the range at which the shot had been fired which entered Kerrigan's body. His conclusion was that the gun must have been fired from close range, not farther than eight yards.⁷²

Although the word 'wound' does not appear in this newspaper account, the phrase 'the appearance of the shot as it took effect' suggests that the late Kerrigan's wound was what the gunsmith was referring to, albeit indirectly via a photograph.

In the same case, the questioning of Dr John Anderson, a Glasgow pathologist, suggests an overlap of his work and that of Martin. Anderson testified that, in his view, the gun had been fired no more than eight yards from the victim. The judge asked him, 'You substantially agree, then, with the view expressed by the gunsmith?' He did.⁷³ A medico-legal specialist and a gunsmith were being asked to comment on the same matter. In the investigation of shootings, the boundary between medicine and skilled trade was porous.

This negotiable boundary is apparent not only in the courtroom but from the written reports produced by expert witnesses as part of the process of investigation. For example, in 1941, in preparation for the trial of a serviceman for the fatal shooting of his wife, John Glaister Jr. and the gunsmith AE Martin put together a report about their examination of several articles, and their subsequent investigation into firing distances. After scrutinizing the post-mortem report, the police's photograph of the victim's face (where she had been shot), and cartridges, they fired test shots using the rifle belonging to the accused. The shared nature of the enterprise is made clear by the fact that no differentiation was made between the representatives of the two vocations in their tasks. They wrote, 'One of us, in the presence of the other, fired from [the] rifle ... several of these cartridges at cards, some of which had been smeared with tallow.' When a shot was fired eighteen inches from the target, the pattern

⁷² "Perthshire murder trial," *Scotsman*, 29 November 1935, 8.

⁷³ "Perth murder charge," *Scotsman*, 30 November 1935, 18.

of powder grains on the target resembled that on the victim's face.⁷⁴ As a part of this joint effort, much like in the Merrett case, the gunsmith was involved in the scrutiny of a wound, a seemingly medical matter. In this case, the jury returned a verdict of 'not proven', after the defence's medical witness argued that an accidental discharge, during a struggle, could not be ruled out.⁷⁵

Experimentation in forensics

As mentioned already, the major issues on which the case hinged were the questions first of how far away the shot had been fired, and whether this distance indicated murder, or suicide or accident; and second of whether this distance could be determined at all given the circumstances of the case. This could not be determined without recourse to experiment. Although the condition of Mrs Merrett's wound had been noted by the doctors who treated her in the infirmary and by Littlejohn at the post mortem, the firing distance could not immediately be determined, as will be made clear below, because the extent of powder blackening, the major indicator of distance, varied according to circumstances. Thus, specific blackening/distance patterns for Merrett's gun had to be established.

The shooting experiments aimed to replicate the conditions of the original incident in a controlled setting. The question of replication has been a central issue in science and technology studies, especially since HM Collins identified the problem of 'experimenter's regress' in 1985, a concept which, although first applied to research science, is of relevance to the 'applied' field of forensics. Collins argues that the performance of further experiments to verify or rebut earlier experimental conclusions is fraught with difficulty; 'since experimentation is a matter of skilful practice, it can never be clear whether a second experiment has been done sufficiently well to count on as a check on the results of the first'. Thus, a third experiment is required to verify the

⁷⁴ Copy of report of AE Martin and John Glaister Jr. (first joint report) in case of A[-] P[-], 29 November 1941, GUA FM/2A/12J. Anonymized in accordance with archive data protection policies.

⁷⁵ "Murder charge: professors' evidence in trial at Stirling," *Scotsman*, 30 January 1942, 6; "Murder charge: verdict of not proven at High Court trial at Stirling," *Scotsman*, 31 January 1942, 6.

second, and so on ‘*ad infinitum*’.⁷⁶ Collins’s model is apt for the Merrett case because the defence also commissioned a set of experiments in order to derive the distance from Mrs Merrett’s ear from which the shot was fired; this set of results was used to counter those of the Crown. Since the conclusions of the two sets of tests were different, there was extensive deliberation in the court as to whether either had been performed sufficiently well. Questions of skilful practice, namely whether the experimental conditions mirrored those of the original incident to an appropriate degree, were paramount.

This theme is continued by later historians and science-studies specialists, who have approached criminalistics and forensic science as their subjects. Simon Cole cites one of the earliest appearances of latent-fingerprint identification in the American courts, in which an experiment was carried out in the courtroom, during the trial of a burglar in 1911, to demonstrate the power of the technique and its practitioners’ abilities to the jury. A juror’s fingerprint, placed on a piece of glass while the expert was out of the room, was lifted and identified correctly. This display met with objections from the defence, who argued that the demonstration had been misleading. The defence lawyer ‘suggested that the court was creating pristine experimental conditions unlike the messy state of the crime scene’.⁷⁷ Controlled experiments were not, in his view, a reliable replication of outside events, such as the placing of latent fingerprints. An objection of this sort, which questioned the validity of experiments so comprehensively, was not raised during the Merrett trial; because both sides conducted their own experiments, the side which raised it risked undermining their own evidence as well as that of their adversary. Nevertheless, the defence gunsmith, Robert Churchill, later raised such an objection privately, to his biographer, arguing that replicating the behaviour of living flesh was impracticable under experimental conditions.⁷⁸

The form of courtroom challenges to DNA-profiling evidence examined by Michael Lynch is also of interest when considering the Merrett trial. Lynch draws parallels between the tactics of the defence team of OJ Simpson during

⁷⁶ HM Collins, *Changing order: replication and induction in scientific practice* (London: Sage, 1985), 2, 83-4.

⁷⁷ Cole, *Suspect identities* (2001), 184.

⁷⁸ Hastings, *The other Mr Churchill* (1963), 117-18.

his 1994-5 trial for murder and the practices of sociologists of science. He argues that both involve the deconstruction of scientific and laboratory techniques and processes, the opening of Latour's 'black box'. Simpson's defence lawyers advocated the open scrutiny of every stage in the DNA-profiling procedure, examining each point in the process for potential sources of uncertainty, for example the possibility of contamination through careless handling of evidence or the failure to observe hygiene protocols. Indeed, a particular issue they identified was whether the protocols necessary to prevent contamination, such as changing gloves or cleaning work surfaces at appropriate intervals, were observed each time the experiment was run. Having had the opportunity to observe the employees of the relevant crime labs, the defence asked whether they worked to the same level of exaggerated care when their work was not being observed. It transpired they did not.⁷⁹ This serves as a useful analogy for the tactics used to challenge the findings of two sets of experiments in the Merrett case. It was suggested to both the prosecution and defence witnesses that they had failed to observe the experimental conditions necessary for the test findings to be applicable to the shooting of Mrs Merrett, for example the use of the same weapon and type of ammunition as found at the scene. Textbook authors stated that this was a necessary condition of any shooting experiment. Thus, although the character of their specific criticisms was different, lawyers in both the Simpson and Merrett cases highlighted shortcomings of their opponents' experts' experimental setup and procedure, such as non-adherence to procedural expectations, which, they contended, undermined their conclusions.

By the time of the Merrett case, the practice of conducting shooting experiments to determine the distance of fire was well established. The 1920 edition of *Taylor's principles and practice of forensic medicine*, edited by Frederick Smith, noted that there was significant variation in the resultant wounds at different distances between different weapons. Therefore, Smith argued, 'no general rules can be laid down. Experiments *must* be done with the

⁷⁹ Lynch, "The discursive production of uncertainty," 840-53.

weapon and with cartridges (or loading) similar to those which are alleged to have been used'.⁸⁰

Similarly, Sydney Smith's 1925 textbook, *Forensic medicine*, urged the reader to perform experiments with the weapon and ammunition in order to 'reproduce the condition found in the body'. He did, however, also include descriptions of some of the general characteristics of shotgun wounds at various distances:

At about a yard the charge of shot will enter as one mass, making a hole with irregular edges about an inch in diameter, surrounded by a zone of blackening, burning, and tattooing from unburnt particles of powder. At 2 to 3 yards there will be a ragged central hole with a few stray shot holes around it without blackening or burning, but with a certain amount of tattooing.

Nevertheless, Smith included a caveat with this information:

These details are given merely as a working basis; they vary with each weapon and its charge, but they are the outcome of hundreds of experiments with different weapons, and therefore have a certain value.⁸¹

They were, therefore, only given as a general guide to the variation of blackening with distance, and were not intended as a replacement for case-specific experiments.

While the above literature focused on the use of the same weapon and type of ammunition, during the Merrett trial the advocates took a more general interpretation of the principle, subjecting a number of aspects of the experts' procedures to a replication test. Both the Crown and the defence deemed aspects of each other's experiments to be inconsistent with this experimental ideal. As well as the issue of whether the correct gun had been used,

⁸⁰ Frederick John Smith, *Taylor's principles and practice of medical jurisprudence*, 7th ed., 2 vols., vol. 1 (London: J & A Churchill, 1920), 540.

⁸¹ Smith, *Forensic medicine* (1925), 129.

environmental issues, such as variation in temperature and moisture, were raised, as was the question of whether suitable targets had been employed.

Although Littlejohn and Glaister had performed experiments on both cardboard and skin targets, the Crown had only produced, as exhibits in court, the card targets. Thus, the results from their experiments with cardboard targets were the basis of their evidence to the court. The defence, on the other hand, had produced both the card and skin targets from Spilsbury and Churchill's experiments. This discrepancy was exploited by Aitchison, the defence advocate. He suggested that the prosecution productions were inadequate, because the powder markings adhered more readily to card than skin. Thus, any test with a cardboard target did not suitably simulate the effects of firing upon human skin. Cross-examining Littlejohn, he suggested that 'when you fire at skin, as regards blackening, you get a very different result from the result which you get when you are firing at cardboard'. He suggested that Spilsbury's experiments had shown that 'if you make comparative experiments on cardboard and on skin, you will find that the degree of blackening is very much less in skin than it is on cardboard'. Littlejohn countered that the results would be the same, whatever the medium. His own experiments, performed on skin and card, had shown this to be the case. However, as Aitchison pointed out, the skin targets were not on the list of productions, and so could not be admitted as evidence without the defence's permission, which was not, of course, forthcoming.⁸² The testimony of Churchill and Spilsbury reinforced Aitchison's point about the differences between cardboard and skin targets. They both agreed that it was easier to wipe blackening from skin than card. When asked by Aitchison whether, in his view, 'experiments upon paper carry you any length at all in a case of this kind', Churchill answered that they did not.⁸³

Why did the Crown choose to foreground the card experiments over those carried out with skin targets? Crowther and White imply that the decision not to reveal the provenance of the prosecution's skin samples, an amputated

⁸² Testimony of Harvey Littlejohn, NRS JC36/53, pp. 297-8.

⁸³ Testimony of Robert Churchill, NRS JC36/53, p. 562.

leg, was made to ‘spare’ the jury from unnecessarily gruesome details.⁸⁴ In a letter to the procurator fiscal, written in December 1926, Glaister wrote:

I should like Crown Counsel to know privately that in that part of my report which deals with the shooting experiments into skin, what really took place was Professor Littlejohn was in possession of an amputated lower limb of an unfortunate man who had had a railway accident, and that the uninjured parts of the same were utilised for these shooting experiments.⁸⁵

This detail was withheld from the doctors’ official reports, which were read out in open court. An exchange during the trial between Aitchison and Glaister offers corroboration for the explanation that the motive was to spare the jury. After Glaister answered Aitchison’s request for the provenance of the skin samples, he told the defence counsel that he had ‘brought out a fact that I did not think it was necessary to bring out to the Court’.⁸⁶ Thus, Crowther and White’s is a plausible explanation. Nevertheless, Littlejohn and Glaister did not hesitate to mention the skin experiments when questioned by the Lord Advocate. Also, the concern for the jurors’ sensibilities was not shared by Aitchison and his experts.

The material used for the targets was not the only point raised by the defence about the applicability of the Crown’s experiments. Aitchison suggested that Littlejohn and Glaister had not taken the effects of environmental factors such as temperature and moisture on their results into account. Indeed, from Littlejohn’s answers, it would appear that they were not systematic regarding moisture. Aitchison asked, ‘Were you careful to carry out experiments with skin in different states of moisture?’ Littlejohn answered, ‘No, not altogether different states of moisture.’⁸⁷ Spilsbury and Churchill had, on the other hand, wetted some of their cardboard targets before firing.⁸⁸

⁸⁴ Crowther and White, *On soul and conscience* (1988), 65.

⁸⁵ Copy of letter from John Glaister Sr. to Edinburgh procurator fiscal, 10 December 1926, GUA FM/2B/20/3.

⁸⁶ Testimony of John Glaister, NRS JC36/53, p. 339.

⁸⁷ Testimony of Harvey Littlejohn, NRS JC36/53, p. 300.

⁸⁸ Testimony of Sir Bernard Spilsbury, NRS JC36/53, pp. 594-5.

Finally, Aitchison suggested that the failure to use blood in the experiments affected their value. He asked Glaister whether they had made ‘any experiments over a wound over which blood had flowed for half an hour, and on which blood had coagulated’. Hearing Glaister’s reply that he did not think that would have been legally feasible, Aitchison wondered whether ‘accordingly, may I take it in making your experiment it was quite impossible for you to reproduce the actual condition with which we have to deal in this case’. Glaister responded that one of the skin targets had been kept immersed in water since they performed the tests, and that ‘the blackening is as fresh to-day as it was at the moment of production’.⁸⁹ However, they had not attempted to remove this blackening by rubbing.

These criticisms of Littlejohn and Glaister’s experiments suggest that there was a level of ambiguity about the importance of the replication of the original conditions of a crime. It would appear that the control of some factors, such as moisture and the presence of blood, were either thought to be unnecessary or not feasible. However, the defence was eager to question these decisions, countering that these were important factors, the neglect of which inevitably cast doubt on the prosecution’s conclusions about the likely distance at which Mrs Merrett had been shot. Thus, in a manner not unlike those charted by Lynch and Cole, the defence attempted to deconstruct the Crown’s experimental procedure and label it unsatisfactory.

The defence’s experiments were also subjected to similar criticisms regarding their applicability to the circumstances of the shooting. The major criticism of the defence’s experiments was that the crucial set of results, which were subjected to washing to demonstrate the removal of blackening, were carried out in London with a different handgun and a different brand of ammunition. Thus, Spilsbury and Churchill had failed to replicate the incident in two crucial respects. This was contrary to the advice of much of the textbook literature, noted above.

⁸⁹ Testimony of John Glaister, NRS JC36/53, p. 340. On this matter, Roughead, who was well connected in the legal world, wrote, ‘I recently examined in the laboratory of my late friend, Professor Littlejohn, the specimen in question. Though it has now been for well-nigh two years soaked in water, the blackening is as plain as ever.’ Roughead, *Trial of John Donald Merrett*, 39 n. 3.

Of course, Spilsbury and Churchill were not unaware of this principle of experimental practice. Having performed their main set of experiments at Churchill's premises in London, they had not been able to perform their experiments with Merrett's gun or the rest of the unspent ammunition found at Buckingham Terrace. They had, however, attempted to compensate for this. Spilsbury stated that, in London, they tried to obtain a gun and cartridges as similar as possible to those of Merrett. He further stated that when he had the opportunity to compare London and Edinburgh cartridges, he found them to be 'practically identical'.⁹⁰ Churchill also noted that the two sets of cartridges were both made by one manufacturer, Nobel. He argued, during his re-examination by Aitchison, that the question of the difference between the cartridges of the experimental set-ups had been rendered moot by the fact that washing had taken place:

Q. Although you got a difference in density between the Edinburgh and the London experiments, does it make any difference at all to the conclusion which you draw as to the probability of any blackening being removed if the wound were washed?

A. No. As the wound was washed, it is impossible for me to determine any distance.⁹¹

Churchill's response, that the omission of the Merrett gun did not really matter, mirrors the responses given by the prosecution witnesses in the Simpson case when confronted with their procedural irregularities, as highlighted by Lynch. For example, they argued that it did not matter that they had not changed gloves, because in their professional judgement, the risk of contamination was minimal.⁹² As in Churchill's case, the claim of having exercised professional judgement was used to repel the suggestion of a lackadaisical and incompetent approach to their work.

⁹⁰ Testimony of Sir Bernard Spilsbury, NRS JC36/53, p. 594.

⁹¹ Testimony of Robert Churchill, NRS JC36/53, p. 577.

⁹² Lynch, "The discursive production of uncertainty," 854.

In spite of the efforts to use an equivalent weapon and ammunition and Churchill's claims that the presence of bleeding had rendered the type of weapon used immaterial, both the prosecution lawyers and expert witnesses exploited the apparent deviation from the experimental procedure necessary to adequately replicate the shooting under investigation. For example, when shown one of the defence's targets by Aitchison, Littlejohn protested that the London cartridges gave 'a totally different appearance from cartridges such as were used on Sunday last [in Edinburgh]'.⁹³ In a similar vein, the Lord Advocate, in his cross-examinations of Spilsbury and Churchill, forced them to agree that, as far as shooting experiments were concerned, 'the advisable thing in every case is to carry out tests with the actual weapon and with as identical powder and ammunition as you can get'.⁹⁴ He was able to back Spilsbury into a corner on this matter. Spilsbury agreed that, in terms of 'judging of the effect in the actual case', the Crown experiments, as well as the ones that the defence carried out in Edinburgh, with Merrett's gun, prior to the trial, were to be preferred. Of these two sets, however, skin targets had only been used by the prosecution, doubtless because of availability. The Lord Advocate took the point to its logical conclusion:

Q. And if Professor Littlejohn found that the Edinburgh powder on skin could not be so easily washed away as in the case of your London experiments, again I ask you would you not prefer to take Professor Littlejohn's experiments?

A. No, I think a good deal depends on the degree and the extent of the rubbing, as well as on the condition of the skin at the time when the weapon was fired.

Q. Assuming the conditions of rubbing and the conditions of skin being the same, you would agree that the Edinburgh experiments would be perfect?

⁹³ Testimony of Harvey Littlejohn, NRS JC36/53, p 306.

⁹⁴ Testimony of Robert Churchill, NRS JC36/53, p. 576.

- A. I think we ought to judge by the combined effects of both in such a case as that.⁹⁵

The Lord Advocate tried to persuade Spilsbury to admit that Littlejohn and Glaister's experiments, which suggested that the shots had been fired from a distance that precluded self-infliction, were the closest replication of the event, and so should carry the most weight. Spilsbury rejected this by citing another possible source of uncertainty in the prosecution experiments, the extent of rubbing which the targets had undergone to determine the ease at which blackening could be removed. This further illustrates the multifarious variations which presented obstacles to the adequate replication of uncontrolled events.

The courtroom exchanges in this case reveal the difficulties encountered in attempting to replicate real events experimentally, especially when faced by a well-organized and well-resourced adversary in the courtroom. Lawyers and experts picked apart the opposing side's experimental procedure, highlighting sources of uncertainty and failures in replication which, they argued, undermined their results. While both sides acknowledged that, ideally, the original conditions of the incident would be replicated as far as possible, compromises and lapses, such as the use of similar, rather than identical, weapons and ammunition and the failure to regulate temperature and moisture, were made.

What did not emerge in court, yet provides an insight into the place of experimental reconstruction at this time, was the degree of disagreement between the defence experts, Churchill and Spilsbury, about the usefulness of the tests. According to his biographer, Macdonald Hastings, Churchill believed that neither shooting experiments using cardboard, nor skin targets would provide any useful information about the death. His main objection was that neither adequately replicated the behaviour of living flesh. Churchill believed that the flow of blood over the wound would obliterate any powder blackening. However, Spilsbury wished to go ahead with the experiments, and obtained an amputated leg after appeals to London hospitals. Hastings, who knew Churchill personally, later discussed the case with him:

⁹⁵ Testimony of Bernard Spilsbury, NRS JC36/53, pp. 605-6.

Churchill himself wasn't entirely happy with the experiment. He said to me years later that, if it had been any other than Spilsbury, counsel would have challenged his evidence by pointing out that the reaction of dead flesh is quite different from living flesh. But Churchill himself was in no doubt that the evidence of the experiment, such as it was, was of no significance.⁹⁶

Given the character of the Crown case, which placed a great deal of reliance upon tests of this kind, the prospect of the Lord Advocate challenging the evidence on this basis was less likely. On the other hand, considering Aitchison's criticism of the Crown for only producing the cardboard targets, it is possible that an objection to the nature of the Spilsbury and Churchill's targets could have been raised by Merrett's legal team during their preparation for the trial.

This episode, providing that Hastings's account is reliable, is a further illustration of the perceived importance of the replication of conditions in forensic experimentation. It demonstrates that there was a degree of scepticism about the usefulness of certain medico-legal techniques. Interestingly, it was Churchill, the gun-maker, rather than Spilsbury, the doctor, who objected to the use of dead or artificial tissue as a representation of live human flesh, commenting on an anatomical and physiological matter. However, it also illustrates how the misgivings of one expert could be eclipsed by the forcefulness of a colleague. Dissent of this kind within an expert team did not normally emerge in open court; it was only in retrospect, after his death, that Churchill's objections became public. Indeed, his views were recounted by a third party, and with the benefit of hindsight. Given the verdict, the emergence of feelings of uncertainty about the medical and scientific techniques was not surprising.

Despite Churchill's reservations, the use of shooting tests in a case of this character was in line with the advice of medico-legal textbook authorities. The evidence from textbooks and other professional forums, such as the

⁹⁶ Hastings, *The other Mr Churchill* (1963), 117-18.

Medico-Legal Society, shows that concerns with the accurate replication of the specific incident under investigation were paramount. General principles regarding the condition of wounds could not be relied upon. This emphasis on specificity was reflected in the courtroom debates that took place during Merrett's trial. Both the prosecution and defence experts were accused, by each other and by hostile counsel, of having failed to replicate conditions properly, from the use of a suitable target, to the use of a different gun and set of ammunition. The means and grounds by which the forensic evidence in the Merrett case was contested are strongly reminiscent of the disputes surrounding latent fingerprint identification and DNA profiling which have been identified by Cole and Lynch. Questions of adherence to accepted experimental standards, such as using the same gun in the experiments as was found at the scene, and the emergence of sources of uncertainty which undermined the possibility of the adequate replication of the events under investigation, were central. The means by which the results were obtained, rather than just the results themselves, were analysed and challenged. Also, the existence of two competing sets of experiments, those carried out by Littlejohn and Glaister, and those of Spilsbury and Churchill, each of which purported to be the better representation of the moment of Mrs Merrett's shooting, brings to mind the concept of experimenter's regress. The impasse which developed, with each set claimed to be more reliable than the other, may well have bewildered the jury, which returned a verdict of not proven in the murder charge.

Conclusions

An examination of the Merrett case can thus tell the historian a number of things about experimental culture relating to gunshot wounds, as well as about the different professional groups involved in these cases. It is clear from the aggressive line of questioning to which Littlejohn was subjected that those present in the courtroom were aware of the issue of experimental standards, and the difficulty of relating them to the context of the case under investigation. Nevertheless, the fact that the experiments on card were chosen to represent the simulated wound in court suggests that metaphorical representations of bodies, rather than the bodies themselves, were acceptable to the courts.

The case also demonstrates the range of expertise which was employed in the investigation of shootings at this time. While the bulk of the essential forensic testimony was given by the doctors involved in the case, they did share a certain amount of investigative space with gunsmiths. Indeed, the part played by the defence's firearms expert, Robert Churchill, was crucial to their experiments; he collaborated very closely with Spilsbury, and challenged the authority of one of the medical experts, John Glaister Sr. Of course this relationship was not replicated to the same extent on the prosecution's side, although, as we have seen, in other cases, particularly in Glasgow, the relationship between forensic medicine and gunmaking was more intimate, with closer collaboration.

This chapter has argued for the growing importance, especially during the 1920s, of a perspective in the investigation of shooting cases which was wider than just the dead body, especially demonstrated by the textbook literature, and the accounts of the investigation of the Stack investigation. The Merrett case, on the other hand, demonstrates that the wound as a conceptual category remained important. While cardboard targets acted as simulated or surrogate wounds, how Mrs Merrett's wound was affected by the gunshot, and subsequent treatment, remained the key question in determining her son's innocence or guilt.

Chapter 4: Photography and forensic medicine

The examination of court records and other sources shows that the primary modes of communication for forensic medicine were the written and spoken words; the former in the form of case reports and textbooks, the latter courtroom testimony. After the experts had carried out their examinations, they submitted written reports to their paymasters, and then read the report out loud in court, before answering questions. However, to focus purely on verbal media would be to neglect another important element, the visual, in particular, the role of the photograph.

Photography played an important role in forensic medicine in the early-twentieth century, both in Scotland and further afield. Images, created by various photographic methods, including conventional, x-ray and microphotography, were used not only as a means of recording, but also for the communication of findings, and as a fresh frame of analysis, allowing more information to be gleaned about a piece of evidence than could be seen with the naked eye. This chapter explores these ways in which photography was employed in forensic practice and examines the debates about photographic reliability and utility in which practitioners were engaged at the time. For example, some experts emphasized the photograph's potential to mislead the careless investigator, whereas others saw it as vital insurance against the fallibility of human memory.

The chapter consists of three main sections. The first examines the role of photography in recording information about cases during investigations, and the use of these photographs to aid communication both between professionals and with courtroom audiences. The section includes an exploration of challenges to photographic reliability and responses to these. The second section addresses a theme related to photographic communication, the use of images outside casework, largely for the purposes of teaching and posterity. Photographs of medico-legal subjects appear in textbooks and practitioners' archives. The third section focuses on photography's use as an enhanced frame of analysis for experts, whereby it could reveal things which were invisible to

the naked eye, for example staining. It also facilitated the comparison of objects. The chapter ends with an example of how photographic manipulations allowed dismembered heads to be compared with portrait photographs to help identify their owners.

Throughout the chapter, I will refer both to cases in which photography was used and to expositions in textbooks and journal articles on the subject. Whilst most of the cases and archival collections referred to in this chapter are from Scotland, reflecting the geographical focus of the research project as a whole, the published sources are drawn from a broader arena. This is because the intellectual debates about photographic evidence did not adhere to national and regional boundaries. For instance, Scottish practitioners wrote in the same journals as their English counterparts, and thus shared a common intellectual space.

The professional and disciplinary space in which forensic photography sat was also more fluid than in other areas of forensic medicine. Medical and police practice overlapped to an extent; photographs were often taken by specialist police officers, and then analysed by doctors, as well as other police. Areas of analytical interest to both of these groups encompassed not only the body, but also the crime scene and trace evidence. In this regard, there are thematic parallels with the story of gunshot examination, as well as, in part, the story of the forensic laboratory, in which some of the caseload was borne by analysts from hospital laboratories, alongside forensic specialists. The case of photography takes these themes of cooperation and collaboration to a different level, in which the boundaries between different professional groups were further blurred, through the overlapping of practices.

The ways in which photography has been used in science and for other purposes, such as proving identity, have been the subjects of a number of historical enquiries. In particular, the ways in which the photograph was established as an acceptable form of evidence, for example of a particular scientific phenomenon, have been examined from various perspectives. Allan Sekula has explored the links between the emergence of photographic portraiture in the nineteenth century and the use of the 'mug shot' in criminal

record keeping. He argues that the use of the photograph to record the appearance of criminals was made possible by the development of systematically constructed archives, which allowed visual imagery to be transcribed and cross-referenced, and therefore used effectively. Their employment can therefore only be understood in a wider context of the growth of state apparatus and attempts to regulate the criminal body. For example, the mug shot was used alongside the taking of detailed measurements of criminal bodies in order to aid the identification of recidivists.¹ Likewise, the examples of the use of photography in forensic medicine detailed in this chapter demonstrate the importance of the wider context of the photograph, such as their use as visual aids in courtroom testimony.

The use of photography in the criminal justice system has also been referred to by John Tagg, who places the photograph within a Foucauldian model of state authority and examines the means by which the photographic image was accepted as a reliable representation of reality. He argues that the social context in which the photograph was used was crucial to its adoption as a form of evidence of identity to be used in the detection of crime. Tagg identifies 'realism' as being a dominant 'régime of sense' within society, the means by which human senses were understood. There was a belief, he argues, in the existence of a fundamental reality which could be captured by the camera. Distortion was, of course, possible, but only to a limited degree:

The falsifications that can occur – cropping, retouching, interference with the negative – are only perversions of this purity of nature. Behind every distorted or inadequate photograph is a truth which might have been revealed.²

The question of truth, fundamental to the realist position, was also relevant to the emergence of the concept of objectivity in scientific images, of which the photograph was an important form. From the late-nineteenth century, objective views, free from any human interference or interpretation, became the ideal standards for visual representations in science. Lorraine Daston and Peter

¹ Allan Sekula, "The body and the archive," *October* 39 (1986): 3-64.

² John Tagg, *The burden of representation: essays on photographs and histories* (Basingstoke: Macmillan, 1988), 98.

Galison have charted this in relation to the compilation of scientific references, such as anatomical and botanical atlases, as well as in other contexts, such as the use of x-ray photography in court. They chart a shift away from an emphasis on hand-drawn illustrations which were 'true to nature', in which various samples of, for example, a leaf were amalgamated by an artist into one 'typical' drawing, with any imperfections erased, towards a representation of an object in which no effort was made to alter its appearance. An effort was made to eliminate all human judgement and interpretation from the creation of the image, which scientists regarded as having a distortive effect on the subject. This ideal was termed 'mechanical objectivity'. Although this was attempted with drawing, photography was held to be an ideal medium for this because of its relative mechanization. Machines, of course, did not exercise their own judgement and interpretation.³

The emphasis on objectivity survived into the period studied by this thesis. The desire to eliminate human interference can be seen with regard to the photography of crime scenes. The dangers of interfering with crime scenes and the positions of bodies before any photographs had been taken was noted by both medical and police authors on the subject. Experience had taught them that such blunders could undermine prosecutions.

Despite their objective potential, photographs had the capacity to mislead – a fact about which their proponents were well aware. Jennifer Tucker has examined the means by which scientific groups sought to minimize these risks. They actively sought to shape the types of submissions they received from amateurs who had, for example, photographed meteorological phenomena, setting appropriate standards and regulating the provenance of images. Photographic exhibitions laid bare photographers' methods, subjecting them to scrutiny.⁴ Likewise, in the medico-legal context, it was necessary to demonstrate the provenance of any photographs produced in court. The

³ Lorraine Daston and Peter Galison, "The image of objectivity," *Representations* 40 (1992): 81-128; Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), 115-90.

⁴ Jennifer Tucker, *Nature exposed: photography as eyewitness in Victorian science* (Baltimore: Johns Hopkins University Press, 2005), 12, 145-58.

photographer might be expected to speak to their veracity and produce original negatives, their methods being scrutinized.

The photograph as a recording and communication device

One of the major uses for photography during the period under study, both in forensic medicine and the broader sphere of criminal investigation, was the creation of a visual record of a case. Examples of this can be seen throughout the period of study, from Harvey Littlejohn's routine work as Edinburgh's police surgeon over the first two-and-a-half decades of the century, to the Ruxton case in the 1930s. Littlejohn, who was both the police surgeon for Edinburgh and Regius Professor of Forensic Medicine at the university, compiled two large photograph albums of images taken from post-mortem examinations over a number of years, which are now held in the archives of the University of Edinburgh.⁵ Many of the photographs are cross-referenced to the appropriate case report in Littlejohn's post-mortem notebooks, and each is accompanied by a caption describing the contents, among which are images of whole bodies before dissection, close-up photographs of relevant parts of the body, and tissue samples removed and retained afterwards. However, the collection is not fully comprehensive; not every autopsy in which Littlejohn participated is represented by a photograph in the album. However, this does not disprove that photographs were taken more often; Littlejohn may only have retained those images which he thought were most interesting. It is likely that in many, if not most cases, a police photographer was at the ready to record anything noteworthy.

Certainly, later textbook authors argued that the photograph was an important means of recording the post-mortem examination, being more effective than written descriptions. For example, Douglas Kerr wrote, in 1936, that it was 'frequently advisable', once a body had been identified, for a photograph to be taken which included a view of the injuries and other signs of violence. 'Such a photograph conveys a much better idea of the position of any injuries than can possibly be given by a description, however good,' he wrote.⁶ Thus, as well as preserving the image to aid the memory of the expert,

⁵ Post-mortem photographs of Sir Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/3.

⁶ Kerr, *Forensic medicine* (1936), 23.

photographs were also a more effective medium of conveying information to the court, for example, about the positions of injuries and other details. Of course, as Kerr stated, it was important to establish the veracity of the images before they were used in this way. He wrote, ‘Should it be desirable to use such photographs at the trial, their accuracy will have to be spoken to by the witness who took the photograph.’⁷ This requirement was, in part, an acknowledgement of the potential for the photograph to mislead, if not interpreted carefully.

It was also considered important to take photographs, both at post mortem and during the examination of live subjects, of objects likely to change over time, again to ensure their appearance was recorded. For example, Robert Churchill wrote in 1929 of the importance of photography in the investigation of gunshot wounds:

Photographs of direct flesh wounds before cleansing, and the careful notes of medical witnesses of any peculiar markings, are invaluable assistance in determining distance, particularly in double or doubtful cases of ‘Murder and Suicide,’ in order to make sure that there is no possibility of it being a carefully planned double murder.⁸

As we learned in chapter 3, the pattern of powder markings on a wound could be used to determine the distance at which the shot had been fired, which was an important consideration when trying to determine whether the wound was self-inflicted or not. If a shot had been fired from a distance greater than arm’s length, suicide would most likely be ruled out as an explanation. This vital powder might have been washed off before the post-mortem examination to give a clearer view of the wound or, if the victim had survived, before a dressing was applied.

Interestingly, in this instance, Churchill’s suggestion was that photographs should be used alongside the written observations of the medical witnesses, rather than being allowed to speak for themselves. This raises a

⁷ Ibid.

⁸ Robert Churchill, "The forensic examination of firearms and projectiles," *Police Journal* 2, no. 3 (1929): 369.

parallel with some of the early responses to the use of x-ray photography in court in the United States, a point which has been identified both by Daston and Galison, and Tal Golan. Plaintiffs in medical negligence lawsuits sometimes employed x-ray images. Surgeons believed that the photographs could be easily ‘misinterpreted’ to demonstrate a surgical injury or error, for which they could be held liable. The effects of changes in, for example, the position of the x-ray lamp on what the image appeared to show could be profound. Thus, it was necessary for surgeons to be able to interpret the image, and provide a convincing explanation of its contents for the jury, rather than allow them to draw their own hasty conclusions in what could be a hostile courtroom environment.⁹ Representatives of the medical profession argued that the doctors’ experience and expertise should not become subordinate to ‘the pictorial testimony of the skiagraph [radiograph]’.¹⁰ In addition, it is notable that Churchill, a gunsmith by trade, rather than a doctor, in commenting on the investigation of wounds, was, to a certain extent, occupying a medical space. This was, of course, in keeping with the scope of his evidence in the Merrett trial of 1927, explored in chapter 3, in which he offered opinion on Mrs Merrett’s wounds, which were an ostensibly medical matter.

Photographs were also taken during the post-mortem examination for the purposes of identification. According to Sydney Smith, photographing the corpse, full-face and in profile, was an important step in the identification process, alongside the recording of the person’s dimensions, age, sex and any distinguishing features.¹¹ On the other hand, Smith did not argue that photographs were to be taken as the corpse was dissected, instead stating that ‘as the autopsy is proceeded with, details of the examination should be taken down verbatim by an assistant, and sketches made of all important injuries.’¹² Indeed, among Smith’s post-mortem records, there are often special diagrams with the injuries marked on them.

⁹ Daston and Galison, "The image of objectivity," 110-12.

¹⁰ Golan, *Laws of men and laws of nature* (2004), 198.

¹¹ Smith, *Forensic medicine* (1925), 42-3. The data which Smith stipulated be recorded all proved crucial in the investigation of the Ruxton case in 1935. John Glaister, Jr. and James Couper Brash, *Medico-legal aspects of the Ruxton case* (Edinburgh: E & S Livingstone, 1937).

¹² Smith, *Forensic medicine* (1943), 50.

Douglas Kerr also cited photographs as being a 'ready means of identification', although he recognized that caveats to their use existed, since they could easily be rendered misleading, for example by the reversal of a negative.¹³ Indeed, potential legal problems with the use of photographs in the identification of potential suspects were a frequent topic in policing literature. It was thought that exposing a witness to a selection of photographs of suspected persons before their viewing of an identity parade might prove prejudicial.¹⁴

Forensic photography was not, of course, confined to photographs of human bodies, dead or alive. Scenes of crimes and other incidents, such as traffic accidents, could also be photographed. Ostensibly, this might seem to have been the domain of the police investigator and photographer, rather than the medico-legist, and indeed, there was a recognizable demarcation between the two. Nevertheless, this divide was porous. Medical experts ruminated on the subject of photographic representations of crime scenes, alongside their non-medical counterparts, in textbooks and journal articles. Some aspects of crime-scene photography were intimately bound to medical concerns. Photographs could record the positioning of the body and any biological traces, such as bloodstains. Also, because the crime scene was a space with multiple stakeholders, practitioners had to be aware of each other's needs, to prevent the inadvertent loss of valuable evidence. They had to cooperate closely. This is made clear in a typescript contained in the archives of the forensic medicine department in Glasgow, which has been attributed to John Glaister Jr.:

There is no fault more common nor one more disastrous than that of irresponsible searching for evidence by either police or [*sic*] medical authorities. Police officers, if they disturb the body prior to a view by the medical examiner may destroy evidence relating to the cause, manner and time of death. The medical examiner, if he devotes his attention exclusively to the body without regard for non-medical evidence, may destroy

¹³ Kerr, *Forensic medicine* (1936), 35.

¹⁴ "Legal notes: photographs and identification," *Police Journal* 2, no. 2 (1929): 346-7.

fingerprints or footprints which would have been invaluable in the apprehension of a suspect.¹⁵

It was therefore vital that an effective strategy for sharing the scene be developed.

In general, medical commentary on the crime scene photograph reflected this theme, recognizing that the crime scene was fragile, and could easily be spoiled. Thus, medical authors stated that photographs should be taken of the scene before anything was moved or otherwise altered, with particular regard to the position of the body. For example, Smith wrote, in the 1928 edition (and in subsequent revisions) that:

Should the medical examiner be fortunate enough to be called in before anything is touched, he should have photographs taken of the body and its surroundings and write a precise description before he moves anything. If this were always done it would save much subsequent trouble.¹⁶

In an article in the *Police Journal*, JE Whitley MacFall, Professor of Forensic Medicine at the University of Liverpool, gave an example of just the sort of ‘subsequent trouble’ which might occur if the photograph was taken too late, namely after the scene had been disrupted:

We have an example in one well-known case where the photograph showed a mackintosh, not beneath the body; when I saw it first, it was partly under the body. In the words of the late Professor Glaister, we are liable to draw a wrong conclusion from false premises.

Nothing could be gained, he argued, from attempting to recreate the original scene for the benefit of the photograph, since the arrangement of items would be ‘never quite the same’. For this reason, it was his inclination to ‘always

¹⁵ “Preservation of evidence at scene”, GUA FM/6/1/21, p. 1. The archive’s catalogue attributes this to Glaister, as does Paula Summerly. Paula Summerly, “‘In camera’: photographing forensic medicine and science c. 1920-1940,” *Journal of Visual Communication in Medicine* 30, no. 1 (2007): 20, 23 n. 13.

¹⁶ Sydney A Smith, *Forensic medicine: a text-book for students and practitioners*, 2nd ed. (London: J & A Churchill, 1928), 43.

carry in my car a loaded camera ready for use', although a photograph taken by a specialist photographer was preferable.¹⁷

The fragile nature of the crime scene was also emphasized by non-medical authors on the subject, who were mainly drawn from the ranks of police detectives and specialist photographers. J O'Brien, an inspector in the Metropolitan Police, acknowledged that, on occasion, items might be moved before being photographed. Like MacFall, O'Brien stated that, in such an eventuality, no attempt at reconstruction should be made. In the first of a series of articles entitled "Simple photography for policemen", he noted that it was the photographer's responsibility to take photographs of what he saw on arrival:

Anything which has been moved prior to the photograph being taken is the responsibility of the person who has moved it; any attempt to reconstruct a scene must obviously destroy the value of any photographs taken, and it is quite certain that they will not be admitted as evidence.¹⁸

It can therefore be seen that both medical experts and detectives viewed the photographic preservation of the crime scene's integrity as being a vital part of the investigative process. This was, of course, in recognition of the fact that the crime scene could not remain pristine forever. The relative positions of objects, and their appearances, which could be of vital importance, 'must of necessity be destroyed in the process of investigation'.¹⁹ The fact that photographs allowed the observer to 'return' to the scene long after it had been cleared was one of the qualities to which the experts referred in their writings, both implicitly, and more explicitly. At one level, a photograph of a crime scene, as long as nothing had been moved, provided demonstrable proof as to the positions of any objects, and bodies, when the crime was discovered. Hans Gross, the Austrian criminal jurist, argued that 'photography may be employed ... each time that an object should be fixed for future reference'.²⁰ This was

¹⁷ JEW MacFall, "The medical side of criminal investigation," *Police Journal* 7, no. 2 (1934): 156.

¹⁸ J O'Brien, "Simple photography for policemen: part I," *Police Journal* 9, no. 1 (1936): 66.

¹⁹ "Preservation of evidence at scene", GUA, FM/6/1/21, p. 1.

²⁰ Hans Gross, *Criminal investigation: a practical textbook for magistrates, police officers and lawyers*, ed. J Collyer Adam (London: Sweet & Maxwell, 1924), 171.

especially important in cases of suspicious death, in which murder, rather than suicide, was suspected. One Chief Inspector Storey, of the Liverpool City Police, writing in 1934, made an explicit comparison between the usefulness of a photograph in such a situation, and the shortcomings of investigators' memories, which were subject to variability:

A mental photograph of the body is not sufficient. That point cannot be too forcibly stressed, as experience has repeatedly shown that two persons giving a mental picture of the position of a body will differ in some detail as to how the body lay. One will say the left hand was under the head, while the other will be equally emphatic that the head was resting on the right hand.

This confusion on the part of witnesses could have serious consequences for the prosecution in court:

In cases in which an actual photograph has not been made of the body, the defending barrister at the Assizes will quickly have the witnesses at variance and the jury fogged over what may be a vital point as to how the body was found.²¹

Photographs were thus means both of fixing the scene, and helping to secure a conviction.

Besides creating a permanent record of the scene to prevent obfuscation by hostile parties, experts argued that the crime-scene photograph allowed the various investigators to re-examine the scene, and pick up on anything they may have missed on their first inspection. Indeed, MacFall argued that images of the body could allow other experts, who might not have been able to attend the crime scene in the first instance, to contribute. 'An experienced eye can find upon such photographs, details which the first investigator had not noted, although present at the scene of the crime,' he wrote.²² This is reminiscent of the role of the medical post-mortem report, discussed in chapter 1, which allowed experts not present at the autopsy to give an opinion on it. The utility

²¹ Chief Inspector Storey, "Murder in the guise of suicide," *Police Journal* 7, no. 2 (1934): 161.

²² MacFall, "The medical side of criminal investigation," 156.

of this feature of photography was reiterated by O'Brien, who noted that many people were not particularly observant, and could not recall, for example, every object found in a room. This applied to police officers as well as the general population, despite the former's special training:

I remember some years ago an officer, quite honestly, but nonetheless emphatically, denying, in the witness-box, that a particular window in a house he had visited was there at all, until he was shown a photograph of it.²³

A crime-scene photograph, which could be returned to, could also prove useful when the focus of an investigation changed. This point was made eloquently in the typescript attributed to Glaister, "Preservation of evidence at scene", in which he argued that, even in cases which seem straightforward, photographs should still be taken, since the case might later take an entirely new direction:

The entire completion [*sic*] of the case may subsequently change and the absence of photographs becomes a serious handicap. Relationships which at first were overlooked because they were thought to be insignificant, become highly important. (Where was the rock with respect to the head which subsequently disclosed a depressed fracture? Where was the discharged cartridge case with respect to the window through which the shot was supposed to have been fired? What was the position of the body at the scene with respect to the livor disclosed at autopsy? Did the blood on the bottom of the feet of the victim get there when the body was moved by the undertaker, or was it originally present before the body was disturbed?)²⁴

²³ O'Brien, "Simple photography for policemen: part I," 65.

²⁴ "Preservation of evidence at scene", GUA, FM/6/1/21, p. 3. 'Livor' refers to livid (i.e. black and blue) discolouration on the skin of a corpse. Unfortunately, this particular document is not dated, so it is difficult to determine where it fits into the story of this chapter. According to the archive's catalogue, it could have been produced anywhere from the 1930s to the 1950s. Nevertheless, despite its short length (five pages), it provides a fairly comprehensive exposition of crime-scene procedure, and is thus of some interest.

The “Preservation of evidence” document is not the only source which suggests that the usefulness of photographs, or other visual records, was not always immediately apparent. In a 1949 article about the forensic analysis of footprints, tyre-marks, and tool-marks, Douglas Hamilton, a detective in the Identification Bureau of the Glasgow police, reflected on the nature of this type of evidence, and how it fitted in with other parts of the investigative framework. He noted that, unlike fingerprinting, the identification of footprints and other such markings was not specific. Thus, they could only be evidence of a ‘supplementary and corroborative nature’. While this could, in the most favourable of circumstances, help ‘strengthen other evidence into an irrefutably strong chain of fact’, on other occasions this potential was not immediately recognized:

Instances occur from time to time where marks of the above nature found at the scene of a crime are dismissed as being valueless, but, if the corroborative value of such evidence were appreciated it would be seen that the marks might be the missing link in an otherwise complete chain of evidence.

The photograph, or indeed the plaster cast, could help overcome this problem, allowing later reflection on part of the crime scene, from which new perspectives could spring:

The cast or photograph of traces of footwear, etc., often reveals characteristic data which was not suspected of being present in the first visual examination, and if any doubt exists it should be the practice to photograph or take casts of all traces found, and study these before deciding on their ultimate value as evidence.²⁵

Photography, in other words, ought to be routine.

Given the importance attached to photography, it is worth considering the extent to which the photograph was considered to be a reliable standard of

²⁵ Douglas Hamilton, "Traces of footwear, tyres and tools, etc., in criminal investigation," *Police Journal* 22, no. 1 (1949): 43.

proof. This varied, of course, among different authors. Some wholeheartedly embraced photography as being an arbiter of truth, while others highlighted its limitations. The photographic image could be conceived as a standard against which other forms of visual observation were measured. For example, in 1929, Herbert Winstanley, an Assistant Chief Constable in Liverpool, illustrated the shortcomings of visual memory by a comparison to photography:

When you take a photograph the image is focused on the photographic plate and is automatically recorded there. Now that is not the case with the eye. In the first place the field of vision is different from that of an ordinary lens. The lens records everything in its field of focus with equal precision. The eye on the contrary either sees a wide field of view in broad masses, or a narrow field of view in detail.²⁶

The author of “Preservation of evidence at scene” expressed similar views. He cited four ways in which important details of the crime scene could be recorded: ‘memory’; ‘written description’; ‘drawings’; and ‘photographs’. He described photography as being ‘frequently the most exact’ method of recording details, being ‘relatively unaffected by [the] subjective emphasis of the investigator’.²⁷

Nevertheless, some authors argued that there were shortcomings to photography, especially in certain situations. For example, the Chief Constable of Brighton, WJ Hutchinson, writing in the *Police Journal* in 1937, argued that for the investigation of road accidents, plan-drawing was a preferable technique of recording the layout of the scene to photography, which he saw as having a number of specific shortcomings. Indeed, he argued that when it came to their use in court proceedings, plans which had been drawn to scale were more reliable than photographs. For instance, there were some things which the camera could not accurately record, especially angles and dimensions. One such example cited by Hutchinson was that of the angle at which a side road joined a main road, which could not be accurately captured by the camera. On

²⁶ Herbert Winstanley, "The limitations of evidence," *Police Journal* 2, no. 2 (1929): 180.

²⁷ “Preservation of evidence at scene”, GUA FM/6/1/21, p. 3.

the other hand, this could be shown on a plan.²⁸ Similarly, taking a photograph of a road to demonstrate its dimensions would be a futile task:

While the width of the road may be correctly represented, the length cannot be shown in the same scale. For instance, the road width of 30 feet may occupy 3 inches of the photograph while the length which may be 100 yards occupies only a depth of half an inch.²⁹

Hutchinson cited further issues with photographic accuracy, stating that the severity of a bend in a road could vary with the angle at which a photograph was taken. To illustrate this, he used two photographs of the same bend in the road taken from a manslaughter case, one taken by the prosecution, the other by the defence. The two photographs had been taken from different positions. The bend as it is represented in the former appears gentler than in the latter. A plan, which was also drawn at the time, appears to have been the only way to mediate between the two images. Indeed, the trial judge stated that, because they could be 'deceptive', photographs 'should be treated as an accessory to the plans which we have before us'. As Hutchinson himself said, 'However beautiful a picture may be, embodying almost every detail of any scene, the fact remains that the essential point, accuracy, is lacking.'³⁰

It was not only in the context of road accident investigation, but at other loci also, that Hutchinson felt that the photograph was trumped by the hand-drawn images, due to shortcomings of the photographic technique. Shadows, which were an almost inevitable part of any photographic image, would create difficulties, especially when photographing crime scenes, as this example cited by Hutchinson shows:

Both photographs and scale drawings of stains in a cupboard were produced in connection with a murder trial. The photographs were very clear, but owing to certain shadows being cast, owing to the relative positions of the cupboard and

²⁸ WJ Hutchinson, "Plans and photographs," *Police Journal* 10, no. 1 (1937): 49.

²⁹ *Ibid.*, 50-1.

³⁰ *Ibid.*, 50.

the window light, unless one was acquainted with the actual object a misinterpretation was possible.

This was not the case with scale drawings. ‘The scale drawings produced gave a true representation of the position *and size* of these stains, and left no doubt as to their evidence,’ he wrote.³¹ Nevertheless, despite these misgivings, Hutchinson acknowledged that photographs served some purpose, although they lacked the plan’s reliability.

Hutchinson’s misgivings about the use of photography in the surveying of crime and accident scenes mirror the debates identified by Daston and Galison in their account of the emergence of objectivity as a scientific ideal. While the photograph offered a means of eliminating a degree of human agency from the image-creation process, it resulted in compromises which some scientists were not keen to entertain. For example, it was argued that drawings offered a better depth of field than photographs, allowing more useful detail and colour to be included; they were thus of greater utility to the student. On the other hand, as Daston and Galison point out, plenty were willing to sacrifice some utility in favour of objectivity, which had a significant moral currency attached to it.³² Similarly, the photograph in the forensic context retained its objective value, despite the limits Hutchinson described.

Overall, the photograph appears to have been an important means of recording data about specific cases, both on the medical side and in the investigation of crime scenes. It was a useful way of preserving an immediate view for later, in case some detail was missed at an initial examination. It also served as an aid to communication in the courtroom. For example, a photographic representation of injuries offered a much clearer demonstration of the injuries than did a verbal description. Finally, it offered a lasting proof of a particular moment in time, for example demonstrating the position of a body as it was found at a particular locus, allowing prosecutors to fend off challenges which might be launched if the only evidence was from the memories of witnesses.

³¹ Ibid., 49.

³² Daston and Galison, *Objectivity* (2007), 160-1, 179, 185.

The trial of Buck Ruxton, in 1936, for the murder of his wife and servant, can in many ways be seen to be an icon for the use of photography in forensic medicine and criminal investigation. Ruxton, a general practitioner based in Lancaster, was accused of murdering and dismembering his common-law wife, Isabella, and their maid, Mary Rogerson, and then dumping the remains in a stream near Moffat, in south-west Scotland. The case involved the reconstruction of the two bodies by medico-legists and anatomists from the universities of Edinburgh and Glasgow. This culminated in the creation of the spectacular images of the mutilated heads superimposed onto photographs of the two missing women, in order to help demonstrate the remains' identity. These pictures achieved longevity through their inclusion in textbooks, and other accounts of the case. Their importance, both as a courtroom spectacle and as an example of photography used as a frame of analysis, will be discussed in a later section of this chapter. However, the case also exemplified a more routine use of the photograph in forensic medicine, as a means of recording the appearance of the body parts which had been found, 'in view of the possibility of court proceedings'.³³ This provides an insight into the authority which was ascribed to the photographic image. For example, the case demonstrates some of the shortcomings of photography as a means of documentary record keeping. What appeared in the photograph sometimes contradicted the testimony of the medical experts. This led to a conflict of authority between the photograph and the medical experts; in this case, the medical authority of the experts prevailed.

A very comprehensive photographic record of the case was made, of the body parts, the place they were found and the Ruxtons' house in Lancaster, the alleged scene of the killings. Many of the photographs appeared in a textbook about the case, *Medico-legal aspects of the Ruxton case*, authored by John Glaister Jr. and the Edinburgh University anatomist James Couper Brash, who both took part in the investigation. The photographs were also produced in court as exhibits. During their evidence, the prosecution medical witnesses referred extensively to the photographs. An example of this is Brash's description, in court, of the extent to which one set of remains, 'Body No. 1', believed to be that of the maid Mary Rogerson, could be reconstructed. Brash

³³ Glaister and Brash, *Medico-legal aspects of the Ruxton case* (1937), 4.

began by detailing the body parts which were available to him, for which he used photographs as visual aids:

[Body No. 1] consisted of the head and limbs, as shown in the photograph No. 7, Exhibit 177. These photographs were taken under my supervision. No. 7 shows the skull, the two upper portions of the arms and the two forearms with the hands, two thighs and two legs with the feet.³⁴

He then went on to describe how well the joints in the arms and legs fitted together.

In his evidence, Glaister used the photographs to point out features of the remains which indicated violence, for example on one of the arms of Body No. 1:

In photographs 15 and 17, dealing with the upper arm, can be seen a bruise. On cutting into that area, we found that there was free blood which one would expect in bruising by violence.³⁵

As well as being a form of documentation for the body parts and their condition, regarding injuries, the photographs provided the expert with a means of signposting important details in their testimony, such as the appearance of free blood in the bruising Glaister described.

The Ruxton trial also raises questions about the reliability of photographic evidence, and shows how apparent contradictions between what the expert said and what the photograph appeared to show were reconciled. Debates centring on the photographic record of the case took place between the prosecution's expert witnesses and the barrister for Ruxton's defence, Norman Birkett, who pointed out photographic details which appeared to be at odds with the prosecution's case. The primary example of this concerned one of the disarticulated hands, which the prosecution experts argued belonged to the rest of Body No. 1, which they believed to be the remains of Mary Rogerson. The

³⁴ RH Blundell and G Haswell Wilson, eds., *Trial of Buck Ruxton*, Notable British Trials (Edinburgh: Hodge, 1937), 180. It should be noted that Brash clearly attests to the provenance of the photographs being presented to the court.

³⁵ *Ibid.*, 144.

defence suggested otherwise. Since Mrs Ruxton's hands had already been accounted for, two scenarios were possible. The first was that the hand had indeed been Rogerson's. The second was that the hand belonged to neither of the missing women, but to a third body. This would have cast doubt on the identities of the bodies being those of Ruxton's wife and maid, and undermined the prosecution. Birkett argued on two grounds that the hand in question was not Rogerson's: first, that it showed evidence of having worn a wedding ring (the maid was unmarried); and, second, that the fingernails were too well manicured to be those of a maid. Birkett based this line of argument on what was shown in one of the photographs which had been taken of the body parts.

Birkett first confronted Glaister with a photograph which appeared to show 'the distinct marking of a ring having been worn' on the ring finger which the Crown contended had belonged to the unmarried Mary Rogerson. Glaister admitted that there was a patch of light and shade in the photograph, but asserted that when he had examined the hand itself, 'there was no suspicion of any ring mark in that location on 1st October'. When Birkett pressed him on this, Glaister persisted, saying that he had not observed anything of that sort, but that the condition of the body was not immutable:

I might add that the changes which may, and are likely to, have taken place in these parts, after the treatment they have had and the interval of practically four months from the initial examination, might easily account for a lot of things at this stage.³⁶

In other words, the markings which Birkett observed could have been caused by the preservation (the body parts had been treated with formalin) and other, natural, processes to which the hand had been subjected, and which had manifested themselves after Glaister's initial examination.³⁷ Dr William Gilbert Millar, of Edinburgh University, gave a similar account to Glaister. He agreed that there was a mark on the photograph, though he denied that it had been left

³⁶ Ibid., 154.

³⁷ Glaister and Brash, *Medico-legal aspects of the Ruxton case* (1937), 18.

by a wedding ring. He too stated that he had not seen any 'special mark' when he examined the hand in question.³⁸

Finally, Sydney Smith was questioned on the subject of the alleged ring-mark. He agreed that there was 'certainly ... a most distinctive mark', which 'may look like a ring mark; it is certainly a ridge'. When pressed on this, however, he pointed out that a more careful examination of the photograph ruled out a ring-mark:

But if you examine it carefully you will see that there is quite a distinct ridge at the base. How we are going to get that by wearing a ring I have no idea. If a tight ring is worn constantly you get a gradual atrophy in the tissue of the finger. I have never seen anything approaching this appearance caused by a ring.³⁹

Clearly, a very careful and detailed examination was necessary before interpreting pictures of medical evidence. This led to a different conclusion from that arrived at by the defence, whose gaze, it was implied, had been cursory. This echoes some of the arguments raised when x-rays were first deployed in the courtroom, namely that it took an expert's interpretation to reveal the image's true meaning. Lay eyes could not be relied upon to properly interpret its content.⁴⁰

Responding to this revelation, the judge asked Smith whether he had examined the hand itself. This suggests that the direct examination of a body part was granted greater authority than the inspection of its photograph, for reasons which will be explained below. Smith had indeed examined the hand, several times. On past occasions, he had not seen anything which suggested that the deceased had worn a ring. This was the main point he wished to get across. When he was re-examined by Crown Counsel, he emphasized that when he initially examined the hand, he had not seen any significant mark. He went on to say that he had in fact been looking generally for 'anything that might

³⁸ Blundell and Wilson, *Trial of Buck Ruxton*, 176.

³⁹ *Ibid.*, 194.

⁴⁰ Golan, *Laws of men and laws of nature* (2004), 197-205.

help in identification', but had found nothing. Recently, however, there had been a marked change:

To-day I had another look at the hand, and there is no question of doubt at the present time, to-day, there is quite a different impression on the side of the ring finger.

This led to an important exchange between the defence counsel and the expert witness:

Q. If you were examining that hand to-day, would the hand give every indication of that finger having worn a ring?

A. It would have to be taken into very serious consideration whether that mark in itself means that a ring has been worn or not.⁴¹

Thus, had the examination of the hand been left until later, a different (or at least more ambiguous) conclusion about the wearing of a ring might have been reached, the possible consequences of this for identifying the remains being discussed above. Crucially, the effects of the body's decay and the preservation attempts, which would have been a hindrance to the expert, would not have been mitigated by reference to the photographs, since, as shown, they were a source of ambiguity themselves.

Indeed, the ambiguity of the photographic technique was demonstrated by the judge when, for the benefit of the jury, he summed up the exchanges between Birkett and Smith, and the comparison of photographs which appeared to show different things despite having ostensibly the same subjects:

Look at the [photograph] Mr Birkett was asking about, No. 25. If you look at the ring finger on No. 25, the left hand of Body No. 1, you see something which looks like the mark of a ring. The witnesses who have given evidence about the hand said they did not notice any mark of a ring. This gentleman has been to look at it to-day, and he says there is something like that. Now

⁴¹ Blundell and Wilson, *Trial of Buck Ruxton*, 194.

he refers back to No. 21. He says, look at that and you will see the same thing on the middle finger. If, further, we look at No. 20, we see no sign of a ring mark on the ring finger on the surface of the hand there exposed.⁴²

As Smith said, ‘with photographs you are so much at the mercy of light and shade’.⁴³

The discussion of the ring-marks was not the only point during Sydney Smith’s testimony where he cited the shortcomings of the photographic technique in response to one of Birkett’s challenges. The challenge in question again related to the left hand of Body No. 1, and was another attempt to show that it was not Mary Rogerson’s. Birkett had been asking all the medical witnesses whether the fingernails on the hand in the photograph were in fact too well manicured to have belonged to a maid, who would have undertaken significant amounts of manual labour during her life, resulting in torn and scratched nails. Birkett again used the photograph as a prompt to begin the conversation:

Q. I suggest to you, Professor Smith, and I suggest it quite strongly, that the photograph of the hand, photograph 25, Exhibit 136, shows well-kept nails on that hand?

A. Well, I suppose you would be entitled to say that looking at the photograph of them.⁴⁴

Smith’s response to the question is the first clue that he regarded the photograph as being an inferior, if not misleading, alternative to direct examination. Responding to further questioning, he stated that when he had examined the fingernails, both with the naked eye and ‘under magnifying lenses’, the nails were in fact considerably scratched. This was not clear in the photograph because of how cameras are focussed:

⁴² Ibid., 195.

⁴³ Ibid.

⁴⁴ Ibid., 194.

This photograph is not focused for the nails, but for the skin at the bottom of the nail, and even being slightly out of focus you may get an idea of the scratches on the index finger. The ring finger on this photograph shows very little.⁴⁵

This shortcoming of the photograph in general, namely that the whole subject could not be shown in the same amount of detail, was down to the fact that cameras have a limited depth of field.

In the Ruxton case, the extensive photographic record of the investigation was an important tool for the prosecution's expert witnesses, to which they were able to refer in order to clarify testimony. On the other hand, it was also a means by which the defence could challenge the expert's authority, highlighting supposed discrepancies between their testimony and what the images appeared to show. Despite these efforts, however, the expert witnesses were able to dismiss the objections, maintaining that their original observations, in which they had not noted any ring-marks, had been correct, and offering explanations for changes in the hand over time. Sydney Smith, in particular, suggested that there were inherent difficulties in interpreting photographs for forensic purposes, since issues associated with focussing and the problem of shadows could lead to confusion.

The forensic photograph for posterity and teaching

While many photographs were taken for the purpose of supporting an investigation and any subsequent court case, their use often went beyond this. Photographs played an important role in the teaching of forensic medicine, most visibly through their appearance in textbooks, as well as in collections which appear to have been partly assembled for posterity, such as Harvey Littlejohn's personal albums, contained in Edinburgh University's archives. This section will explore some of these uses, engaging with secondary literature which focuses on other aspects of medical photography, in particular clinical photography, in which particular medical conditions were depicted.

⁴⁵ Ibid.

There have been a number of studies of the historical use of photography in medicine, ranging from brief pieces in specialist medical journals, to large-scale historical studies.⁴⁶ John Harley Warner and James Edmonson examine the place of the photograph in American medical student life. They present numerous images of anatomy pupils posing with the cadavers they dissected, and reflect on the images' representations of what was a rite of passage for young doctors.⁴⁷ The work invites parallels with Littlejohn's photograph collection, in that in both cases the images of dead bodies appear to have been taken for posterity. Also highly relevant is a thesis by Paula Summerly which examines the use of photography in the late nineteenth-century clinical context. Her study is based on a number of Glaswegian collections, most notably those of a surgeon, William Macewan, who started to amass his collection of over eight hundred images in the 1880s.⁴⁸ The photographs were used for teaching as well as record keeping. Summerly also identifies a system of exchange of interesting clinical photographs between doctors. For example, a doctor might gather various images in the course of a foreign trip, passing them on to colleagues upon return, which Summerly describes as a 'form of clinical currency'.⁴⁹

There are a number of features of the uses of clinical photography, identified by Summerly, which are analogous to the image's place in forensic medicine. One of these is the creation of collections of images by one or more doctors over several years. Harvey Littlejohn, for example, amassed two albums of photographs, acquired largely through his normal casework, as well as from external sources.⁵⁰ The photographs themselves date from the late 1890s to the 1920s, and cover a wide range of medico-legal subjects, from whole bodies and wounds, tissue and organ specimens, to other artefacts, such as weapons. Collections of a wide range of photographs relating to crime are

⁴⁶ Daniel M Fox and Christopher Lawrence, *Photographing medicine: images and power in Britain and America since 1840* (New York: Greenwood Press, 1988); Wilfried HG Neuse et al., "The history of photography in dermatology: milestones from the roots to the 20th century," *Archives of Dermatology* 132, no. 12 (1996): 1492-8.

⁴⁷ John Harley Warner and James M Edmonson, *Dissection: photographs of a rite of passage in American medicine 1880-1930* (New York: Blast Books, 2009).

⁴⁸ Paula Summerly, "Visual pathology: a case study in late nineteenth century clinical photography in Glasgow, Scotland" (University of Glasgow, 2003), ii.

⁴⁹ *Ibid.*, 63.

⁵⁰ Post-mortem photographs of Sir Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/3.

also present in the archives of the Glasgow University forensic medicine department, including images taken at post-mortem examinations, medical examinations of living subjects and crime scenes. Many of these are undated, but appear to stretch into the 1960s.⁵¹

One of the complaints made by Summerly about the historical treatment of medical photographs is that attempts to create a chronological and thematic account of the history of medical photography are often at the expense of analysis of the local context of the photographs' creation.⁵² She also acknowledges that the 'fragmentary' nature of many of the sources can cause difficulties, since the context of their creation, when they were taken and what they were intended to depict cannot be established.⁵³ Some of the photographic collections relating to forensic medicine at Glasgow University are quite fragmentary, and cannot be explicitly connected to specific cases, although others are contained in case files alongside other material, such as written reports. The provenance of much of the Littlejohn photograph collection is clearer. Besides being fixed in albums, the photographs are individually captioned, and many are cross-referenced with specific cases in Littlejohn's post-mortem notebooks.⁵⁴ This allows the researcher to better appreciate the context of the photographs. It also suggests an interpretation of how the photographs contained in the album were used. The fact that many of the images were explicitly linked to specific entries in Littlejohn's casebooks suggests that the photograph and the corresponding post-mortem report were meant to be viewed together. Thus, the fullest understanding of the photograph could only be achieved with reference to the wider context of its creation, alongside the findings of the autopsy at which it was taken. As with Smith's treatment of the Ruxton ring photograph, there are echoes of the belief that the scrutiny of photographs on their own was not sufficient without interpretation.

Many of the captions alongside the photographs provide interpretive detail. Some of them direct the viewer to a specific phenomenon which the

⁵¹ Departmental photographs c.1909-c.1962, Records of the Department of Forensic Medicine and Science, GUA FM/4.

⁵² Summerly, "Visual pathology," 9-10, 17.

⁵³ *Ibid.*, 31.

⁵⁴ Post-mortem photographs of Sir Henry Harvey Littlejohn, EUL SC, EUA IN1/ACU/F1/3.

photographer, presumably the doctor in charge of the case, wished them to note. For example, the caption accompanying four photographs of a set of knees includes the following:

Lower limbs from thighs to feet covered in petechial ecchymoses due to PM effects. Even on dorsal aspects of feet numerous pin point ecchymoses.

The dorsal aspects of the feet are not visible in the photographs. The author of the captions did not feel too constrained by the contents of the photograph, although this may be because this entry in the album is not one of the ones accompanied by a cross-reference to a case report; Littlejohn may have wanted to include as much detail as possible.⁵⁵ Not all of the images are accompanied by such a detailed caption. Indeed, some do not have any caption at all, for example, two images of the head and shoulders of a body lying on a wooden table, with damage to the throat. These images are not dated, cross-referenced, or described.⁵⁶

As stated above, the contents of the albums encompass a broad range of subjects. There are several images of bodies photographed, presumably as they were discovered, at the scene of the incident. For example, one image shows a murder victim lying in bed. This is cross-referenced with a case in the post-mortem notebooks.⁵⁷ Regarding a case from 1924, three images are presented of the same body in situ, each from a different viewpoint. There is a shot of the head and shoulders, one of the whole body taken from the side, and one taken from the feet.⁵⁸

There are also a number of pictures taken in what appears to be the post-mortem room or mortuary, judging by the presence of uniform décor across images relating to a number of different cases, as well as the fact that

⁵⁵ ‘W[-] S[-] 39. LH 72 [?] [?] Seen alive 5-5 am. Found hanging 11 am. Same date 21/9/21. Deep furrow on neck and back. Lower limbs from thighs to feet covered in petechial ecchymoses due to PM effects. Even on dorsal aspects of feet numerous pin point ecchymoses.’, EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 11.

⁵⁶ Uncaptioned photographs, EUA IN1/ACU/F1/3, vol. 2, p. 7.

⁵⁷ ‘Woman murdered by blows with fist and possibly kicks sentence 12 years. XIII p. [*sic*]’, EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 6.

⁵⁸ ‘Suicide in Barnton Plantation, Queensferry Road [?] 1924’, EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 8.

many of the bodies are lying on plumbed slabs. The images include whole body shots, clothed and unclothed, and close-ups of wounds and other interesting features, some of which had been taken before and after washing. Some of the shots of cadavers had clearly been posed. For example, one shot, from around 1901-2, of a person whose throat had been cut shows the body 'sitting' on the slab propped up with a chair and a block of indeterminate material, unclothed, apart from a sheet covering the legs.⁵⁹ In another case, from the same period, it was explicitly stated in the caption that the body had been 'tilted in order to photograph, but arms etc. in position in which she was found'.⁶⁰ This caption would seem to acknowledge the fact that a photographic subject ought to be as close to the original discovery as possible, although this was not always possible.

Another example of a posed body is that of a man who died from hanging. The ligature was still attached, and the body appears to have been re-suspended, after removal to a mortuary, on a hook from the wall, presumably to illustrate how the ligature appeared. The wall is panelled, and the hook from which he hangs is one of a row, of which one is broken.⁶¹ This location is uniform with some images from other cases; similar hooks can be seen in the background of a picture of another body, this time on a slab.⁶² This uniformity is the basis for the hypothesis that the body has been re-suspended and the photograph taken in the mortuary; there is no explanatory caption. Another possible explanation is that the mortuary itself was the location of a hanging; however, there is no evidence for this.

Many of the images of whole bodies appear to have been chosen for inclusion because their appearances were unusual, for example particularly horrific or because they were holding something, to give two examples.⁶³ This

⁵⁹ 'Suicidal Cutthroat JM aet. 19 IV p. 180', EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 15. The cross reference refers to Littlejohn's casebook covering 1901-2.

⁶⁰ 'Woman found in house 59 Comely Bank Road. 13 months after death. IV p. 267.', EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 24.

⁶¹ Uncaptioned, undated image of hanged man, EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 9.

⁶² 'Drowning. Body recovered from [illegible] after 7 months immersion. 17/06/02. IV p. 157.', EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 9.

⁶³ 'Showing results of falling into cauldron of molten metal.', EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 5; 'Weeds found in hand in case of suicide in St Margaret's Loch.' EUL SC, EUA IN1/ACU/F1/3, vol. 1, p. 6.

would suggest that Littlejohn did indeed have an eye to posterity. On the other hand, a number of the photographs appear to have been taken with a more instructive purpose in mind. This can especially be seen in images of specimens taken during the post mortem, many of which were grouped in the album according to type. This would have given students the opportunity to understand and interpret the different conditions of a particular organ or body part they were likely to encounter during autopsies or other examinations. An example of this is the collection of images of hymens. They were made up of nine photographs and one pencil drawing, some of which were specimens removed from the body, others of which had been taken in situ, without having been separated from the body.⁶⁴ These images demonstrated the variety of appearances which the hymen could take, including one which had belonged to a pregnant woman, but which nevertheless was intact. Being able to report on and interpret the condition of the hymen was an important part of the portfolio of skills required of the medico-legalist. Such knowledge was necessary, for example, in order to perform an examination in the wake of an allegation of a sex crime. Textbook authors noted that, while the hymen was normally ruptured during first sexual intercourse, this was not always the case, as illustrated by Littlejohn's photographs.⁶⁵

Although it is not clear whether Littlejohn's colleagues and students would have had access to his albums, the images themselves were intended to play a role in the teaching of forensic medicine. This is shown by their inclusion in Littlejohn's 1925 book, *Forensic medicine*. This was not a comprehensive textbook along the lines of those of Smith, Glaister or Kerr, but rather a collection of photographs of medico-legal subjects, drawn exclusively from the practice of Littlejohn himself, as well as those of Douglas Kerr, his assistant, and John Wright Mason, a police surgeon from Hull who had a

⁶⁴ 'Intact hymen of woman aet. 41. Suicide by Lysol. 1924.'; 'Intact hymen of girl aet. 18 died from accidental rifle wound. The [?] hides the lower segment of the hymen. See book p. 285.', EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 13; 'M[-] D[-]. 26 unmarried. Pregnant 6 months, suicide by carbolic acid. The hymen was intact.', pencil drawing of vagina, EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 17; 'Circular hymen'; Hymen consisting of narrow band.'; 'Fibrinated hymen', EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 42; 'Semilunar hymen.'; 'Deflorated hymen.'; 'Private parts of a prostitute. Absence of all trace of hymen.', EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 43; picture of intact hymen in a case of death from CO poisoning, November 1926, EUL SC, EUA IN1/ACU/F1/3, vol. 2, p. 53.

⁶⁵ Smith, *Forensic medicine* (1925), 224-8; Kerr, *Forensic medicine* (1936), 166-7.

notable collection of his own.⁶⁶ Littlejohn's introduction to the book demonstrates that he considered the viewing of photographs by students to be useful, especially when combined with the reading of informative textbook passages. He wrote, 'It is hoped that this volume will be of practical use to students and general practitioners, and help them to appreciate more easily the descriptive accounts in the text-books.' He went on that the book was best used as 'a companion volume to text-books on Forensic Medicine', supplementing them with illustrations of subjects which were 'not as a rule fully portrayed'.⁶⁷ These statements add further credence to the view that Littlejohn believed that the consumption of the photographs was necessarily accompanied by textual interpretation. His photographs were intended to complement, rather than replace, textual accounts of forensic medical practice.

Littlejohn expressed further opinions about the role of the photograph in teaching in an article about his department, which he wrote for the Rockefeller Foundation, published posthumously in 1928 as part of the *Methods and Problems of Medical Education* series. In it, he advocated the use of photographs, in the form of lantern slides, as a means of demonstrating 'bodies previous to dissection', as well as 'supplementing the museum specimens by illustrations taken from books of remarkable and uncommon conditions'.⁶⁸ Nevertheless, he preferred to use physical specimens, rather than pictures, if at all possible:

Diagrams and illustrations serve a useful purpose, but it is much better, if possible, to illustrate lectures by actual preparations. We are fortunate in possessing a large museum of preparations from medicolegal cases embracing every branch of the subject.

Specimens pertinent to lectures were set out in one of the laboratories at 'special hours', to allow students to examine them.⁶⁹ This writing further suggests that while Littlejohn viewed the use of photographs in teaching as

⁶⁶ Henry Harvey Littlejohn, *Forensic medicine: illustrated by photographs and descriptive cases* (London: J & A Churchill, 1925), vii-viii; "John Wright Mason, MB, CM, DPH," *British Medical Journal* 1, no. 3607 (1930): 363-4.

⁶⁷ Littlejohn, *Forensic medicine* (1925), vii.

⁶⁸ Henry Harvey Littlejohn, "Department of Forensic Medicine University of Edinburgh," *Methods and Problems of Medical Education* (1928): 10.

⁶⁹ *Ibid.*, 9.

useful, it was only one part of a range of potential visual aids, including museum specimens, which could be employed to useful effect in the teaching of forensic medicine. Experience of handling actual specimens was more valuable. However, the text demonstrates that both were tied to lectures. The expert gaze had to be trained to interpret both photographs and physical specimens.

In addition to lecture- and museum-based teaching in universities, textbooks were an important means of imparting medico-legal knowledge. The preface to Littlejohn's own book suggested that he believed textbook illustration in general to be sparse; he thought it necessary to supplement them with images of his own. Certainly, the major textbooks of the time, such as those by Glaister and Smith, were only modestly illustrated. Far from every condition or phenomenon described in the text was represented by a photograph, and most pages did not contain a picture. However, the books did contain some photographs of medico-legal subjects. These were mostly drawn from real cases, either those of the author or ones provided by other practitioners. These included photographs of wounds, other injuries, such as the effects of lightning strikes, and microscopic subjects, such as blood cells. The books also contained some hand-drawn illustrations, which allowed a clearer level of detail to be shown on some subjects, for example samples of different fingerprint types.⁷⁰ Some microscopic subjects, such as the structures of hairs and fibres, were also rendered by hand, probably for reasons of clarity. Smith's textbook also contained drawings of different hymens, in contrast with Littlejohn's photographs, providing a level of detail which would be harder to achieve photographically.⁷¹ The textbooks' authors did not reflect on the implications of their choices between photographs and drawings in terms of reliability, objectivity, or 'truth to nature'. However, the fact that the illustrations of medico-legal subjects were largely photographs drawn from real cases, rather than hand-drawn diagrams, suggests that the objective viewpoint, in the terms of the debates chronicled by Daston and Galison, was favoured in the compilation of textbook illustrations.

⁷⁰ Glaister, *Medical jurisprudence and toxicology* (1921), 80-2. Interestingly, however, the hand-drawn diagrams of fingerprints were also accompanied by some genuine examples.

⁷¹ Smith, *Forensic medicine* (1925), 225-6.

The photograph as an analytical tool

Photography could also be used as an analytical tool in its own right. It could enhance the naked eye's view in two ways. The first was as a means of making visible things which had previously been invisible. This was true of photography using the visible spectrum of light, and especially of x-ray and infrared photography. Second, the photograph provided a platform for the meaningful and accessible comparison of two things, such as markings on bullets or flecks of paint from a car. As with the other uses of photography detailed above, there were various caveats and criticisms associated with the use of photography in this manner.

An enhanced view

Standard light photography as a means of offering an enhanced view of a body, or scene, was advocated in *Criminal investigation: a practical textbook for magistrates, police officers and lawyers*, by its author, Hans Gross (1847-1915), an Austrian magistrate and professor of criminal law. The edition referred to here was published in 1924, having been adapted by J Collyer Adam, a Madras barrister, from Gross's 1893 *System der Kriminalistik*. The original had been an instruction manual for the Austrian *Untersuchungsrichter*, or investigating magistrate, a judicial officer whose role it was to lead investigations into major crimes.⁷² Many of Gross's principles were relevant to the work of personnel at various levels in the criminal investigation hierarchy, and the book was influential in the development of policing and forensic science.⁷³ Gross specifically advocated photographing subjects, because details not visible to the naked eye might be shown by the image:

An object has been observed with great minuteness and application; a whole series of observations have been made regarding it; nothing striking has been noticed about it because one has been accustomed to its appearance; but if it be photographed, the new colour, the new situation, and the new

⁷² Burney and Pemberton, "Making space for criminalistics: Hans Gross and *fin-de-siècle* CSI," 1-3.

⁷³ W Jerry Chisum and Brent E Turvey, "A history of crime reconstruction," in *Crime reconstruction*, ed. W Jerry Chisum and Brent E Turvey (San Diego: Academic Press, 2011), 30-2.

aspect enable us to see it from another point of view and reveal fresh details which have not yet been discovered.⁷⁴

One of the most striking ways in which this could occur, according to Gross, was with red markings left on a body after physical force. These might be too subtle to be seen during a medical or post-mortem examination. However, because some colours appeared more vivid in photographs than when viewed directly, he believed that ‘it is possible in a general way to render brown and red marks yet in a latent state visible by photography’:

Every pressure exercised on the skin of a man results in the breaking or at least in the inflaming of the small veins, and each time redness is produced. If the pressure has been very feeble the redness will exist but will not be discernible by the eye.⁷⁵

He went on to suggest possible situations, which the investigator might have encountered, in which this principle could be useful. These could include cases of suffocation or hanging, which might have been written off as natural deaths were it not for the discovery of bruises or other markings indicating the involvement of a third party.⁷⁶ Photography was, therefore, a tool which could enhance the vision of the investigator, alerting him to pertinent details which would otherwise have been missed. Nevertheless, Gross did not provide any specific examples of cases in which this phenomenon had been exploited.

The technique of using conventional photography to enhance the post-mortem view, as espoused by Gross, does not appear to have been used by Scottish medico-legal practitioners. While photographs were taken, this appears to have been done for record keeping, rather than to expose hitherto unseen details. I have not come across any example of this in case records, and the textbook authors did not suggest that such a technique be used.

However, the potential of other forms of photography to enhance the vision of the detective or the medico-legist was recognized within Scottish and

⁷⁴ Gross, *Criminal investigation: a practical textbook for magistrates, police officers and lawyers* (1924), 171.

⁷⁵ *Ibid.*, 174.

⁷⁶ *Ibid.*, 174-5.

wider-British professional literatures. In particular, infrared photography, which captured light from the red end of the spectrum, could reveal things which were not visible to the naked eye. Articles and correspondence to this end began to appear in the relevant professional journals from 1933.

Frank Martin, one of Glaister's colleagues in the forensic medicine department at Glasgow University, wrote a short letter to the *British Medical Journal*, published in June 1933, advocating the use of infrared rays in the analysis of evidence. Acknowledging that ample literature existed on the use of ultra-violet light, to which he himself had contributed, he demonstrated that infrared light could also reveal stains invisible to the naked eye. He reproduced two photographs of a piece of cloth, one of which had been taken using normal apparatus, the other with an infrared plate. A stain on the cloth was visible in the infrared photograph, but could not be seen in ordinary light.⁷⁷

Although, as with conventional photography, infrared does not appear to have been an integral part of enhancing the post-mortem view in Scotland, it was acknowledged by some authors, albeit outside of forensic medicine, that infrared images could reveal markings on bodies which were invisible to the naked eye. The technique had potential clinical applications in the field of dermatology. An account of a 1933 Dublin trade fair in the *British Medical Journal* suggested that infrared light could reveal skin conditions which were 'scarcely noticeable to the eye or on the ordinary [photographic] plate'.⁷⁸ Additionally, Herbert Greenwood, the author of a book about infrared photography for the general reader, albeit with a chapter on the use of the technique in criminal investigation, also suggested that it could reveal markings on the skin. In his example, tattooing had been obscured by inflammation caused by 'diathermy treatment and exposure to ultra-violet light'. However, when an infrared photograph was taken, the tattooing became visible.⁷⁹

Infrared photography was used by police laboratory staff, particularly in work concerning documents. Research had shown that different inks of the

⁷⁷ Frank W Martin, "Infra-red rays in criminal investigation," *British Medical Journal* 1, no. 3779 (1933): 1026.

⁷⁸ "Supplement 1507," *British Medical Journal* 2, no. 3789 (1933): 142.

⁷⁹ Herbert W Greenwood, *Infra-red for everyone: a handbook on the use and applications of infra-red photography* (London: Fountain Press, 1940), 65.

same colour could be differentiated under infrared light.⁸⁰ Harold Edlin, a physicist at the Nottingham forensic science laboratory, wrote that this allowed fraudulent alterations to documents to be revealed. He cited a case in which the date on a receipt had been altered so that a payment appeared to be due a month later than it actually was. An infrared photograph revealed that an 'I' had been added to the Roman numeral 'XI' (thus changing November to December) using a different ink, an alteration which was not obvious to the naked eye.⁸¹ Infrared light could also reveal markings which had been erased, allowing the reuse of revenue stamps to be detected. It could even be used to read through envelopes, since the beams of light could penetrate paper.⁸² As well as fraud, infrared techniques could cast light on shootings. 'Contact rings', caused by the heat of the muzzle of a gun fired in contact with its target, could be difficult to see under ordinary light. However, when viewed or photographed under infrared rays, the rings became visible. This worked for bullet wounds on bodies, as well as other materials.⁸³ This was invaluable in determining the distance from which a shot had been fired, a crucial issue, as shown in the previous chapter.

X-ray photography was also advocated by medico-legists in Britain, who cited its capacity to enhance their vision and, sometimes, to obviate the need for dissection. For example, x-ray photographs could reveal the bone structure of a person, particularly their bone development, which could help to determine their approximate age; this was 'simpler than dissection'.⁸⁴ X-ray photography was also very important when assessing the severity of fractures and other injuries in live subjects. This was an important part of medico-legal practice in civil cases, where claims of negligence were sometimes made against employers, doctors and others.⁸⁵ X-rays could also reveal the presence of projectiles and other foreign bodies in injured persons.⁸⁶

⁸⁰ C Ainsworth Mitchell, "The use of infra-red rays in the examination of inks and pigments," *Analyst* 60, no. 712 (1935): 454-61.

⁸¹ C Harold Edlin, "Case of an altered document," *Police Journal* 11, no. 2 (1938): 179-80.

⁸² Greenwood, *Infra-red for everyone* (1940), 59-60.

⁸³ Joseph T Walker, "Bullet holes and chemical residues in shooting cases," *Police Journal* 15, no. 3 (1942): 236.

⁸⁴ Smith, *Forensic medicine* (1925), 48.

⁸⁵ Smith, *Forensic medicine* (1928), 148, 152.

⁸⁶ Smith, *Forensic medicine* (1925), 65-6.

Nevertheless, Smith acknowledged that there were important caveats to the x-ray's use. In the second edition of his textbook, he noted that distortion could arise; thus, it was important to take pictures from several angles.⁸⁷ In the case of the detection of firearm projectiles, some innocuous materials could be mistaken for projectiles in x-ray photographs, as this example shows:

In a recent case which I examined the accused person had a scar in the leg alleged to be the result of a bullet wound received while engaged in brigandage. X-ray examination showed a considerable amount of foreign matter in the tissues, which had led a medical officer to give an opinion that the wound was due to a gun shot; the appearance and distribution of the foreign matter, however, indicated such a substance as bismuth, and inquiry elicited the fact that the accused had long been suffering from a sinus, which had been cured by the injection of bismuth and iodoform paste.⁸⁸

As with all forensic techniques, proper interpretation of the results demanded great care.

Photographs for comparison

As well as offering unique views of forensic subjects, photography was also employed for the purposes of comparison. The versatility of the photographic method allowed objects and portraits to be compared. For example, FH Newman, professor of physics at the then University College, Exeter, advocated the employment of photography in the examination of tools and tool-marks, an important task in the investigation of theft and burglary. Newman, writing in the *Police Journal*, provided several examples of the use of photography in this regard. In the case of a tool such as a jemmy or gimlet having been used to force a lock, photographs would be taken, with the aid of a microscope, of both the tool and the impressions believed to have been made by that tool on the lock, ensuring that the same scale was used in both images:

⁸⁷ Smith, *Forensic medicine* (1928), 150.

⁸⁸ Smith, *Forensic medicine* (1925), 66.

Then these two photographs—using the negatives—would be superimposed, and the resulting photograph would clearly indicate any similarity between the two, *viz.*, the tool and the impression.⁸⁹

While he provided examples of cases in which he had used this technique, Newman nevertheless warned that great care had to be used in the photographic process, since careless lighting could easily cause distortions in the image:

Unfortunately one has to be very careful about the lighting used to illuminate these objects, as it is possible to get entirely different pictures by altering the inclination at which the light falls on the object—tool or scratch—being photographed. This is particularly the case in photographing scratches, where very shallow and narrow grooves are formed by small projecting parts of the tool's blade.⁹⁰

This potential for distortion had been noted before. Almost a decade earlier in 1929, Robert Churchill had evaluated various methods of comparing markings on bullets, several of which involved photography. One of the methods he described, somewhat dismissively, bore stark resemblance to that later advocated by Newman:

The fifth method is simply the taking of enlarged photographs of all grooves on each bullet and superimposing either sections of cut prints or negatives to establish correspondences. It suffers from the inevitable distortion of photographic methods and is open to several objections. Strong lateral light is usually employed to accentuate contrast, and the photograph shows hair-line ridges casting strong shadows which may appear as

⁸⁹ FH Newman, "The examination of tools and tool-marks," *Police Journal* 11, no. 2 (1938): 215.

⁹⁰ *Ibid.*, 217.

grooves. Very slight errors in light adjustment or centralization of the object may yield deceptive results.⁹¹

Churchill's preferred method involved the use of the comparison microscope.

Perhaps the most prominent and iconic use of photography in forensic medicine and science was in the Ruxton investigation and trial in 1935-6. It was the use by investigators of a kind of photographic manipulation which made the Ruxton case all the more notorious: the superimposition of photographs of the severed heads onto portraits of the two missing women, to demonstrate that the dismembered heads found near Moffat belonged to the supposed victims, Isabella Ruxton and Mary Rogerson. In this way, the features of each portrait would be mapped onto corresponding features of the heads, and identity demonstrated, or rather, not precluded. The procedure used by Brash, who oversaw this part of the investigation, was reasonably straightforward, although it required a great deal of precision. A number of photographs of the two women existed, although these were of varying quality. While there was a high-quality studio portrait of Mrs Ruxton wearing a diamante dress and tiara (which allowed for the dimensions of the sitter to be ascertained, and thus for the image to be enlarged to actual size), only snapshots existed of Rogerson. These photographs were enlarged to as near to actual size as could be determined. In the case of Mrs Ruxton, this was done with reference to clothing and jewellery, whereas the enlargement of the photographs of Rogerson was based upon the dimensions of a gatepost next to which she was standing. In the case of the photographs of Rogerson, this was only an approximate enlargement, due to the poor quality of the image, in which the precise dimensions of her face were obscured by her hair.⁹²

Thomas Stobie, the police photographer assigned to the case, then took life-sized photographs of the heads, in the same orientations as the heads of the two women in their photographs. Two steps were taken to ensure that this parity of orientations was accurate. First, the skulls were mounted in special metal frames to hold them in place, and which allowed for the precise

⁹¹ Churchill, "The forensic examination of firearms and projectiles," 376.

⁹² Glaister and Brash, *Medico-legal aspects of the Ruxton case* (1937), 249-56.

adjustment of their orientations relative to the camera. Second, a transparent outline of the portrait the orientation of which was being matched was placed on the camera's viewing screen. Once the desired orientation was found, the photographs were taken.⁹³

On each of the photographs – both of the missing women and the recovered heads – the salient facial features were outlined in Indian ink. The outlines of both skulls were compared with the outlines of both portraits, and the conclusions regarding the facial work drawn from this comparison of the feature mapping. According to Brash, the comparisons showed, first, that 'Skull No. 1' was definitely not that of Mrs Ruxton, although 'Skull No. 2' might have been. Second, Skull No. 2 could not have belonged to Mary Rogerson, although Skull No. 1 might have done.⁹⁴ Questioned by the judge, Brash stated that he did not wish to stretch his conclusions about the skulls' ownership further than this. However, he agreed with the judge that there was an 'amazing similarity' between the outlines of Skull No. 1 and Rogerson's portrait, and Skull No. 2 and Mrs Ruxton's picture.⁹⁵

In addition to the outlines, the images from the portraits were superimposed onto the images of the heads taken by Thomas Stobie to produce a composite image. According to Glaister and Brash's book, this was 'for the purpose of demonstration'. The compositors experimented with various combinations of positive and negative images of the heads and portraits, before arriving at the optimum, a negative of the skull and a positive image of the portrait.⁹⁶ The implication of the creation of a composite image in addition to what was required by Brash to form his conclusions is that this new technique demanded an impressive courtroom spectacle.

⁹³ Ibid., 152-4.

⁹⁴ Ibid., 154, 165.

⁹⁵ Blundell and Wilson, *Trial of Buck Ruxton*, 184-5.

⁹⁶ Glaister and Brash, *Medico-legal aspects of the Ruxton case* (1937), 164.

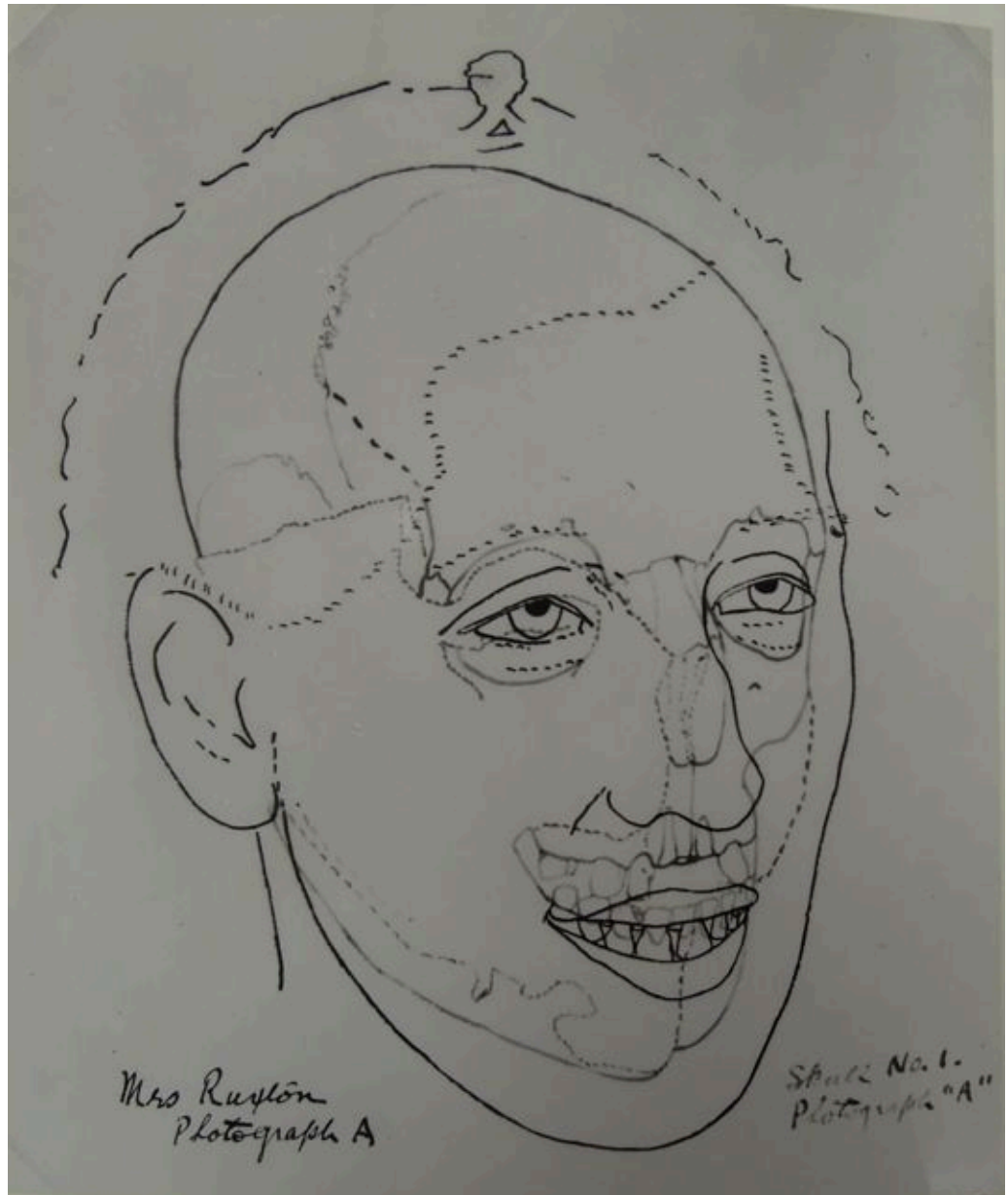


Figure 1: Inked outline of Mrs Ruxton's photograph superimposed onto outline of Skull No. 1. The two do not match. National Archives, DPP 2/306. (Photograph, Ian Burney)



Figure 2: Photograph of Mrs Ruxton superimposed onto photograph of Skull No. 2. National Archives, DPP 2/306. (Photograph, Ian Burney)

The exploitation of striking courtroom displays has been noted by Simon Cole with reference to the emergence of another forensic method, latent-fingerprint analysis. He shows that the provision of a spectacular demonstration of the technique's efficacy and its practitioners' competence was an important part of the process of its legitimization when it was first introduced. In some of the early appearances of latent-fingerprint evidence in American courts, fingerprint examiners performed feats of identification in front of juries, for example by identifying a print left by a juror on a piece of glass. This demonstrated the technique's usefulness. To establish that each person's fingerprints were unique, displays of the prints of identical twins were used; the stark differences pointed to on photographic enlargements. Thus, the jury were shown that an error would be very unlikely, the chance of confusing two people's prints being almost impossible. Enlargements were also used to demonstrate matches to the jury who, Cole argues, were made to think they had 'witnessed the match' themselves. Overall, these displays combined to make juries more receptive to this type of evidence. Cole goes on to argue that once fingerprinting had become more established in the court and the popular imagination it was no longer necessary to perform demonstrations of the capabilities of fingerprinting; the technique had entered its Latourian 'black box'.⁹⁷

The importance of such highly staged, theatrical courtroom demonstrations to the introduction of a new form of forensic evidence is of significant relevance when considering the head and portrait comparisons in the Ruxton case. Here, as with the fingerprinting example, there was an imperative to demonstrate the legitimacy of a new technique to the jury. They therefore demonstrated that a decisively negative result could be obtained using the technique:

From the medico-legal point of view, it seemed to be even more important than in the case of the feet and the shoes—since the evidence was novel and skulls not so familiar as feet to the

⁹⁷ Cole, *Suspect identities* (2001), 181-5, 199.

layman—to demonstrate that the method could without question, from the comparison of the skulls with one set of portraits, warrant a negative conclusion.⁹⁸

This was in reference to another test of identity from the case, in which plaster casts of the feet found in the stream were inserted into shoes owned by the missing women. In this instance, a negative result had been exemplified by fitting the foot believed to be Mary Rogerson's into one of Mrs Ruxton's shoes, and vice versa.⁹⁹ The above quote presumes that people without anatomical training would be more familiar with the concept of a person's footwear relating to the size of their feet than the shape of their skull affecting their outward appearance.

The demonstration of a negative result would, presumably, allay any suspicions on the part of the judge and jury that the results of the technique were ambiguous and open to partisan interpretation. A cynical juror might find it a little too convenient if perfect matches between the portraits and the skull photographs were found. The technique was new to criminal justice, and thus not without its uncertainties. The outlines and the photographs could not prove identity conclusively, as Brash acknowledged in his testimony, but were merely suggestive. However, it could, he showed, disprove identity. When the outline of the head believed to be Mary Rogerson was superimposed over that of Mrs Ruxton, and vice versa, it was clear that they did not match.

Given the inconclusive nature of the comparison, which did not prove the two heads' ownership, the overall importance of the evidence to the case may be questioned. It can be interpreted as an opportunity for the expert witnesses to demonstrate their skill and innovative abilities, rather than a crucial element in the identification of the remains found near Moffat. Indeed, the judge alluded to this possibility, saying, 'It might be that it is very excellent work no doubt and shows every possibility, but it does not enable you to say more than that [it might be the skull of Mrs Ruxton]'.¹⁰⁰

⁹⁸ Glaister and Brash, *Medico-legal aspects of the Ruxton case* (1937), 161.

⁹⁹ *Ibid.*, 138-43.

¹⁰⁰ Blundell and Wilson, *Trial of Buck Ruxton*, 184-5.

Conclusions

One of the major themes of this thesis has been the high degree of cooperation and collaboration that existed between practitioners of forensic medicine and representatives of other disciplines. This was particularly acute in the case of the use of photography in the investigation of crime. Medico-legists shared a disciplinary space with police photography specialists. Both sets of experts wrote on the subject of forensic photography, whether of crime scenes or bodies, and published in the same forums, such as the *Police Journal*. The Ruxton case, discussed in the chapter, provides an example of police and medico-legal specialists working together in the photographic arena. While the images were shot by Thomas Stobie of the Glasgow police, this was done under the supervision of Glaister and Brash, for whom the complete visual record of the case was compiled.

The thesis has also been concerned with how medico-legal work was recorded. The place of the medical report was discussed in the first chapter. The photograph provided a complementary means of recording information. It was used both during the investigatory and prosecutorial processes and as a means of recording for posterity and education. Despite its undoubted importance, as with other scientific uses of the photograph, there were concerns about its usefulness from some quarters. Issues such as perspective and depth of field meant that some preferred drawn plans for use in the recording of some sites, such as those of road accidents. However, the photograph's supposed objectivity was valued in the sphere of criminal investigation. Nevertheless, just as in other scientific fields, this objectivity could be undermined by 'human interference', for example if the positioning of objects at the scene of a crime was altered before a photograph was taken. Thus, just as in other areas of forensic medicine, such as the autopsy or firearms investigation, care was needed to ensure mistakes did not jeopardize the whole enterprise.

Medico-legal photography involved the creation of artefacts, photographs, in part for posterity. Many of the products survive in textbooks and archives. The next chapter explores an even more explicit exercise in legacy creation, the writing of memoirs by Sydney Smith and John Glaister Jr.,

in which they projected favourable images of their own practice and expressed their hopes and intentions for the future of their discipline.

Chapter 5: Medico-legists in the media – recollection and reflection

The preceding chapters of this thesis all deal with elements of the practice of forensic medicine between the First and Second World Wars. The approach of the present chapter is different. It takes as its subject the output of Scottish forensic specialists in the popular media, namely newspapers and books. These writings, in which they reflected on their careers and notable past cases, were normally written after their authors had retired. This chapter explores the popular works of two of the most prominent medico-legal specialists operating in Scotland during the period under study, Sydney Smith and John Glaister Jr., both of whom produced material for public audiences in the 1950s and 1960s. The two men published memoirs and Sunday newspaper serials, written with assistance, which narrated their working lives and their most famous cases. Additionally, Glaister attempted to get a novel published (without success) and served as a consultant to Scottish Television and the BBC for two drama series featuring forensic medicine, *Glaister* and *The Expert* respectively, the former of which was based on some of his own cases.¹

In this chapter, I will examine a number of aspects of this popular media output. As well as providing an overview of their contents, which are of interest in their own right, I will demonstrate how the material can help to reveal the intentions and aspirations of the practitioners. This analysis will focus on two main areas. The first relates the material produced retrospectively to the first four chapters of the thesis, examining the degree to which the themes which emerge from the historical study of the practice of forensic medicine are reflected in the medico-legists' own memorials. Thus, the extent to which the participants were aware of phenomena such as networks of expertise and collaboration and the central place of standards and quality assurance can be assessed. It will be shown that Smith and Glaister, the two exemplars, were clearly aware of these themes, and actively promoted them in their output.

¹ Fiction papers, Personal papers of John Glaister Jr., GUA, DC 403/2/5; Television papers, Personal papers of John Glaister Jr., GUA, DC 403/2/7.

The second area of the analysis examines the ways in which the practitioners' personal images were constructed by the popular output. I will argue that, although there were differences between the self-presentation of the two men, in general they were portrayed as being servants of science and justice, rather than the Crown, who maintained an outlook of fair-minded neutrality. Through the examination of the medico-legists' retrospection and their projected self-images, the political purposes of this output will be explored. For example, Glaister's memoir appears to have been partly a manifesto for a wider effort to place forensic medicine on a surer institutional footing. During the latter half of the twentieth century, a number of figures in forensic medicine, including Glaister, wrote in the medical press about the perilous state of the discipline, which they saw to be neglected by both the state and the rest of the medical profession. How far were these arguments replicated in popular works? The extent to which the popular output of experts aimed to change public attitudes to medical, and other, evidence in the context of the courtroom will also be assessed. For instance, a number of Smith's newspaper articles appeared to encourage jurors to exercise greater critical judgement in their assessment of expert and police testimony, arguing that neither was infallible.

However, evidence suggests that there existed a degree of separation between Smith and Glaister and their public images. The public personae were not wholly dependent on the input of the two men themselves; certain aspects seem to have been beyond their control. For example, although the by-lines of the newspaper articles bore Smith and Glaister's names, they appear to have largely been drafted by the papers' own staff. Indeed, Smith wrote to the *People* newspaper, which carried his serial, to complain about the tone of the pieces. Nevertheless, the output still represented the public face of forensic medicine, in spite of this level of disconnection. The incongruity merely demonstrates that others, besides practitioners, contributed to the construction of the discipline's public image and heritage.

In addition to being an interesting example of the representation of science and medicine in the media, an examination of this public face of forensic medicine complements the analyses from the previous chapters. It

provides a valuable insight into the motivations of some of the most prominent participants in the story of forensic medicine in the early-twentieth century. Although their limitations cannot be ignored, the memoirs and articles can reveal something of their authors' beliefs and attitudes (or at least their purported views), including opinions about professional rivals and difficult cases, about which they could be more candid after retirement than they could have been in public at the time of the events. Additionally, the output allowed the retired practitioners to comment on matters such as the role of new technologies in forensic medicine during their years in practice with a degree of hindsight.

The analysis of Smith and Glaister's popular media outputs is also worthwhile because of their on-going visibility and resonance as a source for the history of forensic medicine. This role is manifested on two levels. First, the memoirs of Smith and Glaister, *Mostly murder* (1959) and *Final diagnosis* (1964) respectively, have been used as source material by historians of Scottish forensic medicine, for example by Anne Crowther and Brenda White for their history of forensic medicine in Glasgow (although they use archival sources to a much greater degree). Second, the books, particularly *Mostly murder*, which remained in print into the 1980s, are an important reference point for forensic medicine's past in contemporary professional and popular imaginations. For example, in a 2011 radio programme, current Home Office pathologist Basil Purdue referred to Smith's memoir during a discussion with a younger colleague about the changes to forensic pathology he had seen over the course of his career.²

In addition, a passage from *Mostly murder* sparked controversy in 2007 when it was read by a distant relative of two small boys, William and John Higgins, who had been murdered in 1911 by their father, Patrick Higgins. Disposed of in a flooded quarry in West Lothian, the bodies, when recovered in 1913, showed remarkable formation of adipocere, a waxy substance formed when dead fatty tissue is exposed to certain conditions. Smith harvested a significant amount of this tissue for teaching purposes after he and his then

² "Forensic pathologists," *The Generation Gap* (BBC Radio 4: 28 February 2011).

superior, Harvey Littlejohn, had performed medico-legal autopsies. Smith described the somewhat brazen incident in his memoir. While Littlejohn ushered out the two police officers who had been observing the autopsy to ‘confer’, Smith, in his own words, ‘helped myself to some choice specimens and parcelled them up’.³ An American descendant of the boys’ mother’s cousin, directed to the book by a genealogist, was angered when she read of the episode, and, amid publicity, wrote to the University of Edinburgh to complain.⁴ In 2009, once it was proved that she was related to the boys, the university released the remains, which were cremated after a service at the university’s Catholic chaplaincy.⁵ The incident illustrates the book’s emotive power, as well as suggesting a hardening of attitudes towards the purloining of human remains.

Despite its clear potential for the historian, the autobiographical medium must be used carefully, due to its highly constructed nature and the fact that events were often described a long time after they had taken place. Nevertheless, it has been argued that the passage of time can confer advantages to autobiographies, over the immediacy of diaries, allowing a better understanding of events. James Young demonstrates this, using the memoirs of Holocaust survivors as an example. He argues that memoirists’ hindsight gave them a clearer comprehension of events, compared to diarists. Victims’ diaries, contemporaneous to events, were subject to distortions of the situation on the part of perpetrators, who might mask the true significance of events with illusions of humanity, for example. Retrospective authors, on the other hand, were writing at a time when the Nazis’ manipulation of reality was over; writers were thus able to reflect on the true implication of their experiences.⁶ Although the forensic autobiographies were not written under anything like the same circumstances, and there are no diaries to serve as alternatives, the opportunity for reflection can be seen to have had its advantages for them. For instance, they openly acknowledged that being in a state of retirement allowed them to expatiate about their work, whereas before they could not. Also,

³ Smith, *Mostly murder* (1959), 50-1.

⁴ Chris Paton, "Stolen lives," *Scotsman*, 18 July 2007.

⁵ "Murdered boys' final remains laid to rest," *Scotsman*, 18 July 2009.

⁶ James E Young, "Interpreting literary testimony: a preface to rereading Holocaust diaries and memoirs," *New Literary History* 18, no. 2 (1987): 416-8.

hindsight allowed them to see cases in a wider context. For example, their interpretations of the Merrett case may have been partly shaped by knowledge of his crimes which took place decades after his mother's death, namely the murder of his wife and mother-in-law, followed by his killing of himself.

Regarding the reliability of autobiographical testimony, it may, of course, be produced with a particular agenda in mind, which might shape or distort the account of events being described. Much autobiography can be seen to be ideological in character, by which the author sets out to justify his or her actions, and to portray himself or herself in as favourable a light as possible. Irving Louis Horowitz describes autobiography as being a strategic action, not merely a literary exercise but 'a social injunction: a tactic for making people take seriously the words and deeds of their leaders', performed with an eye to immortality.⁷ Some events may even be fabricated with this purpose in mind. Nevertheless, it has been argued that this need not be the hindrance it might at first appear. For instance, once identified, distortions in an autobiography can be revealing about authorial intent. Indeed, as Jennifer Jensen Wallach argues, the autobiographical perspective can be superior in some ways to a more objective approach, since it can give an insight into motivations which led to events, by allowing an understanding of actors' thought processes in relation to these events:

Using the techniques of literary art, a memoirist finds ways to capture the relationship between purpose, affect, and perceptions, and to present his or her own thoughts and feelings about a historical moment in relation to other persons in the same social scene.⁸

Using their own palate of emotions, the historian can empathize with a memoir's author, and thus gain a fuller understanding of the events described. There is, however, a caveat to Wallach's argument. She makes a distinction between literary and non-literary memoir, classifying the former as a form of

⁷ Irving Louis Horowitz, "Autobiography as the presentation of self for social immortality," *New Literary History* 9, no. 1 (1977): 173.

⁸ Jennifer Jensen Wallach, "Building a bridge of words: the literary autobiography as historical source material," *Biography* 29, no. 3 (2006): 448.

creative writing, containing challenging prose, and the latter as ‘literal’. She argues that non-literary memoirs are less useful, since they make ‘empathetic reconstruction’ more difficult, due to an absence of sophisticated imagery.⁹

It is, of course, possible to argue that this stance merely betrays elitist prejudice and a deficit of imagination. Certainly, the practitioner memoirs which I will examine would probably constitute ‘non-literary’ autobiographies; they are written in quite a matter-of-fact style and probably do not come into the category of ‘creative writing’. However, just because an emotion or an opinion is described baldly does not make it inaccessible. Although, in the following passage about an early foray into general practice, Smith wears his heart on his sleeve, the emotional significance of the passage is not lost on the reader:

It was at this post in Fife that I learned first what it was like to lose a patient. A young girl, beautiful and sweet-natured, was pregnant and suffering from continuous convulsions. I tried all the regular forms of treatment, emptied the uterus and used every drug I knew to stop the fits. Finally I had to put her under chloroform. It was all to no purpose. She died holding my hand and thanking me for all I had done for her. For what, I thought – and I spent a miserable night thinking of the futility of medicine in certain circumstances. I am afraid that I worried too much about patients, and felt aggrieved when they did not return to treatment. By the end of the month as a locum I was pretty sure I was not cut out for general practice.¹⁰

Additionally, Smith’s book employs tropes from English literature, such as Sherlock Holmes’s detection abilities, to glorify its author, relating anecdotes about Smith’s own work in such a way as to invite parallels with the triumphs of Conan Doyle’s character. This suggests an element of literary sophistication on the part of the author.

⁹ Ibid., 451.

¹⁰ Smith, *Mostly murder* (1959), 27.

Wallach's views on non-literary autobiography need not be dismissed altogether, however, since they do resonate with some of the limited material which has been written on the subject of scientific autobiography. For example, it has been suggested that the descriptive nature of some scientists' memoirs, in which their career milestones are little more than listed, limits their interest to the reader. Topics likely to appeal to their audiences, such as their scientific philosophy, are not revealed.¹¹ Even so, a lack of expressive depth can be revealing in its own way. For example, the spare quality of Darwin's autobiographical writing has been interpreted as being a stylistic device, whereby the self is minimized, allowing the author to appear as a 'humble collector of facts'. Emotive brevity conveys the impression of the avoidance of subjectivity, in his scientific work as well as his retrospections.¹² Such a desire to project an underlying impression about oneself in a memoir, suggested to have been a feature of Darwin's, can be seen in much of the popular work of Smith and Glaister. As detailed below, the trait of objectivity, or more precisely personal and institutional impartiality, was conspicuously conveyed in both the books and the newspaper features, being held up as an important attribute for the medico-legist.

It has also been suggested that scientific memoir, and popularization in general, can be used to push a particular viewpoint or agenda, or to bring issues of supposed importance into the public sphere. For example, Edward Yoxen has argued that *The double helix*, James Watson's account of his role in the discovery of the structure of DNA in 1953, had the object of advocating a new model of working in the biosciences, one which involved 'ruthless predation on other fields and other's work, minimal courtesy to supporting colleagues and peers, continual defiance of troublesome data and a positive contempt for traditional intellectual concerns'. Yoxen demonstrates that this purpose

¹¹ Michael Shortland, "Exemplary lives: a study of scientific autobiographies," *Science and Public Policy* 15, no. 3 (1988): 175-6.

¹² Michael Shortland and Richard Yeo, "Introduction," in *Telling lives in science: essays on scientific biography*, ed. Michael Shortland and Richard Yeo (Cambridge: Cambridge University Press, 1996), 9-11.

overtook that of explaining Watson and his colleagues' scientific discovery, which was dealt with perfunctorily.¹³

While the forensic memoirs might not be of quite the same single-minded purpose as Watson's (although, like *The double helix*, *Mostly murder* and the associated newspaper extracts contained robust criticism of professional rivals), Glaister's in particular contained an argument for a new state of affairs, namely medico-legal oversight of the scientific side of investigations. As will be seen, the content of *Final diagnosis* in this regard complemented some of Glaister's earlier writings on this subject in the medical press, thus bringing his concerns and ideas into the wider public forum.

Retrospection in memoirs and similar material also offered practitioners the opportunity to assert their place and role in past events, such as notorious cases. Attempts by forensic experts to do this in their writing have been briefly noted by other historians. Norman Ambage notes that in the autobiography of JB Firth, head of the Preston crime laboratory, accounts of some cases differ from contemporary sources, presenting his science as having played a more decisive role in the case.¹⁴ In other instances, problems with scientific and medical evidence have been understated when the cases were retold. Although not referring to an autobiography, Ian Burney has noted that Alfred Swaine Taylor rewrote his part in the William Palmer case in an article and successive editions of his textbooks. His initial testimony that the victim, John Parsons Cook, had died of strychnine poisoning had been controversial and subject to much criticism at the time. However, in his writings, Taylor gradually shifted the meaning of the case from one of controversy to one of demonstration.¹⁵

Certainly, the accounts of some cases contained in Smith and Glaister's memoirs do not always reflect contemporary sources. For example, they rarely mention instances of their mutual collaboration. More strikingly, the memoirs are used to assert their position in a case, for example stating where they

¹³ Edward Yoxen, "Speaking out about competition: an essay on *The Double Helix* as popularisation," in *Expository science: forms and functions of popularisation*, ed. Terry Shinn and Richard Whitley (Dordrecht: Reidel, 1985), 165.

¹⁴ Ambage, "Origins and development of the Home Office Forensic Science Service," 188-91.

¹⁵ Burney, "A poisoning of no substance: the trials of medico-legal proof in mid-Victorian England," 86-92.

believed a miscarriage of justice to have occurred, and making clear that they thought and said this at the time. This ties in, of course, with their affirmations of impartiality and, in Smith's case in particular, iconoclasm. Their autobiographical activities were, at least in part, an attempt to shape their legacies.

The historiography relating to autobiography suggests that, when used carefully, it can provide a useful insight into the attitudes and motivations of the authors. However, a potential barrier to the successful analysis of *Mostly murder* and *Final diagnosis* is the question of the books' authorship. Both were written with the extensive assistance of ghost writers. This adds a layer of remove between the subjects, Glaister and Smith, and the books' readers. Nevertheless, this does not mean that the two doctors did not have overall responsibility for the books' contents; for instance, it is clear from correspondence that Glaister collaborated closely with the journalist who drafted *Final diagnosis*, and approved of the final version. Thus, any analysis of Glaister's intentions derived from the work remains valid. Indeed, it was Glaister who made the decision to employ a professional writer in initial correspondence with Hutchinson's, his publisher:

The fact that some of your authors in the past have been assisted by a collaborator is of interest to me, for I have decided to employ a 'Ghost Writer', with prolonged professional experience, in setting out my material along lines likely to appeal to the author, publishers and the reading public.

He went on to state that when his material was 'tuned by professional experience in this class of writing' it would provide more drama for the general reader, implying that its message might be more effective.¹⁶ His use of the term 'my material', alongside his decisiveness, suggests that he retained a sense of clear ownership over the work. Additionally, correspondence between the publisher and the ghost writer, Bill Knox, reveals that important editorial

¹⁶ Copy of letter from John Glaister to Gerald Austin, Director, John Long Ltd., 24 January 1962, GUA, DC 403/2/6/1.

questions, including the task of ensuring that the text was not defamatory, were addressed in conjunction with Glaister.¹⁷

Smith, on the other hand, produced an initial draft himself. However, the manuscript was deemed unpublishable, due to its excessively academic style, and was revised by an editor, Patrick Pringle. The correspondence between Pringle and Smith, much of which is preserved, suggests a degree of tension between the two men. Pringle believed that Smith disapproved of his revisions. Nevertheless, Pringle's drafts were sent to Smith for approval, Pringle noting that he had 'tried too hard to respect your wishes and not been drastic enough in cutting and changing what you had written'.¹⁸ Thus, Smith still had a degree of involvement in the text's creation, although, reading between the lines of Pringle's letter, he may have disagreed with such an assessment.

As long as this authorial process is acknowledged, it remains valid to use the memoirs as a tool to explore the motivations of Glaister and Smith. The roles of Pringle and Knox were not made public; thus, as far as their audience was concerned, the medico-legists were responsible for the output; the books and the journalist-drafted newspaper articles constituted part of their public image.

However, as mentioned above, the retrospective output of the medico-legists should not be used as a substitute for primary sources, such as court documents and contemporary textbooks, when the years in which they actively practised are under discussion, however compelling any later narrative might appear. The over-reliance on convenient memoirs, especially when there is a supposed dearth of other source material, for the purposes of drawing out broader generalizations has been addressed in secondary literature about memoirs.¹⁹ The limits of what can be learned from the popular output of Smith and Glaister must be appreciated. Therefore, conclusions about the intentions

¹⁷ Copy of letter from Bill Knox to Gerald Austin, 9 July 1963, GUA, DC 403/2/6/1.

¹⁸ Letter from Patrick Pringle to Sydney Smith, 3 December 1958, RCPE, SMS/7/63.

Unfortunately, the archive only contains letters received by Smith, not copies of those he sent.

¹⁹ Robert Liberles, "'She sees that her merchandise is good, and her lamp is not extinguished at nighttime': Glikl's memoir as historical source," *Nashim: a journal of Jewish Women's Studies and gender issues*, no. 7 (2004): 14-15, 19.

and attitudes of these two men will not be extrapolated into generalizations about the beliefs and opinions of practitioners of forensic medicine as a whole.

Outline of output material

The popular, retrospective output of practitioners of forensic medicine, whether in written or broadcast form, has not been subjected to an in-depth study before. It is, therefore, worthwhile outlining its content. This descriptive section will be arranged by medium, beginning with the newspaper articles, before moving on to the autobiographies.

After their retirements, serials covering the famous cases of both Sydney Smith and John Glaister Jr. appeared in national Sunday newspapers, with Smith and Glaister named as the authors. Smith's stories appeared in the *People* in 1959, and were tied in with the publication of his autobiography, *Mostly murder*, in the same year. Glaister's articles appeared in the *Sunday Pictorial* in 1962, and were not related to his memoir. As well as containing accounts of famous cases, the articles made general points about the discipline. For example, Glaister described his 'theory of interchange', and Smith warned readers of the dangers of holding expert witnesses to be infallible.

These were not the first newspaper series about famous cases in forensic medicine. In 1949, the Glasgow *Sunday Mail* carried a lengthy serial entitled "The Master Witness". Written by, or at least attributed to, 'A Scottish Advocate', the articles explored well-known murder cases from Scotland and further afield. These ranged from the trial of Madeleine Smith for the murder of her lover in 1857, to the case of George Joseph Smith, the infamous 'brides-in-the-bath' murderer, hanged in 1915. Each instalment featured one or more cases in which medical or scientific techniques had been employed to help snare the accused, whether successfully or not; one Sunday, the Merrett case was featured.²⁰ These articles contained explanations of the scientific and medical techniques of the forensic investigator, and appear to have been aimed at the intelligent lay reader.

²⁰ "The mysterious case of Mrs Merrett," *Sunday Mail*, 30 January 1949, 2.

There are two interesting points to be made about the authorship of these articles. First, the author was anonymous. It was merely stated that he was an advocate. This anonymity may have been because it would have been considered unseemly for a lawyer to write articles in the popular press trading on his own name, in parallel with bars on practising doctors' appearances in the media except under anonymity. Second, the articles suggest that there was a high degree of professional regard and cordiality between legal figures and medico-legists, to the extent that the former wanted to promote and, indeed, adulate the skills of the latter in a very public forum. For example, the series' first instalment was accompanied by photographs of Smith, Glaister and JC Brash, the anatomist who took part in the Ruxton investigations, with the caption 'The Men Most Dreaded By Murderers'.²¹ The legal author may have thought it propitious for the public, who, it should not be forgotten, made up juries, to form a high opinion of medical expertise. If so, it would not be the only time the popular press was used to influence the public view of the capabilities of expert witnesses, as demonstrated later in the chapter.

While the *Sunday Mail* articles are significant – cuttings from them appear in the medico-legists' personal archives – the genealogy of the experts' popular newspaper output can be traced further back to 1935, when Glaister wrote a series describing his late father's cases for the *People's Journal*. They featured accounts of various aspects of the elder Glaister's professional career, from famous investigations to amusing anecdotes drawn from his dealings with medical students. In the first instalment, the younger Glaister stated that his father had been planning to compose memoirs for the *People's Journal* before he died, one reason why his son was writing the series. He also wrote 'in consideration of the fact that [John Glaister Sr.] served the public over a long period in many and varied capacities, thus coming into contact with practically all classes of the community'.²²

While these articles are of interest, I have chosen not to include them in the analysis of the medico-legists' popular output for two reasons. First, they

²¹ "The master witness," *Sunday Mail*, 9 January 1949, 2.

²² John Glaister, Jr., "The big cases of Professor John Glaister," *People's Journal*, 28 September 1935, 28.

were produced during a much earlier period than the rest of the material for this chapter, which mostly originates from the late 1950s and early 1960s. Second, they are not autobiographical in character, as the other material is. Indeed, in writing them, the younger Glaister did not generally refer to his own role in some of these cases, even though for much of the time he worked alongside his father in the laboratory. This may have been because Glaister felt less freedom to reflect on his own practice whilst he was still working.

The appearance of these sets of articles suggests that there existed a degree of public interest about forensic medicine and the scientific investigation of crime over a broad period. Indeed, newspaper coverage of murder investigations and trials devoted a significant degree of space to medical and scientific aspects, for example recounting detailed exchanges between lawyers and expert witnesses in the courtroom. The Ruxton trial is one example of a case in which extensive coverage was given over to medico-legal matters. Thus, the appearance of Smith's articles in 1959 fits in with a general appetite for features of this sort. It is a sign of the public interest he and Glaister inspired that their articles appeared in publications with national, as well as Scottish, circulations.

The *People* articles were based on parts of the manuscript of Smith's autobiography sent to the newspaper, which were then redrafted by journalists. The first appeared on Sunday, 15th February 1959. It featured the Sidney Fox case, in which Smith was a defence witness. In a reflection of the tone of the articles due to appear over the coming weeks, the case was presented in a highly dramatic fashion. Smith was pitted against the legendary Bernard Spilsbury, whose judgement was criticized in the strongest terms in the series. Further cases included the trials of Donald Merrett, Peter Queen and Annie Hearn, a woman who was accused of poisoning her friends with arsenic, and for whose acquittal Smith took credit on 8th March.

The articles were typically single- or double-page spreads, appearing near the front of the newspaper in earlier weeks. The headlines and main body of the texts were in Smith's voice, while some captioning and the standfirst (subheading) were in the third person. The standfirst employed various

superlatives regarding Smith's reputation and abilities. On 15th February, he was described as 'the greatest laboratory expert ever to serve the cause of British justice' and 'the greatest scientific detective of our time'. On 22nd February he was the 'greatest scientific brain ever to engage in the detection of crime'. By 1st March, he had become the 'greatest scientific detective of the century'. The headlines were also of a highly sensational nature. They included: "Condemned by one word yet my tests proved him innocent"; "2 women died – because this killer was let go"; and "They hanged this innocent man on the evidence of Sir Bernard Spilsbury".²³

The articles' content will be examined in greater detail in the examination of the presentation of Smith's persona below. However, it is worth mentioning here that the superlative and sensational manner of the headlines is consistent with the certainty with which the opinions attributed to Smith were related in the articles. There was no doubt expressed, for example, as to whether Merrett was guilty, Queen innocent, and Fox hanged unjustly.

Confidence was also on display in Glaister's articles, which appeared in the *Sunday Pictorial* in February and March 1963. However, rather than ebullient self-confidence, this was of a different sort: confidence in the capabilities of science. For instance, a theme running through his articles was the impossibility of committing a crime without leaving behind some sort of trace, such as blood, a hair, or dirt from the soles of the shoes, at the scene. Glaister called this principle the 'theory of interchange'; he referred to it in much of his popular output at the time. There is a chapter devoted to the theory in his memoirs, for example. In the *Sunday Pictorial* articles, after explaining the theory, he provided various examples of criminals who were caught after a trace, either from their person, or their crime, such as blood from someone they had subjected to violence, was found and identified. In the first article, he used the Ruxton case as an example of this. Although, after murdering his wife and servant, Ruxton had tried to remove as many traces that could link him to the

²³ Sydney A Smith, "They hanged this innocent man on the evidence of Sir Bernard Spilsbury," *People*, 15 February 1959, 2-3; Sydney A Smith, "2 women died - because this killer was let go," *People*, 22 February 1959, 2-3; Sydney A Smith, "Condemned by one word yet my tests proved him innocent," *People*, 1 March 1959, 2-3; Sydney A Smith, "Arsenic in the bodies," *People*, 8 March 1959, 2.

crime as possible, he could not do so completely. 'In spite of all his cunning, he could not beat the Theory of Interchange,' Glaister wrote.²⁴

The examples Glaister chose to highlight from the Ruxton case indicate the different types of trace included in the theory. The first 'trace' was quite conceptual; it lay in the manner in which the body had been dismembered. It had been done skilfully, suggesting that the perpetrator possessed 'medical, anatomical and legal knowledge'. Thus, the manner of a person's actions could leave traces of their past, such as their professional training. The second trace was a piece of newspaper left in the ravine, which was found to have been 'published the day before the two women were last seen alive'. Finally, although Ruxton removed blood-stained wallpaper from his house, he neglected the bloodstains under the mats in the bathroom, which were discovered by the authorities.²⁵

In the same article, and in the one that appeared the following Sunday, Glaister included further examples of the theory of interchange at work. These included collisions on the road, which were interpreted through the analysis of traces left by vehicles on bodies, and a case in which hairs found on a razor left at a crime scene were identified through comparison with those of a suspect.²⁶ Describing these cases, Glaister conveyed a sense of inexorability; no matter how hard criminals might try, they could hardly fail to leave a trace of their presence or actions. 'Not only all the forces of the law but even nature itself is against the criminal,' he wrote.²⁷ This was not the first time the relentless capabilities of science in the fight against crime had been aired in the popular press. As mentioned in chapter two, the former scientific investigator Harry Ashton-Wolfe had written a series of articles on the subject in 1928 for the *Illustrated London News*, in which he bullishly claimed that crime would soon become impracticable due to the powerful analysis of trace evidence.²⁸

²⁴ John Glaister, Jr., "The doctor who hunted villains," *Sunday Pictorial*, 24 February 1963, 8-9.

²⁵ Ibid.

²⁶ John Glaister, Jr., "The close shave that hanged a killer," *Sunday Pictorial*, 3 March 1963, 8-9.

²⁷ Glaister, "The doctor who hunted villains," 8.

²⁸ Ashton-Wolfe, "The scientific side of the detection of crime," 1162.

The third article in Glaister's series added a degree of nuance and qualification to the belief in the power of interchange. Although, he argued, the criminal was bound to leave evidence of his crime behind, or inadvertently take something from the scene with him in his flight, this would not invariably lead to his arrest:

There is a perfectly good reason for this: scientific tests are not direct leads to the discovery of a criminal. It may be that his guilt will not be proved without them—but he must be caught first, and that is the job of the police.

With this in mind, the article featured a number of cases in which the theory of interchange had not succeeded. In a case of robbery and murder, for example, although the perpetrator had left fingerprints behind, he was not traced, because he had not had his fingerprints taken by police before.²⁹

The overall tone of this article was mildly self-deprecating; Glaister was willing to highlight an instance in which his interpretation had been proved wrong, although he stood by his reading of the evidence:

As I am trying to be completely honest in these memoirs, I think it only right that I should recall a case in which my theories were discredited – by the accused herself.

The case concerned a baby who had died from suffocation. A scarf was found around his neck. Glaister suggested that it had slipped down from his head, since 'frequently the head of a newly-born baby is covered with a flannel head-square before washing', and that the baby had been suffocated accidentally by bedding. The mother, who was been accused of murder, and acquitted, was later heard to remark that the 'young doctor' had been 'quite wrong'. 'I put the cloth round the baby's face to stifle his screams,' she said. Nevertheless, Glaister maintained that his original theory had been reasonable. 'All the

²⁹ John Glaister, Jr., "The dark shadow of a gunman... and murder on a lonely station," *Sunday Pictorial*, 10 March 1963, 8-9.

ascertainable facts fitted what I had suggested, but here, in fact, there was another explanation,' he wrote.³⁰

Overall, Glaister's articles were slightly lighter in tone than Smith's, although he was not flippant about the subject of murder and violence. Thematically, they laid a greater emphasis on the capabilities of science, rather than the failings of the author's counterparts.

As a body of work, the newspaper articles by Smith and Glaister focus exclusively on the two men's professional work. Interesting cases, germane to their arguments, are described briefly (given the constraints of the medium). In this manner they differed from the autobiographies of the two men, which, in addition to providing more detail about the cases in which their authors participated, recounted episodes from Smith and Glaister's personal lives, spanning childhood, training, recreation and retirement. In some ways, the arcs of the two men's careers mirrored each other. For example, they both dabbled briefly in general practice, both spent time working in Egypt and both, as well as being Regius professors of forensic medicine, were deans of their university faculties, Smith of the medical faculty at Edinburgh and Glaister of the law faculty at Glasgow. On the other hand, the two men came from very different backgrounds. Smith grew up in a rural mining community in New Zealand with no secondary school; he was apprenticed to, and then qualified as a pharmacist, before travelling to Edinburgh University to attend medical school.³¹ Glaister, on the other hand, grew up in a more affluent household. His career choice was heavily influenced by his father, John Glaister Sr., who disapproved of his son's theatrical ambitions.³²

While Smith's book was very much a memoir, looking back on his life, Glaister's also included commentary on contemporary issues in forensic medicine, and society at large. As well as marvelling at the abilities of the forensic sciences of the early 1960s, he commented on various social issues, for example the treatment of criminals, which he thought too lenient, and

³⁰ Ibid., 9.

³¹ Smith, *Mostly murder* (1959), 18-22.

³² Glaister, *Final diagnosis* (1964), 21.

homosexuality, about which his views were complex. Indeed, it seems that, to some degree, Glaister's book was both memoir and manifesto.

The tone of these books was fairly light and conversational, although they both featured a streak of dark humour. The story recounted in *Mostly murder*, and discussed above, of the removal of adipocere from the bodies of the Higgins murder victims is an example of this. In particular, the account of Smith and Littlejohn's return by train to Edinburgh with the remains mixes the amusing and the macabre:

The train was crowded, and it was a hot day. We had the window open, but pretty soon the other passengers began to wrinkle their noses, sniff, and look at one another's boots. No wonder, for the smell was mephitic. The atmosphere grew thicker, and I could see that Littlejohn was getting uneasy. The true source of the stench was bound to be discovered in time. But the train reached Edinburgh before then, and we got safely home.³³

Glaister's *Final diagnosis* also juxtaposed horror and levity. For example, during a holiday in Troon, Glaister's dog, Roy, uncovered the body of a newborn baby amongst the dunes. Glaister did not wish to have his holiday disrupted; if he made Roy's discovery known to them, he would be expected to put himself, and his professional expertise, at the police's disposal. However, an obvious solution presented itself:

There would be other people strolling along the beach with dogs of equally inquisitive natures—quietly, I began to use one shoe to push some sand back over the little body. I might have got away with it, too, if my wife hadn't come back just then to see what the delay was about.

His wife persuaded him to report the finding. As predicted, the rest of the holiday 'vanish[ed] in a puff of police reports'.³⁴

³³ Smith, *Mostly murder* (1959), 51.

³⁴ Glaister, *Final diagnosis* (1964), 55-6.

Despite the effort to make Glaister's story as palatable to the public as possible, including the employment of Knox to draft the manuscript, correspondence between Glaister and his publisher suggests that the book was not a runaway success and they did not make a profit on it. A paperback edition was considered, but the head of Hutchinson's paperback imprint suggested that much of the general autobiographical material should be excised.³⁵ A paperback edition was not brought out.

Reflection – popular output and the themes identified in the historical study of forensic medicine

The earlier chapters of this thesis identify a number of broad themes that existed throughout the practice of forensic medicine in Scotland from 1914 to 1939. These include the place of forensic medicine within a network of different disciplines and professional groups; the adaptability of its practitioners, namely the necessity of their ability to undertake a wide range of tasks, from performing an autopsy to carrying out tests on firearms; and notions of appropriate standards of practice, to ensure the reliability of expert evidence. This section of the chapter will assess the extent to which these themes were reflected in the popular-media reminiscences of Smith and Glaister. This will help to illuminate the degree to which practitioners were conscious of these themes, and how far they held them to be ideals. Of course, contemporary consciousness of some of the themes is easier to identify than that of others. For example, the fact that evidence of the importance of standards and attentiveness comes from textbooks indicates the high level of awareness on the part of their authors. However, evidence of inter- and intra-professional networks is subtler, being extrapolated from sources such as medical reports, precognition documents and the makeup of prosecution- and defence-witness lists. Thus, a greater reliance is placed on retrospective sources for questions of whether forensic medicine's central figures were aware of their discipline's status as part of a wider network of medical and criminal investigations.

The importance of careful practice and the existence and use of experimental standards in forensic medicine has been identified in the earlier

³⁵ Letter, Gerald Austin to John Glaister, 20 May 1965, GUA, DC 403/2/6/1.

chapters for a number of areas of practice, including the performance of the post-mortem examination and the investigation of gunshot wounds. The solemnity of the courtroom encounter, with its power to condemn defendants to execution, and the risk to witnesses of prosecution if they failed to meet the expectations of truthfulness and circumspection, meant that the consequences of poor medico-legal work could be severe. Expert witnesses were often subjected to searching questions from scientifically well-informed advocates. Thus, questions of best practice were high on the medical agenda. Instructions to observe these norms, which appeared in contemporary textbooks, show that the elite practitioners were conscious of their existence and importance. It is, therefore, unsurprising that when these practitioners reminisced after their retirements, they alluded to expectations of careful practice and the application of high scientific standards.

Certainly, in places, the memoirs alluded to the skill of defence counsel. For instance, in Glaister's *Final Diagnosis*, the author portrayed various lawyers whom he encountered during his career as having been both skilled advocates and appreciative of the key elements of forensic medicine. For example, during the Ruxton trial, he was cross-examined by Norman Birkett, 'one of the ablest legal minds in Britain', a barrister 'who could combine skilled probing with courtesy and scrupulous fairness'.³⁶ Cross-examinations were often depicted as robust. Glaister also suggested that the best legal minds actively sought out learning on scientific topics, beyond the instruction they had received as students. For instance, John Cameron, a well-known Scottish defence advocate and, latterly, a judge, 'had visited the laboratories when I was at work to watch and talk about the practical procedures in progress'.³⁷ On the other hand, Smith suggested that the defence in the 1934 trial of Jeannie Donald had 'under-estimated the medical and scientific evidence' against their client, and refused a plea bargain to a reduced charge of culpable homicide.³⁸ Overall, however, Glaister and Smith portrayed the courtroom as having been a formidable test of their professional abilities.

³⁶ Glaister, *Final diagnosis* (1964), 113,115.

³⁷ *Ibid.*, 148.

³⁸ Smith, *Mostly murder* (1959), 219.

Indeed, Glaister made it clear that it was the court that set the ultimate standard of medico-legal proof, namely whether results derived from a given scientific test were an acceptable basis for a guilty verdict. In one of the later chapters, which is largely given over to general points about the forensic laboratory, he states that it took a long time for the precipitin test and his work on the identification of hairs to be accepted as ‘routine examinations’, although ‘now they are regarded as normal parts of any medico-legal report’.³⁹ His own work on the precipitin test had been motivated by the necessity for scientific tests for the courtroom to be based on a higher degree of certainty than might be required by other applications. Thus, he performed tests that subjected the procedure to different conditions, such as changing temperature, and variations in the age of stains and the materials on which they were situated, ‘develop[ing] the study to a point where British courts would be satisfied and readily accept the test’.⁴⁰

The importance of diligence and the establishment of a secure foundation for the application of science to law were most acutely demonstrated by the practitioners’ accounts of occasions when these principles had been absent. Smith appeared keen to make this point with reference to the Merrett case, both in his memoir and the *People* series. The failure to convict Merrett, which Smith believed to be an injustice, was attributed to ‘bungling’, in the form of two separate failures. The first was when the police neglected to examine the crime scene properly; the second was Spilsbury and Churchill’s inability to adhere to the basic principles of laboratory experimentation.

Smith’s first criticism concerned the police’s initial investigation when Mrs Merrett’s shooting was first reported. After questioning Merrett, the police were convinced that his mother had attempted to commit suicide. Nevertheless, in Smith’s view, this conclusion did not absolve them of their duty to ‘carry out ordinary routine procedures’. They neglected to note the positions of the body and the weapon; they did not test the weapon for fingerprints; they failed to take a deposition from Mrs Merrett before she died; and they were unable to produce the letter she had been writing when she was shot. Of the letter, Smith

³⁹ Glaister, *Final diagnosis* (1964), 202.

⁴⁰ *Ibid.*, 41.

wrote, 'I think they had lost it.'⁴¹ The consequence of these failings was clear: acquittal. Crucial information, which might have implicated Donald Merrett, had been missed. Smith showed, in his account of the fiasco, how the defence advocate, Craigie Aitchison, was able to capitalize on these mistakes. Describing them as 'an almost criminal defect of an obvious and imperative duty', Aitchison was able to suggest that Merrett might have been exonerated by his mother's deposition, because of the lack of information to the contrary. 'In point of fact,' wrote Smith, 'it would probably have hanged his client.'⁴² Through this account, Smith showed how a failure to perform a careful and methodical examination of the available evidence could undermine a prosecution and allow opposing counsel to take advantage of any areas of the investigation in which important information was lacking. Although it was a failing of the police, rather than the medical witnesses, the message was consistent with the themes that ran through his and others' earlier textbooks, discussed in the chapter on autopsy practice.

Smith's second set of criticisms relating to the Merrett affair concerned the conduct of the two expert witnesses who were called by the defence, Bernard Spilsbury and Robert Churchill. In his memoir, and one of the *People* articles, Smith rejected Spilsbury and Churchill's experiments: they had used a different gun and brand of ammunition to those found in the Merrett house, thus not replicating the conditions of the original shooting. Smith commented, 'You cannot prove with one gun what another gun can or cannot do.' The experiment had been badly designed, and Smith lamented the failure of the judge to rule the results inadmissible as evidence. Spilsbury and Churchill's incompetence was contrasted with Smith's own awareness of the requirements of the investigation of firearms and gunshot wounds. 'I had studied this fascinating topic in the laboratory,' he wrote, 'and in many cases I had proved in court that I knew a good deal myself about ballistics.' Churchill, on the other hand, was 'very far from being the leading expert he has often been painted'.⁴³

⁴¹ Smith, *Mostly murder* (1959), 144-5.

⁴² *Ibid.*, 145.

⁴³ Smith, "2 women died," 3.

Although Smith did not directly allude to notions of experimental standards, in which readers of the *People* might have only limited interest, it is clear that he regarded the question of what was a fair laboratory replication of the conditions of a crime to be one of the most resonant features of the Merrett case. The question of laboratory replication was, of course, an important point of debate in the trial itself. Smith's criticism of Merrett's defence and the police's initial investigation in his book and newspaper article, alongside Glaister's illustration of the development of laboratory techniques for the courtroom, show that the qualities of diligent method, a sound and thoroughly tested scientific basis for procedures such as the precipitin test and proper experimental planning, were seen by practitioners looking back as a cornerstone of forensic medicine.

The earlier chapters also showed that the multifaceted aspect of a medico-legist's work was an important feature of forensic medicine as practised at the elite level. This was readily acknowledged and discussed by the practitioner memoirists. There was an expectation that one expert would be able to perform a wide range of medico-legal techniques, from the autopsy to the precipitin test for determining the species of a blood sample. Their memoirs and the newspaper series clearly show that Smith and Glaister performed a wide range of medico-legal tasks in their work. For example, Glaister recounts performing autopsies with his father, working on the improvement of the precipitin test for use in court and using his expertise in the identification of fibres to prosecute safe-blowers.⁴⁴ Similarly, Smith describes, among other things, performing medical examinations on live suspects, examining cartridge cases and performing laboratory tests on the clothes of suspected safe-blowers to determine whether they had been in contact with explosives.⁴⁵ On the other hand, he also stated that there was less variety in his work in Edinburgh than there had been in Egypt.⁴⁶

Smith and Glaister both explicitly reflected on this breadth of forensic medicine. Smith suggested that there was an incongruous element to the wide

⁴⁴ Glaister, *Final diagnosis* (1964), 42-3, 51-2, 140-1.

⁴⁵ Smith, *Mostly murder* (1959), 238-9, 276-8.

⁴⁶ *Ibid.*, 150.

range of medico-legal subjects of analysis. He singled out the analysis of bullets and cartridge cases, an area on which he had carried out a substantial degree of research. Highlighting this anomaly, he gave an indication of how it arose. Admitting that there was ‘nothing medical about the identification of firearms from an examination of bullets and cartridge-cases’, he wrote that he had been initially tasked with the identification problem because of a parallel medical interest in wounding:

There is no separate specialty of forensic ballistics, and this work has in my time fallen into the province of the medico-legal expert, because he was accustomed to dealing with bullets in relations to wounds, and because there was no one else to undertake it.⁴⁷

Thus, the province of the medico-legist could expand to include non-medical evidence.

Although it was of general relevance, the above example provided by Smith referred to his practice in Egypt, where a wave of political assassinations heightened the necessity for a technique which could assist the investigation of shootings. Glaister, on the other hand, commented directly on the multifaceted role of the Scottish forensic medical expert, contrasting it with the English viewpoint. In Scotland, the medico-legist was ‘trained to carry out both the bulk of work involved in scientific aids and the necessary pathology’, whereas in England, these tasks were divided between the forensic pathologist and the Home Office laboratory scientist. An ‘English colleague’, he recounted, ‘caustically’ described the Scottish situation as ‘two for the price of one’. Glaister, on the other hand, believed the Scottish system to be superior, describing the medico-legist as ‘an almost unique free-lance investigator in search of truth’.⁴⁸ This implies that there was a morally superior, neutral quality to the Scottish medico-legal expert, in which scientific truth was achieved independently, free from the partisan concerns of the courtroom, to which the English Home Office scientist, who was, after all, an employee of the

⁴⁷ Ibid., 38.

⁴⁸ Glaister, *Final diagnosis* (1964), 217-18.

prosecutorial system, might be subject. Whether or not such an assessment about the English scientists is fair or not is, of course, open to question. As Ambage has shown, the establishment of Home Office laboratories, separate from the individual police forces building cases against individuals, was, in part, a strategy to avoid any undue influence over or interference with laboratory results. Nevertheless, as Ambage notes, Home Office scientists were not permitted to conduct defence work.⁴⁹

Although Smith and Glaister referred to the day-to-day permutations of their own jobs, they did not perform every single scientific or medical task which an investigation might require. Indeed, Glaister stated explicitly that ‘no man or group of men can possibly encompass all skills’.⁵⁰ Experts from other disciplines were required. In their memoirs, Smith and Glaister cited various examples of calling in external expertise. Through these examples, and subsequent reflections as to their significance, the popular forensic output reflected one of the central themes of the earlier chapters of this thesis: the existence of inter- and intra-disciplinary networks of communication and collaboration. Both authors listed separate scientific disciplines with which they had worked to furnish criminal investigations with necessary details. According to Smith, ‘co-operation is often needed from the botanist, the zoologist, the entomologist, the geologist, and other specialists’.⁵¹ Examples in Glaister’s *Final diagnosis* included an instance in which he received assistance from the staff of Regent’s Park Zoo in the investigation of the illegal dyeing of greyhounds’ coats as part of a ‘betting coup’.⁵² According to Glaister, what often united ‘the medico-legalist, the chemist, the botanist, the zoologist, the geologist, and many other experts’ was the theory of interchange, the pursuit of traces left by someone’s presence at a locus, or their interaction with another person.⁵³ Smith and Glaister thus recognized that their work involved a significant degree of interaction with specialists from other disciplines and their own.

⁴⁹ Ambage, "Origins and development of the Home Office Forensic Science Service," 94-5, 120.

⁵⁰ Glaister, *Final diagnosis* (1964), 142.

⁵¹ Smith, *Mostly murder* (1959), 38.

⁵² Glaister, *Final diagnosis* (1964), 142.

⁵³ *Ibid.*, 139.

During the Ruxton investigation, noted for the extensive collaboration between experts, medico-legists from Glasgow and Edinburgh worked together, along with anatomists, dentists and others.⁵⁴ The case was featured in both *Mostly murder* and *Final diagnosis*, although Glaister's involvement in the case was greater than Smith's. Glaister revelled in the teamwork which the case involved:

It made a refreshing contrast with an older outlook, which sometimes left one man sitting on a case on his own, guarding it against all comers like a dog savouring a juicy bone.

He wrote that the conduct of the case was the embodiment of what was, as far as he was concerned, the ideal manner of investigation, in which 'scientists and police worked side by side', exemplifying 'absolute teamwork towards a common objective'.⁵⁵ This emphasis on teamwork was in keeping with other mid-century thinking about the best ways of investigating crime. Arthur Dixon, a Home Office civil servant who played a crucial role in the establishment of the Forensic Science Service, argued in the 1930s that active collaboration between detectives, scientists, and police surgeons from the outset of investigations was of vital importance. By the 1950s, as Ambage shows, this had come to pass.⁵⁶

The importance of the network of expertise, in which various academic disciplines could be marshalled for forensic purposes, was such that Glaister argued that it was necessary that this be taken into account when the organizational and institutional structures of forensic medical services were being constructed. Glaister believed that the best location for a medico-legal institute was in the university, so that adjacent expertises in the wider scientific sphere could be exploited:

[A university-based medico-legal] institute is in turn embedded in the heart of a larger institution, the periphery of which holds representative specialists in the various fields and branches of

⁵⁴ Katherine Watson, *Forensic medicine in Western society: a history* (Milton Park, Abingdon: Routledge, 2011), 139-40.

⁵⁵ Glaister, *Final diagnosis* (1964), 117.

⁵⁶ Ambage, "Origins and development of the Home Office Forensic Science Service," 240-1.

science which from time to time may be required to give aid and assistance. In this way it is possible always to have a ‘standing army’ of experts with full facilities in their several fields without, to put it bluntly from the taxpayers’ point of view, the need to keep them on a separate strength!⁵⁷

It should be noted that this argument was written in the present tense. Glaister was using the Ruxton case, which occurred almost thirty years before the book’s publication, to reinforce an argument about the state of forensic medicine in the early 1960s. Indeed, an alternative interpretation is that Glaister used the fact of cooperation as a means of promoting the primacy of forensic medicine in the university and the place of forensic medicine in the investigation of crime. Such an endeavour may have been related to the general concern of Glaister, and others, about the perilous health of British forensic medicine since 1950, when it ceased to be mandated by the General Medical Council as part of the medical curriculum. Glaister argued in a 1952 article in the *British Medical Journal*, “Whither forensic medicine?”, that a lack of provision for the discipline in the National Health Service, a lack of training opportunities and poor remuneration for specialists had left ‘prospects [which] seem rather disquieting’.⁵⁸ The situation was not set to improve. In a 1977 article, Arthur Harland, Glaister’s successor but one to the Regius chair, asked whether the discipline should be ‘allowed to die’. He noted that ‘once a prestigious branch of medicine, Forensic Medicine is at the present time in a state of disarray’.⁵⁹

Overall, the popular output of Smith and Glaister reflected a number of the themes identified in the previous chapters of the thesis, including the multi-faceted nature of the medico-legist’s role, the importance of diligent practice and the importance of the wider network and its interactions with forensic medicine. Glaister’s praise of the network and the collaboration it brought was consistent with his campaigning writing about the state of forensic medicine as

⁵⁷ Glaister, *Final diagnosis* (1964), 119.

⁵⁸ John Glaister, Jr., "Whither forensic medicine?," *British Medical Journal* 2, no. 4782 (1952): 475.

⁵⁹ WA Harland, "Should forensic medicine be allowed to die?," *Scottish Medical Journal* 22, no. 3 (1977): 193.

a discipline from the early 1950s. His description of the ability of Scottish forensic medicine, located in universities, to marshal the expertise of other scientific disciplines, can be seen as an argument for its continued survival, which his 1952 *British Medical Journal* article advanced.

Self-presentation of experts

Although professional writers assisted the memoirs of Smith and Glaister into print, outwardly they represented a personal legacy. The memoirs and newspaper series were a means of communicating an image of themselves to a public audience. This opportunity was not neglected. Both authors conveyed strong central character traits, which would have been seen to be ideal for the medico-legalist, such as impartiality and open-mindedness. The attributes of Smith, in particular, were contrasted with those of other experts, such as Spilsbury, as part of a broader argument, in his case an attempt to shape the public's attitude towards forensic medicine and medical witnesses. This section will explore the authors' self-presentation and the views and causes to which it was linked.

The image projected by Sydney Smith's memoir and articles is multifaceted and striking. The account of his early life shows his rise from humble beginnings to the top of his profession as dean of the medical faculty of the University of Edinburgh and, for a time, the university's acting principal. His route to medical school was gradual and largely self-propelled. Without access to secondary education (although he is full of praise for his primary-school teacher, 'WA Reilly, BA'), he was apprenticed to chemists in the town of his birth, Roxburgh, and Dunedin, where he was able to obtain the scientific education he needed to enter the University of New Zealand. After a year in Wellington, he travelled to Edinburgh, having obtained a scholarship to attend the medical school.⁶⁰ Smith's trajectory is in keeping with a well-known trope in the popular mythology of Scottish education, that of the 'lad o'pairts'.⁶¹ Emerging in sentimental literatures of the nineteenth century and continuing into the twentieth, it was a celebration of democratic qualities of the Scottish education system. The lad o'pairts was typically a young man from a poor,

⁶⁰ Smith, *Mostly murder* (1959), 20-3.

⁶¹ Trans.: lad of parts.

rural background who, educated in a parish school by an enthusiastic ‘dominie’ (schoolmaster, of which ‘WA Reilly, BA’ fitted the stereotype), entered university thanks to his intellectual merit and capacity for hard work. Once there he would work hard and obtain his degree, after which he would often die of exhaustion.⁶² Although these young men were traditionally from rural Scotland, rather than the colonies, Smith’s story still resonates with the trope, and it might have appealed to sections of his readership.

His arrival at Edinburgh University marked a significant step in Smith’s life. Throughout the memoir, he referred to his association with it in various ways. Indeed, it would appear that his public link with the institution was something he wished to cultivate. He dwelled on his experiences as a student, recounting tales of eccentric professors and his participation in various hi-jinks.⁶³ He also reflected on his later role as dean, which included dealing with bribery attempts from the parents of prospective students.⁶⁴ He described his election as Rector of the university after his retirement as ‘the highest honour that could be paid to me’. Finally, he was awarded an honorary degree, ‘further enhancing my feeling of kinship with my *alma mater*’:

As undergraduate, graduate, assistant, lecturer, professor, Dean of Faculty, and Acting Principal, I had been associated with her over a period of nearly half a century.⁶⁵

While this affection for the university, formed over a prolonged exposure, can be taken at face value, his association with such a body, which was, of course, separate from the prosecutorial authorities, was important for the formation of the most crucial aspect of his public image: his impartiality. The two were explicitly linked in one of the *People* articles. ‘As a university professor, I was in an independent position,’ he wrote. ‘My only interest was to see that justice was done.’⁶⁶ This was in relation to his part in the defence of Sidney Fox, who was tried in England. However, the statement could as well

⁶² Robert Anderson, "In search of the ‘lad of parts’: the mythical history of Scottish education," *History Workshop Journal* 19, no. 1 (1985): 82-104.

⁶³ Smith, *Mostly murder* (1959), 22-6.

⁶⁴ *Ibid.*, 149.

⁶⁵ *Ibid.*, 294.

⁶⁶ Smith, "They hanged this innocent man," 2.

have applied to Scotland, where he also consulted on defence cases. As the *People* quote suggests, the fact that he was employed by the university, rather than permanently by the Crown Office, meant that he was free to lend his expertise to defence cases without fear, for example, of losing his income, which came from his university position.

However, according to his memoir, his neutrality ran deeper than his employment situation. Whilst in Egypt, although he was a government employee he adopted positions that were controversial. For example, he gave evidence in court against a prison commandant charged with beating a prisoner excessively; he demonstrated that marks on the prisoner's body had been caused by a whip.⁶⁷ Smith learned later that his testimony had caused a stir in the Cairo legal community, 'because I, a whole-time Government official, gave evidence in favour of a prisoner against a senior Government official'. He then stated his explicit view on the importance of impartiality, which was vital, especially in view of the advantages that the prosecution had over the defence. These advantages manifested themselves, Smith argued, in terms of financial resources, and a tendency for the court to favour prosecution witnesses over those of the defence when their evidence conflicted:

All the more reason for [the expert witness] to be strictly impartial. He should not think of a conviction as a victory, of an acquittal as a defeat. He should state the facts – and his interpretation of the facts – fully and frankly, without considering whether they strengthen, weaken, or even destroy the Crown's case. His evidence may be crucial: on it may depend the liberty or even the life of a fellow human being. His responsibility is indeed great.⁶⁸

This episode in *Mostly murder* was central to the establishment of Smith's public persona. He was portrayed as being willing to stand up for the underdog against the power of the state, and resolute in his devotion to 'the facts', displaying moral courage in the process. This position of impartiality,

⁶⁷ Smith, *Mostly murder* (1959), 55-6.

⁶⁸ *Ibid.*, 56.

highlighted in the book and the articles, was related to another aspect of his public character, his iconoclasm.

The icon in question was Spilsbury, on which Smith appeared to fixate. The dust jacket of the first edition of *Mostly murder* carries the question, ‘Was he greater than Spilsbury?’ Arguably the first British ‘celebrity pathologist’, Spilsbury had a reputation as a skilled witness-box persuader. Although, by the mid-twentieth century, his solitary approach had fallen out of favour with younger pathologists, who preferred to lead multi-disciplinary teams, he was still a well-recognized and respected figure in the popular imagination, despite having died in 1947. For example, a 1951 profile of a forensic pathologist in the *Daily Express* referred to him as ‘a new “Bernard Spilsbury”’.⁶⁹ Even when it emerged, in 1954, that Donald Merrett, for whose defence Spilsbury had given evidence in 1927, had killed his wife and mother-in-law before killing himself, the journalist Keith Waterhouse’s account of the first trial was not critical of Spilsbury, describing his evidence as ‘canny’ and ‘the learned experiments of a learned man’.⁷⁰ Looking back at Spilsbury’s career, the *People* article ostensibly penned by Smith described him as a ‘public idol’. ‘There was a magic about Spilsbury that made many judges and juries accept his conclusions as gospel,’ he wrote.⁷¹ Smith did not share this reverence. Indeed, the use of quasi-religious imagery heightened the sense of iconoclasm when the vituperative criticisms of Spilsbury in the *People* were launched in Smith’s name.

⁶⁹ James Bartlett, "Murder week man," *Daily Express*, 11 August 1951, 4.

⁷⁰ Keith Waterhouse, "One small piece of human skin... and he was free for a life of crime," *Daily Mirror*, 18 February 1954, 7.

⁷¹ Smith, "They hanged this innocent man," 2.

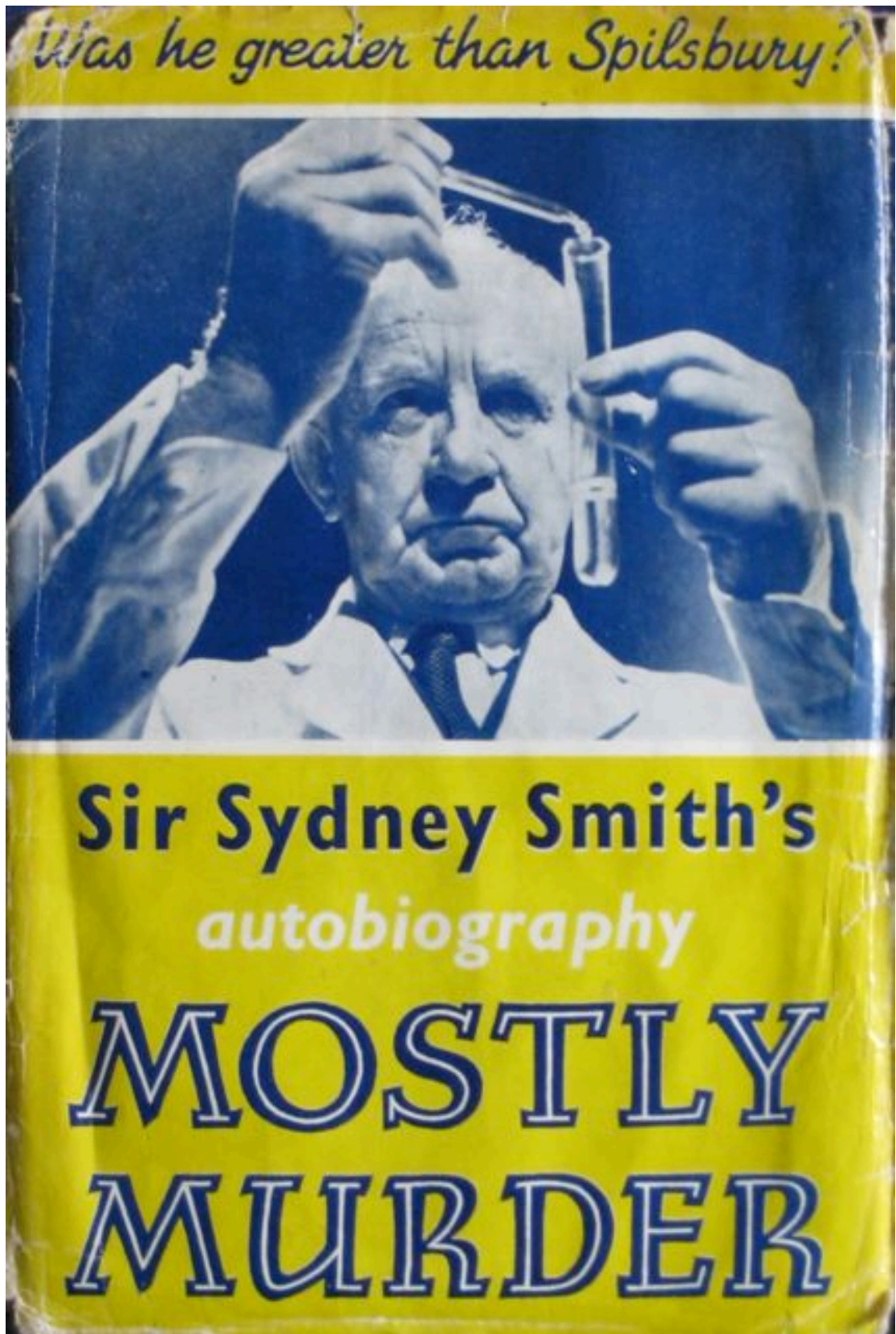


Figure 3: Front cover of Smith's memoir, *Mostly murder* (1959). (Photograph, the author)

The first of the cases covered in the series was the trial of Sidney Fox, who was accused of the murder of his mother in a hotel room in Margate in 1929. Although this was an English case, Smith acted as a defence witness, while Spilsbury spoke for the Crown. Spilsbury stated that his post mortem had revealed bruising in the tissues of Mrs Fox's neck, which showed she had been strangled. Smith found something different. 'Imagine my astonishment, however,' he wrote, 'when I went to examine the bruise for myself. *It was not there.*' When this was put to Spilsbury, he refused to concede that he had made a mistake. Instead, he argued that the bruising had faded between his and Smith's examinations. This position did not impress Smith. However, when he tried to argue the point with Spilsbury, the prosecution witness continued to insist that the 'bruise' had been there.⁷²

Spilsbury's stubbornness in the face of contradictory evidence was the article's main criticism of him. 'If anybody produced fresh evidence which tended to prove his conclusions wrong, he flatly refused to look at it.' In the end, despite the judge's summing up which 'stress[ed] the points in Fox's favour', the jury convicted him, and he was executed. Smith was clear where the blame for what he considered a miscarriage of justice lay. 'But I am afraid it was not the only case in which Spilsbury's stubbornness in error thwarted the cause of justice,' he wrote.⁷³

The impression of Spilsbury's stubbornness was reinforced by the article on the Merrett case, which appeared the next week. An assessment of Spilsbury's behaviour ('Spilsbury was a stubborn man, given to making quick decisions, then sticking to them even when proved wrong') was juxtaposed with an example of the behaviour of Smith's own mentor, Harvey Littlejohn, when the manner of Mrs Merrett's death was called into question as a result of the discovery of her son's fraud. Littlejohn had initially suggested that her death had been either accidental or suicidal. However, when Merrett's

⁷² *Ibid.*, 3.

⁷³ *Ibid.* This was not the first time Spilsbury's interpretation of bruising had been called into question. In the 1925 trial of Norman Thorne for his fiancée's murder in Sussex, Spilsbury stated that bruises beneath the skin on the body of the deceased were indicative of a vicious beating. Defence experts thought them to be much less serious. However, Thorne was convicted and executed. Writing about the case, Burney and Pemberton note Spilsbury's celebrity status. Burney and Pemberton, "Bruised witness," 51-3.

suspicious behaviour emerged, the pathologist was compelled to revise his findings:

Littlejohn readily admitted his mistake. He changed his earlier opinion that it could have been suicide or accident, decided that it was murder and therefore appeared for the prosecution.⁷⁴

Littlejohn's willingness to change his opinion in the face of new evidence was in stark contrast to Spilsbury's inflexibility.

Highlighting the proper behaviour of others may have been a strategy to isolate Spilsbury. In another *People* article, Smith recounted a case in which he and another doctor came to conclusions which contradicted Spilsbury's. The case was the trial of Claude Avarne, a Jersey doctor who was accused of performing an illegal abortion. A young woman had allegedly approached Avarne to ask him to terminate her pregnancy. He refused. Later, she returned to him. According to Avarne, he examined her and determined that the foetus had died. He therefore operated to remove it. The woman then consulted another doctor, who became suspicious and notified the police. Spilsbury was called in to examine the foetus. He determined that it had not been dead when the operation took place, and that Avarne had, therefore, terminated the pregnancy. He stated that there was no maceration (softening of tissues after death) of the foetus, which, had it been present, would have been a sign of the foetus having been dead in the uterus for some time. Yet, when Smith, who had been recruited by the defence, examined the specimens taken by Spilsbury, he observed clear signs of maceration. However, Spilsbury did not change his opinion when Smith confronted him with this.⁷⁵

In the subsequent trial, Spilsbury also gave opinion about the treatment Avarne had given. He testified that the operations had been unnecessary, meaning that Avarne had mistreated his patient. Cross-examination revealed, however, that Spilsbury had not attended a pregnancy for twenty years. Another defence witness, Aleck Bourne, a gynaecologist, spoke scathingly about Spilsbury's opinion:

⁷⁴ Smith, "2 women died," 3.

⁷⁵ Smith, "Condemned by one word," 3.

Bourne exploded: 'I have the greatest respect for Sir Bernard when he speaks as a pathologist about things in bottles.

'But when he starts to talk about the symptoms and diagnosis of living things, then I cease to listen.

'He has no experience at all of clinical observations in maternity cases. When he dares to give an opinion about the treatment of a living woman, I would regard it with contempt.'⁷⁶

Thus, Avarne was acquitted and Spilsbury humiliated. He was shown to have either failed or refused to observe visible signs of maceration on the foetus specimen, as well as having overstretched himself by making pronouncements on matters outside his expertise.

Because of the complications, discussed below, associated with attributing authorship of these articles, the underlying reasons for the vituperative attacks on Spilsbury, whether attributable to personal animosity or a newspaper's house style which leaned towards the sensational, are difficult to define. However, the stated reason for the criticisms was to educate jurors about the limitations of the evidence of medical witnesses, which was part of a wider effort to inform the public about how 'laboratory experts', a group in which he included himself, reached their verdicts. This was in response to the way in which 'ordinary people, and even judges and juries' believed expert witnesses to be infallible. This, the author argued, was dangerous, and resulted in miscarriages of justice.⁷⁷

Setting out his views on fallibility, Smith made a distinction between scientific tests and the scientists themselves. The tests could be 'foolproof' if performed with due care. 'After my own long career, which includes 25 years as Professor of Forensic Medicine at Edinburgh University, I have no doubt of that,' he wrote. However, the scientists, 'who carry out the tests and then present their conclusions in the witness box', were indeed fallible. They could make mistakes and express 'questionable' views in the witness box. Thus,

⁷⁶ Ibid.

⁷⁷ Smith, "They hanged this innocent man," 2.

when excessive reliance was placed on these views, the consequences were ‘frankly appalling’. Spilsbury served as the prime example of this, being ‘often wrong – obstinately, dangerously wrong’.⁷⁸

In Smith’s eyes, it would seem, Spilsbury was a useful personification of egregious medico-legal blundering. However, it would be a mistake to take this at face value. This is because of the issue of the authorship of the *People* articles. Although they were attributed to Smith in the by-line, the paper’s journalists had redrafted what was already a rewritten version of Smith’s memoirs. The opinions expressed in the articles may thus have been exaggerated or distorted. Indeed, there is evidence to suggest that Smith himself felt this to be the case and that he wrote to the paper to complain, specifically regarding their treatment of Spilsbury. Although Smith’s letter to the *People* does not survive, a reply from Dennis Winston, one of the newspaper’s staff, is preserved. It answers various points raised by Smith, including about the criticism of Spilsbury:

I am a little surprised that you object to the way in which we are referring to Spilsbury, because we are simply printing – with slight alterations to introductions, etc. – the instalments which I checked through with you so carefully. ... I honestly do not think that Spilsbury is being hit too hard. One of the vital points about this series of articles is your differences with Spilsbury and, as I explained to you when we last met, we are simply highlighting these a little. I do not think that anybody would interpret these differences as anything but professional differences of opinion between two experts in a profession where differences are inevitable.⁷⁹

Clearly, Winston did not believe that Smith’s views had been misrepresented.

There are several possible explanations for Smith’s response. The first is that the *People* had exaggerated his disapprobation for Spilsbury. Another is that, although the tone of the articles did represent his true views, he thought,

⁷⁸ Ibid.

⁷⁹ Letter from Dennis Winson to Sydney Smith, 25 February 1959, RCPE SMS/7/62.

on reflection, their publication had been ill advised. Whatever the explanation, their outward attribution to Smith means that they contributed to his public image. The articles' overall message, to which the Spilsbury episodes contributed, namely the encouragement of critical thinking by jurors and the importance of having evidence to back up medico-legal opinions, is consistent with other sources for Smith's views, including *Mostly murder*, over which he had a greater degree of control. Thus, the *People* articles are still of historical interest, and their contribution to an overall public face of forensics was significant. Smith's apparent response, however, adds nuance to our understanding of the issue, reminding us that a celebrity expert's public profile was, to a degree, independent of the man himself.

Smith, or at least his public persona, also encouraged readers of the articles and his memoirs to question other figures of authority besides medico-legal experts. The evidence of police witnesses could also be unreliable. This point was made in Smith's *People* article about the case of Peter Queen, a young Glasgow man who was accused of murdering his girlfriend, Chrissie Gall, by strangulation. Smith was, again, a defence witness, this time, unusually, alongside Spilsbury. They argued that Gall might have, in fact, killed herself.

The main prosecution evidence was from police witnesses, who testified that Queen, when he reported Gall's death at a police station, said 'I think I have killed her.' Queen, on the other hand, maintained that he had said 'Don't think I have killed her.' Smith was not convinced that Queen had confessed. It emerged that Queen's statement had not been written down at the time. 'Yet nearly seven weeks later [the police officers] were being asked to remember the exact words,' Smith wrote. Despite such doubts, Queen was convicted, although the court's original death sentence was commuted to imprisonment on appeal.⁸⁰

The *People* article stated that the jury had chosen to accept the police testimony in spite of 'almost incontestable' expert evidence. This supported the argument signposted at the beginning of the article:

⁸⁰ Smith, "Condemned by one word," 3.

The case of Peter Queen underlines one of the most important lessons I have learned from my long experience of the courts—that it can be highly dangerous to rely on a policeman’s memory of statements made after a suspected crime.⁸¹

The issue was cited as an example of police fallibility, and the article did not suggest that there had been a wilful distortion of Queen’s statement. Whether the police’s alleged inaccurate testimony was deliberate or not would have been beside the point. Jurors needed to think critically about witnesses’ testimony, whether any inaccuracies were intentional or not.

Interestingly, Smith’s account of the case in his book was much more muted in character, particularly regarding his belief in Queen’s guilt or innocence. While he still criticized police for failing to record what was ‘tantamount to a confession of murder’, noting that the witnesses were ‘evasive under cross-examination’, he made more of the ambiguity of whether Queen had killed Chrissie Gall than in the *People* article. ‘The facts did not warrant a definite opinion either way,’ he wrote. When Smith asked himself whether Queen had been guilty, his answer was only ‘probably not’.⁸² Conversely, elements of the newspaper article more readily suggested that Smith was convinced of Queen’s innocence. According to the headline, for example, Smith’s tests ‘proved him innocent’. One sentence in the article appears to be at odds with the ambiguity of the book: ‘I had rarely been so sure of my solution to a crime puzzle as I was in the Queen case.’⁸³

This is likely to be another example of the adjustments made by the *People* to the text sent by the publishers of *Mostly murder*. A popular Sunday newspaper might require a more unequivocal tone to attract readers’ attention. In any case, the Queen piece was in keeping with the rest of the series, both in terms of the portrayal of a diametrical opposition between the views expressed by Smith and those in authority, and, by extension, in the way in which he

⁸¹ Ibid., 2.

⁸² Smith, *Mostly murder* (1959), 190-4. Smith noted that Spilsbury was much more convinced of the conclusiveness of their examination of the ligature, which showed that Gall could have used it to commit suicide, than he was.

⁸³ Smith, "Condemned by one word," 2.

appeared to encourage the audience of potential jurors to question that authority. This intention was summed up in the article about the Merrett case:

I can only hope that, in making the facts known now, I may at least help the public to realise that the police can sometimes go badly wrong—and that scientists in court are fallible human beings.⁸⁴

Overall, the impression of Smith provided by his popular media output, including the memoir and newspaper articles, is of a man who rose from humble beginnings to the top of his chosen profession. His vocation demanded impartiality and the courage to impart findings that might not support those in positions of authority. The material suggests that Smith was capable of meeting these demands, as shown by his work in Egypt, his encounters with Spilsbury and his work on the Queen case. This persona was in keeping with the campaigning element of Smith's newspaper articles, which urged the public to exercise caution when assessing the testimony of experts and police witnesses. Greater understanding of the processes through which medico-legal conclusions were reached, he argued, would help prevent miscarriages of justice. Of course, the evidence of his complaint to the *People* after the publication of the first of 'his' articles demonstrates that aspects of this retrospective public image of his career were beyond his direct control. The extent to which the memoir and the articles mirrored his personal views is difficult to ascertain, due to the collaborative nature of their authorship and Smith's associated concerns. However, there is no evidence to suggest that he objected to the texts' underlying messages about authority's fallibility.

The self-presentation of Glaister in his popular output, the *Sunday Pictorial* articles and his memoir, differed in important respects from that of Smith. Although there were similarities, such as an emphasis placed on the importance of impartiality, Glaister did not convey the same sense of urgency about the prospect of injustice. Indeed, he appeared to display a greater degree of confidence in the judicial system; he did not emphasize perceived miscarriages of justice, for example. Differences of opinion between expert

⁸⁴ Smith, "2 women died," 2.

witnesses were not problematized to the extent that they were in Smith's work. The tone of Glaister's articles was strikingly different from that of Smith's. He suggested that there was an inherent fairness in the system, because, he wrote, the defence 'can call any expert they like providing the merits of the case justify it'. To think otherwise was a misconception. 'The public have an idea that the dice are loaded against the accused because they think the prosecution can always get the best man,' he wrote. Countering this, he pointed out that he had, himself, appeared for the defence on a number of occasions.⁸⁵

His confidence in the fairness of forensic medicine and science was implicit in his account of his choices of which defence cases he took on:

It is true that in forty years I have turned down 85 per cent of the cases in which I was asked to appear for the defence.

But this was only because in these cases I did not think there was justification for contesting the prosecution evidence.

Otherwise, he wrote, he would offer his services unhesitatingly.⁸⁶ This passage is reassuring in its nature. Writing it, Glaister was suggesting that the degree to which medico-legal conclusions appeared questionable was relatively low. This was in stark contrast to the cases chosen by Smith for his *People* series, in which there was always a sharp dichotomy between the views of the prosecution and defence experts.

Glaister also addressed the issue of differences of opinion in the courtroom, albeit in an abstract sense. In keeping with the tone of the above views about defence expertise, he did not think expert disagreement was threatening. He acknowledged that, as far as the public were concerned, it could be baffling; however, it was to be remembered that interpretations, rather than facts, were what was in contention. Such variance could be, he argued, 'the surest way of arriving at the whole truth':

⁸⁵ Glaister, "The dark shadow of a gunman," 9.

⁸⁶ *Ibid.*

Skilled counsel, with two possibilities before them, are very often able to arrive at the full facts by examination and re-examination of witnesses.⁸⁷

In other words, when forced to choose between two opinions, lawyers would test the merits of each through rigorous questioning, before deciding which was the more convincing. Implicitly, the court acted as a safety valve for scientific evidence; it was subject to testing and so, overall, could be relied upon.

Smith held quite a different view. In his examples, the differences between his and Spilsbury's opinions were factual rather than interpretive. In the Sidney Fox case, Smith did not believe that the bruising observed by Spilsbury had ever existed. Likewise, Smith saw maceration of the foetus in the Claude Avarne case, whereas Spilsbury did not. They did not disagree in their interpretation of the bruising or the maceration, but on the facts of their existence. Smith did not appear reassured by the supposed probity of the court. In his view, judges and juries treated Spilsbury's testimony with undue reverence.⁸⁸

Despite the differences between the public attitudes of the two men, Glaister and Smith were in agreement on the matter of impartiality. Glaister argued that the expert should be ready to give his facilities to either the Crown or the defence, and that his only loyalty was to justice and the facts. In his memoir, he recounted an incident in which this was tested. An unnamed procurator fiscal confronted him about his work for the defence:

‘Look here, you are not to go into the witness-box and give evidence against the Crown doctors again. I don't like my Crown medical witnesses doing that sort of thing,’ he growled. ‘If you do this again I'll not take you into any more Crown cases.’

⁸⁷ Ibid.

⁸⁸ Smith, "They hanged this innocent man," 2. Glaister did not share Smith's public disdain for Spilsbury's talents. 'If there were errors,' he wrote, 'it must be remembered that the views he expressed twenty or thirty years ago were reached on beliefs and techniques which were then only at a certain stage of maturity. ... Writers who query [Spilsbury's greatness] make the mistake of failing to consider the development of forensic science in the years which have passed.' Glaister, *Final diagnosis* (1964), 188.

Glaister's response was assertive, answering, 'I'd like you to say that again, this time in the presence of witnesses.' According to this account, Glaister was 'really disgusted' by the procurator fiscal's behaviour.⁸⁹ The employment of such a dramatic incident reinforces the impression of Glaister's impartiality in the reader's mind which, like that of Smith, was consistent with the whole body of his popular works.

The defensive reply sent to Smith by the *People* after the appearance of the first part of his serial had shown that Smith attempted to exercise a degree of control over the parts of his public image that were produced by other people. An exchange of letters within Glaister's personal correspondence suggests that he, too, made attempts to exert a degree of control over his public image, this time beyond the publication of his own memoirs and newspaper features. In this instance, the Glasgow *Evening Times* ran a series of articles about his most famous cases, prior to his retirement, without his participation or agreement. Writing to John Spencer Muirhead, the chairman of George Outram & Co., the newspaper's publishers, Glaister complained about the serial, entitled "The man the murderers feared". He wrote, 'at no time was my permission asked for this step, nor indeed was I consulted in connection with any of these articles'. He demanded to know what was going to be done about this.⁹⁰ Muirhead did not share Glaister's concern. In his view, the *Evening Times* journalist, Lee Scott, had not done anything wrong. The articles were merely summaries of cases in which Glaister had given evidence, the substance of which had already been reported years earlier. 'There is no suggestion in Mr Scott's articles that they were inspired by you,' he wrote. It was perfectly reasonable, he continued, for the paper to report on the activities of public figures such as Glaister.⁹¹

To what extent can this exchange be interpreted as an attempt by Glaister to control media coverage of his career? While this is one possible explanation, another possible reason was one of contractual obligation, and Glaister's fear of being found to be in breach. In his letter, Glaister mentions

⁸⁹ Glaister, *Final diagnosis* (1964), 80.

⁹⁰ Letter from John Glaister to John Spencer Muirhead, Chairman, Outram, 2 October 1962, GUA, DC 403/2/6/1.

⁹¹ Letter from John Spencer Muirhead to John Glaister, 4 October 1962, GUA, DC 403/2/6/1.

that he had already agreed to a series with ‘a well-known London Newspaper Combine’, and, as a result, had turned down similar offers from ‘almost all of the well-known weekly and Sunday newspapers’. The actions of the *Evening Times* were, therefore, problematic:

You can readily imagine the position in which I find myself, more particularly when I mentioned to the ‘Times’ that I was also under contract to write an autobiography for a well-known London publisher.⁹²

The ‘Newspaper Combine’, which was Sunday Pictorial Newspapers, might infer that Glaister had sold his story to another publication, despite signing a contract stipulating that he was not to do so until after the appearance of their articles.⁹³ Additionally, because he had turned down several offers from other papers, he might have resented the *Evening Times* taking advantage of the occasion of his retirement to sell more copies. The newspaper deals could be lucrative; the *Sunday Pictorial* paid him £2000 for his story.⁹⁴ The *Evening Times* paid him nothing.

Conclusions

Overall, the memoirs and newspaper features associated with Smith and Glaister provide a useful insight into their attitudes and their public images. While forensic medicine was a discipline which faced more public exposure than other areas of medicine and science, through court appearances and the reporting of violent crime in the press, the examination of this popular output shows the themes and topics of interest which representatives of the specialty wished to express directly to the public, including the importance of investigative teamwork, the continuing status of forensic medicine, and the need for jurors to assess evidence critically.

⁹² Letter from John Glaister to John Spencer Muirhead, 2 October 1962, GUA, DC 403/2/6/1.

⁹³ The threat of litigation was not far from Glaister’s mind. He attempted unsuccessfully to take out libel insurance before the publication of *Final Diagnosis*, and sought assurances from Sunday Pictorial Newspapers that they would indemnify him, which they did. Letter, JE Turner & Copland Ltd., insurance brokers, to John Glaister, 21 June 1962, GUA, DC 403/2/6/1. Letter, RT Payne, Editor, Sunday Pictorial, to John Glaister, 14 June 1962, GUA, DC 403/2/6/1.

⁹⁴ Agreement between Sunday Pictorial Newspapers Ltd. and John Glaister, 2 January 1962, GUA, DC 403/2/6/4.

The popular outputs of Smith and Glaister produced quite different portraits of the two men's characters. While there was a common element, that of devotion to impartiality, they expressed different attitudes towards the criminal trial, particularly in their newspaper series. Smith portrayed a dangerous courtroom, in which judges and juries were too much in awe of the evidence of figures of authority, to the detriment of justice. In this, he was something of an iconoclast. Glaister, on the other hand, saw the adversarial encounter as a good means of reaching the truth about scientific evidence. He used his articles and his book to showcase the power of forensic medicine and science, which could turn the smallest traces into the building blocks of a successful prosecution.

As well as adding to our understanding of forensic medicine through the illumination of practitioners' retrospective output, this chapter has, I hope, shown the value of the analysis of popular presentation of science and medicine in general. However, the complex authorship of Smith and Glaister's books and articles demonstrates that a nuanced understanding of the production of the public images of doctors, scientists and their disciplines is required. How they were presented was not always within their control, despite the testimony of the by-line.

Conclusion

This thesis has examined forensic medicine in Scotland, 1914-39, with reference to two broad themes and a number of subsidiary ones. In terms of activities and workspaces, I have shown that forensic medicine was a multi-faceted discipline. As well as the core activity of the medico-legal autopsy, which did not undergo a significant degree of change over the period of study, the discipline encompassed laboratory work, such as tests on blood; the investigation of shootings, with reference to weapons and ammunition as well as wounds; and aspects of photography. Additionally, two of the practitioners turned their hands to autobiographical writing, albeit with assistance. The thesis has shown that the variety of activity was not just at an institutional level, but at a personal one as well. Figures such as Littlejohn, Smith and the Glaisters examined blood-stained clothing and weapons, for example, as well as performing post mortems. Their written work, in the form of textbooks and journal articles, demonstrates the breadth of their expertise.

I have also argued that the links forensic medicine enjoyed with other disciplines, institutions and sources of information are crucial to understanding its nature. At the most basic level, as shown by the various precautions taken by autopsy practitioners, its use in the courtroom shaped its performance, for example ensuring that no potential evidence was lost. Its practice sometimes relied upon external sources of information, such as a deceased person's medical history. Medico-legists also collaborated with representatives of other disciplines, both inside and outside the medical profession, including gynaecologists, chemists and bacteriologists. Their work sometimes overlapped with that of others, for example police photographers and gunsmiths. The boundaries of the discipline were not always distinct. Medico-legists and others shared intellectual spaces, such as the pages of the *Police Journal*, another example of collaboration between different groups towards a common aim.

Important geographical links also existed between the elite level of forensic medicine, based in university departments, and medical practitioners undertaking medico-legal tasks, such as post-mortem examinations, whereby

elites could offer opinions or carry out additional work remotely. This was facilitated by the format of medico-legal inscription which existed at the time, the medico-legal report. This feature of the Scottish legal system, which obliged expert witnesses to submit a written account of their findings rather than merely state their observations in the witness box, produced one of the major artefacts of the practice of Scottish forensic medicine. The post-mortem report was an important means of fixing the condition of the body before it was further claimed by decomposition. Other experts could make use the descriptions contained in the report, even if their eventual opinions differed from those of the report author. Nevertheless, the Merrett case illustrates that the qualities of the report could not compensate for any destruction of evidence before the autopsy took place.

The Ruxton case illustrates that the photograph could also be used as an inscription device. Photography was used to record the appearance of the body parts found in the stream near Moffat. Witnesses in the courtroom used them as a visual aid to direct the attention of the jury to salient points. However, their use was not without question. When it was suggested in court that what was shown in a photograph appeared to differ from what a number of the experts had testified, the expert's testimony was accepted over the photograph. Likewise, the *Police Journal* included comments from authors who recognized the limitations of photography, because of distortions of perspective and depth of field. In some circumstances, such as the recording of road accident sites, it was argued that plan drawing was of greater utility.

Another theme which has recurred has been the authority of the expert witness and, in particular, challenges to it. The examples of the autopsy, the medico-legal laboratory and the investigation of shootings show that this authority was partly established by the adherence to various protocols and standards, in order to avoid error, as well as lucidity in writing reports and transmitting evidence in the witness box. The failure to adhere to accepted protocols for forensic procedures formed the basis of many courtroom challenges to expert authority. This was particularly clear in the case of the Merrett trial, in which the firearm experiments carried out by the defence experts deviated from the standard practice of using the actual weapon used in

the alleged crime, causing much debate in the courtroom. Likewise, the Crown experts' failure to regulate environmental variables, such as moisture, during their own experiments was used against them. In both instances, the adequacy of the experimenters' replication of the incident under investigation was called into question.

Of course, a link was perceived between authority and reputation. This issue was addressed in some of the memoir literature, in particular by Sydney Smith with reference to Bernard Spilsbury. According to Smith's view, juries were awed by Spilsbury's reputation, treating his testimony as the highest authority, at the expense of justice. Much of Smith's autobiographical output represents an attack on that reputation.

The last major historical work on Scottish forensic medicine was Anne Crowther and Brenda White's 1988 history of the discipline in Glasgow, written to coincide with the 150th anniversary of the inauguration of the subject at the University of Glasgow. Crowther and White's work, in the vanguard of this area of the history of medicine, not just in Scotland but also worldwide, provided valuable groundwork in the history of medico-legal practice. In particular, their work on the Glaswegian context and the institutional politics surrounding the discipline has not been surpassed. However, since 1988, there has been a significant expansion in the historiography of forensic medicine and science and other relevant areas, such as the history of photography. In particular, as we have seen, a number of studies on modern forensic medicine and science, including forensic pathology and DNA profiling, have raised new questions about the practice of such technologies when applied to the law.

The present study has applied a number of the concepts developed in these works, which have emerged largely from the field of science studies, to forensic medicine in the interwar period. These works have informed sections in this thesis about the construction of expert authority through the post-mortem report, the development and adaptation of experimental procedures for medico-legal purposes, and the challenges to these procedures launched by hostile legal counsel. Applying these historiographical concepts to the interwar period has proven productive.

Much of the work on modern forensic science and medicine has been fulfilled through the use of ethnomethodological approaches, whereby researchers observe practitioners at work, noting their interactions with each other, the difficulties they face, and their approaches to solving such problems. Indeed, one such researcher, Stefan Timmermans, has argued that projects which do not use this approach, instead relying on the written outputs of medico-legal practice, risk missing the processes by which expert opinions are reached.¹ Of course, due to the historical nature of the present study, the observation of the featured medico-legists at work was not possible. Instead, it has relied heavily on the written products of forensic medicine, namely reports, as well as textbooks. However, despite Timmermans's misgivings, it has been possible to construct a picture of interwar medical jurisprudence using these sources. While some aspects of the discipline and its practices cannot be recovered, sources such as courtroom transcripts, in which medico-legal practices are interrogated and, to an extent, deconstructed, allow a nuanced and complex picture of forensic medicine to be drawn.

This thesis has focused, for the most part, on the practice of forensic medicine in early twentieth-century Scotland, rather than on its institutional or political histories. This is an area of history which is still relatively underserved, although the wider field of the history of forensic medicine and science has grown over the past twenty years. I have examined both the development of techniques such as blood testing and the analysis of firearm injuries, and the ways in which they were deployed in investigations and court cases. The present study has, I hope, carried out groundwork which will facilitate further research into the history of medicine and the criminal law in Scotland and further afield.

Although not focussing as much on the institutional context as previous studies have, the studies of the techniques here have shown that the makeup of institutions was relevant to practical work. The structure of the legal system, for example, affected the way post mortems were performed and recorded. Likewise, links between forensic medicine and other disciplines determined

¹ Timmermans, *Postmortem* (2006), 294 n. 60.

and facilitated the use of analytical techniques. This, of course, leads back to the broad theme of the geographical and social connections enjoyed by the discipline of forensic medicine. Overall, the thesis has examined the entire course of a number of forensic medical techniques, from their inception and development, their deployment in the field in casework, to their presentation in the courtroom, where they were often challenged. It has shown that while the use of these techniques centred on the discipline of forensic medicine, which itself encompassed a wide range of activities, their performance was enabled by the exploitation of links to a number of other disciplines, from serology and biochemistry to gunmaking and photography.

I have also explored the popular media output of Sydney Smith and John Glaister Jr., namely their memoirs and newspaper articles. These proved to be rich source material, affording an insight into the practitioners' views on their past experiences and their interactions with their peers, albeit, crucially, mediated through ghost writers and newspaper journalists. As well as shining a light on the personal views of the practitioners of a very public form of scientific and medical endeavour, the example of these medico-legal memoirs contributes to the history of the popular writings and public faces of scientific and medical figures as a whole. When such sources are available, they can reveal their authors' feelings about their work, the slant they would like to give their legacy, and their hopes for their discipline's future. Of course, as archival documents relating to Smith and Glaister's examples have shown, they were not always in full control of their public images, even when that image was being projected by a newspaper article which bore their name on the by-line.

In more recent years, senior representatives of forensic medicine have despaired about the state of their specialty. Complaints about its marginalization, particularly in the light of its exclusion from the National Health Service, have been made, alongside the suggestion that too many medico-legal autopsies are being undertaken by clinical pathologists, at the expense of specialist expert probity.² This is in some contrast to the forensic medicine of the early-twentieth century, examined by this thesis. Far from

² A Keith Mant, "Forensic medicine - what is its future?," *American Journal of Forensic Medicine and Pathology* 7, no. 1 (1986): 17-22.

being at the margins of medical and scientific work, it has been shown to have been deeply engaged with other fields, dynamic, and prominent in the public eye.

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