

## The Role of the Forensic Pathologist

The Role of the Forensic Pathologist.....	1
The Role of the Coroner .....	5
Training.....	6
Skills .....	9
Clinical Skills.....	9
Forensic pathology skills .....	9
Anatomical pathology.....	10
Neuropathology.....	11
Cytopathology.....	11
Haematology .....	12
Microbiology.....	12
Immunology.....	13
Chemical pathology and toxicology .....	14
Legal skills.....	15
Scientific skills.....	16
Communications skills.....	16
Roles .....	17
Medical Practitioner.....	17
Public health.....	18
Other patients.....	19
Specialist Pathologist.....	20
Death Scene Examiner.....	20
Dead Body Examiner.....	21
Forensic biologist.....	22
Forensic Radiologist .....	23
Forensic Toxicology .....	24
Forensic Sociologist.....	24
Medical Detective .....	25
Recommended Reading .....	25

In order to appreciate the role of the forensic pathologist within the justice system, it is important to understand the manner in which forensic pathologists are recruited and trained for the services that they provide.

Forensic pathologists are recruited from the medical profession, generally from among from pathology specialists who practise in the field of anatomical pathology or histopathology. Specific training programmes in forensic pathology are now emerging, but whilst the justice system has appreciated the needs of forensic pathologists for some time, it is only since the 1980's that the professional medical bodies responsible for the training and accreditation of pathologists have recognized the need for accreditation and training of full-time forensic pathologists. The need of the justice system in the United Kingdom for forensic pathologists was well stated in the Brodrick Report:

According to the evidence received the basis of forensic pathology is the small amount of work which, although it is carried out on behalf of the coroner, is particularly the concern of the police ... Every police force needs to be able to call on the services of a specially experienced pathologist to help in the investigation of murder and other serious crimes against the person. Ideally, this person should be a pathologist with a sound training in morbid anatomy who has added to this general knowledge some additional skills, most notably the ability to detect, and give authoritative testimony about, unusual features of a dead body and the surrounding circumstances which may well be of evidential value. He should be able to command the facilities of a well-equipped pathological laboratory, be readily available on call to police and courts, and be prepared to travel at short notice anywhere in the area which he serves.

Report of the Committee on Death Certification and Coroners (Cmnd.4810), 22.18

Whilst the fundamental principles of pathology applied in the work of the forensic pathologist are the same as those of the work of clinical pathologists, there is a considerable difference in the nature of the work performed and in the mental and analytical processes applied. The forensic pathologist's focus is the end-point of the forensic investigation which is the judicial process, usually a criminal court trial or coroner's inquest. This is not to say that the forensic pathologist ignores broad community interests in relation to public health and safety. Indeed, much of the work for the coroner involves a focus on issues of health and safety, and hazard recognition. The legal system has long accepted that there is indeed an essential difference between those pathologists engaged in clinical, hospital-related practice and those engaged in forensic pathology practice. In the Brodrick Report, this issue was addressed:

Do the police need the services of a special kind of pathologist who can for the most part be distinguished from a clinical pathologist in a hospital? Do coroners need the services of the same kind of pathologist as the police? ... Our answer to the first question is an unequivocal 'Yes'. We accept the view that while every forensic pathologist needs to be a competent morbid anatomist, the reverse statement does not follow: Many morbid anatomists will never have the inclination to undertake forensic work, i.e. work for the police or the criminal courts. The nature of the problems most often encountered in criminal investigation is different from that most often encountered in clinical work. So are the circumstances in which the two kinds of pathologists are called upon to work. The Forensic Pathologist may be required in field work literally! There is also a difference between writing an opinion for a colleague, and giving evidence based on that opinion or being cross-examined on that opinion in the criminal court. There are pathologists who feel attracted to this particular kind of challenge and also have the ability to cope with it, and there are pathologists who do not feel this urge and who may not have the right attributes. We conclude that the difference between a clinical pathologist and a forensic pathologist is as much in the nature of the man as the nature of the work. [23.13-14]

Whilst it is certainly true that the difference between a clinical pathologist and a forensic pathologist is in the nature of the person performing the task as well as the nature of the work, it is not true to say that forensic pathology can be carried out only by medical practitioners with a certain type of personality. Instead, this personal aspect of the difference between clinical and forensic pathologists is accounted for by training and experience. The forensic pathologist has to be trained in, and develop an understanding and aptitude for, the legal process of investigation in conjunction with their knowledge of the scientific process of investigation. These two approaches to investigating matters are quite distinct and few medical practitioners have any real understanding of or feel for the legal investigative method. It is a knowledge of the role that legal systems play in society, as well as an understanding of the legal process and legal method, that distinguish forensic pathologists from their clinical counterparts. Certainly there are areas of specialist factual knowledge that forensic pathologists are familiar with that their clinical counterparts are not. However, simply acquiring factual knowledge on forensic issues will not provide a clinical pathologist with sufficient skills to undertake forensic work.

A practical result of this difference is that forensic pathology does not sit comfortably within a professional clinical pathology environment. Indeed, the service requirements of forensic pathology mean that the service is usually more efficiently provided by specialist forensic pathologists working together and providing a broad based regional forensic pathology service for a range of clients. Such an organizational structure allows for:

- continuity of professional services
- appropriate internal case review and audit
- personal professional development
- concentration of expertise for the purpose of undergraduate and postgraduate training.

In some jurisdictions, this is the preferred organizational structure of forensic pathology, whilst in others this structure is combined with part-time practitioners who also have a clinical pathology role.

The nature of forensic pathology is such that the service does not require a large number of medical practitioners in any particular jurisdiction. However, a continuous supply of a small number of experienced and well-trained medical practitioners is needed to provide forensic pathology services. In this regard, undergraduate and postgraduate teaching, together with affiliation with medical schools and the appropriate professional training colleges, is an important part of a forensic pathology service. Undergraduate and postgraduate training in medicine is supervised by a medical school whose focus is, of course, on the production of competent medical practitioners for the community. Because only a few forensic pathologists are required, there is little emphasis on this area within the medical undergraduate curriculum and this is probably appropriate. It is in the area of postgraduate training that forensic pathology training programmes come into their own. Whereas the majority of universities and medical schools do not feel the need to develop

training systems in forensic medicine and forensic pathology, there is little doubt that the legal system does express the need for such practitioners.

In April 1989, the Home Office in the United Kingdom published the report of the Working Party on Forensic Pathology., the Wasserman Report. Paragraph 1.1 stated:

Forensic Pathologists play a vital role in the Criminal Justice system. Strictly speaking, their responsibility is simply to undertake the post mortem examination of bodies found in 'suspicious circumstances' in order to establish, as far as possible, the cause of death. ('Suspicious circumstances' are those in which there is suspicion of murder, manslaughter or infanticide.) In practice, however, it is often their professional judgement which determines whether a particular death is dealt with by the coroner by inquest as one due to accident, natural causes or suicide, or is investigated by the police as a preliminary to a criminal trial. To this extent theirs is the first step towards bringing to justice those responsible for the most serious crimes in our society.

Legal jurisdictions differ in the way they organize death investigation services and the relationship between a coroner and police investigators is at times complex. Some general rules, however, appear to be common, at least in Australia and England and Wales. The authority to investigate a death lies with a coroner and it is the coroner who institutes and authorizes a pathologist to perform a post-mortem examination. The police have a similar duty to investigate a death and, with respect to certain aspects of the death investigation, they act as agents of investigation for the coroner. In this situation, the forensic pathologist is another co-investigator for the coroner.

Where a matter involves direct criminal issues, much of the practical investigation is carried out by the police on behalf of the criminal justice system, a system in which the coroner plays little part. In these circumstances, there is a practical basis for concluding that the pathologist in fact is carrying out a service for the police investigators. In reality, a criminal investigation involves many phases. Traditionally, the forensic pathologist was involved in that phase of an investigation that is centred on a death or injury, and in particular the examination of an injured or deceased person to ascertain the nature and cause of their injuries. In practice, however, forensic pathologists play a wider role with respect to the criminal investigation. For example, they may become involved in the examination of scenes of death, or in the examination of suspects who may have inflicted injuries on the victim. They may evaluate medical records for medico-legal purposes, and examine the statements of other witnesses with regard to medical matters. They are certainly involved in the later stages of a criminal investigation, including the compilation of a brief of evidence and assisting with the evaluation and presentation of that evidence both before and during court proceedings.

Forensic pathologists in practice have a wider role than dealing with suspicious deaths. The vast majority of autopsies conducted by forensic pathologists involve unconfirmed natural deaths which society requires to be scrutinized and confirmed. The investigation of non-suspicious natural deaths, accidents (fatal incidents), deaths from suicide, and deaths from other forms of intentional and non-intentional injury form the vast majority of their case work. The information that can be gained from investigating these deaths is potentially very significant for the community. The role of the forensic pathologist in relation to suspicious deaths and the criminal justice system is the one most readily understood and appreciated by the community. However, this wider role with respect to autopsies in non-suspicious cases is far less defined and less understood by the lay, legal or even the general medical community.

### ***The Role of the Coroner***

In order to examine the role of the forensic pathologist, it is essential to understand the development of death investigation systems including the role the coroner plays in such jurisdictions. The office of coroner has its roots in Norman times where death investigation had associated with it important political and financial considerations. Coroners were associated with the collection of a number of fines and taxes that could be levied by the Crown in association with certain types of deaths. Deodands comprised taxes paid to the Crown that were based on the financial value of the implement or object that had caused a person's unnatural death, so that if a person was run over by a cart, the cart or its value was forfeited to the Crown as a tax and the coroner was responsible for ensuring that the tax was paid. Similarly the fine of presentment of Englishry was payable by a local community if the coroner found that a deceased person was not of English blood.

The role of the coroner in criminal matters relating to death was limited, although the coroner had the ability to ensure that potential criminal matters were brought within the criminal justice system. Their main function in relation to crime was to keep a check on the sheriff and to ensure that revenues such as fines reached the King. With regard to the prevention of deaths, the coroner had little or no direct function, although some early coroners made attempts to highlight hazards in the community and to reduce their impact.

Over time, the coroner's role diminished and the office became an onerous one with the coroner having to pay many of the fees associated with the work out of his own pocket. Early coroners were not necessarily medically or legally trained, and many of the early coroners' appointments were essentially political rather than professional.

Today the approach of coroners in Australia differs from that of coroners in England and Wales. Much of the function of the office of coroners in Australia

is focused on prevention, with the coroner empowered to make broad recommendations surrounding the issues of public health and safety and judicial administration. Such an approach gives the coroner a dynamic function in contributing to the welfare of the community. In this modern framework the role of the full-time forensic pathologist has been revitalized. The forensic pathologist is not involved only with the investigation of suspicious deaths that may have a criminal connotation. Instead, the forensic pathologist's role has been widened to include a wide range of natural and unintentional deaths, investigation of which, can lead to improvements in the health and safety of the community. In conjunction with the coroner, the forensic pathologist is a watchdog who maintains a constant surveillance on potential fatal hazards in our society and ensures that preventable deaths are recognized and the issues surrounding them addressed.

### ***Training***

As mentioned before, any training of a forensic pathologist must take into account that forensic pathology is based on the techniques and skills of clinical pathology, in particular anatomical pathology, histopathology and morbid anatomy. Any substantial period of study and training will equip a clinical pathologist with the factual knowledge necessary in order to deal with the scientific investigatory issues that surround the work. The development of the necessary legal investigatory skills is more difficult. In the past, the majority of forensic pathologists gained these skills by experience. The very act of taking part in complex police investigations and in court processes within the coronial and criminal legal systems provides forensic pathologists with an insight into the legal investigatory process and the evidential requirements of the legal system.

There have been several attempts to introduce training in the legal method into some undergraduate and postgraduate forensic medical courses. For example, in the undergraduate course in forensic medicine at both Monash University and the University of Melbourne, students take part in moot (practise) courts and a number of joint law-medicine subjects are now available for undergraduates from the Faculties of Law and Medicine. Despite this, it is not easy for medical students to acquire knowledge and understanding of the legal method. Increasingly, medical practitioners who are interested in forensic medicine and forensic pathology are turning to the study of law itself to acquire these skills. Not only are all doctors becoming more aware of the legal issues surrounding medical practice but there has also been an increase in the number of medical practitioners who have obtained formal qualifications in law.

With regard to postgraduate training, there has been a considerable increase in the interest of the professional pathology organizations around the world in the specialty area of forensic pathology. The Royal Colleges of Pathologists of both Australasia and the United Kingdom offer specialist fellowship and membership examinations in forensic pathology. Whilst accrediting

examinations are now available in forensic pathology, training programmes are still limited. A limited number of forensic pathology training posts have been available within pathology and forensic pathology departments, but these training positions have not usually been part of an organized national formal training programme in pathology. The degree of organization varies from place to place, and the lack of formal training programmes has been recognized in a number of jurisdictions. The Wasserman Report stated in paragraph 3.34:

The qualifications of the overwhelming majority of forensic pathologists presently practising were acquired at their own expense and in their own time. There has never been a centrally managed training scheme, although Brodrick recommended one based on the National Health Service.

The importance of formal training and accredited external examinations cannot be overemphasized. If society and the courts are to be assured that they are receiving expert opinion evidence from a person who has the necessary skills and knowledge, then the availability of accredited qualifications based on organized training is essential.

The Royal College of Pathologists of Australasia in its information booklet for trainees states:

In forensic pathology trainees must gain the following experience/knowledge:-

1. Conduct under supervision of at least 500 coronial post mortem examinations comprising a mix of adult and infant deaths and unexpected natural, accidental deaths, suicides, homicides and postoperative and anaesthetic deaths.
2. Training and experience in special autopsy procedures relevant to forensic pathology including:
  - (a) the demonstration of the vertebral arteries, the cervical cord, the urethra and structures of the neck,
  - (b) enucleation of the orbits,
  - (c) neonatal and infant autopsy techniques,
  - (d) identification techniques,
  - (e) the collection of organs, tissues and fluids for toxicological examination.
3. A working knowledge of associated forensic fields including,
  - (a) toxicology and its place in forensic pathology,
  - (b) forensic radiology,

(c) forensic odontology,

(d) osteology,

(e) forensic immunohaematology,

4. Attendance at scenes of suspicious and homicidal deaths including training in the principles of trace evidence collection and its preservation at the scene of death and at the post mortem examination.

5. The use of biological and physical forensic sciences in assessing the mechanism and cause of accidental, homicidal and suicidal deaths and in reconstruction of the circumstances surrounding such deaths.

6. Giving factual and expert evidence in Australian courts of law.

7. The functions, operation and legislation relevant to the coronial and criminal justice systems, and the law relating to transplantation and the determination and certification of death in Australia and New Zealand.

To qualify as fellows of the Royal College of pathologists of Australasia in forensic pathology candidates sit a final written examination which covers both anatomical pathology (morbid anatomy) and forensic pathology. The final practical examinations include assessment of microscopic sections of human tissues in selected pathology cases, both anatomical and forensic and forensic case analysis based on the examination of photographs of crime and death scenes and autopsy findings. The Fellowship final examination also requires the candidate to present a case book in which ten coronial post-mortem examinations are described and annotated in detailed discussion papers. It also includes a viva voce in which candidates assess a variety of visual material as well as answering formal questions. Before this final examinations can be attempted, candidates must have already passed preliminary examinations in basic pathological science and anatomical pathology which include both written and practical tasks.

The diploma examination in forensic pathology at the Royal College of Pathologists of Australasia is made available for those college fellows who have already specialized in a branch of clinical pathology. This examination is focused specifically on forensic pathology and includes written, oral and practical examinations as well as the presentation of a case book.

The aim of professional examinations is to ensure that the candidate has reached a standard of proficiency which the profession recognizes as being the minimum required to undertake competent professional practice in that field. The acquisition of such professional qualifications does not exempt the pathologist from further study. Continuous professional education is now a requirement of most specialist branches of medicine; many of the Royal Colleges governing professional practice have set up or are setting up programmes which require fellows and members to engage actively in educational activities in order to retain their professional accreditation. Whilst

courts require an expert witness to prove their expertise each time they give evidence, a witness who holds professional qualifications which carry with them the obligation of continuing professional education has a powerful item of proof of up to date knowledge and expertise.

Forensic pathology training and the associated examinations in Australia are very similar to those found in other countries and jurisdictions, and it can be seen that forensic pathology is not a discipline that stands alone as an unconnected and discrete specialty. In practical terms, forensic pathology is a sub-specialty of pathology; most practising forensic pathologists have a wide range of experience in the areas of clinical pathology, and in particular the sub-specialties of anatomical or histopathology.

## **Skills**

As a result of their training, forensic pathologists have a variety of specialist skills which they apply in their work. The basis of these skills is completion of a medical course, including appropriate clinical internship and a variety of other clinical appointments. As a result, the skills of a forensic pathologist cover a wide variety of sub-disciplines in medicine and particularly sub-specialities within pathology. These can be divided into clinical, pathological, and legal areas, together with general skills in science and communication.

## **Clinical Skills**

Forensic pathologists are first and foremost medical practitioners. They have undergone a full undergraduate training course, of five to seven years which has included both pre-clinical and clinical studies. All forensic pathologists have spent at least one year and, in some cases, several years working in clinical medicine within a hospital setting. Some will have spent a considerable time working in other clinical specialty areas within a hospital or, in some cases, in general practice and their knowledge in these clinical areas may be considerable. However it should not be assumed that because of such experience they are currently experts in clinical medicine or that they have kept their clinical medical skills up to date. The rapidity of developments in clinical forensic medicine and therapeutics makes it difficult for practitioners who are not actively engaged in clinical medicine to maintain clinical medical skills. With the rapid increase in clinical sub-specialties, any forensic pathologist's knowledge of clinical medical practice will be necessarily limited in most cases to general principles only.

## **Forensic pathology skills**

As mentioned above, forensic pathology involves the application of basic pathology disciplines in the forensic or medico-legal setting. The pathological skills involved in forensic pathology can be divided into a number of areas: anatomical pathology, neuropathology, cytopathology, haematology, microbiology, immunology, chemical pathology and toxicology. We will look at them in turn.

## **Anatomical pathology**

Various descriptive terms are applied to the skills encompassed within anatomical pathology. There are indeed distinct semantic differences between these terms, but for most practical purposes the type of professional specialization and skill involved is the same. Some of these terms include anatomical pathology, histopathology, surgical pathology and morbid anatomy. Pathologists practising in these areas have skills in the macroscopic or naked-eye examination of diseased organs and tissues, and microscopic examination of human organs and tissues. Microscopic pathology examination, sometimes referred to as surgical histopathology, forms the bulk of the work of anatomical pathologists in a hospital setting. Pieces of human tissue, removed either at surgery or in sampling techniques such as biopsies, are processed in the laboratory. Thin sections are cut, placed on to a glass microscope slides, and stained in order to reveal the nature of their cellular components. These sections of tissue are then examined by a pathologist under a microscope for the purpose of identifying whether there are any abnormalities present in the tissue, and if there are abnormalities, what type of disease is involved. The accurate determination of disease type is important for the future management of the patient and for short- and long-term prognosis. In addition to examination of biopsy material, large portions of organs that are removed during surgical operations as part of a curative surgical procedure, are also examined by pathologists to ensure that the surgery has included the removal of all of the diseased tissue. In the case of operations for the removal of tumours, the pathologist also looks to see whether lymph nodes adjacent to the main tumour site are free from tumour or contain secondary deposits.

In addition to this surgical pathology work, the anatomical pathologist also performs autopsies in a hospital setting where consent has been obtained from families and next of kin.

Most forensic pathologists have completed full anatomical or surgical pathology training and therefore they are experienced in the performance of hospital autopsies as well as forensic pathology autopsies. In addition, they are skilled in the areas of microscopy of human tissues and the identification within those tissues of various types of human disease. This surgical pathology training gives the pathologist experience of a wide variety of other medical specialties. A surgical pathologist may have experience in dealing with biopsy material involving the diseases of children and the elderly. Obstetrics and aspects of maternal pathology and gynaecology, together with medical specialty areas such as thoracic or cardiac surgery, are other areas in which the hospital pathologist provides surgical pathology services. As a result, the hospital anatomical pathologist is exposed to a wide variety of medical and surgical material from many clinical sub-specialties. In some cases, an anatomical pathologist gains specific additional skills in certain disease areas. For example, pathologists with a particular interest in diseases of the skin work closely with dermatologists and gain considerable dermatological knowledge.

As a result of the variable backgrounds of surgical pathologists with regard to training and experience, the lawyer must accurately identify the extent of the knowledge and experience of an anatomical pathologist in any given sub-specialty. Similarly, a surgical pathologist or forensic pathologist who is writing medico-legal reports should state their additional areas of experience in the preamble of the report so that the true extent of their expertise is made known to the court dealing with the case.

## **Neuropathology**

Neuropathology is a discrete sub-specialty within anatomical pathology. A neuropathologist is usually an anatomical pathologist who specializes in the organs and tissues that comprise the central nervous system, the peripheral nervous system and muscles. In a hospital setting, the neuropathology staff are involved with the clinical disciplines of neurosurgery and neurology. Neuropathologists deal with diseases of the brain, the spinal cord, the peripheral nerves and the muscles of the body. A large part of the work of neurosurgeons is management of trauma to the head and central nervous system. Neuropathologists also deal with traumatic damage to the tissues of the central nervous system. The skills of neuropathology have a particular relevance for forensic pathology with regard to the processes involved in head injuries.

Whilst all anatomical pathologists are trained in aspects of neuropathology, forensic pathologists have a particular interest in traumatic neuropathology. A few forensic pathology centres include specialist forensic neuropathologists amongst their staff to deal with cases involving damage and injury to the central nervous system. The investigation of deaths from head injuries can involve identification of the type of forces applied to the head by reference to the pattern of skull fractures, the resulting damage to the brain, and the nature and extent of bleeding inside the skull.

## **Cytopathology**

The processes for identifying diseases of the body involve examination of whole organs, specific tissues, and the cells that go to make up those tissues. The histopathologist or anatomical pathologist who examines microscopic sections of tissues under the microscope, looks at tissues of the body where the cells are arranged in their normal anatomical configuration. Cytopathologists examine the cells of the body in isolation or in small clumps where the cells do not form part of an intact tissue structure. The cells are obtained through a variety of sampling processes: scraping of the surface of tissues, as in the examination of the cervix or neck of the uterus; aspirating fluids from various parts of the body; or aspirating solid tissue masses. A spatula or like object is used to scrape the surface of organs whereas a needle is used to aspirate cells or fluids containing cells from the body. The specimen or sample is usually concentrated and spread on to slides, and then stained and examined under the microscope. A large proportion of the work of the cytopathologist involves screening samples collected from people who have no obvious disease or illness. Screening attempts to discover diseases

that have not yet made their presence known, so treatment can be started at an early stage. In the case of some diseases, particularly certain cancers, such early detection can result in effective cures.

The role of cytopathology within forensic pathology is limited. However, a wide variety of cytological techniques are employed within forensic pathology and some tests for drowning and for the identification of spermatozoa employ procedures similar to those used in cytopathology.

## **Haematology**

Haematology involves the diagnosis and treatment of diseases of the blood and includes the examination of peripheral blood and the blood precursor cells found in the bone marrow. Blood and bone marrow can be examined using techniques similar to those of cytopathology. A number of other tissues and organ systems are closely related to the blood and are often included in examinations performed by haematologists. Lymph nodes, the spleen, the thymus, together with the bone marrow, are some of these additional tissues and organs that are examined and by haematologists.

Haematology is a specific sub-specialty of pathology, and many practitioners do not have an extensive background in anatomical pathology. Haematologists are often divided into two types of practitioner: those that deal with blood transfusion services together with the laboratory examination of blood and related tissues as part of a diagnostic service, and those that practice as physicians treating individuals with diseases of the blood and related organ systems. Some haematologists practise in both areas, and some undertake specialized work on areas such as bone marrow transplantation and blood transfusion.

Whilst the clinical aspects of haematology do not impinge greatly on the work of the forensic pathologist, many of the principles of the identification of blood and the determination of blood grouping used in forensic science and forensic medicine involve the same laboratory techniques and procedures.

## **Microbiology**

Microbiology is the branch of pathology that deals with the identification of micro-organisms that cause disease. Bacteria, viruses and fungi are just some of the agents which are dealt with by a microbiologist. Like other pathologists, the microbiologist deals with samples taken from the human body but in addition their work can involve the analysis of specimens taken from the environment. These samples are examined to determine which micro-organisms are present, and often the organisms are tested to see whether they are sensitive or resistant to antibiotics and other drugs. Like haematology, microbiology is a pathology discipline in which most

practitioners have little training in anatomical pathology. Like haematologists, microbiologists can be divided into two types of practitioner: those who do laboratory work and those who do clinical work as infectious diseases physicians. Microbiology has a specific role to play, not only in the diagnosis of infectious diseases, but also in the monitoring processes that take place in hospitals, looking for sources of hospital-acquired infection and ensuring that equipment and clean area are in fact free from significant numbers of potentially infectious agents.

Whilst microbiology has limited application in the field of forensic pathology, all forensic pathologists understand basic microbiology principles and incorporate the results of microbiological testing into their medico-legal reports. Microbiological diseases play a part in a number of deaths investigated by forensic pathologists, and many of the individuals whose deaths form the subject of forensic pathological investigation have life-styles which involve current or previous infection with particular agents. A good example of this is death associated with overdose of intravenous drugs, where there is often prior infection with Hepatitis B, Hepatitis C or HIV.

## **Immunology**

Immunology has emerged in recent years as a key discipline within pathology. Immunological principles are applied in many of the other branches of pathology, including microbiology, haematology and anatomical pathology. Immunology has grown as a division of pathology and is now recognized as a major sub-specialty. Immunologists study and test the function of the immune system of the body and the diseases that are associated specifically with immune system dysfunction.

Many diseases involving the immune system present with symptoms that are relevant to other branches of pathology. For example, autoimmune diseases that attack the blood are often managed by haematologists, and immunological diseases affecting the skin are diagnosed in association with anatomical pathologists. Many of the techniques used to identify infectious micro-organisms rely on immunological principles. Understanding of the body's immune defence mechanisms has resulted in the identification of a number of specific disease processes involving the immune system alone. The overlap between molecular biology and immunology is considerable, and many people working in clinical immunology have a close links with specialists dealing in the analysis of tumours and genetic diseases.

With the advent of tissue transplantation and the matching of tissues between donors and recipients, the skills of the immunologist have come to the fore. There are a number of specific disease processes associated with individuals who have had tissue or organ transplants, and immunologists play a major part in the management of these diseases.

From the perspective of forensic pathology, many of the techniques of immunology are used in the forensic testing processes. The serological tests and blood grouping tests that are a feature of forensic science and forensic medicine are based on immunological principles. In some difficult forensic pathology cases involving the identification of biological material and drugs, professional immunological expertise may be required.

### **Chemical pathology and toxicology**

Chemical pathology, sometimes referred to as medical biochemistry, can also encompass the field of toxicology. There are chemical pathologists who specialize in the area of toxicology, but most doctors working in chemical pathology deal principally with biochemical testing of human samples. Like haematologists and microbiologists, chemical pathologists tend to practise in one of two areas, diagnostic services or clinical practice in the field of metabolic diseases. In clinical practice, chemical pathologists provide therapeutic advice and treatment for enzyme and hormonal disorders and for the management of individuals with complex biochemical abnormalities, including patients who require treatment in intensive care units. Many of the specialist analytical methods used in chemical pathology involve immunological techniques, and the chemical pathologist has an important role to play in neonatology and paediatrics by providing screening tests for a variety of genetic disorders.

The field of toxicology uses many of the techniques of analysis that are found in the chemical pathology laboratory. The toxicologist does not generally measure natural body substances but analyses human tissues for the presence of drugs and other chemical agents that may have been taken into the body. Many hospital chemical pathology departments analyse body samples for the presence of drugs and in fact provide a limited toxicology service, usually to support medical treatment and diagnosis of poisoning or adverse drug effects. Many aspects of advanced toxicological analysis and interpretation lie outside the everyday work of the chemical pathologist. However, all pathologists have been trained in basic toxicology in relation to therapeutic and non-therapeutic drugs.

From the perspective of forensic pathology, chemical pathology and toxicology is an important related discipline. Toxicological analysis is a routine part of most of forensic autopsies. Homicides, suicides and motor vehicle accidents are perhaps the most common cases in which drug analysis is involved. However, there is a wide variety of apparently accidental deaths, including those associated with work and recreation, where toxicology and drug analysis are important in analysing the circumstances of the death. As a result of this, forensic pathologists are regularly required to incorporate the results of toxicological analysis in the conclusions that they reach regarding the autopsy findings and cause of death. The professional forensic toxicologist and forensic pathologist are required to work closely with each other in many investigations. Forensic pathologists and forensic toxicologists

are often to be found working in the same organisation. The integration of these two disciplines, with a high level of communication, provides an ideal environment for the investigation of problematic suspicious deaths.

## **Legal skills**

The areas of knowledge that distinguishes forensic pathologists from their clinical colleagues, is their understanding of legal process, medical law, court procedures and their rules of evidence. Whilst doctors who engage in civil injuries work are also familiar with court processes, the remainder of the medical profession has little contact with the legal system and consequently has little knowledge of the legal principles involved in civil and criminal cases. Many forensic pathologists have gained their knowledge of the legal system through long experience of working with it. Most forensic pathologists agree that a sound knowledge of the legal principles that underlie their forensic work is of value in improving the quality of service they provide for the legal system. In general, the legal profession also is more comfortable dealing with those medical practitioners who are familiar with, and regularly participate in, the legal process.

A medical practitioners can read a simple text on criminal law and at the end of it understand the major principles. However, to understand the background and detail of the operation of legal systems and legal investigative processes requires a much wider ranging study of the law or a long period of exposure and experience of working in the legal system.

The training of medical practitioners is based on the scientific method and the scientific investigative process. Whilst the legal system uses the scientific investigative process in some areas, its operation relies on a legal investigative process that differs both in structure and philosophy from the theories of scientific investigation. It is the appreciation of this that distinguishes forensic medical practitioners from their non-forensic colleagues. An understanding of the nature of the legal investigation process and the role of the medical practitioner within it, both before and during a judicial hearing, enables the forensic medical practitioner to play an effective part in the judicial process.

The main skill that forensic practitioners have in relation to their knowledge of legal process is the ability to communicate medical fact and opinion, within the confines of the laws of evidence, to a tribunal composed largely of lay people. Medical practitioners are becoming increasingly better trained in the skills of communication, both at an undergraduate and postgraduate level. However, the skills they are taught relate largely to communicating with patients and with scientific and medical colleagues. These communication skills, whilst important and relevant, do not take into account the rules of evidence and legal procedure that constrain the way in which forensic medical practitioners

communicate their findings to a court. A fundamental understanding of the legal process and the law of evidence can make all the difference in communicating matters of scientific fact and opinion during judicial proceedings.

### **Scientific skills**

When assessing the skills of the forensic pathologist, it is important to remember that, as doctors with a general background and training in medicine, their early training both at secondary and tertiary level has been based on the sciences. All medical students study science either before or at the time of entering a medical course and in many medical schools the first year of undergraduate medical teaching often includes further study of physics, chemistry, mathematics and biological science although these are naturally oriented towards the needs of medical practitioners. The remainder of undergraduate pre-clinical and clinical training relies upon the knowledge of scientific principles, and such basic scientific knowledge is further developed and reinforced during a medical course.

For the pathologist and forensic pathologist, many of these areas of general scientific knowledge take on special meaning and relevance to professional forensic pathology practice. General principles of physics apply to ballistics, and chemistry and biology have particular relevance to toxicology and chemical pathology. Principles of mathematics including the use of statistics apply across the board. Forensic medical practitioners should remember that they have specialist knowledge in many sciences but that the extent of their knowledge varies between different scientific areas. In the same way, it is important for lawyers to recognize that medical practitioners have a basic general scientific background which will, on occasions, enable them to give opinion evidence as experts in certain scientific areas.

### **Communications skills**

As discussed earlier, skill in medico-legal communications is a particular attribute of forensic pathologists. Such skill does not arise solely from experience in forensic pathology or formal training in witness techniques. The reason that doctors often make good witnesses is that communication with patients in a medical consultation lies at the heart of the practice of medicine. Through their undergraduate training and additional years of postgraduate training, doctors develop and rely upon communication skills. The term 'bedside manner' is used by lay people to describe a doctor's performance as a communicator. Regardless of the nature or type of medical consultation, a variety of communication skills are employed. Doctors are familiar with techniques to overcome barriers to communication. They are aware of the deliberate use of silence, confrontational, and summarizing techniques. When one examines these skills, it becomes clear that many of the communication skills involved in medical consultations are similar to the skills of barristers examining or cross-examining witnesses in court. In practical terms,

individuals in a jury are very similar to the patient in a medical consultation. Their range of medical knowledge, intellectual ability, scientific background, attention and commitment, mirrors closely the range found by doctors when dealing with patients. As a result, the skills that a doctor uses to communicate with a patient can be used to great effect in communicating with a jury.

Forensic medical practitioners' communication skills are not confined to oral performance. Written communication is a feature of medico-legal work, and the formulation of appropriate medico-legal reports that meet the needs of the legal system is a basic task performed by the forensic pathologist. Medico-legal reports differ from ordinary medical reports in a variety of ways. Medico-legal reports do not have a fixed format, but vary in their style and design according to their legal purpose. However, there is a basic structure to such reports, which can assist in their use by the justice system. (Sample reports to use as a guide are given in the Appendixes.) Just as there is a need to develop forensic medical oral communication skills, there is a continuing need to develop forensic medical written skills. The forensic pathologist, by training and experience, is usually well versed in the compilation of appropriate medico-legal reports and this can be of considerable assistance to other doctors who from time to time are required to provide medical reports to be used within the justice system.

## ***Roles***

We have looked at the skills acquired by forensic pathologists in their training and experience. In what ways then do forensic pathologists utilize their skills in everyday practice? In order to understand this, we need to identify the various roles that forensic pathologists take in their work and the services they provide. Forensic pathologists, like many medical specialists, in fact practise a number of roles: medical practitioner, specialist pathologist, death scene examiner, dead body examiner, forensic biologist, forensic radiologist, forensic toxicologist, forensic sociologist and medical detective. We will look at them in turn.

## **Medical Practitioner**

Most forensic pathologists do not take part in clinical medical practice involving the diagnosis of illness and disease or the provision of surgical and medical treatment. They are none the less medical practitioners, committed to the maintenance of good health within the community. The forensic pathologist retains the basic medical skills in clinical diagnosis and therapeutics. In providing an autopsy service for the coroner and other individuals involved in the health and justice systems, the forensic pathologist is involved in analysis of clinical, diagnostic and therapeutic issues as well as broad public health issues including occupational health and safety. The media, the lay community and indeed a number of medical and legal

professionals tend to view the forensic pathologist as being concerned only with criminal justice aspects of death investigation. In reality, deaths involving a suspicion of criminal activity represent a small percentage of the work of the forensic pathologist. Whilst the forensic pathologist remains a watchdog on the lookout for criminality during death investigations, most of their work involves deaths associated with natural disease and unintentional traumatic injury. These deaths have important considerations for public health policy and health service planning as well as for community health and safety.

## **Public health**

Community health and public health are sub-specialties in the area of clinical medical practice. Forensic medicine, particularly in Europe, had its origin in the work of the public physicians, doctors who had responsibility for public health and general public medical services in city states during the Renaissance and after. The justice system turned to these early public health physicians in order to obtain medical services to assist in the investigation of crimes, particularly crimes against the person. In time, the office of public physician formed the basis of the public and university institutes of forensic medicine that developed in Europe. These European developments were also seen in Scotland, where the early university departments of forensic medicine were joint departments of public health. This early association of forensic medicine and pathology with public health was gradually lost, but forensic medical institutes are returning to this field by becoming involved in issues of public health, occupational health, and community health.

The forensic pathologist in the course of everyday work identifies natural disease processes within all age groups and all sections of the community. In order to completely identify all aspects of natural disease in an autopsy, the investigation has to be thorough and complete. In many cases, the identification of a cause of death at autopsy is straightforward. However, in order to identify and recognize all the natural disease processes that are present and to assess their relevance both for the death and the ante-mortem symptoms, a thorough autopsy examination is required. In those legal systems where the forensic autopsy simply provides a cause of death, the quality of information obtained from autopsies may be limited. However, the coronial system in the more modern jurisdictions, has a responsibility to find not only the cause of death, but also the circumstances of the death, and any factors that contributed to it, including those associated with the operation of the health and legal systems. The autopsies performed within these jurisdictions provide much more information. In reality, no cause of death can be satisfactorily ascertained at autopsy without ensuring that the autopsy investigation has been thorough enough to exclude potentially significant but rare natural diseases. In autopsies where the death is the result of an unnatural process, in particular deaths from intentional injuries such as homicides, it is essential to accurately assess, document - and in some circumstances to exclude - the influence of natural disease processes. In criminal cases, the forensic pathologist is often asked to assess the degree to which a pre-existing disease might have contributed to the traumatic death.

In view of the substantial decrease in the number of hospital non-forensic autopsies performed in many jurisdictions around the world, the capacity for the non-forensic autopsy to contribute to knowledge regarding the prevalence of disease processes within the community has become limited. Forensic autopsies in the State of Victoria, now account for half of all autopsies performed within the State. The findings arising from these autopsies have a major part to play in providing information on disease prevalence and the outcome of therapeutic interventions. Current screening processes performed as part of an autopsy help to identify the prevalence of infectious diseases such as hepatitis B, hepatitis C and HIV.

As well as playing a part in providing information regarding physical disease, an efficient forensic pathology service can contribute a therapeutic service to the health service community. Tissues, such as corneas, heart valves, skin and bone, are taken from cadavers at the time of autopsy and made available to surgeons for transplantation; thus forensic pathology practitioners contribute to a fundamental therapeutic service. On a broader basis, most deaths are associated with a family and friends who require information regarding the death in order to complete their grieving. Where family and friends have concerns regarding a death, the forensic pathologist can arrange to meet them and inform them of the results of the pathological examination and the conclusions that can be arrived at regarding the circumstances of the death. Whilst not all families wish to discuss a death with the forensic pathologist, those that do often find the consultation helps their grieving process.

### **Other patients**

Whilst in most cases the practice of a forensic pathologist is limited to investigating death, forensic pathologists in fact play a wider role with regard to examination of the living. In a limited number of cases where injuries are concerned, forensic pathologists often make a clinical assessment of individuals in order to document injuries and analyse their cause. This role overlaps the services provided by specialist forensic physicians. In fact there are many forensic pathologists who practise clinical forensic medicine to a greater or lesser degree, and become particularly involved in the wider issues surrounding physical and sexual assault (see Chapter 6). Many of the fundamental principles of forensic pathology overlap with those of clinical forensic medicine. There is increasing recognition of the considerable advantages to be gained by integrating forensic medical services so that forensic pathologists and clinical forensic physicians can work as a team to assist the justice system.

## **Specialist Pathologist**

Most forensic pathologists are qualified clinical pathologists, and indeed their work calls upon the basic scientific knowledge of pathology as well as the skills and knowledge associated with each of the major branches of clinical pathology. As we have seen, forensic case work can involve recognition and understanding of the principles of haematology, microbiology, chemical pathology, immunology, and anatomical pathology or histopathology. In this regard, forensic pathology can be seen as an applied area of clinical pathology which has its focus on the delivery of primary information to the legal system regarding the medical issues surrounding the causation and the circumstances of a death.

## **Death Scene Examiner**

The forensic pathologist's work extends beyond the routine performance of autopsies and the presentation of the results to the coroner and the courts. The case investigation for a forensic pathologist is initiated by a death; the investigation process includes analysis of information relating to the deceased person prior to their death, together with examination and analysis of the scene and environment in which they died or were found dead.

In allegedly suspicious deaths, the death scene is examined by a team of individuals that comprises police officers, forensic scientists, forensic pathologists and other specialist examiners such as forensic anthropologists (for investigation of skeletal remains). A variety of other individuals are also involved in the examination of a scene of a suspicious death including photographers and video cameramen.

In most cases after a dead body is found in suspicious circumstances, the forensic pathologist is called to the scene not only to examine the body and provide initial information to the investigators, but also to study the environment in which the body lies. The investigation of the environment of the death helps the pathologist in coming to conclusions regarding the subsequent macroscopic and microscopic autopsy findings. In many cases, by virtue of training and long experience in attending at death scenes associated with crimes, the forensic pathologist can contribute directly to the crime scene examination and provide initial advice in areas of forensic science, including forensic biology and ballistics. The inclusion of specialist forensic scientists from a wide variety of disciplines within the death scene investigation team is important, and the forensic pathologist may well have a part to play in helping to determine the appropriate specialists that may be required.

Forensic pathologists usually include details of their crime scene investigation in the autopsy report. In doing so, however, they usually refer to those elements of the crime scene that impinge directly or indirectly upon the characteristics of the deceased person. In most circumstances, it is the police crime scene examiners or forensic scientists who complete the remaining examination of a crime scene and deal with all of the matters not related to the body.

The amount of information that can be gathered from a crime scene is considerable. The correlation of the appearances of a death scene with the findings at autopsy may be of crucial significance in reconstructing the circumstances surrounding the individual's death. For example, suppose an individual is found face down in the kitchen with an external head injury that upon autopsy is revealed to be associated with an underlying haemorrhage around the brain; the injury could have been caused either by an attack by another person, or by a fall. Close examination of the scene of death may reveal blood and hair on the sharp edge of some furniture, suggesting that the individual was injured in a fall; or alternatively, blood and hair on an implement such as a potential weapon, suggesting that the injuries were caused by the deliberate action of another person. This integration of both the physical examination of the dead body with the physical examination of the environment in which the body is found is of crucial significance in the reconstruction of the events surrounding a death.

### **Dead Body Examiner**

The media and most of the lay public recognize the forensic pathologist as a dead body examiner. As we have just seen, the pathologist performs a preliminary examination of a body at the death scene (or the place in which the body is found). The formal examination of a dead body occurs of course during the process of the autopsy. But the autopsy is more than an external examination of the body followed by dissection and an internal examination. The process of an autopsy covers a wide range of activities, and can include radiology and fluoroscopy as well as endoscopic techniques for examining the interior of the body without formal dissection.

The scope of examination of a body at the scene of death depends on the circumstances, but in most cases, some initial information can be gathered from the position of the body, the presence or absence of any rigor mortis or post-mortem hypostatic lividity (discoloration of the skin), and the temperature of the body. A body that is fully clothed or otherwise wrapped and partly concealed, may be difficult to examine adequately at the scene, and no definitive conclusions regarding the nature of the death should be made until the body has been examined fully at autopsy and the necessary follow up tests have been completed.

In some cases, it may be possible for a pathologist on examining a body at the scene of a suspicious death to raise the possibility that the death is in fact the result of a natural disease process. There are situations where a pathologist is confronted with an apparently suspicious scene of death for example, one involving substantial blood loss, but evaluation of the body at the scene reveals that alcohol may have played a part. In this example the death may have occurred as a result of complications of alcohol related liver disease, where with cirrhosis of the liver, varicose veins can form in the gullet or oesophagus and can bleed profusely. In other situations, individuals have been found covered in blood which appears to have come from the region of their head and which was thought to have been caused by trauma to the head. In a number of these cases the blood has been identified as coming from the nose and mouth and the bleeding has been shown to be the result of lung tumours or tuberculosis eroding into major blood vessels. Clearly, an autopsy will ultimately resolve these situations, and an efficient and timely autopsy service can be of great benefit to the coroner, police and other investigators.

The process of the forensic autopsy is discussed in Chapter 7. However, it is in this specific field of death investigation that the forensic pathologist has almost sole responsibility. The efficiency of this service and the provision of timely information from the pathologist to co-investigators, such as the police, may result in better focusing of police investigation. In the case where a suspicious death is rapidly confirmed as being the result of natural disease, the information can prevent the waste of expensive police time.

### **Forensic biologist**

Forensic biology is one of the core divisions of forensic science. Forensic biology services are for the most part provided through major institutes of forensic science, and a number of these exist in association with institutes of forensic medicine. The overlap between forensic biology and forensic pathology has, in the past, been considerable. Many forensic pathology departments and institutes have provided forensic biology services and in some jurisdictions, forensic biology services are provided by biologists and pathologists together.

Given the background of the training of a forensic pathologist and the concentration upon basic biological principles in undergraduate medical training, it is not surprising that there are many areas in which a medical practitioner has the necessary expertise to take part in forensic biological service work and to give expert evidence in the field of forensic biology. Pathologists with their knowledge of clinical haematology have a basic understanding of the serology that forms part of the work of a forensic

biologist. Similarly, the anatomical pathologist has usually trained for several years beyond their basic medical training in the area of microscopy of human tissues and cells, and therefore has the necessary expertise to engage in many of the areas of forensic biology that involve microscopy of human tissue, including, for example, the identification of spermatozoa in forensic samples. Despite this similarity in basic knowledge and overlapping areas of expertise, many aspects of forensic biology go far beyond the boundaries of knowledge of the average clinical pathologist. In some of these areas, the forensic pathologists have particularly developed their skills so that they further overlap the expertise of the forensic biologist.

Clinical pathologists are involved in a wide variety of new and developing techniques. For the anatomical pathologist, the advent of electron microscopy and immunohistochemistry, have revolutionized the way in which pathologists gain an understanding of disease at a cellular and sub-cellular level. Molecular biology techniques are also increasingly used in routine clinical pathology. Interestingly enough, the same developments have also made their mark in forensic biology. Today, molecular biology involving the analysis and comparison of DNA is one of the great success stories of forensic biology, and forensic pathologists are well equipped to analyse and comment on the general use of these techniques.

### **Forensic Radiologist**

All medical practitioners are involved in the examination of radiographs or X-rays of patients. Indeed, whilst most doctors do not take radiographs, the examination of the films is part of normal medical practice. Nevertheless a wide variety of radiological studies require special techniques, and specialist radiologists are able to deduce much more information from radiographs than would be expected of the ordinary doctor. Clinical radiology is a major medical specialist area, providing both routine and specialist diagnostic services. It uses using a variety of techniques, including plain X-ray films, computerised axial tomography (CAT) scans, and magnetic resonance imaging. All forensic pathologists are involved in the examination of X-rays, but their expertise varies considerably. There are some who have made a special study of forensic radiology, whilst others rely on specialist clinical radiologists who have developed a special interest in forensic radiology.

The application of radiology techniques to forensic pathology is very broad. Occasionally forensic radiology may assist in determining the cause of death, whilst in other cases it may be used particularly to help with human identification and to assist with the location and retrieval of foreign material within the body. There are many advantages to undertaking a radiological study of a deceased person prior to autopsy. Whilst radiology does not always reveal pathology that is detected at autopsy, radiology can be the best technique for identifying some pathological processes in particular pneumothoraces, air embolism and some musculoskeletal injuries.

## **Forensic Toxicology**

Medical pharmacology and therapeutics form part of the basic education of all legally qualified medical practitioners. Knowledge of drugs and their normal and abnormal effects on the human body are fundamental to medical practice. Whilst most doctors understand the toxic effects of therapeutic and some non-therapeutic drugs, details regarding the wide range of substances that are dangerous to the human body exceeds the knowledge of most doctors. It is scientists specializing in forensic toxicology who screen and analyse human tissues for drugs and toxins. Forensic pathologists, perhaps more than any other discipline group within medicine, have a specific interest in this area. This is because the forensic pathologist has to determine issues relating to the cause of death and circumstances of death of individuals. Where such deaths are apparently the result of toxic substances, then a forensic pathologist must collect the appropriate body samples and together with a forensic toxicologist arrange for the most appropriate analysis.

Forensic toxicology cannot be treated in isolation when it comes to investigating deaths and determining a cause of death. In practice, the pathway by which forensic toxicologists contribute to the death investigation is a complex one. Whilst the scientific reports of toxicologists are provided directly to the courts, the investigation of the medical cause of death remains the responsibility of the forensic pathologist. It is essential therefore that the forensic pathologist receives the toxicology report and integrates that report and its findings into the overall medical report on the death. Finally, the integrated forensic medical report, including the toxicology report, is provided to the courts and the justice system. These reports are sometimes considered separately by the court and sometimes considered together. There are many occasions when a forensic pathologist is able to give the majority of the expert toxicological evidence to the court, particularly where such evidence is straightforward. However, in many cases the nature of the toxicology information is such that it requires a specialist toxicologist to deliver the evidence before the court.

## **Forensic Sociologist**

It may seem strange to consider forensic sociology in the list of roles carried out by forensic pathologists. In practice however, forensic pathology has to do with issues of human behaviour in settings which involve violence and death. There is no doubt that forensic pathologists acquire considerable expertise in certain areas of criminology and in respect of certain community social settings. A knowledge of police culture, prison culture, drug culture and other particular subcultures is a feature of the professional experience of forensic pathologists. The very nature of their work with regard to the investigation of suspicious and non-suspicious deaths involves them with many of these subcultures. A variety of sociological issues cause enormous community concern. Many of these are associated with the work of forensic pathologists: deaths in custody, violence associated with control agency response, deaths associated with failures of health professionals including health and social services, suicide and the influence of mental health on crime and social

violence. Forensic pathologists investigate deaths that occur in a wide variety of social settings. In many cases the social setting contributes considerably to the death, and this is an area of particular interest to some forensic pathologists.

### **Medical Detective**

Forensic pathologists, more than all other specialists in medical practice, are medical detectives. Acting as a co-investigator for a coroner or the police, forensic pathologists play a far wider role than just providing an autopsy report. They are often involved in all phases of a death investigation and form part of the detective team which analyses the circumstances of a death. This role of medical detective is often glorified in the media, and in such productions the forensic pathologist is often elevated to the key player in the investigation. This is certainly not the case in practice. Despite the media portrayal of the forensic pathologist as a high-profile medical sleuth, the reality is that the forensic pathologist participates on an equal basis with all other specialist investigators in the team investigating the death.

From the description of the roles taken by forensic pathologists and the services they provide, it can be seen that the work of the forensic pathologist is not limited to the narrow confines of the autopsy. The role of forensic pathologists must be viewed in relation to the health and legal community needs which they attempt to meet. The forensic pathologist is far more than a simple medical examiner or pathologist for the coroner. Their unique range of skills and expertise overlaps many of the traditional scientific, medical and legal compartments and as such can be a highly effective and efficient resource for medical and legal services.

### ***Recommended Reading***

(Brodrick Committee Report.) Cmnd. 4810. *Report Of The Committee On Death Certification And Coroners* : November 1971. Published by the Home Office in the United Kingdom, London 1971.

Busuttil, A. and Jones, J. S. P. *Deaths in Major Disasters : The pathologist's role.*: The Royal College of Pathologists, London 1990.

Crowther, M. Anne, and White, Brenda. *On Soul and Conscience : The medical expert and crime: 150 years of forensic medicine in Glasgow*. Aberdeen University Press, Aberdeen 1988.

Gonzalez-Crussi, F. *Three Forms Of Sudden Death : And other reflections on the grandeur and misery of the body*. Picador, London 1987.

Hill, Rolla B; and Anderson, Robert E. *The Autopsy : Medical practice and public policy*. Butterworths, Boston 1988.

Knight, Bernard. *Forensic Pathology*. Edward Arnold, London 1991.

Plueckhahn, V. D. and Cordner, S. M. *Ethics, Legal Medicine & Forensic Pathology* : 2nd Edition. Melbourne University Press, Melbourne 1991.

Selby, Hugh. (ed.). *The Aftermath of Death: Coronials.*: Federation Press, Leichhardt, NSW, 1992.

Spitz, Werner U. (ed.) and Fisher, Russell S. *Spitz And Fisher's Medicolegal Investigation Of Death : Guidelines for the application of pathology to crime investigation*. Charles C. Thomas, Springfield, Ill. 1993.

David Ranson