Fifty Years of Forensic Science
A commentary

Edited by

Niamh Nic Daéid

Centre for Forensic Science, University of Strathclyde, Glasgow, UK

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For Gill

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Preface

The Forensic Science Society held its inaugural meeting on the 31st October 1959 and the first volume of the *Journal of the Forensic Science Society*, later *Science and Justice*, was published the following year in 1960. The Journal, as it's known within the Society, has been published continuously ever since making it one of the longest established journals of its type in the World.

What makes the Society's journal truly different from its peers, is that each issue contains an editorial piece. This provides an invaluable and often fascinating commentary of the development of our profession, of our science and the articulation of our place within the judicial system. Over the past 50 years, forensic science has changed enormously, however it may be of interest for readers to note that many of the current perspectives and debates have been considered, sometimes at great length, by our predecessors many years ago. The influence of television programmes on forensic science education, for example, was first mentioned in an editorial in 1968, the development of a professional body for forensic scientists was first discussed in 1965 and the introduction of a forensic science watchdog examining professional standards was discussed as far back as 1973.

The existence of the editorials has provided the opportunity to produce this text. They have been divided into a number of broad categories and presented in chronological order within each section. The choice of how to categorise the editorials has been mine and hopefully I have done a good job which reflects the different topics well. In a few cases I have also chosen to include correspondence produced in response to the editorials to give a broader and developed perspective of the debate which was provoked. The authors of the editorials are sometimes anonymous (as was the policy of the Journal for many years), but were always respected members of the profession. Many of the pieces were penned by my learned and respected previous editors, Stuart Kind, Russell Stockdale, Roger Davis, Bill Tilstone, Brian Caddy and Robert Forrest. They have provided insightful and often very entertaining commentary in their writing and have made some marvellous choices for invited authors. It is a humbling experience to be considered within the same company.

This has been a fascinating and enjoyable project to work on. I'm delighted to be able to work with Wiley-Blackwell Publishers who listened to what began as one of my crazy ideas, and resulted in the production of this text to celebrate the Golden anniversary of the Forensic Science Society. Each section has a short commentary apart from the first two sections (the professional aspects of forensic science and the development of science and technology in the field) which are both introduced by Brian Caddy's initial comments.

I would like to thank my fellow contributors to the commentaries, Claude Roux, Max Houck, Brian Caddy as well as Sue Black, Robert Forrest, Jim Fraser, Katy Savage and Gillian Urquhart for useful and helpful discussions. I hope you, the reader, find the contents stimulating and enjoyable.

Niamh Nic Daéid,
Glasgow 2009

INTRODUCTION: WHAT IS THE FUTURE FOR FORENSIC SCIENCE?

Emeritus Professor Brian Caddy
University of Strathclyde, Glasgow

The question posed in the title above would suggest that there may be some reason to believe that the future of forensic science may be in doubt. But how can this be when everyone is aware of the relevance of this scientific discipline as portrayed by the media and the success of DNA databases in the identification of suspects involved in criminal acts? For a science to be successful it must be based upon sound scientific principles supported by continuing scientific research. Moreover, in order to attract appropriate funding for its development it must be seen as a financially viable discipline and one which can be professionally managed. Financially viable does not have to mean profitable although profitability should not be excluded but it does mean that it meets the needs of the society it serves. The problem with forensic science is that it is a discipline that is a collection of other disciplines one of which is not a science, namely law. So forensic science has two masters a scientific one and the legal and these two can sometimes be in conflict although some would argue that both are trying to "test" the truth, the one through experiment and the other by question and answer.

While the previous statements may be argued we must try and identify what we mean by forensic science. There have been many definitions proposed and few if any meet all aspects of the discipline but for our purposes we will mean "scientific investigations that support the legal process". The first questions therefore that must be asked is "within what arena must forensic science operate?" and to try and answer this question we must look at the governorship of forensic science and its management.

Governorship and Management of Forensic Science

There have been many debates as to where forensic science should be best placed in society if it is to be seen to demonstrate the impartiality it purports to apply to its function and no doubt this debate will continue in the future. Many countries see forensic science as residing within a Ministry of Justice or some other government department of state (or subunits of a country) and argue that this demonstrates an impartiality and commitment to justice. Funding for its activities comes directly from government sources and so is subject to the vagaries of government spending. This is a pattern common perhaps to most countries where central funding is common place. An alternative model is for the control of forensic science to be conducted through a police budget, that is, forensic science is under the control of police forces. Does such control impugn the integrity of forensic science and what happens when governments decide to cut police force budgets? Many would argue that forensic science works best when there is close contact between the investigating officer and the provider of forensic science services but should this mean under the control of police forces?

Could universities be encouraged and financed to establish forensic science services as a means to demonstrate not only impartiality but to provide bases for research into the discipline? A number of universities already fulfil such a role in some countries, usually those with a small population.

Finally, why should forensic science not become a purely commercial enterprise subject to the vagaries of the commercial world with its activities governed by its shareholders? Does such an arrangement not show impartiality and value for money? But can commercial forensic science be genuinely independent of government forces when governments have financial control over police forces and police forces are the paymasters of the commercial forensic science organisations? Moreover, do financial pressures on commercial organisations lead to "cutting corners" in the quality of forensic science and if so, what price justice then?

Clearly the positioning of forensic science in society is a debate that will continue but which ever model is adopted society needs to be assured that the practice of forensic science meets acceptable quality standards and this relates to professional management of forensic science laboratories and those delegated to recover items from, and to interpret, crime scenes.

What is quality forensic science and does the implementation of quality management systems mean that no mistakes will be made in the recovery, analysis, and interpretation of forensic science evidence? The answer must be no to this question because all such activities are carried out by humans all of whom possess human failings. All that such systems can achieve is to minimise the possibilities of such human errors. Unfortunately the media do not recognise this and often exploit those unfortunate to be at the centre of failures. The debate must therefore be, how can we best achieve quality in all we do in the forensic science arena? Such processes are not static in nature but represent a dynamic re-evaluation of best practices in quality management.

The concept of quality covers at least two aspects, one the accreditation of the individual to identify competence and the other the validation of systems. Most professional laboratories possess some form of accreditation for systems under ISO 17025 or ASCLD/Lab or some other national standards. These require operators to process samples according to written processes deviations from which can be tolerated providing the reasons for so doing and the different processes adopted can be rationalised and documented. The debates that will continue in this area surround the establishment of the standards and the processes that require validation. What is validation? There are various views expressed on what constitutes validation. Certainly it must include reproducibility studies; statistical evaluation of linearity (where appropriate), limits of detection, specificity etc. but should it also include publication in peer reviewed scientific journals, reproducibility by a different group of unrelated workers, acceptability by the wider scientific community (how does one assess this?) adoption by other laboratories in other countries and if the last, how many other countries and perhaps last, acceptability to the courts? Validation can become more of a problem when related to crime scene investigation because every crime scene is different but there are some international standards available that are helpful (ISO 17020 associated with the management of crime scenes, and the personnel framework under Skills for Justice) but whether these become universally accepted is open to debate.

What then of the accreditation of individual personnel, which is perhaps the most important area for controlling quality. Clearly persons involved in such work must meet the required ethical standard. But what is the ethical standard and how can one be assessed as meeting such a standard? This is a difficult area, and only when a person has failed to meet what may be considered an ethical approach to forensic work, does this arise. Should all forensic practitioners be examined psychologically for personality defects incompatible with forensic science practice, before being offered employment? If so, what would be, and who would describe, the psychological standards to be employed? Ethical status on its own does not ascribe competence to carry out forensic science testing. This begins through a training programme designed to see if the candidate can meet the standards of the proscribed testing procedure. The debate is what should be the length of training and at what point does a person become competent. Here it is important to distinguish between competence and experience. Experience on its own is not sufficient since a person could be incompetent and experienced e.g. “doing it wrong for 10 years.” What, for example, would be a satisfactory training period for a person to search clothing, using a proscribed procedure, to recover samples for further examination? At the end of such a period would such a person be aware of the significance of the absence of any compromising material on garments given the circumstances of the case? Should such a person have a pre-knowledge of the circumstances surrounding the case, and if so, how much might this influence what might be sought for on the garments [1]. Should searching always be carried out “blind” so that casework details do not direct the search programme? These questions are still to be answered and the answers put into practice. Having completed the training programme, personnel will require monitoring/mentoring but at what point is competence to work on ones own identified – by random testing perhaps by an already competent experienced officer or regular double searching by different personnel as part of the quality control system with all the cost implications of such a process? All such training programmes are dynamic in nature as research leads to modifications to,

and the introduction of, totally new processes and instrumentation. Are laboratories maintaining the currency of their training programmes and who, external to the organisation, monitors this?

This latter brings into focus the need for some body external to each forensic science organisation, and that includes crime scene workers usually attached to police forces? In the United Kingdom the organisation responsible for this is the United Kingdom Accreditation Service (UKAS) in collaboration with the Forensic Science Regulator. This latter is a Home Office appointment with powers to set standards and to monitor compliance with all standards [2]. Some, perhaps most, of these standards have been generated through UKAS but others have been developed under the auspices of the Regulator and Skills for Justice. The question that must be asked is "what is the mechanism by which compliance with these standards is to be monitored?" It would seem that many of the assessors using the proscribed standards are employed by the organisations whose personnel are to be tested. The correctness of assessment is to be monitored by UKAS through dip sampling the process. Will such monitoring demonstrate sufficient independence for the courts to recognise practitioners as being impartial and competent, or should the assessors be totally independent of all the forensic organisations and if so would this be a practical alternative option given that all the expertise resides within these organisations? Certainly any such alternative would be more expensive and in the present fiscal climate, unlikely to be financed.

Whether this, or alternative methods for assessing individual competences, is to be adopted by other countries, is yet to be seen but this arrangement will be looked upon with interest internationally.

Technology and Science

The rapid growth in the sciences especially in the area of molecular biology will undoubtedly have an impact upon the forensic sciences but perhaps an area which could benefit from further scientific appraisal starts at the beginning of the forensic process namely identification and recovery of material from the scene and in the laboratory, this latter often associated with clothing. Over recent times the use of different light sources on their own or in combination with chemical treatments have become routine and have successfully revealed material of forensic significance that was not obvious to the unaided human eye. But is there other technology developed by other scientific disciplines that can be used for this purpose? For example, one is amazed at the clarity and detail with which cameras employed by astronomers are used to explore the universe. Could these be adopted to scan garments for trace materials instead of employing chemical testing and the aided human eye with all the built in fallibility of the latter process? Forensic science needs to look to novel applications of methods and processes developed in other disciplines to enhance its repertoire of investigative tools.

The area the general public most associate with the forensic sciences is that of DNA. This technology has had an enormous impact upon the successful prosecution of felons but already decisions will have to be made to enhance the SGM plus system that is presently used by most counties, by the introduction of more loci. Different pre- amplification procedures have now been validated and implemented but more needs to be researched on the interpretation of mixtures and criteria for acceptability and rejection of given profiles obtained from mixtures [3]. It is important that any such criteria are accepted by the forensic DNA community at large. The use of very rapid DNA sequencers and the development of emulsion PCR could have an important part to play in forensic science applications. In respect of the former, this would need a complete change in the DNA data bases that have already been established which would be a costly exercise and unlikely to find favour with financing bodies.

An area already directed at DNA analysis (SNIPS) is that of Biochip technology. This has the potential for determining DNA profiles at the crime scene given that it can accommodate a contamination free environment [4, 5, 6, 7]. The advantages of this coupled with on line access to DNA databases could greatly increase the rapidity of person identification and would reduce the pressure on over- extended laboratories. The use of biochip technology for forensic purposes does not stop at DNA but can be used to detect drugs [8, 9] and explosives [10]. The former discoveries could have an impact not only upon the detection of users of illicit drugs, for example in prisons, and for post mortem toxicological investigations but also for monitoring road

traffic infringements associated with drug taking especially if the system could accommodate both saliva and perspiration as test material.

The individualisation of chemicals associated with criminal activity has for many years been the aim of forensic scientists especially for the characterisation of illicit drug samples and explosives, with the aim of matching samples recovered from different sources and identifying the manufacturing source. Variations in the use of mass spectrometry coupled with separation techniques have been partially successful in meeting this objective but the introduction of stable isotope mass spectrometry [11] already has, and will continue to provide, improvements in the individualisation of such samples. This technique has found other applications within the forensic sciences.

The sensitivity of Raman spectroscopy was for many years an inhibitor of its widespread use as an analytical tool but with the advent of surface enhanced resonance Raman scattering (SERRS) its sensitivity has been greatly increased and its application to the individual characterisation of samples of forensic interest explored. Procedures are well advanced in using this technique for the characterisation of DNA samples, at present mainly restricted to diagnostic probes for medical purposes, but the advantages of using a multiplex system of DNA analysis that shows greater sensitivity than fluorescent systems and does not require the use of any separation analytical system must be addressed [12, 13].

From what has preceded and other techniques not referred to in this review, it is apparent that techniques are being developed that will enhance the identification and characterisation of materials of forensic interest. However, while such identifications and characterisations are essential, the results of such analyses need to be interpreted in the context of the case if the work is to be of any value to the legal process. Over recent years, following the work of Evett et al, [14], much effort has been invested on interpreting evidence from a sound rational scientific basis using Bayesian statistics, an area of statistics well suited to forensic science problems. Work is continuing in this area and in particular efforts are being made to put fingerprint identification on a sound scientific basis for the first time [15, 16].

One aspect of interpretation requires that there are in place appropriate databases that are, relevant, accurate, complete, and up to date. It is important that such data bases are monitored for their efficacy and documentation should be available to demonstrate that this is so. Data bases for DNA, footwear, paints, fibres, glass, and fingerprints etc. are expensive to run and maintain and the question arises as to whether those responsible for financing forensic science organisations are willing to provide the necessary capital to facilitate their continued availability?

The Legal-Science Interface

The interface between members of the legal profession and scientists can be a difficult one since few scientists have a good appreciation of the law and few lawyers have a full understanding of science especially where new and complex technology needs to be explored for acceptability to the legal process.

One question that has arisen since science was first admitted to the courtroom is that of expertise. How does the court know that the person giving the scientific evidence is an expert in his/her field? Many of the early experts were medically qualified and much emphasis was, and in some instances, still is, placed upon experience. While experience is important it must be associated with competence and the area of competence clearly defined. Failure to define the area of competence has lead to some serious miscarriages of justice because evidence has been presented to the courts, by an “expert witness”, that was outside their area of competence. While this should not happen, even the most experienced scientific/medical witness can sometimes be coerced into making unsubstantiated comments when under pressure from skilled counsel. This type of problem may suggest that perhaps the adversarial legal process is not best suited to the delivery of scientific/medical evidence to the courts and that the inquisitorial process may be an advantage? This debate is one that will continue but which must also take into account the decision by the European Court of Human Rights that the accused must have “equality of arms” to the prosecuting authorities in relation to their own

forensic analyses. This decision must surely lead to an adversarial process. But how do the courts operating in the adversarial systems of justice try to reassure the public that experts are delivering the correct science to the courts? It is usual for the courts to evaluate the professional qualifications of the witness to include degrees and laboratory experience although it has been known for the former to be forged. The rigor of the examination and cross examination is meant to illicit any shortcomings in the scientists ability but is this sufficient when it is recognised that lawyers don't have wide, if any, scientific knowledge? Larger laboratories will have quality management systems in place and lawyers could test compliance with such standards but do lawyers know what these standards are? An independent organisation, the Council for the Registration of Forensic Practitioners (CRFP), was able to provide a register of competent forensic practitioners through a rigorous assessment process but this has since ceased to operate mainly because of its cumbersomeness and high cost to the industry. It is suggested that the courts do need a register of competent practitioners open not only to the large companies but also to the small organisations who offer expert testimony.

Assuming that the expert is expert, the courts have another hurdle to surmount and that relates to the presentation of evidence arising from new technologies that have not previously been brought before the court. How does the court judge what is acceptable as evidence? The United States have tried to tackle this problem through the Frye hearings [17] and Daubert judgements [18] which identify the series of steps the court should look to before a technique becomes acceptable to any deliberations. A similar set of criteria have recently been proposed by the English Law Commission [19] who envisage the gatekeeper for such judgements to be the judges themselves. One must ask, for very complex scientific technologies, do the judges have the skills and knowledge to make such judgements even with the assistance of scientific advisors? The debate must continue?

Conclusions

From what has preceded it is clear that forensic science has a future. In practice it has become pivotal in its role in supporting criminal justice systems throughout the world. How forensic science is validated and integrated into criminal justice systems is still open to debate. As science develops newer methods will be added to the battery of tools available to support the justice systems but who will judge on the correctness and acceptability of such techniques has still to be decided by legal bodies. Much will depend upon financial support for the forensic science industry and this is either directly or indirectly controlled by governmental processes at the national or local level. Given that government spending in many countries has become very restricted it does not bode well for future developments in the forensic sciences. This view was recently vocalised by a government spokesman at a recent conference held by the Forensic Science Regulator in the United Kingdom when he said that the Home Office would not be supporting any research in the forensic sciences. Given that none of the government scientific research councils are either unwilling or unable to support research in the forensic sciences this does not auger well for future developments but it will survive because it is needed by the judicial process.

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SECTION I: THE PROFESSIONAL DEVELOPMENT OF FORENSIC SCIENCE

The very first editorial written by Stuart Kind in 1960 addressed the issue of criminal aspects of forensic science in Great Britain. There followed over 50 other commentaries on the changes and sometimes painful developments of our profession over the last half century. Forensic Science provision in the UK as well as elsewhere has, of course, changed enormously in this time. The editorials have demonstrated a maturing of the debate over time about what it means to be a professional forensic scientist. They address the development of practice and standards, the dramatic changes in service provision from the development of the home office laboratories through to the widening of the market place that we are experiencing today in 2009.

In 1973 an editorial discussed the introduction of a "forensic science watchdog to take thought of their interests . . . expecting the highest standards of behaviour . . . [and] perhaps enforcing those standards". Twenty years later in 1993 an editorial commenting on the Royal Commission on criminal justice for England and Wales discussed the establishment of a 'forensic science advisory council' and in 2008 the newly appointed forensic science regulator wrote for the journal.

N. Nic Daéid

Fifty Years of Forensic Science: A commentary Edited by Niamh Nic Daéid

1(1) - 1960: Criminal Aspects of Forensic Science in Great Britain

The security of the citizen is very largely determined by the detection and punishment of crimes directed against his person and his property.

Until comparatively recently the systematic application of science to investigations relating to crime was directed mainly to major offences such as murder or more generally to crimes against the person. The field of such investigations was known as Forensic Medicine and were carried out by medical men. Until comparatively recently the methods of diagnosis in poisoning cases were very limited, depending very largely on observation before and during illness prior to death together with post mortem appearance.

For many years little was done on the chemistry side. The work of Christison (1829) and Taylor (1844) laid the foundation of toxicology and to-day the detection and estimation of poisons and the ultimate presentation of this evidence in poisoning cases has passed from the medical man to the chemist.

In 1872 it became compulsory for local authorities to appoint a public analyst, but it was not until 1900 that proof of ability in analytical chemistry was required, to-day he must also be a competent microscopist.

Until fairly recently, the main source of scientific assistance available to the local police was from a local medical practitioner (usually the police surgeon) and the local public analyst.

In 1938 a system was devised by the Home Office to divide the country into regions, each served by a laboratory to be equipped with up-to-date apparatus, each laboratory to be staffed so as to make it as comprehensive as possible.

Although the scheme provides for most problems likely to arise it does not cover all; in some problems investigations (or information) of a very specialised nature may be required. Such contingencies are provided for by the utilization not only of other government laboratories, but also by the research and technical laboratories of many industries. Even the individual specialist can be pressed into service when required. Thus it becomes possible to bring to bear on a criminological problem the scientific resources of the country.

The development of Forensic Science has led to a considerable increase in the scientific evidence brought before the courts.

The normal training of solicitors and barristers includes very little science, thus with few exceptions, solicitors and barristers are poor scientists.

For those whose duty it is to “hearken” to scientific evidence some degree of “scientific appreciation” is essential in the administration of justice.

Scientists on the other hand, should present their evidence in a language understandable to a lay jury. The evidence of a brilliant scientist may be lost to a jury if presented in a highly technical or scientific language.

4(2) - 1964: Forensic Science or Sciences?

There are two opposing trends evident in thinking on forensic science. These can be roughly equated with the “lumpers” and “splitters” of classical taxonomy.

The first school of thought in its extreme form adheres to the view that a forensic scientist must be a general practitioner and be prepared to work in fields as far apart as document examination and traumatic pathology. That this view is absurd is accepted in most civilised countries and nowadays we seldom witness attempts by one specialist to transgress into the field of another.

The fact that this view is absurd is, however, often taken as a basis for quasi logical argument which seeks to show that for efficient working forensic science must be divided into what can best be described as academic specialities. Thus there is a growing tendency for all thinking on forensic science to be compartmentalised into “Chemistry”, “Physics” and “Biology”. Although physical evidence may be classified (with doubtful value) in this way for teaching purposes, in actual case work it can seldom be said to fall entirely into one of these divisions.

Sciences can be classified in two ways, either by *content* or by *purpose*. The first of these divisions includes the so called "natural" divisions of science such as Physics and Geology. The second division comprises the "technologies" such as Engineering and Medicine where the subject matter (which may be rather heterogeneous when viewed from the viewpoint of the academic scientist) is provided with a unifying cement of *purpose*.

The view that Forensic Science is a hotch potch of different specialities seems of late to have gained the upper hand and it is the purpose of this Editorial to suggest that this latter point of view is equally indefensible with the former. Leaving aside the established specialities such as Pathology, Psychiatry and Toxicology which pose special problems, the forensic scientist is concerned with the degree of individuality and identity of tangible objects. He is concerned with *"Information"* in the broadest sense whether it be information left by skin ridges in the form of fingerprints, information left by rifling marks on a bullet or tool marks on a safe, information left by blood, metal scrapings, paint chips, footprints, hairs, fibres, glass fragments and any other of the multitudinous materials likely to be transferred.

The fact that all these materials have other aspects than the purely informational ones is perfectly true and it would be an unwise forensic scientist who extrapolated his knowledge of the individuality of paint and glass to the extent of advising on the painting and glazing of a new building but this is saying no more than that the dermatologist does not necessarily know anything about the individual character of fingerprints and generally that one cannot classify phenomena but only *attitudes* towards phenomena.

It will probably not be long before Society wakens up to the fact that apprenticeship, although valuable, is probably not the most efficient way of training forensic scientists and it would be a tragedy if any courses which are then instituted were to be based on anything other than the concept of unity in forensic science despite what the academics may say.

4(4) - 1964: Shriving a Science

Was ever an area of human endeavour so cursed and so blessed as that of forensic science?

From its origins the beastly science proved of horrific yet riveting interest to devotee and observer alike. A background of cultured urbanity, of intelligent and vaguely scientific guesswork such as informed the creatures of Sir Arthur Conan Doyle's imagination set the trend for the great men of the age of forensic medicine now almost passed into obscurity. Were not Tidy and Willcox, Pepper and Roche Lynch, Littlejohn, Sydney Smith and the Glaisters just such combinations? And Spilsbury the greatest of all in public esteem, whose reputation made him a spellbinder of juries to the extent almost of embarrassing the outcome of his cases. The forerunners of the modern forensic scientist certainly were men of character, personality and renown. Merged in public imagination with the experts of fiction these clever, superior almost psychic figures descended as from Olympus to pronounce a doom acceptable to reader or juror.

But these days are almost gone. Today the tradition wavers and fails.

True the Crown pathologists still command a considerable following. Molly Lefebure could create an aura of hushed respect about the doings of one of the most eminent whose thoughtful, bowler-hatted figure is to be seen, sometimes even on television, perambulating the scene of some murder or the gruesome remains of a sudden tragedy. The endless spate of second class writing on crime and criminals still caters for such a market, and to a degree such is still the public image. But the complexity of the science, the sweep of its interests, the Babel of its languages seldom fully permeate public consciousness. It is easy to venerate the wisdom of a greybeard, but the anonymous toiler at his laboratory bench stirs little applause. And those faceless individuals among whom the great man's interests are fragmented seldom communicate with one another and may soon find it impossible to do so. What affinity does the lawyer whose concept of proof is a weighing of testimony adduced within rigid and archaic rules have for the scientist whose approach is to adopt whatever hypothesis for the moment fits all the known facts so long as it continues to contain them?

What communion is possible between the police officer whose concern is to fence his suspect with evidence sufficient to satisfy judge and jury and the serologist whose studies both confirm and disprove the Pauline assertion that God hath made of one blood all nations of men for to dwell on the face of the earth? And what feeling has the judge, reared probably in a literary/classical tradition for the most social and practical of all branches of science?

The shriving of forensic science demands first an improvement in intercommunication, and then a new public revelation. If reverence has given way to indifference, if the omnicompetent savant is yielding place to the pallid multitude of anonymous workers, the doubtful boon of public recognition may soon pass into the curse of blank rejection. To ensure its re-emergence forensic science must forego the empire-building of the celebrity of more spacious days in favour of informed public acceptance of the discipline rather than the man. Such a blessing well befits the modern age.

A.R.B.

5(1) - 1965: A Public Image

Over the past few years it has become very fashionable for organisations of all kinds to give attention to their "Public Image". Sometimes this has led to nothing more significant than a decision to present dried skim milk powder as the "heart of milk". However, when a Public Image is based on misinformation as to the facts themselves, the case for trying to correct it is raised to a quite different level.

What then is the Public Image of Forensic Science to-day? Nurtured by novels, radio, television and the newspapers, the forensic scientist is almost always an omniscient university pathologist, who pronounces with authority on all subjects. Partly this is a legacy of the past, as was pointed out in "Shriving a Science" (Editorial, this Journal, October, 1964). On the other hand, what is said now has an equal effect, and one can only envy the freedom of university pathologists to state their views and regretfully to contrast this freedom with the censorship which fetters the state-employed forensic scientist.

It is difficult to see how the Home Office could give their employees full freedom to pronounce on controversial subjects, but there is surely a compromise between this and acting as though it were necessary for every statement of every employee to have the status of Holy Writ. There is unquestionably a case for independent comment to be encouraged.

Despite the recent erosion of the forensic medicine departments in some British universities which is deplorable, the position of forensic science is infinitely worse, for there is not a single appointment in this subject other than in specialities ancillary to medicine.

The time is now opportune for the establishment, possibly in one or more of the newer universities, of a Department of Forensic Science for research and teaching in the subject. It would create a situation more in accord with present facts and needs than the outworn, but current, Public Image of forensic science, which in time it would also correct.

David Patterson

5(2) - 1965: Don't Forget Them In Swahililand

A recent reviewer of Glaister's new edition of *Medical Jurisprudence* objected to the inclusion by that author of simple laboratory tests on the grounds that such testing should be left entirely to specialists. While such a recommendation may be scientifically sound, it is hardly practical in these times for many parts of the world. Most of the newly-emerging nations are hardpressed to find even one forensic scientist, let alone a battery of specialists.

The older and larger nations are neither producing enough forensic scientists to take care of their own normal attrition nor providing for expansion. We may bewail the fact that general practitioners perform medico-legal autopsies or that routine chemists attempt toxicology, but until the universities and criminalistics laboratories can produce enough specialists to staff more than a hundred countries, a great deal of forensic science is going to be done by generalists.

As comedian Jimmy Durante once put it: "Those are the conditions what prevail".

Forensic science is at best a lonely trade, standing unique in the law enforcement field in that its practitioners cannot look for guidance and assistance from their police and lawyer associates. They can only get help from others of their kind, and their nearest colleague may be thousands of miles away in another country. Books and periodicals are the only ready source of forensic information to the man in Singaradja, Zihuatanejo, or the Seychelles. He has no other specialists with whom he can consult.

If we delete the simple tests from the textbooks or confine our periodical contributions to esoteric methodology and elaborate instrumentation, we are not being fair to our occasional colleague in the hinterland. We may deplore his dabbling in matters that we believe he's not qualified to do, but he's going to make the tests anyway because he has to. The simple microdiffusion tests of Feldstein, the paper chromatography of Clarke and Curry, or the fruit-jar techniques of Rieders are the lifelines of assistance to the district medical officer in Baluchistan with a murdered corpse on his hands.

Every publishing forensic scientist should pause now and then as he drafts another ponderous paper designed to impress his peers. Let him remember his less fortunate colleague in a remote place who has little equipment and a problem on his hands. However forensically untrained, these men need all the help they can get from us. Our books and periodical articles can give it to them.

Elliott B. Hensel

6(2) - 1966: The Vacant Headquarters

Forensic science is unique among the sciences in that it lacks a focus and a centre. Not only has it no one organised professional body, but it sports so many interests interlocking with other disciplines as almost to defy definition. Yet this stellate structure provides an unusual number of pressure points at which fruitful interaction takes place. Chemistry, police procedure, ballistics, pathology, criminal records . . . the list is almost as endless as you care to make it. And all have a part to play and an influence to exert.

Our last Editorial "Progress in Research" welcomed the opening of two new laboratories, the increased evidence of University activity, and the hopeful signs of growth which these manifest. This Editorial reviews several more scattered changes taking place on the wider scene embraced by forensic science, and the implications they present.

Eleven policemen will shortly commence to study law, economics and modern history at London and Manchester Universities and at the London School of Economics. They will do so under a scheme conceived and put into execution by the Bramshill Police College, ushering in a welcome new approach to police science and a foretaste of the type of candidate the police desire to attract to higher office in the future. The scholarship scheme is eventually to be expanded to cover sixty candidates.

Lawyers too are engaged in a period of self-analysis coupled with an unwonted urge to reform. Juries are to be permitted to decide by a majority, the necessity of police caution is under fire, the defence of alibi may have to be notified in advance of trial. A judge has expressed the hope, discussed in the Third Programme, that no obstacle will be put in the way of the use of scientific evidence in paternity cases. The possibilities of computerised fingerprint records on a national scale is receiving active consideration. The social conscience is being alerted to the misuse of drugs. Even the clergy are weighing in with the suggested abolition of the matrimonial offence in divorce law; and abortion may soon attain a new respectability.

Changes are in the air; reform is *de rigeur*. And all of this activity is excellent and greatly to be welcomed.

But as a recent Editorial "The Price of Road Safety" criticised the abolition of the individual's rights as proposed in an excessive enthusiasm for the imposition of breath, blood and urine testing by a recent White Paper (subsequently modified in the new Road Safety Bill) so there is need now for a degree of caution amongst the uncontrolled clamour of reform. The call is for sober reflection on a wide front, and for a planned approach to forensic science as a whole, taking account of its legal implications and its social impact.

Degree courses may produce more literate policemen; they will not themselves transform the police from an overworked body into a modern and effective force. Procedural amendments may facilitate the work of the Courts; they will not bring about significantly more efficient conviction of the guilty, nor abate the crime wave. Blood and urine alcohol tests carefully applied may serve in a proportion of cases to sharpen the ascertainment of impairment, but they will hardly put the drinking driver off the road.

Who in all this reform, apart from the Home Secretary with a responsibility (amongst so many others) for Government laboratories, is giving any thought to fostering the development of forensic science as an entity? Who is controlling the wise expenditure of funds to serve best the current and future needs of emerging knowledge? Who takes thought for the most fertile areas for research, for recruitment to the profession, for the co-ordination of scattered departments in different Universities with an interest in the subject once known as forensic medicine? And most of all, who will teach, expand, define and rationalise the subject of forensic science and ruthlessly expose to examination the philosophical foundations on which it is built and from which its fruits are offered in the service of justice?

The Forensic Science Society has made its mark especially amongst scientists. The British Academy of Forensic Sciences has played a useful role particularly amongst lawyers. But for the overall strategy needed to steer a steady and meaningful course no one person or body is responsible.

It is idle to deny that the past history of forensic science has had its factions and its recriminations. These must now be tolerated no longer. The elusive Institute of Forensic Science has remained a dream, and the British who have the ability and experience to lead the world in forensic science have seemed strangely averse to seize the opportunity to do so. There may never be a more opportune moment than the present. There is a turmoil in society, a mood of reform in our legislators, a willingness for change in our lawyers. Amongst scientists there is a keen stirring of interest and plenty of opportunities waiting to be exploited; and in the crime wave a problem of challenging magnitude to bite upon. This surely is the day for forensic science to assert its presence and to display its potentialities.

But this thing cannot be done in a corner, nor by a faction. It is a matter not only of science, not only of law, not only of practical politics. It is the harnessing of the whole spectrum of forensically implicated sciences in the service of the law and the community.

Clearly the first step is the integration of the splinter societies. The second is a massive and outward-looking reappraisal on something like the scale of a Royal Commission of the relation of science to the service of justice in a modern community.

The vacant headquarters is waiting to be possessed.

A.R.B.

9(2a) - 1969: Six Just Men

The post-war development in forensic science within the United Kingdom has occurred mainly in England. The Central Research Establishment, which is rapidly earning an international reputation, the eight Forensic Science laboratories and the Metropolitan Police laboratory are all situated in England.

While, of course, the bulk of the population live in the central and southern parts of these islands there are still upwards of five millions living in Scotland, mostly in the central belt between the major cities of

Glasgow and Edinburgh. For these five millions a separate system of Scots law operates with its own Courts and procedure, and all the necessary administrative scaffolding to support such a service to the community. It is true that crime is less prevalent in Scotland than in England and that the crime which occurs tends to be of a less sophisticated nature.

Making allowances for all these factors, however, it is still remarkable to discover that the provision of forensic science facilities for Scotland is so pitifully inadequate. One police force (Glasgow) has a small complement of half a dozen full-time qualified forensic scientists whose services are also made available when necessary to the whole of Scotland through the good offices of its Chief Constable. For the rest, various expert services such as photography, microscopy and fingerprinting may be provided either locally by trained police officers or from time to time by special references to one or other of the University departments of forensic medicine which co-operate with the police. Given the obvious limitations of the system this arrangement works well enough but inevitably, despite the occasional brilliant achievement, the overall standard of work cannot but fall short of what it ought to be. This is painfully obvious to those who are in a position to compare the standard and scope of the forensic science backing given to the average criminal case in England with that available for the average criminal case in Scotland. In consequence it follows that valuable evidence which could help towards either conviction or acquittal and which ought to be made available is often absent in Scotland. In present circumstances this constitutes an avoidable and quite inexcusable failure to attain to the highest standards.

Recently the Secretary of State has been meeting in Scotland with all who have a concern for improvement of the criminal law and bringing the offender rapidly to justice, and consideration has been given to what can be done to improve the means of detection and to strengthen the assistance given to the police. While this Society has never been disposed to disparage the excellent work done by both the uniformed and criminal investigation branches of the police or to suggest that scientific aids are any substitute for the arduous and painstaking work which underlie most of their successes, we feel obliged to point to the alarming neglect which is implied by the figure of six full-time forensic scientists to meet Scottish needs as against upwards of three hundred and fifty for England and Wales.

With such a slender staff there can be no possibility of research or teaching, virtually no self-contained career structure and, it would seem, little satisfaction in meeting the needs of the Courts for the sophisticated aids to justice which science can increasingly provide.

The current police publicity campaign features posters bearing the slogan “Don’t leave it all to the police”. If we were given to writing on bill-boards we would want to add “Nor to the six just men”.

Surely Scotland deserves better than this.

A.R.B.

9(2b) - 1969: “A Forensic Scientist?”

The title of this editorial is given in quotes with a query because it is proposed to discuss the question – when can an individual be described with accuracy as a forensic scientist? If the dictionary is of any use as a guide, a forensic scientist is someone who applies his or her scientific knowledge to matters pertaining to the courts of law – a wide definition which could include some present-day criminals as well as investigators! The term could be appropriately applied on this basis, and with an equal measure of accuracy, to scientists working in a police forensic science laboratory, to someone who gives evidence occasionally on a specialised subject, such as car damage or the detection of the traces of metal by neutron activation methods. By the same reasoning a handwriting expert can be a forensic scientist, even though he has had no scientific training whatsoever of a fundamental basis; even a graphologist might claim the title if a truly scientific approach is used.

The term, therefore, makes no distinction as to occupation, branch of work or discipline; and equally it does not distinguish between the forensic scientist of many years' experience and the beginner. In the past this has not mattered so very much. Science was less ramified and scientists could be experts in a number of related fields. Many specialists were known personally to the Courts and accepted by them if of proved worth. Nowadays, however, forensic science is becoming increasingly specialised and new branches are continually forming, each creating a scientific circle of its own. Forensic odontology is a good recent example. More properly qualified forensic scientists are needed to cope with the increase in number and types of crimes, both by the police and because of this (and the legal aid system) by the defence.

The upshot of all this is that the time is rapidly approaching when a recognised qualification for the forensic scientist will become not just desirable, but essential. This type of qualification should be of such a status that it is accepted by the Courts, thereby eliminating, one hopes, an undignified feature of many cross examinations. Once properly established in fact, its acquisition could well be made compulsory for all who seek to describe themselves as forensic scientists and who give evidence in Court. A "grandfather clause" would, of course, have to be built into the regulations so that existing forensic scientists of long and high standing would be given the title on an emeritus basis. As they cease to work their number would decrease by wastage, until they become extinct; and future generations would have to comply with the official standard.

The organisation of such a qualification for the forensic scientist presents a number of problems. Thus, what should the standard be; who should administer the qualifications; how should the forensic scientist's knowledge and ability be tested; what weight should be given to experience as distinct from actual knowledge? Few will disagree that the standard adopted should be a high one – post-graduate it would seem, because this would guarantee a general basic scientific training followed by a period of specialisation. It might be argued that such a system could be unnecessary and even unfair in the case of the individual who finishes up as, say, a document examiner or a ballistics or car accident expert, since much of their scientific training would not be used. I would not agree with such a view. A scientific qualification is a hall-mark, not so much of actual knowledge acquired, as of the fact that the individual has had a scientific training. This training should have taught him how to think and reason in a scientific way and these qualities are as essential to the very special specialist as to the ordinary routine scientist.

Any such qualification should also be a guarantee that the bearer is a good court witness. One so often hears first class scientists who are appalling witnesses; and vice versa. In the former case many of the shortcomings could often have been cured or prevented by proper instruction. Perhaps in future the forensic scientist will do the actual scientific work and a professional evidence giver will put it before the Court. This would have many advantages, especially in saving the time of the scientist, but it might be difficult to incorporate into our present legal system.

A qualification without courses to train scientists to acquire it would be of very little use and here again an official lead is required. An analogy which could well be followed up exists already in the Fellowship of the Royal Institute of Chemistry in Food and Drugs which is the stipulated and official qualification for Public Analyst. The American Society of Questioned Document Examiners has for some years operated an excellent qualifying procedure for those who wish to become members. This consists of a written paper, a verbal examination and a minimum period of practical experience in the laboratory of a member or of someone of suitable equivalent qualification. There is also close scrutiny of ethical and other considerations connected with the candidate before he is admitted. Although the subject matter is highly specialised the overall scientific standard required is commendably high. In England the British Academy of Forensic Sciences is considering this qualification problem also.

The Forensic Science Society with its high proportion and number of scientific members should also be alive to the position. However, the last thing we should want are two "degrees" covering similar qualifications; there are many who deplore the fact that we have two societies covering similar subjects. There should certainly