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Forensic Science Education

Australian Perspective

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“Forensic methods attract a growing interest from professional circles. Many young people focus on this career from the start of their study. It becomes absolutely necessary for them to obtain a specialised grade at the end of their specialised study.”



Prof. R.A. Reiss (1909)

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Object of Study

- Education – yes but what do we study/teach?
- What is Forensic Science?
- Is it a profession?
- Is it a discipline?
- Is it a science?

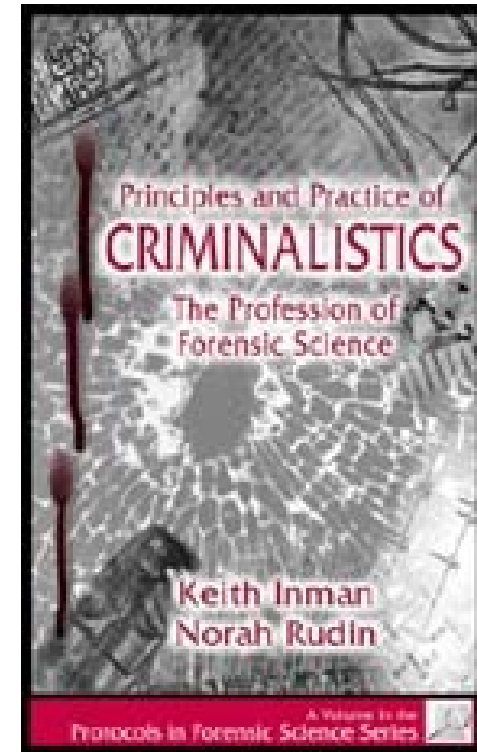
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Translation of Legal Questions

*“The germane questions are legal questions. **The role of forensic science is to translate the relevant legal questions into a scientific question.** If this cannot be done then forensic science has no role to play.”*

Inman, K., & Rudin, N. (2001). *Principles and Practice of Criminalistics: The Profession of Forensic Science*. Boca Raton, Florida: CRC Press, pp. 15-16.

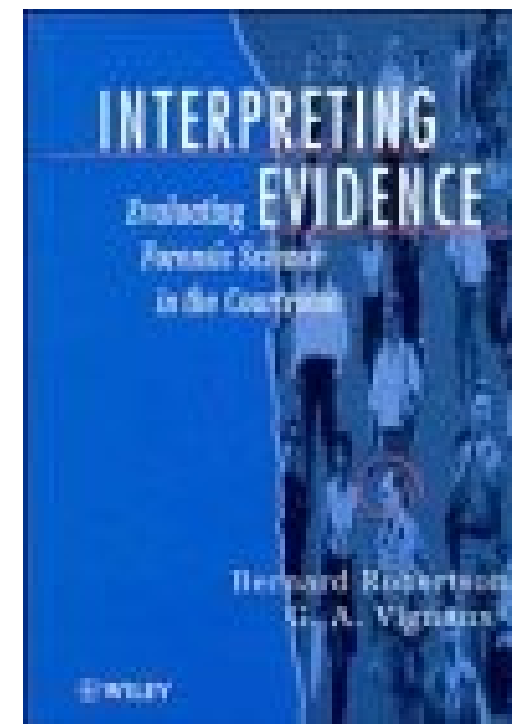


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Inference

*“Forensic science is a discipline concerned with the post-data question of drawing inferences about a particular case from evidence which is actually available. **It is these inferential questions which give forensic science unity** and distinguish it from other areas of science.”*



Robertson B and Vignaux GA (1995) DNA evidence: wrong answers or wrong questions? In Weir BS (ed) Human Identification: The Use of DNA Markers, Kluwer Academic Publishers, pp.145-152.

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Single Scientific Discipline

*“The whole process is therefore highly scientific, even, I dare say, mostly research oriented. It has **all the requirements for a true single scientific discipline**: events are studied as a function of hypotheses; the observations made are used to test the hypotheses; decisions are taken as to what evidence can be found and what tests are to be undertaken to falsify or strengthen one hypothesis. Then the data is considered in light of other circumstantial evidence pertaining to the case. Finally, the data is interpreted and evaluated to ultimately answer the fundamental, essential question (which I assert that forensic science is intended to answer): What is the weight of the evidence.”*

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Recent Drivers in Australia

- Increased level of underpinning science
- Increased responsibility with respect to OH&S
- More scientific testing being undertaken in the field
- New players entering the market place
 - Academic providers and industry providers
 - 383,000 entries for 'forensic' & 'university' with 'au' in domain name
 - 19 institutions, >40 programs
- Aging workforce
- Increased mobility
- Increasing emphasis on professionalisation
- Increased scrutiny in the courts
- Increased demand:
 - From students, and
 - From employers
- Changing environment (education methods, industry requirements, increasing student fees, etc)

Education & Training in the last 10 years

- NIFS Education Summit in Adelaide, 1999.
 - One of the outcomes = creation of the Australian & NZ Association of Forensic Science Educators and Researchers
- In November 2003, SMANZFL commissioned NIFS to prepare an options paper to provide information, discussion, and analysis and options across:
 - the breadth of forensic science disciplines;
 - current and future policing initiatives;
 - current and future academic providers and their programs; and
 - Australian and overseas initiatives
- Final Report published in January 2006.
- Education Summits in 2006 and 2007
- Creation of an Education & Training NIFS Steering Committee in 2007

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NIFS Review - 4 key themes

1. There is a need for a nationally consistent approach to forensic practitioner training and education across Australia
 2. Forensic training and education programs and resources available around the world including with Australasia should be reviewed to establish best practice. Where relevant, their application should be considered
 3. There should be closer liaison between employers of forensic practitioners and the providers of forensic training and education programs
 4. NIFS should continue to have a key role as the national body in co-ordinating specialist forensic training programs and providing a conduit for the dissemination of forensic knowledge to practitioners.
- Visit www.nifs.com.au for more information

A case of great minds think alike (Courtesy of A. Davey – NIFS)

- Science, Engineering, Manufacturing Technologies Alliance (SEMTA) Sector Skills Council, UK (2004)
“Forensic Science: Implications for Higher Education”
- Technical Working Groups for Education and Training in the Forensic Sciences (June 2004)
“Education and Training in Forensic Science – A Guide for Forensic Science Laboratories, Education Institutions and Students”

SMANZFL/NIFS	NIJ	SEMTA
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Quality

- Selling ‘dreams’ makes Universities believe in fairyland.
- QA becomes crucial.
- Difficult to measure:
 - General formal external process: eg. AUQUA
 - Student satisfaction
 - Employer satisfaction
 - Graduate employment
- Possible solutions:
 - External course accreditation
 - Student self-assessment through pertinent questions and content matrix

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Questions to assist prospective students and parents assess the content and structure of tertiary forensic science courses

- What is the name of your course(s)?
- What is the level (BSc, MSc, etc) and duration of your course(s)?
- Is there a specific focus for your course? If so, what is it?
 - ***Ensure the specific focus of the course is relevant for your intended career path.***
- Is it offered in part-time mode?
- Is it offered in distance education mode?
- What are the entry requirements?
- Do you recognise relevant prior learning (i.e. can give exemptions for subjects already passed at other institutions)? If yes, can you name the institutions for which this applies?
 - ***The general expectation is that equivalent subjects at an equivalent level will be recognised.***

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- Do you have any formal arrangement for transfer or exchanges with other institutions? If yes, can you name the institutions for which this applies?
- How many units of general science subjects (eg. chemistry, biology, physics) are in the course and at what level?
 - ***This answer will be course dependent (eg. undergraduate v. postgraduate). For a 3-year Bachelor degree, at least half of the units should be general science subjects.***
- How many units of specialised forensic science subjects (eg. physical evidence, crime scene, toxicology, forensic biology, expert evidence presentation, etc.) are in the course?
 - ***This answer will be course dependent (eg. undergraduate v. postgraduate). For a 1-year Graduate Diploma all units may be specialised forensic subjects.***
- What electives or additional subjects (eg. psychology, law, statistics, criminology) are offered in the course?
 - ***Electives or additional subjects should be relevant for your intended career path.***

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- What is the percentage of practical v. theory?
 - ***Laboratory/field science subjects or courses should have a strong practical component.***
- Does the course include a research component?
 - ***For employment in the forensic industry, a course that includes a research component is highly desirable.***
- Does the course include an industry-based component? For example placements, internships, laboratory visits, etc.
 - ***Some form of industry-based component is highly desirable.***
- Do you involve industry-based personnel in teaching and/or project supervision? If so, to what extent?
 - ***The involvement of industry-based personnel is highly desirable. The extent of this involvement should be appropriate for the level and aims of the course.***
- Do you have academic staff with experience in forensic casework? If so, please provide details.
 - ***It is highly desirable that academic staff delivering specialised forensic subjects have forensic casework experience.***

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- Do you have a Course Advisory Committee or equivalent and who are members of this group? Do they include operational forensic service managers?
 - ***There should be a Course Advisory Committee or equivalent and membership should include operational forensic service managers.***
- What career opportunities will this course give me?
 - ***The career opportunities should be consistent with your intended career path.***
- What is the level of graduate employment on completion of this course? Can you give me some specific examples of graduate employment outcomes?
 - ***The level of graduate employment should be high and specific examples should be provided that are consistent with your intended career path.***
- Can graduates pursue research degrees after this course? If so, what are the options?
 - ***This answer will be course dependent. For an undergraduate degree, there should be a clear progression path to a research program.***

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So Are We Good?

— Good:

- Engagement with industry and mutual respect
- Integration of Research programs into teaching
- Collaborations between universities
- Most field sciences and forensic chemistry strands

— Could do better:

- Professional education / training (induction and refresher courses)
- Online courses
- Forensic biology strand and emerging disciplines (eg. computing, intelligence)
- Internationalisation

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Food for Thoughts

- Education v. training
- Professional scientist v. science literate
- Fundamental sciences v. specialised forensic component
- Science v. technology
- Object of study = hypotheses related to a legal context, and analytical sciences provide the tools, or
- Object of study = analytical sciences, and the forensic context provides the applications...
- Place of the general Forensic Scientist in modern law enforcement and justice?
- Novel delivery methods, including online courses?

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Critical Factors

- Strong collaboration with operational institutions
- Balance fundamental v. forensic science
- Must develop strong analytical minds and communication skills
- Must generate sound scientists and critical thinkers
- Market forces are determinant:
 - Students demand AND
 - Employers demand

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Conclusions

- Exciting times ahead
- Scientific breakthroughs
- Significant need for high quality research
- Expansion of use of Forensic Science
- “Sexy” to teenagers and attractive to high quality students
- Increased responsibility for the forensic community and education providers to ensure that development, education and research occurs with an emphasis on the principles and applications of forensic science.

In the trace evidence context: Back to Basics

Contact?

Duration of contact?

Time after contact?



Nature of deposit?

Quantity of deposit?

Substrate ?

Contaminations?



Don't waste the present worrying about the future.
It will come soon enough—I promise.