Opportunities for Improvement: Critical Areas

for the NAS Committee on
Identifying the Needs of the
Forensic Sciences Community

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January 26, 2007

Overview

- Personal Background & Biases
- What kind of attention is paid to Forensic Science?
- Forensic (Laboratory) Science Education
- Forensic Science Research & Development
- Opportunities for Scientific Improvement of the Professional Practice
- Review of Suggestions / Recommendations

Personal Background (Biases)

Education - UC Berkeley

- **Generalists**
- **Program that subsequently closed**

Crime Laboratory

- **Defense & Prosecution**
- **California**

Academic Forensic Science

- **University of Illinois at Chicago**
- **From: BS & MS in Criminal Justice Department**
- **To: MS in College of Pharmacy**

More Biases

Research Institute

- **Graduate-level specialist in-service training**
- **Trace evidence microscopy**
- **Government research on forensic applications**

Private Company

- **Continuation of government research**
- **Non-traditional applications of forensic science methodology**
- **Not forensic science casework**
- **Not traditional forensic science R&D**

What Kind of Attention is Focused on Forensic Science?

Historically

- **Causes Célèbres, Television, Mystery Novels**
- **Overall assumption by all constituencies that forensic science methodology and casework are:**
  - **going along fine**
  - **adequately vetted and guided by advocacy within the legal process**

Long Term Situation and Effect

- **Laissez-faire: forensic science profession left to define and monitor itself**
- **Academic Forensic Science becomes of little relevance or credibility**

What Kind of Attention is Focused on Forensic Science?

More Recently

- **Causes Célèbres, Television, Mystery Novels**
- **Participation of broader scientific community in some areas**
- **Awareness of limitations & errors in some areas**

Reactions

- **Varying from shock to suspension of disbelief**
- **Forensic practitioners learning about science**
- **Broader scientific community learning about forensic science profession**
- **Increased academic credibility and relevance**

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Forensic (Laboratory Science) Education

Effects of increased public interest

- **More interested students / demand**
- **More academic institutions offering programs**
- **Greater draw of high quality students**

NAS Committee Input

- **Committee members and yesterday's topic area**
- ***A Medical Model for Criminalistics Education***

Forensic Science Lacks an Essential Element of All Professions

There is no organized control over entry into the profession

- **No Degree**
- **No Medical boards, bar exam**
- **No Licensure**

Control is by

- **Employment and function (hired & testify)**

Entry has been delegated to

- **Individual civil service boards**
- **Individual judges**

Distinctly Different Professional Tracks within Forensic Laboratories

Distinct Roles in Forensic Laboratory	Function	Loose Medical Analogy
Forensic Laboratory Technologist	Perform tests with defined protocols	Medical Technolgist
Forensic Laboratory Scientist	Specialized testing and interpretation	Clinical Specialist
Forensic Case Scientist	Integrate results, interpret and communicate in case context	General Practitioner

Forensic Science Research & Development

- Centralized Information Support
- Technology Transfer
- Interpretation of Associative Evidence
- Systems Improvement

Forensic Science Research & Development

Centralized Information Support

- **Reference Collections & Databases**
- **Identification and interpretation**
- **Examples:**

  Glass, automobile paint, fibers

  Standards of fiber production

  Biometric records

Forensic Science Research & Development

Centralized Information Support

- **Reference Collections & Databases**
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CRITICAL = Research access to these resources

Forensic Science Research & Development

Technology Transfer

- **applications-oriented research**

Recommend earmarked NIH or NSF forensic science funding (as in SBIR funding)

- **Highly competitive, highly prestigious awards (high academic visibility and credibility)**
- **Selection and very close monitoring by panel with**
  forensic laboratory representatives
  academic scientists in specialized area
  awarding institution

Forensic Science Research & Development

Interpretation of Associative Evidence

- **Experimentation on the meaning of results in the case context**

Recommend NIJ funding

- **Academic Forensic Science Ph.D.-level research**
- **Requires forensic case scientist expertise, monitoring and participation**

Forensic Science Research & Development

Laboratory Systems Improvement

- Incoming Laboratory Interface
- Outgoing Laboratory Interface

Incoming Laboratory Interface

Evidence Collection: Profession of Crime Scene Specialist

- Educational standards, certification, licensure
- Effective coordination and interface with law enforcement and the laboratory

Investigative Liaison: Choice and Prioritization of Testing

- Scheduling, when tests needed
- Measures of performance other than case throughput and backlog

Outgoing Laboratory Interface

Conveying what this evidence means in the context of the case

- **Reporting of tests, test interpretations, and meaning in the context of the case**
- **Mechanism is responsible to all interested constituencies**
- **Evaluated based on responsiveness to all interested constituencies**

Law Enforcement Liaison

Legal Liaison

Outgoing Laboratory Interface

Focus on readable, accurate, scientific reports, not on testimony

- **Reports are the principal method of communication**
- **They are a more complete and more reviewable record**

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Opportunities for *Scientific* Improvement of Professional Practice

There is no inherent self-testing or scientific progress from the application of forensic sciences to casework

Therefore we must be pro-active and should embrace and encourage opportunities for scientific testing and review

Opportunities for *Scientific* Testing and Review

- **Use of new technologies to test existing analytical methods and interpretations**
- **Use professional case audits to test for consistent application of subjective methods**
- **Use re-testing of evidence using a second laboratory**

Use Re-testing by a Second Laboratory

Carefully consider and reconcile legal, political and institutional barriers to re-testing of evidence

Goals:

- **A workable system to allow scientific progress**
- **A well-defined mechanism addressing scientific, ethical and legal concerns**

Some Concerns to Address

Responsibilities of those doing primary and secondary testing

Clarification of discovery and attorney work-product issues

Ownership, custody, storage and access to samples and associated information

(during investigation, pre-trial, and post trial)

Summary of Recommendations

1. Continue broader scientific scrutiny, oversight, and most importantly participation, with:
   - Recognition of special nature of Forensic Sciences
   - Involvement of forensic science practitioners and academics

   [i.e., what you are doing now, and]

   - Include the viewpoint of academic experts in the Sociology of Professions

Summary of Recommendations

2. Consider the points made in the paper

   A Medical Model for Criminalistics Education

3. Recognize discrete, alternative professional tracks within forensic laboratories that require different levels of education, training and ability.

4. Consider licensure of forensic practitioners at three levels:

   forensic laboratory technologist

   forensic laboratory scientist / specialist

   forensic case scientist

Summary of Recommendations

5. Continue NIJ R&D funding for **centralized information support**, making certain of research access to these resources

6. Fund **technology transfer** R&D with earmarked NIH or NSF forensic science funding, requiring participation and oversight by forensic scientists

7. Fund Ph.D.-level **interpretation of associative evidence** through the NIJ.

Summary of Recommendations

8. Focus on laboratory systems improvement: incoming and outgoing laboratory interfaces.

9. Pro-actively embrace and encourage opportunities for scientific testing and review of forensic science practices.

10. Carefully consider and reconcile barriers to the re-testing of evidence by a second laboratory.