A Possible Model for R&D – Maintaining the “Scientist" in the Forensic Scientist

Eliot Springer, Deputy Director
NYPD Police Laboratory, New York City, NY

These slides do not purport to represent the position or opinion of the NYPD Police Laboratory or NYPD.

What are the main problems that need to be addressed???

First day – my Boss:
WELCOME TO THE TMIC !

Top Management Idiot Club

1. Intro
    a) NAS Report regarding R&D:
        i. Research is needed to address issues of accuracy, reliability, and validity in the forensic science disciplines. The National Institute of Forensic Science (NIFS) should competitively fund peer-reviewed research in the following areas:

        ii. Studies establishing the scientific bases demonstrating the validity of forensic methods.

iii. **The development and establishment of quantifiable measures of the reliability and accuracy of forensic analyses.**

Studies of the reliability and accuracy of forensic techniques should reflect actual practice on realistic case scenarios, averaged across a representative sample of forensic scientists and laboratories.

- **Studies also should establish the limits of reliability and accuracy that analytic methods can be expected to achieve as the conditions of forensic evidence vary.**

- **The research by which measures of reliability and accuracy are determined should be peer reviewed and published in respected scientific journals.**

2. **NIFS promoting scholarly, competitive peer-reviewed research and technical development in the forensic science disciplines and forensic medicine;**

3. **Developing a strategy to improve forensic science research and educational programs, including forensic pathology;**

THE NEED FOR A RESEARCH CULTURE IN THE FORENSIC SCIENCES

**Jennifer L. Mnookin, Simon A. Cole, Itiel E. Dror,
Barry A. J. Fisher, Max M. Houck, Keith Inman, David H. Kaye,
Jonathan J. Koehler, Glenn Langenburg, D. Michael Risinger,
Norah Rudin, Jay Siegel, and David A. Stoney***

"The methods, techniques, and reliability of the forensic sciences in general, and the pattern identification disciplines in particular, have faced significant scrutiny in recent years. Critics have attacked the scientific basis for the assumptions and claims made by forensic scientists both in and out of the courtroom…"

THE NEED FOR A RESEARCH CULTURE IN THE FORENSIC SCIENCES – Mnookin et al – cont.:

"This Article reflects an effort made by a diverse group of participants in these debates, including law professors, academics from several disciplines, and practicing forensic scientists, to find and explore common ground.

To what extent do the forensic sciences need to change in order to place themselves on an appropriately secure foundation in the twenty-first century? We all firmly agree that the traditional forensic sciences in general, and the pattern identification disciplines, such as fingerprint, firearm, tool mark, and handwriting identification evidence in particular, do not currently possess—and absolutely must develop—a well-established scientific foundation."

THE NEED FOR A RESEARCH CULTURE IN THE FORENSIC SCIENCES – Mnookin et al – cont.:

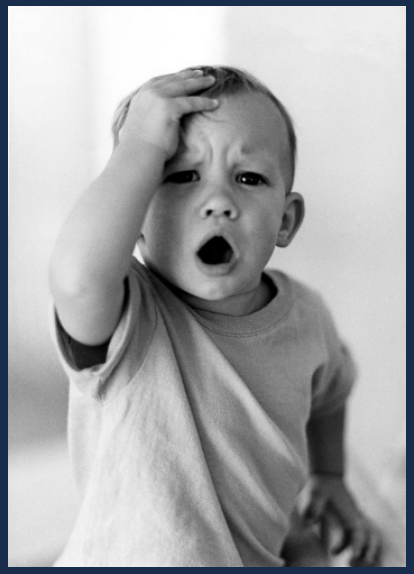
"This can only be accomplished through the development of a research culture that permeates the entire field of forensic science. A research culture, we argue, must be grounded in the values of empiricism, transparency, and a commitment to an ongoing critical perspective. The forensic science disciplines need to substantially increase their commitment to evidence from empirical research as the basis for their conclusions…"

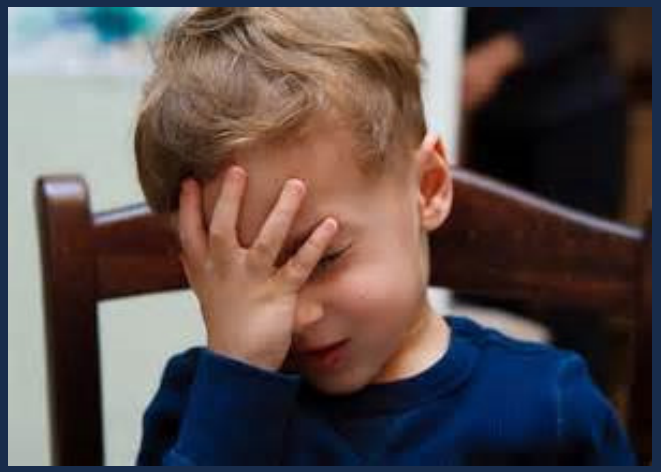
Don’t re-invent the wheel----

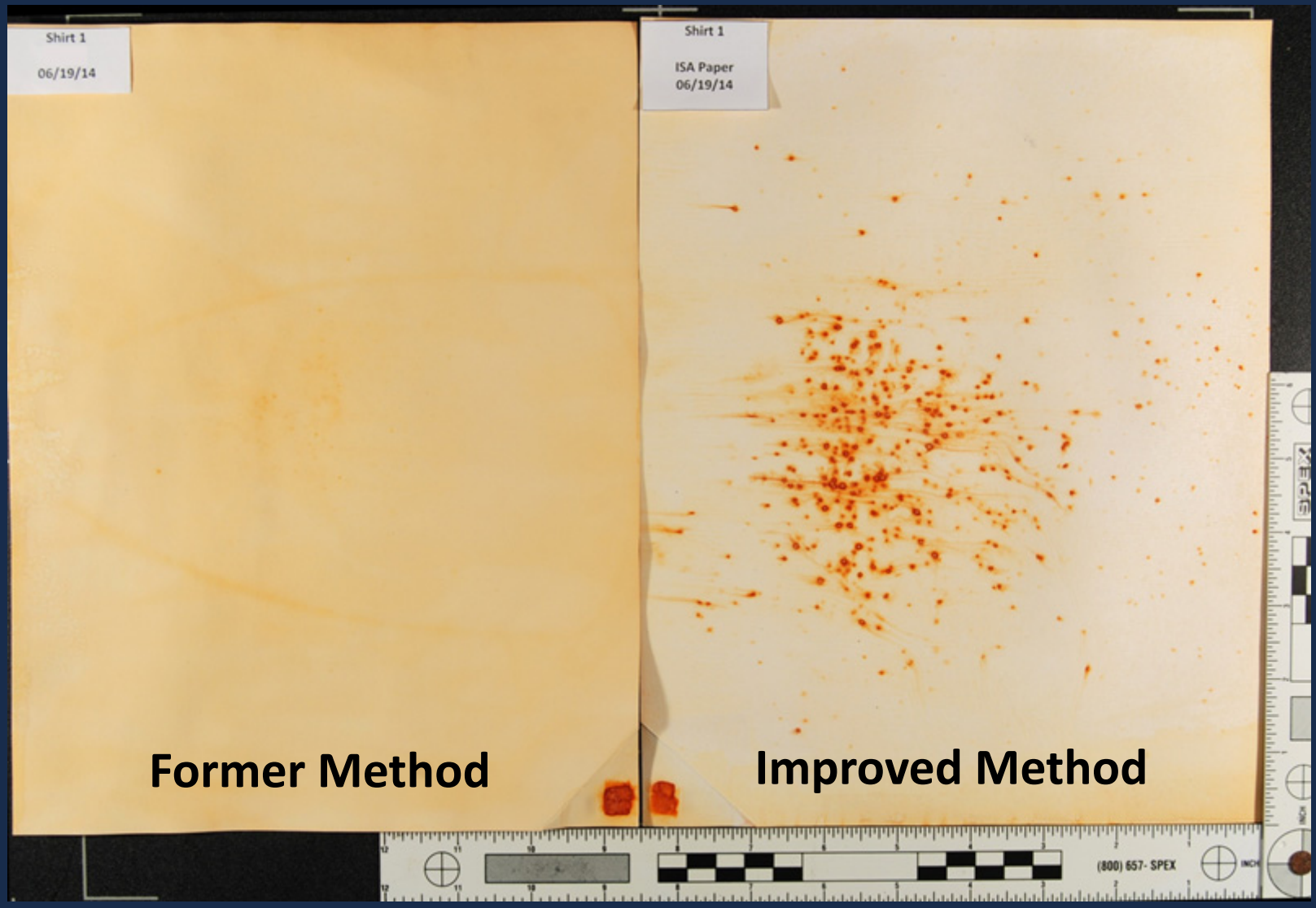
But don’t be afraid
to improve it!!!

- **Have to be honest, open, and willing to re-visit and re-think everything !!!**

- **Often heard – "I've been doing this for_____ years and nobody said anything about it."**



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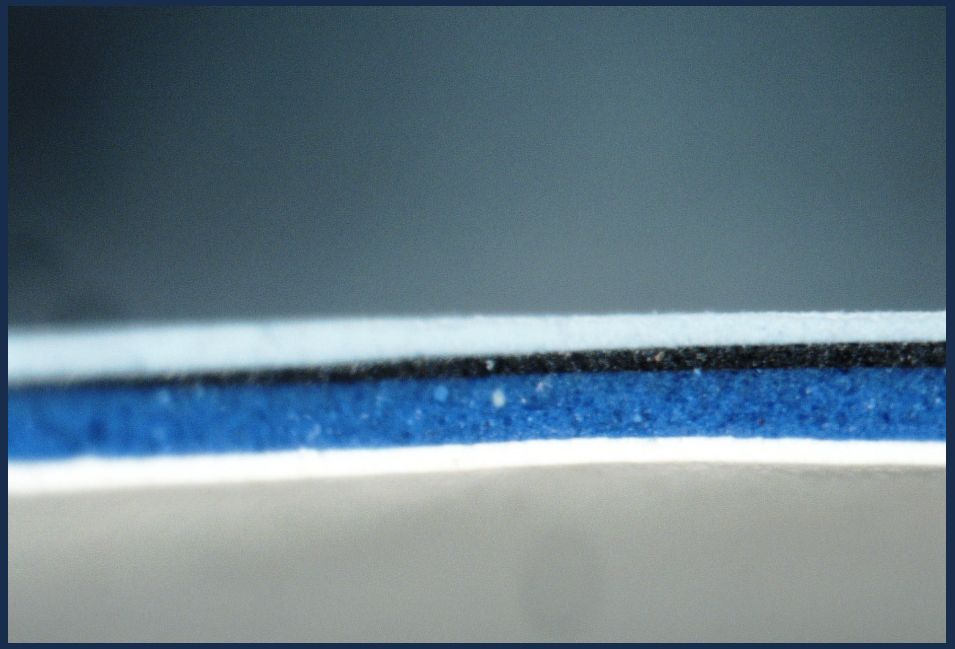
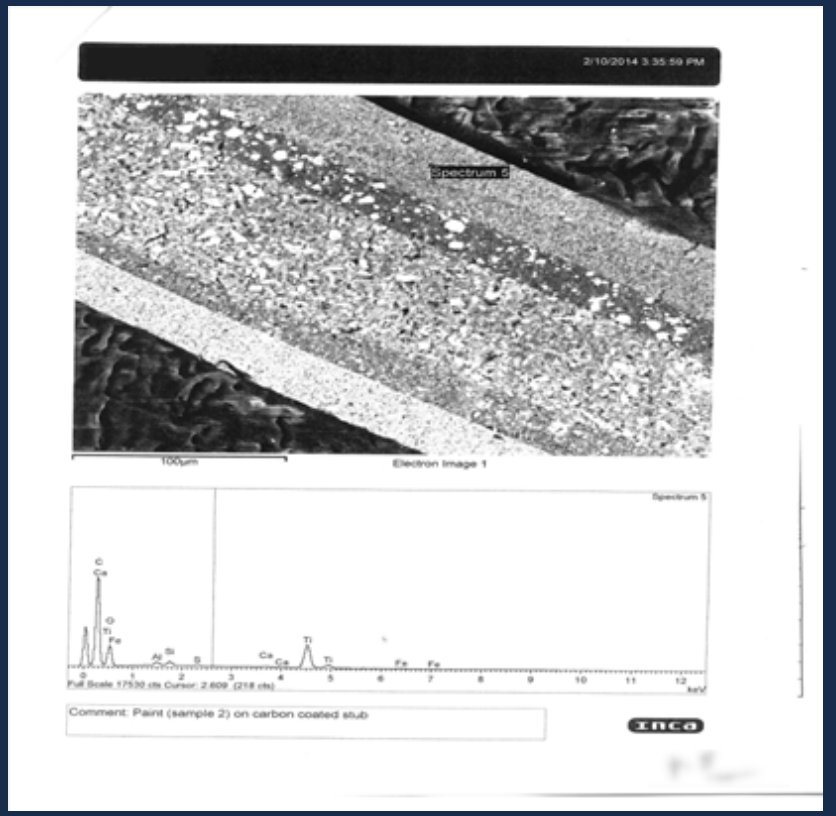


One Method



Improved Method

- **Most Labs have similar constraints of the constant pressure of high profile and/or rush cases in addition to back-logs and other pressing demands!!**

4. **All jurisdictions in every country have their own problems and issues – apply what works!**

    a) Is there overtime?

    b) Unions

    c) Budget Constraints

- **Obstacles to doing R or R & D:**
  - **Time**
  - **Mentality**
  - **Budget**
  - **Equipment**
  - **Knowledge/skill sets**
  - **Proto-types**

The model that seems to work best:

- **Leveraging resources / Collaboration Resource Mapping**
- **“influencing a system, or an environment, by multiplying the outcome of one's efforts without a corresponding increase in the consumption of resources.”**
- **“Do a lot with a little”**

- **Possible operative ideas:**

1. **Giving preference for conference attendance to those that will give a presentation**

    - **They need our help – time, direction, ideas**

2. **Cultural change in Training and Professional Development**
    a. **Short project in training**

Possible operative ideas – cont.:

3. **Intern Programs**
4. **Grants**
5. **Liaison / partnership with Universities**
6. **Liaison / partnership with companies**
7. **Criminalist Research Rank / Level Model**

Possible operative ideas – cont.:

3. Intern Programs:

- Who are they?
- What did they use to do?
  - Tour and shadow
- What do they do now?
  - Quick tour and mentored projects that were difficult for the criminalist to find time to do

Intern Programs – cont.:

- Examples of some projects:
  - Using Hydrogen as carrier gas for analysis
  - Analyzing Synthetic Cannabinoids using FTIR
  - Solid Phase Micro Extraction (SPME)
  - Dung Paper

Intern Programs – cont.:

- **Applied research – aimed to add to lab's casework abilities**
- **Mentored and leverage – lab member escorts**
- **Presentation at end before all of lab**
  - **Great experience for intern and mentor**

Possible operative ideas – cont.:

4. Grants

- Federal, State
  - Defense
  - Homeland Security
- Federally sponsored R&D –
  - COEs – Centers of Excellence and National Forensic Science Technology Center (NFSTC) or the like are great!

Grants – cont.:

- What can be improved upon regarding National Funding for R & D ???
- Concentrated and Specific Strategy for Problem Solving:
- Why aren't there specific answers yet to quantifiable criteria (tool marks, fingerprints, etc.)?
  - How many studies done over the years?
  - Forensic Science is an applied science!

Possible operative ideas – cont.:

5. **Liaison with Universities**
   - **Projects, Exercises, Theses and Internships**

6. **Liaison with companies - projects**
   - **DNA**
   - **Fingerprints**
   - **Firearms**

Grants, liaison with universities/companies – cont.:

- Best model – liaising with partner, you give direction and real-life approach and expertise, they bring advanced scientific knowledge, expertise, and resources:
  - e.g. Soil DNA bacteria colonies
  - e.g. Firearm tool marks automated ID systems tool marks on spent shell casings from AK-47 (terrorism)

Grants, liaison with universities/companies – cont.:

- **Some problems with commercial companies liaison:**
  - **lengthy legal contract negotiations**
  - **Partnering not for profit-share but for end-product**

Possible operative ideas – cont.:

7. Criminalist Research Rank / Level Model
   Present Israel model that worked pretty well:
   a) All or part might be applied
      i. Salary structure
         1. All uniformed
         2. Salary based on:
            a) area of study
            b) Position (traffic, investigator, lawyer, doctor, patrol, etc.)
            c) Rank
            d) Years on force

Possible operative ideas – cont.:

3. **Zero in on INP / DIFS scientists:**
   a) **Salary grades made available based on educational background:**

      1) **Social and behavioral sciences**

      2) **Engineering**

      3) **Natural Sciences**

      4) **Research Grade (+15% - +25%)**

Possible operative ideas – cont.:

3. **Zero in on INP / DIFS scientists:**

    b) **For Research Grade, you need a minimum of either an M.Sc., four year B.Sc., or four year engineering degree**

Possible operative ideas – cont.:

4) Research Grade (+15% - +25%)
   i. Main Grades: C, B, A, A+

      1. Approximately parallel to in the academic sector:
         a) C = lecturer
         b) B = Senior Lecturer/ Assistant Professor
         c) A = Associate Professor
         d) A+ = Full Professor

Possible operative ideas – cont.:

ii. Grade based on outside committee that evaluates your research portfolio, which contains internal reports and published scientific articles in peer reviewed journals, along with letters of recommendation.

Possible operative ideas – cont.:

ii. **Grade based on outside committee:**

1. **Ranks C, B – two committees**
   a) **Internal police committee (3 people)**

   b) **External Committee of 3 PhDs from academics/industry/defense**

Possible operative ideas – cont.:

ii. Grade based on outside committees:

2. Ranks A, A+ – three committees
   a) Internal police committee

   b) External Committee of three PhDs from academics/industry/defense

   c) External Military (or civil) Committee – 5-7 members

Questions, comments, and more ideas????