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National Commission on Forensic Science
U.S. Department of Justice
7th Street, NW
Washington, DC

Dear Fellow Commissioners:

I am unable to join you at our first meeting on Monday and Tuesday due to prior commitments in California for meetings associated with the National Academy of Sciences and the National Research Council. Indeed, I will be chairing one of these meetings on the Monday morning. I had also inquired about the possibility of video/audio link or webcasting but these have been ruled out. I am therefore writing to express some preliminary thoughts about the agenda for the work of the Commission.

The National Research Council report *Strengthening Forensic Science in the United States: A Path Forward* presented the nation with a critical assessment and a bold agenda for the forensic science community. Though there has been progress in the field it is slower than many would like primarily because there is little incentive for the field of forensic science to change. Miscarriages of justice may be few or plentiful. We do not know because they are so rarely exposed for all to see. The research agenda I hope we as the Commission can initiate, and in part oversee, will take many years to bear major fruit. Movement towards standards and criteria for certification will help, but these can only do so much for the field unless we work with others to instill a perspective that will enhance scientific thinking across the forensic sciences.

A simple example illustrates the point. Standard setting is more often than not designed to produce consistency of judgment across investigators. This can produce "reliable" measurements and evaluations where one experts evaluation will be similar to or essentially the same as another's. This consistency does not, however, mean that the evaluations are "accurate." It is only high quality

and potentially innovative science that can produce "accurate" forensic science evaluations. Thus training helps polygraphers reach similar judgements about the deception exhibited by an examinee. But that consistency does not make the polygraph any more accurate in "correctly distinguishing between" those who are deceptive and those who are telling the truth. For a careful explication of this distinction see the National Research Council report *The Polygraph and Lie Detection.* (2003). Many of the items I describe below relate to "reliability" because one can address it more easily than "accuracy."

I have spent time recently conferring with members of the American Statistical Association's Ad Hoc Advisory Committee on Forensic Statistics, and they suggest several steps to address the short term issues and help the forensic science community move forward. I have encouraged them to submit their recommendations directly to the Commission and its staff but I will identify a few in this letter for possible discussion at our initial meeting.

1. **Define and quantify error rates across the forensic science disciplines. Develop approaches for estimating the error rates.**

   All humans make errors in the practice of their jobs. These errors can run the range from an inconsequential failure to follow specified protocol (e.g., a truck driver failing to use a turn signal) to an error that leads to an incorrect outcome (a pilot landing at the wrong airport). A key to improving performance in a field is to try and understand the sources and frequencies of errors and then to develop approaches that minimize the error rates. In forensic science errors that lead to incorrect outcomes appear to be quite rare but they do occur. It is thus essential that forensic science disciplines develop approaches to carefully define error rates (e.g., it is obvious that a declared match which turns out not to be correct is serious error but how should we treat an analysis that determined two prints could not be effectively compared when they were in fact from the same source) and to measure error rates. In the latent print community the recent "black box" study published by Ulery et al. in the *Proceedings of the National Academy of Sciences* (2011) is illustrative.

2. **Produce flowcharts of process for forensic science disciplines similar to the exemplary work for latent prints (and perhaps other disciplines) as a first step for quality control from lab to lab and improving the process—and require that they be followed.**

   Scientific evaluation of forensic science disciplines requires a framework from which to develop hypotheses, tests and assessments. The Expert Working Group on Human Factors in Latent Print Analysis, funded by the Department of Justices National Institute of Justice (NIJ) in collaboration with the Office of Law Enforcement Standards in the Department of Commerces National Institute of Standards and Technology (NIST), recently produced a report with recommendations for improving the practice of latent print examination. A critical step in that groups deliberation involved producing a flowchart that formalized the step-by-step latent print examination process. Each step and decision point in the process is represented in the flowchart. Having the flow chart provides a natural way to identify points where key decisions are being made and thereby enables scientific study where appropriate. For example, one early step in the latent print examination process asks whether the latent print identified at a crime scene is suitable for analysis. One can imagine studies to assess the repeatability and reliability of such evaluations—would multiple examiners within a single laboratory reach the same decision? The flowchart is a natural tool for assessing and improving the practice of forensic science.

3. **Encourage a culture of openness to consulting outside experts (which happens now unevenly) and to statistical thinking. Sound statistical concepts should be incorporated into the inference procedures.**

   The sensitivity of the information which law enforcement officials handle has thwarted efforts to develop a culture of "openness" that explicitly engages outside experts. Certainly confidentiality is important, but other agencies have handled this matter while still involving outside experts. Science advances most rapidly by professional exchange of ideas, so this culture should be encouraged, particularly as some scientists may have expertise that is not readily available in-house in forensic laboratories. Further, much of the science that is needed going forward is interdisciplinary in nature.

4. **Enforce standards and guidelines.**

   A major concern raised in the 2009 NAS report was the fact that, as presently constituted, Scientific Working Groups (SWGs) rarely have authority or formal mechanisms for ensuring that their recommendations and guidelines are followed. Hence, forensic laboratories suffer no consequences if they fail to follow them. For example, in the latent print community the "demonstration" of "following SWGFAST guidelines" may consist of a simple statement by the laboratory that "We use ACE-V." Another important example concerns the role of blind evaluation and confirmation (i.e., the notion that someone verifying an assessment should not know the initial decision). It is well recognized in the field of clinical medicine that double-blind experiments are much less subject to bias than experiments in which the patient, or the patient and the administrator, know the treatment which the patient is receiving, so double-blind experiments are essential for all FDA approvals of new treatments or therapies. Despite this knowledge blind evaluation is rarely applied in forensic science. We should find a way to change this situation

I regret missing our first meeting and I hope we will have many opportunities to interact going forward as we work to ensure that the term "forensic science" is not viewed by others as an oxymoron.

Sincerely,

Stephen E. Fienberg