B171 Human Hair Comparisons: Evaluation Rationale and the Role of Subjective Probability

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The paper discusses the evaluation rationale for microscopy of hairs and the role of subjective probability that may withstand the scrutiny and testing of adversarial process.

Extensive research is required, through modern techniques, to gain a better understanding of the qualitative and quantitative aspect of hair individualization.

Human hair comparisons have been an underrated science in the forensic community for some time. This mode of thinking and trend needs to be changed. In science, truth does not gain acceptance by mere repetition of a set of facts.

Science rather requires patient testing of the facts, the constant re- examination and critical re-appraisal of premises and assumptions, repeating of earlier studies by more modern, better controlled and better standardized methods. This paper discusses these issues and amenability of this subject to empirical testing, the inherent difficulty in studying the phenomenon, and evaluation rationale for microscopy of hairs that may withstand the scrutiny and testing of adversarial process. The role of subjective probability in this context is discussed.

The theories and principles on which microscopic hair comparison is grounded are multi-disciplinary, and draw from such diverse fields as comparative anatomy, physical anthropology, human genetics, human biology, somatometry, somatoscopy, as well as such well established areas as probability theory, pattern recognition, similitude, and lately computer sciences. Although there is an apparent scarcity of scientific studies in forensic hair comparison, the field is a confluence of many discrete, well grounded and previously unrelated disciplines that are expressed in the common language of hair comparison and analysis.

The majority of this multi-disciplinary community has found the principles upon which microscopic hair comparison analysis rests, to be reliable and generally accepted although to some extent subjective in nature. The statements of probability currently offered by hair examiners are qualitative in nature rather than quantitative and are based on a combination of scientific judgment and data analysis. This approach, being void of statistical base, is considered subjective in nature. There is, however, considerable merit in the use of this approach. Arguments has been presented to the effect that it is the mental conclusion of the scientist drawn in the light of experience coupled with the discovered or associated factual distinctions which lead to a conclusion of identification. There is much evidence, relevant, material and admissible, which does not meet the mathematical probability test. There is some physical evidence concerning which the expert will not and should not express an opinion based purely on mathematical probability. Yet, such evidence is logically relevant, and probative. The critics of this approach validly claim that over-reliance on undifferentiated experience does indeed relegate the opinions of testifying experts to "Because I said so" pitfall. Experience is not an adequate substitute for empirical data. Yet, experiences are, to a large extent, essential first steps in the growth of knowledge.

Courts that recently made a distinction between "scientific knowledge" of Fed.R. Evid.702 and turned to "non-scientific" evidence linked to some body of " specialized knowledge" under Rule 702, make a fundamental error in dividing the world into science and specialty categories. Every expert who appears in court has specialized knowledge of one type or another. It could be specialized knowledge based on well established applied sciences, or it may be specialized knowledge based upon years of personal experience, and more often a combination of both. The consequence of this logical view of inference overwhelmingly points to the premise that forensic hair comparison is an effective and harmonious union of "scientific knowledge" and "specialized knowledge" rather than "non-scientific evidence" linked to some body of "specialized knowledge."

Forensic Hair Comparisons, Evaluation Rationale, Subjective Probability