Ear Identification Research

If a person places his ear against the hard surface of a door in an attempt to overhear w people may be talking about behind the door, the eavesdropper may well leave an impre his ear on the door's surface—an impression that can be "developed" much like a latent fingerprint at a crime scene can be made visible.

There are persons in crime laboratories who assume that the human external ear chara are unique to each individual and unchanging during the lifetime of an adult. Some have far as to suggest that such individuality can also be used to identify persons with the sar degree of confidence with which latent fingerprint examiners make a "positive fingerprint identification." A few go even further and suggest that the "suspect" who left a latent ear impression can be identified by comparing the latent print to ear prints of known individu

There is, however, no empirical data to date that proves the underlying premise: that the a human being are in fact so different and distinguishable that their detail is never duplic The only (non-scientific) argument in support of ear individuality that has been forthcomin always a reference to the familiar saying that "nature never duplicates itself" or that "all snowflakes are different."

If we postulate that a case for human individuality could conceivably be made, [and such has already been made in the case of identification by fingerprints and by DNA—excepting identical twins who have the same DNA] that does not answer the question w the purported individuality can also be established reliably solely by an exami of the outside shape and characteristics of the human ear. But even if we wer find that human ears, when studied in all their detail, are different from person person, it will still require a significant further leap to also conclude that such individuality can be established reliably by looking at an incomplete and partia blurred reproduction of an ear such as might be visible in a "latent" ear impres

Yet, the premise is sufficiently intriguing that it deserves a serious inquiry. For that purpo the following pages is contained a draft of a preliminary proposal for "ear uniqueness" re that might provide us the answers which we are seeking to find. We would appreciate in persons to examine this proposed draft and send us comments for improvement as well guidance on how the proposal could be implemented.

PRELIMINARY DRAFT OF A PROTOCOL FOR AN INVESTIGATION INTO THE CHARACTERISTICS OF EARS FOR THE PURPOSE OF DETERMINING WHETHER INDIVIDUALITY CAN BE ESTABLISHED, AND WHETHER THERE ARE PRACTICAL APPLICATIONS FOR USE OF EAR CHARACTERISTICS TO DETERMINE IDENTITY IN CRIMINAL CASES

Introduction

Over the years, suggestions have been made in the occasional literature that the shapes characteristics of the human ear are widely different and may be in fact sufficiently varia it is possible to differentiate between the ears of all individuals. Unfortunately, this "individuality" has apparently been taken for granted (the "snowflake" phenomenon) but never been empirically established. There is not a single published scientific study that establishes that ears are in fact different and distinct and that such individuality can be v through comparison. Perhaps a major reason for such deficiency is that most persons a ear individuality, while well intentioned and full of enthusiasm and energy, lacked a seric understanding of what is needed to conduct empirical investigations. Most advocates of uniqueness and individuality have not been trained in the scientific method and gained t experience in other identification techniques through the "on-the-job" experience and instruction persons with a similar background.

The purpose of the study described herein is to inquire in the characteristics of human e the purpose of exploring whether they can be used for human identification.

Overview of the Study

The descriptive title of this preliminary proposal contemplates a multi-disciplinary approach to conduct research into the individuality of human ears in accordance with accepted stanc scientific research. The initial steps that the research project envisions are subject to rev any time after an investigatory team has been formed and preliminary findings become available. The following four initial steps are contemplated by the Project:

STEP # 1: To assemble a Research and Investigative Team. It is contemplated that the Team will consist of: two forensic physical anthropologists; two anatomists; two to four la enforcement criminalistics specialists; and one coordinator and project leader. This Rese and Investigative Team will hereinafter be referred to as the Research Team.

STEP # 2: To convene the Research Team for the purposes of (1) familiarizing the parti with the occasional literature and accumulated experiences on "ear identification" that ha placed on the public record to date; (2) refining the parameters of the research project a outlined in this document; (3) establishing a common and accepted nomenclature for the of ears; (4) devising a uniform method for the assembling, storing, and studying of a photographic collection of human ears; (5) soliciting the cooperation of all individuals cu in and out of law enforcement who have worked with "ear identification" cases; (6) addin additional goals, procedures, and protocols to this document as the Research Team in it collective wisdom decides are essential and/or desirable.

STEP #3: Selecting a Field Support Team for Investigation and the Collection of Data. T team, which will hereinafter be referred to as the Investigative Group, will consist of approximately twenty law enforcement officers and a similar number of law students, geographically situated throughout the United States, who will, jointly or individually, be charged with the duty of collecting ear photographs from among the general population according to the protocol devised in Step #2. It is anticipated that the Investigative Grou collect ear photographs of approximately 10,000 adult (age 20 or older) individuals natio of which it is expected that approximately 4,000 will be of a predominantly Caucasian ra origin, 4,000 of a predominantly Negroid racial extraction, and 2,000 of Mongoloid or mi racial characteristics. After study of the data collected, the Research Team will evaluate a collection of 10,000 human beings ear photographs is a sufficient sampling of the popula to arrive at a valid preliminary statistical analysis of the characteristics and variability of t human ear. At the conclusion of Step #4, the sufficiency of this data base will be examined.

STEP #4: Convening the Research Team to engage in the following tasks: (1) adding to Team two academically trained Statisticians (Ph.D. level); (2) devising a protocol for stu classification of the assembled data base; (3) classifying and examining the data base fo purpose of determining the differences between shapes of various parts of the ear, (4) determining the frequency with which categories of shapes occur in the general populati also in subgroups of the population according to racial characteristics and geographic distribution; (5) determining the degree of variance between right ear and left ear charac of the same individual; (6) determining whether the population data base of 10,000 indiv yields sufficient data to support statistically meaningful conclusions; (7) examining the re obtained for the purpose of determining what conclusions, if any, can be drawn from a s the data base on the degree of difference between human ears, whether they are suffici individual when studied in their entirely, or, if they are not "individual" and different from others, whether there are nevertheless meaningful conclusions that can be drawn from t concurrence of a certain number of matching characteristics.

What's Next

If the outcome of STEP # 4, Task (7), results in a conclusion that human ears are not su variant in their shapes and sizes to draw meaningful conclusions as to identity, then the project is over, except for the publication of the data in the peer-reviewed literature, and presentation of the conclusions at scientific meetings so that other scientists and researc comment on the study's results.

If, on the other hand, the outcome of STEP # 4, Task (7) results in a conclusion that (a) human ears are different when studied in their entirety, or (b) even if not "unique", huma contain a statistically significant degree of variety which may be useful in projecting the possible matching of information extracted from unknown ears and comparing them with known origin, the Research Team is then to devise protocols for follow-up studies.

Follow-Up Studies

Assuming the findings of the Research Team warrant further follow-up, the following further questions can thereafter be assigned to the same or a different Research Team:

Follow Up Study # 1: Is it possible to translate findings of uniqueness of ear photographs, of statistically significant differences among human ears, to latent ear impressions disco crime scenes?

Follow Up Study # 2: What is the proper methodology for determining whether partial or incomplete ear impressions are suitable for identification purposes?

Follow Up Study # 3: What is the proper method for obtaining standards of known individ ears for comparison with crime scene impressions?

Follow Up Study # 4: What methodology is to be followed in making comparisons betwe crime scene impressions and known ear standards for the purpose of arriving at a concl can be deemed to be based on reliable technical practice?

Follow Up Study # 5: By what method are examiners to be trained in collecting both crim scene and known ear samples? How is expertise of examiners to be established, tested verified?

Follow Up Study # 6: Assuming that meaningful conclusions can be drawn from the rese
what is the degree of certainty with which conclusions can be expressed by examiners v
compare known and unknown ear evidence?

Length of Time of Study - Estimates to Serve As Basis for Funding Request

It is estimated that Steps 1 (Assembling the Research Team) and 2 (Convening the Res
Team for a Preliminary Decision on Methodology) would take approximately five months
the initiation of a formal research project and may require three Team meetings, with inc
work being done by each Research Team member between meetings.

For Step 3 (Selecting the Investigative Group and Assembling the Date of 10,000 indivic
is estimated that at least one year will be required.

For Step 4 (Evaluation by Research Team, setting standings, doing classification, calcul
statistics, and drawing conclusions), it is also estimated that an additional year will be re
with possibly four full-day or weekend meetings of the entire team and much individual ef
during the intervals between meetings.

The length of time Follow-Up Studies will require is impossible to determine at this time,
because these studies will of necessity depend upon the type of data assembled and int
in the First Research Project in the field. Assuming the research of the Project warrants
exploratory research, some of the steps in Follow-Up Studies may be able to be conducted
simultaneously.

The above time sequences are purely approximate time estimates drawn from past expe
in conducting scientific inquiries from persons who have engaged in research and whose
opinions were solicited.

Send comments, suggestions, and recommendations on this proposed preliminary draft

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Additional Articles in Identification Evidence.....

Friction Ridge Evidence:

Creating A Record on Critical Fingerprint Scholarship? *New 06/16/07*
Erroneous Fingerprint Individualizations - Why do they occur? *04/05/06*
Did the Partial Fingerprint Lie? *04/05/06*
Court Challenges to Friction Ridge Impression Evidence - How Long Will They Last?
Validating Friction Ridge Examination Techniques
Court Rejects Challenge To Fingerprint Identification Testimony
Court Excludes Fingerprint Critic's Testimony as "Junk Science"
The Reliability of Fingerprint Identification - A Case Report
Fingerprint Evidence In The U.K.
Is Fingerprint Identification a "Science"?
Fingerprint Identification....More On "Is It A Science?"
Deciphering Latent Fingerprints: Sandwich Method Revisited

Phenotype v. Genotype: Why Identical Twins Have Different Fingerprints

Handwriting and Forensic Document Examination:

Palmprint and Handwriting I.D. Satisfy *Daubert* Rule
Handwriting Identification Meets Daubert.....Again!
The Thornton Handwriting Examination Court Decision
Meeting the *Daubert* Challenge To Handwriting Evidence...Preparing for a *Daubert* Hearing
Handwriting Identification Evidence Meets Daubert - Kumho Tire Test
Handwriting Evidence Meets Reliability Criteria (on U.S. v. Paul)
E-Signatures...Bane or Boon To Handwriting Experts?
The "Gatekeeper" At Work (on U.S. v. Haines)
Graphology / Graphoanalysis - What is it?

Bite Mark Identification:

Man Convicted on Erroneous Bite Mark Identification Evidence Finally Free

Firearm and Toolmark Evidence:

Toolmark Identification Received A Frye (- Daubert) Body Blow In Florida
Fully Automated GSR Package Developed

Lip Prints, Ear Prints, and Other Less Well-known Marks:

Alphonse Bertillon and Ear Prints
Ear Identification In The News Again
Ear Identification Based On Surveillance Camera's Images
Are Dutch Ears Different From American Ears?
Court Holds Earprint Identification Not Generally Accepted In Scientific Community
Protocol For Ear Identification Research
Ear Print Case Commentary Blames "Forensic Science"
DNA Evidence Proves Ear ID Wrong
Another Ear Print Conviction Reversed!
Lip Print Identification Anyone? (on People v. Davis - Ill.)
Lip Print Conviction Reversed - New Trial Ordered *04/05/06*
Can Shoes Catch A Culprit? or Does A Shoeprint Lie? *04/05/06*

Miscellaneous Identification and Biometric Evidence:

Dog Scent Evidence...Is it Scientific?
Forensic Stylistics in the Courts
Biometric Identification
Personal Identification by the Iris of the Eye
Facial Recognition Systems

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