RESEARCH DATA

DEVELOPMENT OF LATENT PRINTS ON HUMAN SKIN

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" The following information is only part of the research data written by the three researchers that was presented at the "INTERNATIONAL SYMPOSIUM ON THE FORENSIC ASPECTS OF LATENT PRINTS" at the FBI Academy in May 1993 and at the annual conference of the INTERNATIONAL ASSOCIATION FOR IDENTIFICATION in Orlando in July. A final research was conducted in October 1993. The entire research presented at Quantico will be available from the U.S. Printing Office."

OBSERVATIONS AND RECOMMENDATIONS FOR DEVELOPING LATENT PRINTS ON HUMAN SKIN

Research and time factors for Supergluing are based on the use of the BOHANAN'S FORENSIC INC. gluing apparatus. The machine was set at 50 percent air flow, allowed a ten minute warm-up with fan off, 5 milliliters glue applied to a new aluminum dish, waited three minutes, turned on fan, and placed appropriate attachment on the skin.

Bodies should NOT be refrigerated prior to processing for latent prints, as refrigeration diminishes ones chances for success.

If a body has been refrigerates or is moist, it should not be processed for latent prints until the moisture dissipates. A control area can be tested.

SKIN TEMPERATURE

A. Warm- near normal body temperature
   5-10 seconds supergluing (use less time for live skin)

B. Cold- other than normal body temperature
   15 seconds maximum gluing time

PROCESSING

A. Regular, magnetic and fluorescent powders can be used. Feather dusters are recommended for non-magnetic powders.

All latent prints should be photographed. Some latent prints developed would not lift.

There are no recommendations or guidelines developed for live skin at this time.

NOTE: Always adhere to MSDS guidelines and follow safety regulations when using all chemicals.

THESE OBSERVATIONS AND RECOMMENDATIONS WERE ESTABLISHED AFTER EXTENSIVE RESEARCH IN KNOXVILLE BY THE FOLLOWING:

Bohanan, Arthur M. Police Specialist, Knoxville Police Department
Futrell, Ivan R.,Supr Fingerprint Specialist, FBI.,Wash.,D.C.
McKinney, Oakley, Special Agent/Forensic, TBI, Nashville, Tn.
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Developing identifiable latent prints on human skin has always been a source of frustration for the latent print examiner. It is recognized that skin, unlike most surfaces examined for the presence of latent prints, is extremely difficult to develop latent prints on. Skin is the largest organ of the human body. It is composed of tissue that grows and constantly renews itself; is pliable, which allows movement; it regulates body temperature; and it excretes waste matter. In addition to these constant changes, skin of assault or homicide victims is subjected to many harsh conditions such as mutilation, body fluids, the elements and decomposition after death. Because of the difficulties and lack of success, only a very few cases in which latent prints have been developed and/or identified have ever been recorded. It is our belief that this is the primary reason why very little research has ever been done and only a handful of cases have been solved by the development of latent prints on skin.

The FBI's Latent Fingerprint Section has for many years been involved in research on methods to develop latent prints on human skin. In the sixties and early seventies, very fine lead powder and x-rays were used in experiments to develop latent prints on skin. The Canadians also began using the iodine/silver transfer method of development. At the same time, latent print examiners in the FBI's Latent Fingerprint Section began conducting experiments with these methods, as well as with powders and chemicals. These efforts for the most part were no successful.

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The present ongoing research began in the Spring of 1991, with a proposal by Police Specialist Arthur M. Bohanan, Knoxville, Tennessee Police Department to Chief Phil E. Keith. Mr Bohanan had on numerous occasions examined homicide victims for latent prints and in some of these cases felt certain that latent prints should be present on the skin of these persons. After many tries and no success, he thought that there must be a technique available to successfully recover latent prints from skin. Mr. Bohanan began contacting latent print examiners throughout the country, as well as searching for literature on this subject. The answer to his inquiries and a review of written material all gave the same reply, that there was no consistent and reliable technique for developing latent prints on skin. After carefully study, Chief Keith gave his approval for Mr. Bohanan to undertake this project.

Over the next several months contacts were made and written permission was obtained from Dr. Randall M. Pedigo, Coroner and Medical Examiner for Knox County, Tennessee and Dr. William M Bass, Professor and Head of the Department of Anthropology at the University of Tennessee, Knoxville, Tennessee, for the use of cadavers under their control. A research proposal and application was also presented to the University of Tennessee Research and Memorial Hospital for deceased subjects and/or tissue for research purposes. Permission was granted by Dr. Francis Jones, Head of Pathology and research protocol #0240

titled "Fingerprint Recovery" was granted. This has since been renewed until October 1994.

Mr. Bohanan then contacted and presented a request to the FBI Latent Fingerprint Section to participate as a joint partner in this research. Supervisory Fingerprint Specialist Ivan Ross Futrell and Fingerprint Specialist Timothy Alan Trozzi were assigned to this project. After much discussion as to procedures and techniques to be utilized, it was decided that we would begin our research on February 4, 1992, in Knoxville.

On our arrival in Knoxville, Tennessee, a meeting was held with Dr. Bass to discuss our plans. We explained to him why it was preferable to conduct research on recently deceased bodies, rather than on bodies that have been dead for a long period of time. Dr. Bass told us that he had just received four bodies from Nashville, Tennessee, on February 3, 1992. The bodies were located at the University Anthropology Facility, which is a fenced area of land next to the university hospital. Bodies at this site are placed on the ground until decomposition and then used in research projects by students at the university.

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Since February, 1992, numerous experiments have been conducted in order to improve our techniques for developing latent prints on skin. On January 4, 1993, we again continued our research in Knoxville, Tennessee. In planning for this current research we realized that an improved method of super glue fuming of skin was necessary. Our previous use of plastic to form an airtight tent over areas of skin and over an entire body was not always successful. It was not possible to obtain an even distribution of super glue over the skin, or to confine all the fumes to the tent. When removing the plastic tent at the completion of the gluing process, the super glue fumes would literally drive us out of the work area. To alleviate these problems, Bohanan developed a new super glue fuming apparatus for our use. It is a hinged two-part wooden box, with an electric hot plate and a small electric fan.....

Research has been conducted on one person on life support prior to death and at the time of death plus all temperature ranges down to fourty-five degrees both male and female and black and white.....

On 10-15-93, research was continued.....research was conducted on a white male .....prints were developed and lifted with lifting tape after eighteen and one half (18 1/2) hours after the skin was touched.... Our greatest success in developing a latent print of value on this cadaver was on a section of skin which was super glue fumed for fifteen seconds and processed with black magnetic powder. This latent print was developed twenty and one half (20 1/2) hours after the skin was touched.

RESEARCH DATA FOR LAW ENFORCEMENT TRAINING ONLY.