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BAREFOOT COMPARISON AND IDENTIFICATION RESEARCH

By: Sergeant Robert Kennedy

TECHNICAL MEMORANDUM

Submitted by
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and Review Section
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NOTE: Further information about this report can be obtained by calling the CPRC information number (613) 998-6343

EXECUTIVE SUMMARY

Sergeant Robert Kennedy of the R.C.M.Police Forensic identification Research and Review Section in Ottawa, Ontario has been involved in gathering data related to feet and footwear to show uniqueness and that identification can be established. This is the third term that the Canadian Police Research Centre has sponsored a part of the research because of the potential benefits to the Canadian police community.

Previous reference material (TM-12-95 and TM-08-96) can be ordered by fax from the CPRC at (613) 952-0156.

RÉSUMÉ

Le serg. Robert Kennedy de la Section des recherches et des etudes en identite judiciaire de la GRC à Ottawa (Ontario) recueille des données sur les pieds et les chaussures en vue de dégager des caractéristiques uniques et de démontrer comment on peut arriver à établir une identite graçe à celles-ci. Le Centre canadien de recherches policières (CCRP) accorde pour la troisième fois des fonds à cette etude en raison de ses benefices éventuels pour la collectivité policière au Canada.

On peut obtenir les documents déjà publiés dans le domaine (TM-l 2-95 et TM-08-96) en en faisant la demande au CCRP par télécopieur, au (613) 952-0156.

INTRODUCTION

The barefoot research described in this report has been conducted on a full time basis from April 1994 to present. It entails the gathering, comparison and physical matching of barefoot impressions to the insides of shoes/footwear, or to any other substance at a crime scene where impressions are found in material such as blood and mud when ridge detail is not present. It would also be useful to identify remains at mass disasters, or the remains of missing children when no other means of identification exist.

SUMMARY See TM-l2-95 and TM-08-96

The purpose of this research remains the same, that is to establish a database of barefoot impressions that can be used with other information gathered throughout this study to show the uniqueness of bare feet, enabling the forensic expert to compare scene of crime impressions found inside footwear, in mud, blood or some other medium with the barefoot of a suspect to establish identity. Not only would this be useful for crime scene impressions, but could prove very useful at times of mass disasters where identification is difficult to establish otherwise.

Mr. Peter Peterson has been contracted to enter barefoot impressions on the database for Auto Cad manipulation. To date approximately 2000 sets of feet have been entered.

Two professors from Carleton University have been contracted to review our measurement protocols and are doing a statistical analysis of our collected data. To date their initial analysis indicates that they are able to differentiate between male and female with statistical significance. They also believe that there is a good probability

that they will be able to show significant differences between races and will be able to determine the approximate height and weight of the individual

Arrangements have been made to have two troops (a total of 64 persons) in the RCMPOLICE Training Academy in Regina, Saskatchewan assist in this research by wearing their work boots and shoes over a period of 1 year beginning March 10, 1997. The foot impressions inside the shoes will be recorded; changes, if any, over that period of time will be noted and recorded.

The arrangement with Dr. Marks, University of Tennessee, continues. He manages the only human decomposition facility in the world. This aspect will illustrate the changes that take place to the human foot as the body decomposes and may prove useful when trying to identify the victim of crimes or disasters.

To date we are still collecting volunteer impressions to be added to the database. The computer program is operating very well with only minor changes as the research progresses. Many more impressions will need to be collected and entered into the system in order to show the individuality of bare feet. We have been advised by Carleton University that it is imperative we collect more female and other race foot impressions in order to balance out the collection. We have also been advised to collect duplicate prints from the same individuals over a period of many years with the same individual collecting the data in order to show the reliability of the collecting process, and to minimize or eliminate the incidences of error (different methodology of collection). We must also have several people enter the same data on the computer program in order to establish an error window for searching the impressions throughout the database.

CONCEPT See TM-12-95

Inked impressions from individuals continue to be collected. I am still receiving assistance with this collection from Dr. Sara Jones, Australia; Dr. Wesley Vernon, England; Dr. Norman Gunn, Canada; and Dr. John Dimagio, Arizona. Their assistance has dropped off somewhat due to lack of contact. I will be speaking with them in upcoming conferences and I am sure I will be able to re-establish enthusiasm. I continue to collect pairs of shoes from individuals interested in this study in order to study any link between inked impressions and impressions found in the shoes. I am collecting at least two pairs in order to establish the consistency of these impressions. Little has been accomplished with the enhancement of the sweat impression inside the footwear. The Luma Lite is still the best option for enhancing these impressions.

NATIONAL AND INTERNATIONAL COLLABORATION

This remains a priority in order to establish some uniformity for forensic experts doing this type of physical comparison. I have maintained contact with may experts around the world. I am part of a committee with the "International Association for Identification" (IAI) to establish a certifying program in order to certify footwear / tire track examiners, which would include barefoot examination. I was also appointed as Chairperson to the Footwear /Tire track committee of the IAI. I have been ask to attend at the "European meeting for shoe print / tire mark examiners".

I have been qualified and have given evidence at a murder trial in San Diego, California. I will be giving a presentation of the progress of this research at the IAI conference in Boston, USA. I have published a paper in the journal of Forensic Science International, Europe and the Canadian Society of Forensic Science Journal.

PRACTICAL USES FOR POLICE See TM-l2-95

Many criminal cases are still coming in for evaluation and many court cases are ongoing. As mentioned above I have given evidence at a murder trial in San Diego, California. and am waiting for several other cases in Canada to go to court. Both Dr. Pressman and Sanping Chen both of Carleton University agree to the value of this research and have done much to help with the statistical analysis of the database. Dr. Pressman is still actively pursuing industry to collaborate in this project.

While this research aids in the identity of criminals at crime scenes, it remains equally valuable in eliminating a person from having made the impression at a crime scene. It can also be used to identify victims of mass disasters or missing persons where other means of identification have been exhausted.

COMMUNICATION OF INFORMATION ARISING FROM RESEARCH TO POLICE

I am still involved with lecturing throughout Canada at law enforcement workshops and seminars on the collection of and the handling of this type of evidence. I have given presentations in San Diego, California, at the lAI in North Carolina, atseveral workshops in Vancouver, British Columbia, Regina, Saskatchewan, Fredericton, New Brunswick and have collected foot impressions at the Canadian Identification Society (CIS) conference in Orillia, Ontario.

FUTURE RESEARCH

- **More research needs to be done on improving the recovery of the stained and indented impressions found inside of footwear.**

- **More foot impressions need to be collected from volunteers.**

- **All the new data must be entered on the computer database and searched through the system collection. This would require the hiring of a person on contract to input the data onto the system, and the hiring of two summer students to collect the barefoot impressions from volunteers.**

- **The information gathered must be analysed to ensure the consistency of the data and to obtain any valuable information that can be extracted from the database. This would require the hiring of the two professors from Carleton University on contract to continue analysing the statistics. The ultimate goal her is scientific validation.**

- **Blind tests need to be done throughout the research process.**

- **Collaboration with experts in this field will continue to keep the lines of communication open so the integrity of this research can be maintained.**

- **Continue contact with shoe manufacturers.**

- **Police agencies must be visited on a regular basis at their training seminars in order to update them on any newly developed techniques.**

- **The occasional use of a computer programmer is required to update the system that is now in place.**

- **A study group of identical twins need be established in order to address the differences and similarities between them.**

- **I have made contact with Thera-Ped Ltd, New Brunswick who are Foot Orthoses Consultants. They have taken multi inked impressions of approximately 6000 patients over the past 12 years, and have given me permission to study the impressions in order to note any changes that may take place in a foot over time.**

CONCLUSIONS

This research indicates that barefoot impressions having sufficient morphological detail may form a basis for possible identification. It goes hand in hand with well established comparison techniques for physical matching in order to analyse barefoot impression evidence in criminal and non-criminal cases. As of the March 10, 1997 eight (8) Forensic Identification Technicians will have been trained in this area of research for the purposes of making comparisons for court purposes. This should allow for more time of applied research.