

IDENTIFICATION OF EAR IMPRESSIONS IN POLISH FORENSIC PRACTICE

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ABSTRACT: The range of criminal investigation has grown in respect to the direct identification of an individual, and it is necessary to broaden interest in ear prints evidence found during the examination of a scene of the crime. The number of these scenes is systematically growing. The ear prints are usually being secured during the examination of burglary cases, homicides and bank robberies crimes which are occurring with the most frequency.

The subject of this article is ear research and ear identification in Poland. The research discussed above has led to creation of a set of useful practical methods of ear print analysis:

1. The method of determining common features.
2. The contour methods.

We can already recognise this, like a first step to establish "protocol" for carrying out a ear print expertise.

The practical use of ear prints in detection work shows that the trace of this kind carries a huge amount of precious information which can be used in the reconstruction of the event, establishing versions and checking them and identifying suspects.

Ear research was also carried out in the Netherlands and United Kingdom. The result of this research constitutes the proof of ear print individuality and also of usefulness in the trace for criminalistic identification.

KEY WORDS: Identification; Ear identification; Ear prints.

Problems of Forensic Sciences, vol. XLVII, 2001, 168–174
Received 18 December 2000; accepted 15 September 2001

INTRODUCTION

In the contemporary forensic science more and more attention has been paid to those traces, which until recently were considered untypical, such as lip, nose or forehead impressions or ear impressions.

It should be clearly stated that the value of those traces is not directly related to the frequency of their occurrence but should be attributed to the increased potential of human identification thus contributing to an improved effectiveness of law enforcement. Presently, the latter is of enormous importance if one considers dramatically growing crime rate. Hence, each effort

aiming at increasing efficiency of forensic methods should be greatly appreciated.

Human auricle has numerous applications in forensic science. An ear constitutes a valuable identification appearance feature used in creating a signalment portrait, various methods of appearance reconstruction, identification of persons based on photographs and identification of corpses. Another important aspect is identification of ear impressions on various surfaces found at the scene of crime.

Nowadays, it is an indisputable fact both in medical circles (among anatomists and anthropologists) and among forensic scientists and practitioners that the structure of an auricle is an individual feature and enables identification.

In Poland, some earlier forensic science manuals (Lewenberg, Schaff authorised translation from Russian – 1949, Horoszowski – 1958) emphasised identification value of the auricle in generating oral description of a human being. In 1965, an extensive report of a book by Iannarelli “The Iannarelli System of Ear Identification” released in the U.S. was published in *Problemy Kryminalistyki*.

In 1971, F. Hirsch’s papers were published in Polish translation. Nowadays, many Polish forensic textbooks briefly touch upon that issue (Czeczot, Tomaszewski – 1989 and 1996, Widacki – 1984, Kulicki – 1991 and 1994, Kasprzak – 1991 and 1995).

In the investigative practice ear impressions aroused more interest in the late 1960s. Today, it is difficult to determine the date of issuing first Polish expertise of auricle impressions. In the second part of 1960s, forensic personnel started to be looking at the marks of plot skin structure, lip traces and also ear traces at scenes of crime. Those traces were usually submitted for analysis to the Fingerprint Examination Department of Militia Forensic Institute in Warsaw. That Department dealt with determination of human appearance on the basis of drawings and sculptures. Experts employed in that Department had also a lot of experience in human identification based on photographs, where the ear was of immense importance. An ear trace was treated as a type of image subject to comparative examination. From the available data it is possible to conclude that approximately 2–3 expertise of that kind were performed a year. Since 1992, auricle marks and auricle image identification from photographs have been separated into two areas. Experts with more experience in fingerprint examination and in analysis of other marks, such as lip traces began specialising additionally in ear traces identification. The total number of ear mark identification casework is presented in Table I.

TABLE I. AURICLE MARK EXPERTISE PERFORMED IN POLAND FROM 1.01.1992 TO 30.06.2000

| Year | Total number of cases | Burglary | Robbery | Theft | Homicide |
|-----------------|-----------------------|----------|---------|-------|----------|
| 1992 | 21 | 20 | 1 | – | – |
| 1993 | 25 | 19 | 4 | 2 | – |
| 1994 | 39 | 31 | 2 | 4 | 2 |
| 1995 | 15 | 14 | 1 | – | – |
| 1996 | 24 | 20 | 2 | 1 | 1 |
| 1997 | 17 | 17 | – | – | – |
| 1998 | 11 | 10 | 1 | – | – |
| 1999 | 14 | 14 | – | – | – |
| Till 30.06.2000 | 5 | 5 | – | – | – |
| Total | 171 | 150 | 11 | 7 | 3 |

In parallel to progressing routine casework, specific methodology was being developed.

In December 1999, I participated in a very interesting and well-organised II International Course in Ear Traces Identification led by specialists from the Netherlands and United Kingdom. The Course constituted an opportunity to compare identification methods used in the West with those developed in Poland. It was interesting to find out that apart from minor differences general rules of adopted method of identification turned out very similar.

BIOLOGICAL FOUNDATIONS FOR AURICLE TRACES IDENTIFICATION

An auricle is an irregular, oblong dermal plica, which embraces the orifice of external auditory meatus. The auricle is almost twice as long as its width and its size vary significantly. The auricle is bent in many directions. Its structure is supported by elastic cartilage. The cartilage skeleton determines most of auricle shape. Only the lower ear-lobe is deprived of cartilage. The auricle belongs to the organs characterised by location, size and shape, which are individual features for each human being.

Numerous studies carried out in the world have demonstrated that the shape of auricle generally does not change throughout human life and this organ is not very much prone to injury. Thus one can talk about biological features of auricle similarly to biological features of fingertip skin ridges pattern, attributing such notions as individuality, unchangingness (stability) and indestructibility.

The skin of the auricle is thoroughly covered with sebaceous substance that comes from sebaceous glands and is transferred from the hair. In case of ear contact with various surfaces, a legible identifiable impression is generated.

DETECTION AND RECOVERY OF AURICLE MARKS

According to practice in Poland, 88% of ear traces are detected during inspections of burglary scenes. In 96% of cases marks are found on objects, which posed an obstacle for the perpetrator, such as doors and windows. In 4% of cases marks were found on window panes in car thefts. Unfortunately, as a rule, auricle marks are revealed accidentally when scene of crime officer searches for latents. For recovery purposes some typical fingerprint powders are used and the mark is then lifted on foil.

It might be considered that in fact more auricle marks are detected than it could be assessed based upon the number of performed expert examinations. Unfortunately, in many cases those marks are not submitted for analysis due to lack of suspects or in case when the police have other sufficient evidence in the case.

COLLECTING COMPARATIVE MATERIAL

Comparative material in case of auricle marks identification needs to be quite extensive. Reference impressions should be made with different pressure and at various angles. The ways of collecting comparative impressions should be determined basing upon the analysis of evidential material. Quite frequently the pressure value causes significant differences in the image of auricle traces from one person. That fact might even evoke some doubts among forensic scientists as regards the very possibility of identification of people based on ear prints.

Polish experiences in that area allow drawing a conclusion that in over 60% cases comparative material was incorrectly collected by police and comparative impressions were less legible than evidential traces. That motivated us to elaborating certain standards of comparative material collection. The definitions "heavy" or "light" pressure was concerned as too general. Experimental studies have shown that comparative impressions should be taken with pressure force of 1 kg, 2 kg and 3 kg, which is feasible with use of a "U-1" kit.

The "U-1" kit is designed for collecting comparative material with controlled pressure. The kit consists of scales and a set of gripping devices. An

impression can be collected directly on black celluloid foil or glass plate. The comparative impression is covered with aluminium fingerprinting powder and fixed. "U-1" enables collecting prints with any pressure up to 5 kg. "U-1" can be also used in collecting comparative glove and lip prints.

In some cases additional comparative material can be collected on glass plates in a manner similar to the way, in which evidential material was generated.

METHODS OF PERFORMING AURICLE MARK EXPERTISE

In the Central Forensic Laboratory of Polish Police (Warsaw) identification of auricle traces is carried out in the following stages:

- 1 – assessment of evidential and comparative material,
 - 2 – group identification examinations,
 - 3 – contour method,
 - 4 – common characteristics method.
1. Assessment of evidential and comparative material involves checking whether evidential trace contains sufficient number of characteristics enabling identification and if it was recovered in compliance with legal requirements. Subsequently the comparative material is checked with respect to quality and legibility. It has to be decided whether material is sufficient for examination and, if necessary, it can be complemented with additional impressions.
 2. Group identification examination involves comparing size and topography of auricle in evidential trace and comparative traces. At that stage it is already possible to eliminate the majority of comparative prints, basing on the found discrepancies.
 3. The contour method involves drawing the contour of the auricle on transparent foil and comparing the contour with the comparative print. This method can be used both in group identification and verification of the common features determination method. This technique allows precise determination of distances and relative location of individual characteristics.
 4. The method of determining common features involves comparison of such auricle parts as helix, anti helix and anti helix region as well as concha, tragus, anti tragus and lobule. In those parts, 24 areas are differentiated. The analysis of anatomy, type and distribution of those areas justify their status of individual characteristics. Those characteristics are presented in Figure 1.

Obviously, usually in an evidential trace only a few among these characteristics are found. Basing on statistical calculations, demonstrating confor-

mity of 7 characteristics in evidential and comparative impression has been decided as sufficient to conclude that they come from the same person. That rule is similar to the one adopted in fingerprint examination.

Fig. 1. 24 areas on the surface of auricle, where individual characteristics can be found in the common characteristics method.

WAY INTO THE FUTURE

Even though ear print examinations are already routinely performed in Polish forensic practice and expert opinions are accepted in court, the following studies are now in progress:

1. Elaboration and verification of auricle individual characteristics catalogue;
2. Research on relationship between pressure force and impression qualities;
3. Research on relationship between a photograph and auricle impression.

Let us hope that completing those projects as well as co-operation and exchange of experiences, particularly with experts from the Netherlands and the United Kingdom will contribute to developing harmonised standards of performance for auricle prints forensic examinations.