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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

M. Edwin O'Neill

### The Reliability of the Identification of the Human Voice

Investigators, as well as lawyers and other workers in the field of scientific crime detection have many viewpoints with respect to the identification of the human voice by witnesses. Psychologists have long felt that the reliability of court procedure with reference to identification of voices is open to serious question from a psychological point of view. Unfortunately, however, psychologists have not concerned themselves with the study of voice identification in any of their many studies on fidelity of report. Perhaps the most dramatic case with respect to that problem of voice identification occurred at the time of the Hauptmann trial. (State v. Hauptmann. Atlantic Rep., 1935, 180, 809-829.) The court procedure followed in this case with regard to voice identification, although consistent with established legal precedent was, in the minds of some psychologists, to be questioned from a psychological standpoint. Sworn testimony of positive identification of the defendant by his voice almost three years after the offense was committed was accepted by the court as material evidence against the defendant. If voice identification is important and if the present practices are unsatisfactory from a psychological standpoint, we may well ask "Why do not competent psychologists interest themselves in this pertinent and timely problem?" The answer is that such a study in that direction has been taken by Professor Frances McGehee, in her article "The Reliability of the Identification of the Human Voice" appearing in the *Journal of General Psychology*.<sup>1</sup>

Assuming that it is possible to recognize an unfamiliar voice after a considerable interval of time has elapsed, to what extent or with what frequency can unfamiliar voices be recognized? The answer to this question should be of aid in determining how much value may be attached to the recognition of a voice as evidence.

Professor McGehee used two kinds of subjects in this experiment—readers and auditors (listeners). A total of 740 auditors were used of which 554 were men and 186 were women. A paragraph of fifty-six words was read once behind a screen placed inside the room so that the reader could enter and leave unobserved by the auditors. The reader was unknown to the group. The readings were divided into, first: initial reading, and second, subsequent reading. On the initial reading, the number of readers varied from one to five. The subsequent readings were after periods of time varying from one day to five months. The method of checking the voice recognition was: (a) to have a selection read by five different readers, only one of which had been heard previously and the subjects would indicate the number corresponding to the previously heard reader, and (b) four readers would read a selection which had been read by these four and the missing fifth. The subjects were instructed to indicate the number of the missing voice. Various modifications such as disguised voices and foreign voices were studied. The subjects were also questioned as to methods of making judgments as well as attested recognition of the voice, that is, whether they would be willing to swear that they recognized one of the voices which they had heard on only one other occasion.

<sup>1</sup> McGehee, Frances, "The Reliability of the Identification of the Human Voice" *Journal of General Psychology*—17:249-271 (1937).

Since the study of voice recognition is a problem upon which no experimentation has been done to any considerable extent, Dr. McGehee cautions the reader to avoid any hasty generalization from her findings. However, these findings should be of great interest to workers in the field of scientific crime detection, as well as those concerned with evidence of a legal nature. To the question "to what extent are unfamiliar voices recognized after varying intervals of time," the findings were that the percentage of auditors recognizing an unfamiliar voice when it recurs in a series of other unfamiliar voices, decreases as the length of time increases between the first and second occurrence. Over 83% of the auditors recognized an unfamiliar voice within a day or two of first hearing it. After three months, only 35% recognized an unfamiliar voice, while only 13% were able to do so after five months. When the number of readers is increased in the initial series, the percentage of recognition by the auditors decreases. When one of two voices heard by the group initially recurred two days later in a series of five unfamiliar voices, 77% of the listeners recognized it. However, when the number of the voices in the initial series was increased to five, only 46% of the listeners were able to recognize the recurring voice, and when the interval between an initial occurrence and subsequent recognition was extended to one week, only 8% were able to select the recurring voice. Changing the voice pitch seemed to be a good method of disguising it since approximately 13% of the voices recognized were disguised by this method.

On unfamiliar foreign (German) voice was recognized by approximately the same percentage of auditors as an unfamiliar American voice when each occurred under similar conditions. The German voice was the second in a series of five foreign voices, including another German, a Chinese, a Greek and a Russian. It was confused more frequently with the Chinese voice than with the other German voice.

"The reliability of court procedure in accepting testimony of positive identification of a defendant by his voice, in consideration of the length of time interval and the common fallibility of memory, would seem to be relatively low in the light of the present experiments designed to test the validity of such a procedure. The percentage of individuals who were unable to recognize an unfamiliar voice, increased from 17 per cent after one day to 87 per cent after five months. A great many factors enter into the identification of a voice when it is required in legal procedure, which yet remain to be attacked by experimental investigation. These factors require special consideration: (a) the conditions under which the voice of an unseen person is originally heard, i.e., whether over the telephone or, under more startling or unusual conditions, in the dark; (b) the strength of motivating factors which contribute to the degree of attention manifested by the auditors; (c) the manner in which the voice is heard, i.e., whether intentionally or incidentally, with or without reference to subsequent identification."

Chicago Police  
Scientific Crime Detection Laboratory

JOSEPH W. HARVEY

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#### A Transmitted Light Box for Document Photography

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Transmitted light photography of documents with a camera on a horizontal mount presents a tedious and time consuming problem without some adequate device for holding and adjusting the document and providing for sufficient and properly diffused light passing through the paper. The accompanying illustration shows such an apparatus, which has been found highly serviceable and easy to manipulate. The principal points in favor



of its design lie in the fact that it can be used in the same manner as a copying frame, without the necessity of removing any of the backboard to which such frames are attached, while its light-weight construction makes for ease in handling.

The box proper consists of two distinct units. The first is the double glass "book" which holds the document, and the second is the "L"-shaped box which houses the mirror reflecting surface that directs the light rays through the document.

The book portion is made up of two glass surfaces, the front being of clear glass and the back of diffusing opal glass, both of which are secured in a frame of one-half inch wood. The open area of the glass front is  $8\frac{1}{2} \times 11$  inches, which will accommodate all standard sheets of paper except legal size. The book is hinged on one edge with small brass hinges and is held closed by means of a hook on the opposite edge.

The "L"-shaped box is constructed of light-weight ply wood with half inch molding at either end. Set at a 45-degree angle across the "L" is an ordinary glass mirror to reflect the light which enters at right angles, parallel to the axis of the camera lens. The glass book is secured to the face of the "L" nearest the camera by means of two brackets at the bottom of the box and two metal fingers at the top, which snap into pins secured in the top of the book.

The entire box extends forward from the backboard 12 inches and is supported below by means of an adjustable 6-inch ledge. It is held in place against the copy board by means of two Alnico permanent magnets which adhere to the steel plate on the face of this board.<sup>2</sup> Thus the entire light box can be manipulated on the copyboard exactly as if it were a copy frame.

The most satisfactory light source has been found to be a single photographic spot equipped with a 1000-watt tungsten bulb. By adjusting the spot properly in front of the open end of the "L", the reflecting and diffusing system of the box provides an even and sufficiently intense light for all usual types of papers and inks so that satisfactory photographs can be prepared without excessive exposures. The use of this separate light source appears to have two advantages—first, easier adjustment of the light source with various subjects than would be possible with a built-in source and second, simple, light-weight wooden construction rather than a more complicated metal construction which provided for some cooling system to keep the light bulb and box from overheating with long use.

ORDWAY HILTON

<sup>2</sup> For a detailed description of the copyboard see: Hilton, Ordway "A Copying Camera Base," *J. Crim. L. & Criminol. (Pol. Sci. Sec.)* 31 (6):769-770 (1941).