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# EVIDENCE vel non

## The *Non* Sense of Voiceprint Identification

By WILLIAM R. JONES\*

### INTRODUCTION

What is this thing called “voiceprint” identification? Is it a new science, a new technical application of an old science, or perhaps black magic? What is a “voiceprint” and how is it made? Is a “voiceprint” like a fingerprint? Can “voiceprint” identification do what its proponents claim? Do we really know enough about it to properly evaluate its degree of reliability?

While the use of “voiceprint” identification is rapidly escalating, unfortunately scientific research on the subject is progressing at a snail’s pace. Courts are making decisions regarding admissibility of this kind of evidence on the basis of expert testimony from witnesses whose conclusions are based upon limited scientific experiments. Proponents of the technique make strong claims of reliability for “voiceprint” identification, while other responsible scientists are willing to say only that the technique has not been sufficiently subjected to well-designed scientific experimentation to assess reliability. Therefore, courts are being misled as to the probative value of “voiceprint” identification evidence.

It is also regrettable that most attempts to introduce “voiceprint” evidence have been made in criminal cases by the prosecution, which has the resources at its disposal to bring in experts who are willing to testify in favor of admission. Generally defendants do not have the financial resources to introduce experts

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to rebut the prosecution's experts.<sup>1</sup> The court, therefore, often is presented only one side of the evidence.

Moreover, these problems are compounded by an apparent snow ball effect which results following a decision allowing admission of "voiceprint" identification evidence. The rapidly developing case law in the area confirms that courts which subsequently examine the problem often follow prior decisions without any real independent exploration of the evidentiary value.<sup>2</sup>

Since use of this method of voice identification is becoming more widespread, it is important that members of the legal profession become familiar with just what it is and *what it is not*. It is especially important that those engaged in the criminal process, whether prosecutors, defense attorneys, or judges, have sufficient knowledge to properly evaluate this kind of evidence. A major scientific study has recently been completed and widely publicized.<sup>3</sup> More recently, the results of this study have been analyzed by six eminent scientists in the field.<sup>4</sup> It is the purpose of this article to present one view about the use of "voiceprint" identification evidence, and in the process to acquaint the reader with these recent developments.

#### WHAT IS A VOICEPRINT?

The theory of voice identification by the "voiceprint" method

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<sup>1</sup> *E.g.*, Carroll L. Gilliam, appointed to prosecute the defendant's appeal in *United States v. Raymond*, 337 F. Supp. 641 (D.D.C. 1972), stated that since the case involved an indigent defendant and appointed counsel with limited funds, there was not as much evidence presented on the "voiceprint" issue as he would have liked. As a matter of fact, the court makes no mention of any defense experts in its opinion. The *Raymond* appeal was argued in April, 1973. As of January 28, 1974 no decision had been handed down. Telephone conversations between Mr. Gilliam and this author on October 12, 1972 and January 28, 1974.

On July 13, 1973, Lt. Ernest Nash, Voice Identification Unit, Michigan Department of State Police, testified that in approximately eighty percent of the 25 cases in which expert testimony/opinion was admitted there was no opposing testimony on the issue of reliability and general acceptance by the scientific community. *People v. Chapter*, Marin County, California Superior Court, July 23, 1973, 13 CRIM. L.R. 2479.

<sup>2</sup> *E.g.*, the *Raymond* trial court decision, *United States v. Raymond*, 337 F. Supp. 641 (D.D.C. 1972), admitting "voiceprint" identification evidence has been cited as persuasive authority in *Hodo v. Superior Court*, 106 Cal. Rptr. 547, 30 Cal. App. 3d 778 (1973); *Alea v. State*, 265 So.2d 96 (Fla. App. 1972); *Worley v. State*, 263 So.2d 613 (Fla. App. 1972); *State v. Andretta*, 296 A.2d 644 (N.J. 1972).

<sup>3</sup> O. TOSI, VOICE IDENTIFICATION THROUGH ACOUSTIC SPECTROGRAPHY (Speech and Hearing Science Lab., Michigan State University, Report No. 171) [hereinafter referred to as the Tosi study].

<sup>4</sup> Bolt, *Speaker Identification by Speech Spectrograms: Some Further Observations*, 54 J. ACOUSTICAL SOC'Y OF AM. 531 (1973) [hereinafter cited as Second Bolt study].

is that people differ anatomically in the size, shape and structure of the larynx and the oral and nasal cavities. In addition, it is stated by proponents of the theory that people exhibit different, but stable, habitual patterns in the way they use the articulators (teeth, tongue, and lips), as well as other parts of the vocal apparatus, in speaking. The combination of so many factors is said to uniquely characterize a particular speaker and distinguish him from all others.

The term "voiceprint" is a coined word<sup>5</sup> which refers to the graphic output of a high speed sound spectrograph. This graphic output, called the spectrogram, displays *some* of the factors alleged to uniquely characterize a particular speaker: frequency and intensity of the voice sound as a function of time. A "voiceprint" is manufactured by monitoring magnetic tape recordings of the voice and excerpting specific cue words to be used. There are ten word sounds which are preferred in analyzing speech for identification purposes: "the", "to", "and", "me", "on", "is", "you", "I", "it", and "a". The tape segment to be analyzed is then threaded around an analyzing drum on the spectrograph. The magnetic head of the analyzing drum scans the magnetic recording on the tape repeatedly for each analysis. A band-shift modulation system is used to select a different narrow band of frequencies each time that the signal is scanned. The scanner is mechanically and synchronously coupled to a recording stylus and a marking drum. This drum supports a sheet of electrically sensitive facsimile paper onto which the display of intensity versus frequency versus time is permanently recorded.

Two basic types of spectrograms may be produced: bar and contour. The bar spectrogram is the type most frequently used in voice identification. (See figure 1.) On a bar spectrogram, the time dimension is plotted from left to right, *i.e.*, the beginning of the voice segment being analyzed is at the left, and the end is at the right. Frequency is plotted along the vertical axis with the lower frequencies at the bottom. Intensity is exemplified by the density of the lines on the spectrogram—the darker the lines, the greater the intensity of the sound at that particular frequency and time.

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<sup>5</sup> C. GRAY & G. KOPP, VOICEPRINT IDENTIFICATION, REPORT PRESENTED TO BELL TELEPHONE LABORATORIES, INC. (1944).

In attempting to identify voices by the "voiceprint" method, both aural and visual means are used. The operator first compares the known and the unknown voices by listening to recordings of the voices. He then examines the two spectrograms of the same spoken words (produced from the recordings of the known voice and the unknown voice), seeking points of similarity. If he finds sufficient points of similarity (variously pegged at 16 or 20),<sup>6</sup> he may conclude that the two voice samples were made by the same person. If the operator cannot find an adequate number of points of similarity, he is unable to make a match and cannot say whether the two voices are the same. In some cases, the spectrograms may be so dissimilar that he will be able to state that the two recordings were *not* made by the same person. One serious problem in identification of voices through use of high speed sound spectrograms is this matter of "points of similarity." The high speed sound spectrograph was not designed for the purpose of identifying voices, but rather as a speech research and therapy tool. As a result, the spectrogram emphasizes the similarities and differences among *words* rather than between *speakers*.<sup>7</sup> This is illustrated by the "voiceprint" samples in Figure 1.

#### ADMISSIBILITY OF VOICE IDENTIFICATION EVIDENCE

Those familiar with trial practice (at least as it relates to reception of evidence) are aware that courts have accepted voice identification evidence from non-expert witnesses for several centuries.<sup>8</sup> There is no real question of *admissibility* of this kind of testimony from a non-expert who has heard the speech of the person to be identified. The issue, rather, is one of *credibility* and is determined by the trier of fact in weighing the evidence.

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<sup>6</sup> Ladefoged & Vanderslice, *The Voiceprint Mystique*, 7 WORKING PAPERS IN PHONETICS 126 (1967) (U.C.L.A. Phonetics Lab), quoted Lawrence Kersta, a pioneer in this type of identification, as claiming he requires 20 points of similarity before he declares a match. In *United States v. Wright*, 17 U.S.C.M.A. 183, 189, 37 C.M.R. 447, 451 (1967), Kersta testified that a minimum of 16 points of similarity were required. There is no indication of how he arrived at the precise number required. See Kamine, *The "Voiceprint" Technique: Its Structure and Reliability*, 6 S.D.L. REV. 213, 216 n.24 (1961).

<sup>7</sup> Bolt, *Speaker Identification By Speech Spectrograms: A Scientist's View of Its Reliability for Legal Purposes*, 47 J. ACOUSTICAL SOC'Y OF AM. 597, 605 (1970) [hereinafter cited as the Bolt study].

<sup>8</sup> 2 J. WIGMORE, EVIDENCE § 660, at 771 (3d ed. 1940), cites the earliest case as one in England in 1660.

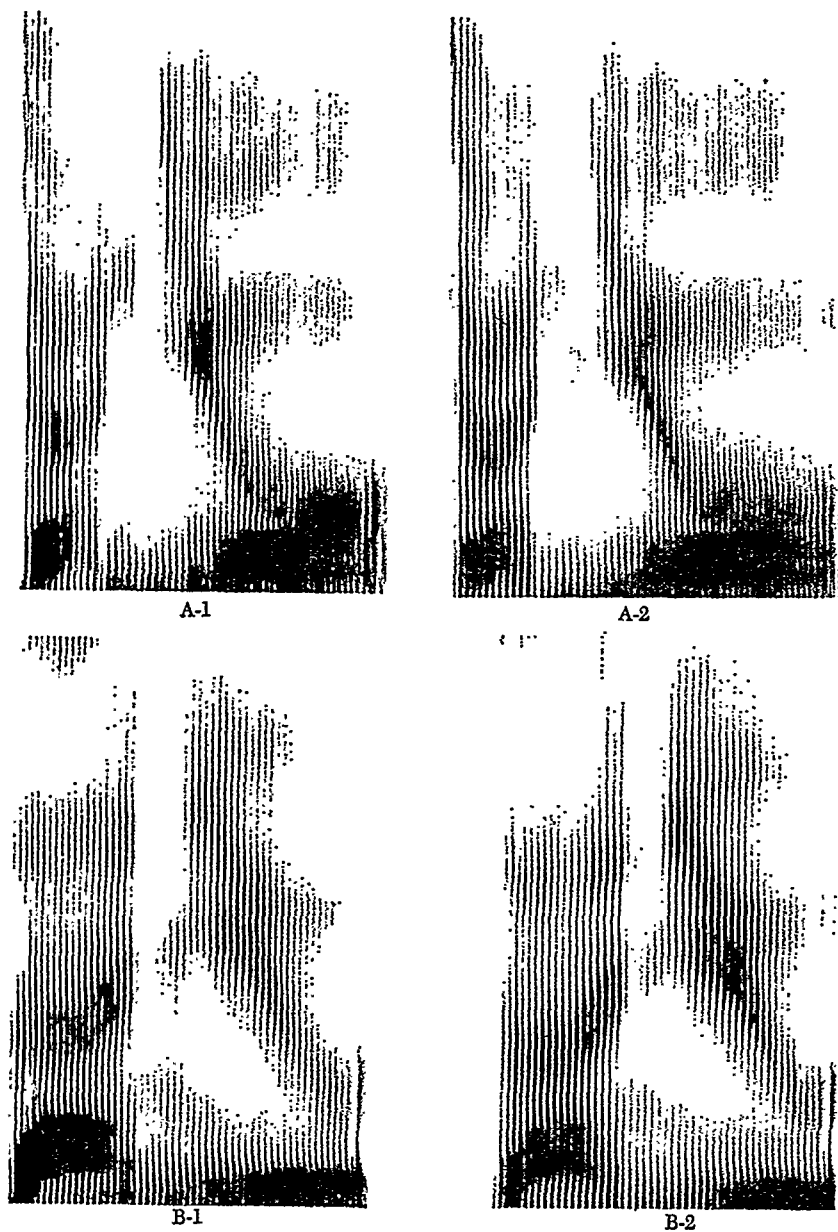


Figure 1

Bar spectrograms of the words "on you". A-1 and A-2 are the words spoken by the same person on different occasions. B-1 and B-2 are the words spoken by two different people. Courtesy of Dr. Oscar Tosi, Department of Audiology and Speech Sciences, Michigan State University.

Even though courts readily receive voice identification evidence from the non-expert based only upon the fact that the witness has heard both the known and unknown speakers, identification by the "voiceprint" method was almost universally rejected by appellate courts until 1971. Two factors, both of which apply also to polygraph evidence, may very well have affected the court's reluctance to admit "voiceprint" evidence, as well as some other kinds of "scientific" evidence.

The first factor is fear that an unjustified degree of certainty may be suggested where an electronic or mechanical device plays a major role in the evidence presented, and the output is interpreted by an "expert" witness. This fear may be particularly strong when the interpretation of the expert witness is extremely subjective, as it is in the case of both "lie detectors" and "voiceprints." This fear of unwarranted certainty is not present in the case of direct testimony of identity from one who heard the person speak on the occasion in question. If one is familiar with a voice, he frequently identifies the speaker without being able to see him. A most common example of this kind of identification of an unseen person is identification of a telephone caller. Mistakes, however, are frequent in such situations. Judges and jurors readily recognize the fallability of this kind of identification by voice alone. Such mistakes are a matter of "common experience." But with "voiceprint" identification, there is a danger that the trier of fact will ascribe a degree of certainty to the testimony of the expert witness which may be undeserved.

The second factor which tends to make courts hesitant in admitting such evidence is the possibility of infringement upon the determination of the ultimate issue. One commentator has suggested that this is an extremely strong factor in the case of polygraph evidence.<sup>9</sup> Courts are aware of the danger that the jury may forego independent analysis of the facts and accept the opinion of the expert witness all too readily. This awareness affects decisions on admissibility even though most jurisdictions have now abandoned the rule prohibiting testimony in the form of opinions or conclusions upon an ultimate issue.<sup>10</sup> "Voiceprint"

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<sup>9</sup> J. RICHARDSON, *MODERN SCIENTIFIC EVIDENCE* § 618, at 160 (1961).

<sup>10</sup> C. McCORMICK, *EVIDENCE* § 12, at 27 (2d ed. 1972) [hereinafter cited as McCORMICK]. See also *UNIFORM RULES OF EVIDENCE* 56(4); *PROPOSED FEDERAL RULES OF EVIDENCE* 704.

evidence would encroach upon the ultimate issue even more strongly than would polygraph evidence, except, perhaps, where the charge is perjury.

To the extent that *expert* testimony regarding "scientific" methods of voice identification is offered, however, we do have issues of *admissibility* under rules of evidence in general use. First is the question of admissibility of expert testimony, *per se*. The non-expert is qualified to testify because he has firsthand knowledge. The expert has something different to offer: the power to draw inferences from the facts which a jury would not be competent to draw. Thus, the general rule has been that when the subject at issue does not lie within the range of common experience or common knowledge, the opinions, inferences, or deductions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.<sup>11</sup> When and to the extent that expert witnesses testify as to "scientific" matters, a further requirement is usually added, *viz.*, "the thing from which the deduction [of the expert witness] is made must be sufficiently established to have gained *general acceptance in the particular field to which it belongs*."<sup>12</sup>

Taken literally, more modern rules of evidence do not promulgate such special rules for admissibility of scientific evidence. Neither the Uniform Rules nor the Proposed Federal Rules have a requirement that the question involved in the expert's testimony must be outside the range of common experience or knowledge. Neither refer to scientific evidence as a separate class; both provide that all relevant evidence is admissible unless the judge finds that its probative value is substantially outweighed by the risk that its admission will create substantial danger of (1) undue prejudice, (2) confusing the issues, or (3) misleading the jury.<sup>13</sup> Nevertheless, courts operating under these rules seem to apply the same analysis as those operating under the general rule in determining the admissibility of expert testimony based upon a scientific principle or discovery. The result seems to be that the

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<sup>11</sup> MCCORMICK § 203.

<sup>12</sup> *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923) (emphasis added).

<sup>13</sup> UNIFORM RULES OF EVIDENCE 7(f), 45 (b); PROPOSED FEDERAL RULES OF EVIDENCE 402, 403(a).



*Frye* rule of "general acceptance in the particular field to which it belongs"<sup>14</sup> is applied to scientific evidence under these rules as well.

#### AN ANALYSIS OF THE CASE LAW

There is a substantial body of case law developing in the area of admissibility of "voiceprint" identification evidence. No attempt will be made to analyze those cases which have not been ruled upon by an appellate court, with one notable exception.<sup>15</sup>

The first appellate court to approve admission of "voiceprint" identification evidence was the United States Court of Military Appeals in *United States v. Wright*,<sup>16</sup> a case involving obscene phone calls. The military court addressed itself only to the question of when expert testimony may be received. It completely ignored the consideration of whether the "voiceprint" identification technique had been accepted by the scientific field to which it belongs, and furthermore made no serious attempt to ascertain its reliability. There was strong identity testimony from witnesses who had heard the obscene phone calls. The tapes of the phone calls were played in open court, and these tapes were taken by the court-martial members into their deliberations. The Court of Military Appeals stated, "[s]ince voice identification by ear is fully acceptable in the courts, the members could thus determine for themselves the margin of error, if any, in Mr. Kersta's expert opinion."<sup>17</sup> The opinion infers admissibility for corroboration, rather than as independent evidence, although the Court did not explicitly so state.

Between the *Wright* decision in 1967 and the 1971 decision in *Trimble v. Hedman*,<sup>18</sup> no appellate court approved the admission of "voiceprint" identification evidence. Apparently, only two state appellate courts had the issue presented to them during this period, and each rejected "voiceprints" as evidence. A California Court of Appeals, in *People v. King*,<sup>19</sup> a case arising out of

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<sup>14</sup> *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

<sup>15</sup> *United States v. Raymond*, 337 F. Supp. 641 (D.D.C. 1972). Although this is a decision of a trial court, the court's opinion has received much publicity and has been cited as persuasive authority in at least four state appellate court decisions. See note 2 *supra*.

<sup>16</sup> 17 U.S.C.M.A. 183, 37 C.M.R. 447 (1967).

<sup>17</sup> *Id.* at 191, 37 C.M.R. at 453. Mr. Kersta, referred to in the opinion, is Lawrence Kersta, founder of Voiceprint Laboratories, Somerville, N.J.

<sup>18</sup> 192 N.W.2d 432 (Minn. 1971).

<sup>19</sup> 72 Cal. Rptr. 478 (Cal. App. 1968).

the Watts riots and burnings, rejected the evidence for two reasons: (1) failure of the witness to qualify as an expert,<sup>20</sup> and (2) lack of general acceptance of "voiceprint" identification in the field to which it belongs.<sup>21</sup> The second case, *State v. Cary*,<sup>22</sup> was an appeal by the defendant from an order by the trial court that he submit voice exemplars for use in preparing spectrograms. After several trips through the courts the New Jersey Supreme Court rejected "Voiceprints", affirming the superior court's determination that "[t]his technique has not . . . attained such degree of scientific acceptance and reliability as to be acceptable as evidence."<sup>23</sup>

Since *King* and *Cary*, five appellate decisions on admissibility of "voiceprint" identification have come to the attention of this writer.<sup>24</sup> All of these decisions on "voiceprint" identification, as well as *United States v. Raymond*,<sup>25</sup> have been based primarily upon the testimony of Dr. Oscar Tosi of Michigan State University that the technique is highly reliable. Tosi bases his claims of reliability upon a study which he and others conducted in cooperation with the Michigan Department of State Police.<sup>26</sup> This study will be discussed in detail in a later section.

*Trimble v. Hedman*<sup>27</sup> was an appeal from the dismissal of a petition for a writ of habeas corpus, rather than a trial to determine guilt or innocence. The court took pains to point this out, specifically noting that ". . . we deal here with the sufficiency of the proof to justify issuance of an arrest and search warrant, not with sufficiency of proof to sustain a conviction."<sup>28</sup> The procedural context in which the case was decided undoubtedly influenced the decision to admit "voiceprint" identification, as probable cause under such circumstances may be established by evidence which would not be admissible at trial.<sup>29</sup> Also, the *Trimble* court's de-

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<sup>20</sup> *Id.* at 486-87, 490-91.

<sup>21</sup> *Id.* at 493.

<sup>22</sup> 264 A.2d 209 (N.J. 1970).

<sup>23</sup> 239 A.2d 680, 685 (N.J. Super. 1968).

<sup>24</sup> *Hodo v. Superior Court*, 106 Cal. Rptr. 547, 30 Cal. App. 3d 778 (1973); *Alea v. State*, 265 So.2d 96 (Fla. App. 1972); *Worley v. State*, 263 So.2d 613 (Fla. App. 1972); *Trimble v. Hedman*, 192 N.W.2d 432 (Minn. 1971); and *State v. Andretta*, 296 A.2d 644 (N.J. 1972).

<sup>25</sup> 337 F. Supp. 641 (D.D.C. 1972).

<sup>26</sup> Tosi study, *supra* note 3.

<sup>27</sup> 192 N.W.2d 432 (Minn. 1971).

<sup>28</sup> *Id.* at 434.

<sup>29</sup> *See, e.g., McCray v. Illinois*, 386 U.S. 300, 311 (1967); *United States v. Ventresca*, 380 U.S. 102, 108 (1964); *Beck v. Ohio*, 379 U.S. 89, 96 (1964).

cision on "voiceprint" admissibility was a limited one; they qualified it by stating:

[W]e are convinced that spectrograms ought to be admissible at least for the purpose of corroborating opinions as to identification by means of ear alone. They ought also to be admissible for the purpose of impeachment.<sup>30</sup>

*Worley v. State*<sup>31</sup> limited its decision to admit "voiceprints" to the facts of the case. The evidence against the defendant was already ample to sustain his conviction, and the court held that it was proper to admit "voiceprints" "to corroborate defendant's identification by other means."<sup>32</sup> The court specifically pointed out that it was not deciding whether "voiceprint" identification alone would sustain a conviction or whether its use is limited to corroboration.<sup>33</sup> *Alea v. State*,<sup>34</sup> also a Florida case (though decided by a different District Court of Appeal than *Worley*), quoted from the above portions of *Worley* with approval. The *Alea* court pointed out that, like *Worley*, there was other substantial evidence to convict. Moreover, two witnesses had identified the defendant's voice as that of the person making the phone calls without the aid of spectrograms.<sup>35</sup> The quotation of language from *Worley*, as well as the reference to other substantial evidence and firsthand identification by two witnesses, places *Alea* in the same posture as *Worley*, i.e., standing only for the proposition that "voiceprints" are admissible for corroboration.

*State v. Andretta*<sup>36</sup> was an interlocutory appeal from denial of the state's request for an order to compel the defendants to submit voice exemplars from which "voiceprints" could be produced. The trial judge, after receiving testimony from several witnesses, held that the state had failed to sustain its burden of establishing general scientific acceptance of the "voiceprint" method and that the five year time span involved since the recording of the original telephone conversation precluded use of the method

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<sup>30</sup> Trimble v. Hedman, 192 N.W.2d 432, 441 (Minn. 1971) (emphasis added).

<sup>31</sup> 263 So.2d 613 (Fla. App. 1972).

<sup>32</sup> *Id.* at 614.

<sup>33</sup> *Id.* at 614-15.

<sup>34</sup> 265 So.2d 96 (Fla. App. 1972).

<sup>35</sup> *Id.* at 98.

<sup>36</sup> 296 A.2d 644 (N.J. 1972).

in any case. The request was therefore denied.<sup>37</sup> The New Jersey Supreme Court reversed with directions that the order be issued and that if the state's experts made a positive identification, another pre-trial hearing was to be held if the prosecution then indicated its intention to introduce the voiceprint evidence. This hearing would be for the purpose of determining whether any identification arrived at through the use of this method was sufficiently reliable to be admissible. In determining reliability, the court was to consider the results of the tests, direct and cross-examination testimony of the state's experts, and such opposing proofs as the defendant might be able to offer.<sup>38</sup> It is important to note that the *Andretta* court did not rule that "voiceprints" were admissible at trial. The court specifically deferred final consideration on the question of admissibility. The New Jersey Supreme Court held only that developments since *Cary* justified ordering the defendants to give voice exemplars.<sup>39</sup> Subsequently, the voice recordings were made and submitted to the Michigan State Police Voice Identification Unit. A positive identification was made, and at the pre-trial hearing, Dr. Tosi and Lieutenant Nash of the Michigan State Police testified that the five year time lag would make no difference in the validity of the match. Thereupon, the trial judge determined that the "voiceprint" evidence was admissible. The defendant subsequently entered a plea of guilty,<sup>40</sup> and as a result, the New Jersey Supreme Court did not review the trial court's determination that "voiceprint" evidence was admissible. The only change in New Jersey's position since *Cary*, then, is that defendants may be ordered to give voice exemplars for "voiceprint" purposes.

The *Andretta* opinion refers to the testimony of four experts. Dr. Peter Ladefoged<sup>41</sup> and Dr. Oscar Tosi<sup>42</sup> testified that the "voiceprint" method has scientific acceptance today. The court noted, however, that this conclusion was apparently based on the

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<sup>37</sup> *Id.* at 645.

<sup>38</sup> *Id.* at 648.

<sup>39</sup> *Id.*

<sup>40</sup> *Andretta* had another prosecution pending in federal court. Also, his co-defendant had disappeared. Telephone conversations between this author and Harvey Weissbard and Michael Querques, defense counsel, August 10, 1972.

<sup>41</sup> Professor of Phonetics, University of California at Los Angeles.

<sup>42</sup> Professor, Department of Audiology and Speech Science, Michigan State University.

absence of criticism by other scientists of the Tosi study rather than upon express declarations of acceptance.<sup>43</sup> Such criticism exists today.<sup>44</sup> Dr. Peter Denes<sup>45</sup> and Dr. James Flanigan<sup>46</sup> were called as witnesses by the court. Dr. Denes believed Dr. Tosi's work was a valid scientific experiment, but only a small step in the direction of general knowledge. He further testified that he could not express a strong opinion since he had not made a careful examination of recent developments.<sup>47</sup> Dr. Flanigan said he had not made an intensive analysis of the Tosi report, but he was of the opinion that it was not scientifically acceptable to generalize Dr. Tosi's results to unknown and unspecified field conditions.<sup>48</sup>

In *Hodo v. Superior Court*,<sup>49</sup> the decision to admit "voiceprint" evidence was once again based almost entirely on Dr. Tosi's testimony that "voiceprint" identification was reliable. When asked if the technique was generally accepted in the field of acoustics, the field of linguistics and related sciences, his answer was: "This is a new kind of technique, so it is not sufficiently widespread, so the answer would be no."<sup>50</sup> However, his subsequent testimony tempered that statement to a very considerable degree. In essence, his subsequent testimony was that not many of his colleagues in his field of speciality were familiar with the technique. Of those who are familiar with the technique, he stated that ". . . in my opinion, they all accept this technique presently."<sup>51</sup> As we shall see, this simply is *not* true. The defense presented no rebuttal testimony. The California Court of Appeals concluded that ". . . most of the skeptics have become believers,"<sup>52</sup> a conclusion resting upon a very questionable foundation.

*United States v. Raymond*<sup>53</sup> is another example of a deficient defense, because there was no attempt to rebut the testimony of the prosecution's experts. The court relied upon the testimony of Dr. Tosi and Dr. Ladefoged in deciding to admit the "voiceprint"

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<sup>43</sup> 296 A.2d at 646.

<sup>44</sup> See the Bolt study, *supra* note 4.

<sup>45</sup> Bell Laboratories, Inc.

<sup>46</sup> Director, Acoustic Research Dept., Bell Laboratories, Inc.

<sup>47</sup> 296 A.2d at 647.

<sup>48</sup> *Id.*

<sup>49</sup> 106 Cal. Rptr. 547 (Cal. App. 1973).

<sup>50</sup> *Id.* at 552.

<sup>51</sup> *Id.* at 553.

<sup>52</sup> *Id.*

<sup>53</sup> 337 F. Supp. 641 (D.D.C. 1972).

evidence. In meeting the argument that "voiceprint" identification was not generally accepted in the scientific community, the court noted that Tosi's study has had significant impact on the scientific community and had altered the opinions of many experts in the field.

A striking example of this can be seen in the case of Dr. Peter Ladefoged. . . . [who] was co-author of a leading article which criticized the Kersta study and conclusions . . . and even testified as an expert against the admission of spectrograms into evidence in the *Trimble* case. . . . After an examination of the Tosi study, however, Dr. Ladefoged stated he now believes that spectrograms have been established as a reliable method of voice identification, and testified in favor of admission of spectrograms in the case at bar.<sup>54</sup>

The court's statement regarding Dr. Ladefoged will be discussed in the following section.

#### RELIABILITY AND SCIENTIFIC ACCEPTANCE

It is obvious, from the foregoing analysis of cases, that admissibility of expert testimony concerning a scientific process or device depends upon the reliability of the process or device. In evaluating the reliability of such a process or device, most jurisdictions have adopted the approach of the District of Columbia Court of Appeals in *Frye v. United States*:<sup>55</sup>

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle of discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.<sup>56</sup>

As previously indicated, neither the Uniform Rules nor the Proposed Federal Rules refer to scientific evidence as a separate class; all relevant evidence is admissible unless the judge finds its

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<sup>54</sup> *Id.* at 644-45.

<sup>55</sup> 293 F. 1013 (D.C. Cir. 1923).

<sup>56</sup> *Id.* at 1014.

probative value is outweighed by the risk that its admission will create substantial danger of undue prejudice, of confusing the issues, or of misleading the jury. This last potential danger, that of misleading the jury, would be particularly important in any decision regarding "voiceprint" admissibility.

In balancing probative value against the danger of misleading the jury, courts are faced with the problem of determining the probative value of the evidence offered. Probative value is, of course, linked directly to reliability.<sup>57</sup> Language from decisions of courts in California<sup>58</sup> and New Jersey,<sup>59</sup> both of which operate under the Uniform Rules,<sup>60</sup> indicates that no new or different standard is applied under the Uniform Rules. In each case the court employed the *Frye* rule of "general acceptance in the particular field to which it belongs."<sup>61</sup> These courts were not ignoring their own rules of evidence, but rather, were using the *Frye* statement as a means of administering the balancing test of probative value versus the danger of the "voiceprint" identification evidence misleading the jury. One court has refined the *Frye* rule to require general acceptance *only by those who would be expected to be familiar with its use.*<sup>62</sup> The *Hodo* court approved this statement of the rule and said that, "... the tenor of Dr. Tosi's testimony is that the technique is generally accepted by those experts in the field who would be expected to be familiar with its use."<sup>63</sup> The validity of this statement will be examined later.

Until a scientific principle or discovery has gained such general acceptance that it is entitled to judicial notice, judges must rely upon the collective opinion of experts in the particular field to which it belongs as a guide to its reliability, and therefore its probative value. An inherent problem, then, may very well be the inability to assign the principle or discovery to a particular field. This certainly is true in the case of "voiceprints." Lawrence Kersta, the

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<sup>57</sup> For a fuller exposition of this view see Jones, *Danger-Voiceprints Ahead*, 11 AM. CR. L. REV. 549, 571-72 (1973).

<sup>58</sup> See, e.g., *Hodo v. Superior Court*, 106 Cal. Rptr. 547, 30 Cal. App. 3d 778 (1973) and *People v. King*, 72 Cal. Rptr. 478 (Cal. App. 1968).

<sup>59</sup> See, e.g., *State v. Andretta*, 296 A.2d 644 (N.J. 1972) and *State v. Cary*, 264 A.2d 680, 685 (N.J. 1970).

<sup>60</sup> CAL. EVID. CODE §§ 351, 352 (West 1966); N.J. REV. STAT. § 2A: 84A-3 Rule 7 (Supp. 1967).

<sup>61</sup> 293 F. 1013, 1014 (D.C. Cir. 1923).

<sup>62</sup> *People v. Williams*, 161 Cal. App. 2d 858, 861-62, 331 P.2d 251, 253 (1958).

<sup>63</sup> 106 Cal. Rptr. at 553.

pioneer in the use of sound spectrograms for voice identification, maintains that the technique has nothing to do with phonetics, but belongs in the field of "electro-acoustics" or physics.<sup>64</sup> Dr. Peter Ladefoged, who has testified as an expert in several cases involving "voiceprint" evidence, is a Professor of Phonetics at U.C.L.A. Dr. Oscar Tosi, whose testimony, based upon the Tosi study, has resulted in several admissions of "voiceprint" evidence, is a Professor in the Department of Audiology and Speech Sciences at Michigan State University. As the court pointed out in the *King* case, ". . . [c]ommunication by speech does not fall within any one established category of science. Its understanding requires a knowledge of anatomy, physiology, physics, psychology and linguistics."<sup>65</sup> It is therefore difficult to say exactly who and what discipline is authoritative in the subject of "voiceprints". One scientific group seems to be recognized by all of these gentlemen, however, and that is the Acoustical Society of America.<sup>66</sup>

In 1966 the Technical Committee on Speech Communication of the Acoustical Society of America unanimously adopted the following resolution:

The Technical Committee is concerned that "voiceprints" have been admitted as legal evidence on the basis of claims which have not yet been evaluated scientifically. The Committee invites the Executive Council to consider the matter and take appropriate action.<sup>67</sup>

Later, the Technical Committee asked some of its members to review the matter from a scientific point of view. This was done by six members, and the results of their study were published in 1970.<sup>68</sup> [hereinafter cited as the Bolt study]. This article evaluated

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<sup>64</sup> Ladefoged & Vanderslice, *The Voiceprint Mystique*, 7 WORKING PAPERS IN PHONETICS 126 (1967).

<sup>65</sup> 72 Cal. Rptr. at 490.

<sup>66</sup> See Ladefoged & Vanderslice, *supra* note 6, at 138, where Lawrence Kersta's participation in Acoustical Society of America meetings is discussed. See particularly the letter dated October 6, 1966, from P. Ladefoged to some 50 scientists in which he states he introduced a resolution before the Acoustical Society of America expressing misgivings over use of "voiceprints" as evidence, and which he says was adopted, in substance, by the Technical Committee of the Speech Communications Section of the Acoustical Society of America. This is the letter referred to in Ladefoged & Vanderslice, *supra* note 6, at 137. Tosi, *et al.* submitted a report of their study for publication in the society's journal. See Tosi, *Experiment of Voice Identification*, 51 J. ACOUSTICAL SOC'Y OF AM. 2030 (1972).

<sup>67</sup> Ladefoged & Vanderslice, *supra* note 6, at 138.

<sup>68</sup> Bolt study, *supra* note 7.



several aspects of the problem including the nature of speech information as it relates to speaker identification, a comparison of voice patterns and fingerprint patterns, experimental evidence on voice identification, and requirements for validation of such identification. The authors concluded that:

. . . [t]he available results are inadequate to establish the reliability of voice identification by spectrograms. We believe this conclusion is shared by most scientists who are knowledgeable about speech; hence, many of them are deeply concerned about the use of spectrographic evidence in courts. . . .<sup>69</sup>

Since the above study was published, the Michigan State University Voice Identification project has been completed by Tosi and others.<sup>70</sup> As indicated previously, the five significant appellate decisions allowing admission of "voiceprint" evidence, as well as the *Raymond* decision, relied almost exclusively upon Dr. Tosi's testimony that this method of voice identification was very reliable. Dr. Tosi, in turn, grounded his testimony upon the results of this project. The issue then becomes whether the results of this project support Dr. Tosi's claims of reliability.

The same study group which in 1970 concluded that "the available results are inadequate to establish the reliability of voice identification by spectrograms . . ." <sup>71</sup> have made a detailed analysis of the published results on the Tosi study [hereinafter cited as the second Bolt study]. The researchers found, however, no reason to modify their original conclusion.<sup>72</sup> They acknowledged that the Tosi study was instructive by indicating the influence of some of the varying factors affecting the accuracy of identification, but pointed out that the study failed to answer the crucial question, "How reliably can a person be identified by examining the spectrographic patterns of his speech sounds?"<sup>73</sup>

These scientists noted that when the spectrograms of the unknown voices were non-contemporary, the error rate was more than twice that for the tests in which the spectrograms of the

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<sup>69</sup> *Id.* at 603.

<sup>70</sup> Tosi study, *supra* note 3.

<sup>71</sup> Bolt study, *supra* note 7.

<sup>72</sup> Second Bolt study, *supra* note 4, at 531.

<sup>73</sup> *Id.* at 523.

unknown voices were contemporary. Speakers' voices might be expected to change from one recording to another, but if the observers used the same average criterion for a match, the percentage of false identification should not change absent differences in similarity among the voices included in the several test sets. The reports offer no explanation for this significant increase in the rate of error.<sup>74</sup>

There was also an increase in the rate of error when the context of the test words was changed from words in isolation to words embedded in random sentence contexts—again the error rate more than doubled. This factor, according to the second Bolt study, coupled with the above-mentioned increase in error rates from contemporary to non-contemporary unknown spectrograms, suggests that any experimental condition that is likely to cause a change in the acoustic characteristics of an utterance will lead to an increased probability of error.<sup>75</sup>

Tosi's study did not examine changes in the psychological state of the speaker. The second Bolt study points out that alterations in the speaker's psychological state might result in significant deviation from his characteristic speech sound.<sup>76</sup> Of course, these psychological alterations may be induced under conditions of stress, and the fact that one is suspected of crime could be assumed to intensify the potential.

Other factors which may potentially modify the characteristics of a speaker's voice include the surrounding noise level, attempts at mimicking or disguise, room acoustics, and recording conditions.<sup>77</sup> With regard to mimicking, Dr. A. J. Fourcin has conducted experiments which have led him to state that it is possible for a person to imitate another's speech so well that their spectrographic patterns may be so confused that they cannot be distinguished.<sup>78</sup> As to recording conditions, Gunnar Fant has written that "[o]ne of the difficulties encountered [in "voiceprint" identification] is

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<sup>74</sup> *Id.* at 532.

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> *Id.* at 532-33.

<sup>78</sup> Dr. Fourcin is Reader in Experimental Phonetics, University College, University of London. He made this statement to the writer in an interview in London, England, June 1972. He has also expressed the same opinion in a letter to Roy E. Hamrick, San Leandro, California, February 11, 1972.

the inferior fidelity of telephone tapped (sic) speech compared to HiFi laboratory recordings.<sup>79</sup> The usual forensic situation involves a telephone recording. The second Bolt study authors conclude that further research is required to determine the influence these factors may have on reliability of speaker identification through the use of spectrograms.<sup>80</sup>

As indicated above, the term "voiceprint" refers to the graphic output of a high speed sound spectrograph. The term is highly misleading as it connotes a degree of accuracy comparable to fingerprints. In fact, Lawrence Kersta, a pioneer in the use of spectrograms for voice identification, made the statement that "everyone's voiceprint is as unique as his fingerprint."<sup>81</sup> News media were quick to adopt the word and Kersta's comparison with fingerprints.<sup>82</sup> Even adventure, science fiction, and police programs on television have used the term and portrayed identifications based upon the technique.<sup>83</sup> This has resulted in an erroneous impression, among lawyers and laymen alike, that "voiceprints" *are* as unique as fingerprints. The analogy is completely misleading.

Fingerprints directly disclose physical patterns of the fingers producing them. Spectrographic patterns are not related so simply or directly to the vocal anatomy. Furthermore, the spectrogram is not the primary evidence, but only a graphic means of examining the sounds a speaker makes.

The fingerprint features that are ultimately used for identification are the most minute details of the skin ridge patterns. These details are determined mainly by random process in prenatal skin development. There are an enormous number of possible combinations of these details and it is known that their patterns remain unchanged throughout life. Comparable voice features for identification, *if they exist*, have not been established.

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<sup>79</sup> Letter to Roy E. Hamrick, March 22, 1972. Gunnar Fant is associated with the Royal Institute of Technology, Department of Speech Communication, Stockholm, Sweden.

<sup>80</sup> Second Bolt study, *supra* note 4, at 532-33.

<sup>81</sup> TIME MAGAZINE, Jan. 10, 1972, at 59.

<sup>82</sup> See, e.g., LIFE, July 21, 1967, at 56a; N.Y. Times, Oct. 28, 1972, at 74 (Magazine); PARADE, April 6, 1967, at 8; TIME MAGAZINE, Jan. 10, 1972, at 59; The Village Voice, March 23, 1972, at 24.

<sup>83</sup> E.g., Star Trek, Mission Impossible, and Hawaii Five-O among others. The portrayal on Hawaii Five-O was particularly misleading in showing an automatic voiceprint machine which gave almost instantaneous results.

Variations found in fingerprint patterns do not consist of changes in patterns from one type to another, but rather in expansions, obliterations, smudges or incompleteness. Spectrographic patterns are affected in a more fundamental way by distortions of frequency, energy, and time that are commonly encountered in the transmission, recording, and analysis of sound. The very dimensions of the pattern are those that are changed by such distortions.<sup>84</sup> The second Bolt study authors wrote that "Tosi's results provide direct evidence of the detrimental effect of intraspeaker variability on voice identification and *its inherent dissimilarity to fingerprint identification.*"<sup>85</sup>

Perhaps the most important factor in the second Bolt study conclusion that "voiceprint" identification has not yet been scientifically established as reliable is the lack of knowledge about voice characteristics and the failure of Tosi's study to identify decision criteria.

The present level of knowledge about personal voice characteristics, their recognition, and how they change under different conditions is still rudimentary. The recent work on speaker identification from spectrograms does not provide any new understanding as to which spectrographic features correlate most clearly or efficiently with the speaker's identity. . . . At the present time . . . the spectrographic identification of a voice by a trained observer appears to rely on a broad assessment of loosely defined points of similarity rather than on a carefully specified set of objectively defined spectrographic attributes. The Tosi experiments, in fact, show considerable disagreement among different panels of observers as to what constitutes a match when they are given the same matching task. . . . Further studies are needed to provide a better understanding of the decision process. For example, no explanation is now possible as to why, in open tests, an observer who is uncertain cannot simply reject the unknown spectrogram as not being similar enough to any of the known spectrograms.<sup>86</sup>

Tosi has written a rebuttal to the second Bolt study conclusion

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<sup>84</sup> The foregoing comparison is a condensation of the comparison made in Bolt study, *supra* note 7, at 599-600.

<sup>85</sup> Second Bolt study, *supra* note 4, at 533 (emphasis added).

<sup>86</sup> *Id.*

on voice identification.<sup>87</sup> Basically, he argues that (1) the Bolt study's opinions are not based upon personal experience, or even on direct observations of real-life examinations, and (2) that they disregard crucial facts that strongly interact with the reliability of those positive decisions produced by professional, full-time examiners such as their special training and responsibility, the five possible decisions they are entitled to produce, the number of samples, and the length of time used to perform each examination. It is Tosi's contention that opinions based on feelings rather than on actual experience are of little value, irrespective of the scientific authority of those who produce such an opinion.<sup>88</sup>

As to item (1), it should be pointed out that Kenneth Stevens, one of the consultants on the Tosi study, was a member of the Bolt study team. Since they are themselves scientists, Tosi and his colleagues should realize that if the experiment is properly designed and the data accurately reported, other knowledgeable scientists should be able to interpret the data as well as those who conduct the experiments. In this regard Tosi's reference to opinions based on feelings rather than on actual experience is rather surprising. Bolt's group based its opinion on an analysis of the data published by Tosi, not on their personal feelings.

The charge in item (2) that the Bolt studies disregarded crucial facts that strongly interact with the reliability of those positive decisions produced by professional full-time examiners may be laid to rest rather easily. The Tosi study "verified" the accuracy of the examiner's identifications by comparing them with police evidence and ascertaining that such evidence did not contradict the identification. The Bolt authors express the opinion that ". . . we do not consider this type of evidence a reliable criterion of the correctness of identification. The only true criterion of correctness of identification is sure knowledge of the identity of the speaker."<sup>89</sup> Tosi's group also contends that the error rate may in fact be lower than the values found in their

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<sup>87</sup> Tosi, *Reply to "Speaker Identification by Speech Spectrograms": Some Further Observations*, 54 J. ACOUSTICAL SOC'Y OF AM. 535 (1973).

<sup>88</sup> *Id.*

<sup>89</sup> Second Bolt study, *supra* note 4, at 533. Note also that information released by Lt. Nash of the Voice Identification Unit, Michigan Department of State Police, shows that of the 105 positive identifications made by the unit from 1967 to 1970, only about 30 of the identified persons admitted culpability or were convicted by evidence other than voice identification. Tosi, *Experiment on Voice Identification*, 51 J. ACOUSTICAL SOC'Y OF AM. 2030, 2042 (1972).

experiments because a prudent practitioner can exercise caution and can listen to voice samples. However, "the Tosi reports give no scientific data that define the practitioner's error rate, or show how the rate might vary with his degree of caution, or indicate what improvement can be had by listening."<sup>90</sup> In other words, their contention is sheer speculation. It appears, then, that Tosi and his colleagues are the ones who base their opinions on feelings rather than scientific data.

Dr. Peter Ladefoged has testified in a number of cases where "voiceprint" evidence has been offered, and in *Trimble*,<sup>91</sup> he testified against admission of "voiceprint" evidence. Since that time, however, he seems to have taken a cautious position in favor of "voiceprint" identification, based upon Tosi's study, and this change of position was noted by the court in *Raymond*.<sup>92</sup> Dr. Ladefoged had testified regarding a letter he had sent to Dr. Edward E. David, The President's Science Advisor, in which he gave an opinion on "voiceprints" which he testified represented the general view of the scientific community.<sup>93</sup> It may or may not be that he is correct that his letter to Dr. David represents the general view of the scientific community, but his letter is far from a ringing endorsement of the technique's reliability. In fact he confirms his earlier concern over the use of "voiceprints" in legal proceedings, and points out some of the weaknesses of the Tosi report, including the lack of female speakers and of an investigation of mimicked or disguised voices. Furthermore, he tempers whatever support given in the letter when, in discussing the possibility of confusing voices, he makes the following statement:

[t]here seems to me to be no way of knowing in advance the likelihood of coming across two confusable voices. . . .

[i]t seems fairly certain that there already has been a case of a wrong "voiceprint" identification involving two people who were both policemen, both having a similar socioeconomic

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<sup>90</sup> Second Bolt study, *supra* note 4, at 533. The Bolt authors point out that the Tosi reports give no scientific data that define the practitioner's error rate, or show how the rate might vary with his degree of caution, or indicate what improvement can be had by listening.

<sup>91</sup> 192 N.W.2d 432 (Minn. 1971).

<sup>92</sup> 337 F. Supp. 641, 644 (D.D.C. 1972).

<sup>93</sup> This letter was written in response to a request from Dr. David for Dr. Ladefoged's opinion. A copy of this letter was furnished to the author by Dr. Ladefoged. Dr. David is one of the six scientists who explored reliability of "voiceprint" identification in both Bolt studies, *supra* notes 4 and 7.

background, and both having a similar physique. There is clearly always a risk of this possibility occurring. . . . At the moment, we do not know if different communities are equally likely to contain a similar number of confusable voices. There may be a larger number of similar voices in the group of young middle class suburbanites living in a Chicago housing tract, or in a group of militant black nationalists living in Watts, than in Tosi's 250 students who almost certainly contained people from different backgrounds. . . . When we consider other possible groups of suspects such as a small neighborhood gang, or a group of drop-outs from the same high school, the degree of similarity among the voices becomes even greater.<sup>94</sup>

Certainly, Dr. Ladefoged raises some important questions which are left unanswered by the Tosi study. However, in spite of these criticisms, he has testified that he thinks "voiceprint" identification is reliable.<sup>95</sup> As for his purported statement that the "voiceprint" method has scientific acceptance today, Dr. Ladefoged has stated to this writer that he did say that but now thinks he was in error.<sup>96</sup>

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<sup>94</sup> Letter from Dr. Ladefoged to Dr. David, note 93 *supra*. The wrong "voiceprint" identification referred to was reported in the New York Times, Mar. 27, 1971 at 57, col. 2. The New York City Police Department recorded a number of telephone calls by an unknown person to a known gambler. One of these recordings was sent to Lawrence Kersta, along with a recording of the voice of the Police Inspector. Mr. Kersta identified the two voices as the same. At a subsequent Grand Jury investigation the Inspector denied any memory of such a call. On the basis of these denials and the "voiceprint" identification by Kersta, the Inspector was charged with being evasive before the Grand Jury and demoted to Captain. Six months later the Inspector and his attorney located a former New York City detective who voluntarily made a phone call to police headquarters. The call was recorded and this recording and the original recording of the unknown caller were sent to Kersta. Kersta and Voiceprint Laboratories then indicated that these two recordings were of the same voice.

<sup>95</sup> See *United States v. Raymond*, 337 F. Supp. 641 (D.D.C. 1972); and *State v. Andretta*, 296 A.2d 644 (N.J. 1972).

<sup>96</sup> Recorded telephone conversation between this author and Dr. Ladefoged, May 23, 1972. In response to the question "Would you say that 'voiceprints' as a method of voice identification now has general acceptance in the scientific community?", he responded, "I think I did say that in some case; probably in the Washington case [*i.e.*, *United States v. Raymond*] I said that. I think now I was in error to say that because, having said that, numerous of my friends, have said, 'No, not true.' I said it in good faith thinking that my friends had accepted it, and I now find that I have been reprimanded by some people." *Id.*

See also *People v. Chapter*, Marin County, Superior Court, July 23, 1973, 13 CRIM. L. REP. 2479, where the trial court in rejecting "voiceprint" evidence states: The record before this Court clearly indicates: . . . [t]hat the statement in *Hodo v. Superior Court*, *supra*, [106 Cal. Rptr. 547], attributed to Dr. Tosi that his technique is generally accepted by experts in the field who would be expected to be familiar with its use—*e.g.*, Dr. Peter Ladefoged and Dr. Lewis Gerstman—is in fact not accurate as reflected [by] Dr. Ladefoged's testimony in this case.

In *Hodo v. Superior Court*,<sup>97</sup> Dr. Tosi testified to the effect that not many people were familiar with the "voiceprint" technique, so it was not generally accepted in the field of acoustics, the field of linguistics and related sciences. But he continued by saying that of those who are familiar with the technique, all had accepted it.<sup>98</sup> Certainly, this statement is questionable. Dr. Ladefoged's position in accepting the technique is cautious at best. The six scientists who were requested by the Technical Committee of Speech Communication of the Acoustical Society of America to review the matter, and who have updated their report to include review and analysis of the Tosi study, have not changed their opinion.<sup>99</sup>

### CONCLUSION

Clearly, the Tosi study has advanced our knowledge and understanding of some of the problems of voice identification from spectrograms. But just as clearly, the data developed is insufficient upon which to base claims of reliability for the technique. Tosi and his colleagues have themselves indicated that some additional areas need study.<sup>100</sup> Dr. Ladefoged, in his cautious reconsideration of the technique, pointed out some serious problems identified by the Tosi study itself.<sup>101</sup> Bolt and his colleagues have thoroughly analyzed the results of the Tosi study, and, in addition to identifying other areas needing study, sharply disagreed with Tosi's evaluation of projections that can safely be made from his experiments. In discussing the forensic application of "voiceprints," Tosi and his colleagues say that the error rate may in fact be lower than the values found in their experiments. Yet, as the Bolt studies point out, no scientific data is given that defines the practitioner's error rate, or shows how the

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<sup>97</sup> 106 Cal. Rptr. 547 (Cal. App. 1973).

<sup>98</sup> *Id.* at 553.

<sup>99</sup> Second Bolt study, *supra* note 4, at 533. In their recent paper, they made this observation:

This evaluation of the projection that can safely be made from Tosi's experimental findings differs sharply from his own interpretation and from that expressed in a letter written and circulated by Dr. Peter Ladefoged; further, *we question the basis on which claims have been made that the dominant view of the scientific community is now in agreement with those interpretations.* [citations omitted] [emphasis added]

<sup>100</sup> Tosi, *et al.*, *Experiment on Voice Identification*, 51 J. ACOUSTICAL SOC'Y OF AM. 2030, 2041 (1972).

<sup>101</sup> See notes 93 and 94 *supra* and accompanying text.



rate might vary with his degree of caution, or indicates what improvement may be obtained by listening. Nor is there any identification of the examiner's decision criteria.

Dr. Ladefoged has said that "Larry Kersta did himself a great disservice by some of his extreme statements, and his continual references to 'voiceprints' being like fingerprints."<sup>102</sup> Tosi and his colleagues may also do themselves a great disservice by attempting to make projections upon the basis of insufficient data. Kersta's experiments were never fully publicized, so his results have never been verified. From what was known about them, they were of questionable scientific value. The Tosi experiment was well designed, but it should be recognized for what it is—a limited beginning. The head-long rush to claim a degree of reliability in forensic situations—a degree of reliability not demonstrated by scientific data—is dangerous.

Dr. Harry Hollien,<sup>103</sup> commenting upon his recent entry into the controversy, summed up the situation thusly:

My entry into the controversy . . . was encouraged by several conditions: 1) the knowledge that we *may* be able to identify individuals from their speech someday but we cannot do so at the present—and to do so will necessitate some complex of parameter analysis; 2) we have been (and are) carrying out research in the speaker identification area; 3) for some strange reason, most leaders in Phonetics have been reluctant to testify, and 4) there has been too much emotionalization relative to this issue. Yet the issue is of great social relevance and a very dangerous situation is being imposed upon the U.S. judicial system. It is as if the legal determination of sanity was not the prerogative of Psychiatrists and Psychologists but rather of a Psychiatric aide—and indeed a *single* one for the entire country. Lt. Nash is no more than a technician. . . . Further, the Tosi research has practically nothing to do with the forensic situation. Hence, descriptions of this research in courts of Law—in support of the use of "voiceprints"—is misleading at best.<sup>104</sup>

Regardless of whether we apply the modified *Frye* rule of

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<sup>102</sup> Letter from Dr. Ladefoged to Dr. David, note 93 *supra*.

<sup>103</sup> Director, Communication Sciences Laboratory, University of Florida, Gainesville, Fla.

<sup>104</sup> Letter dated August 22, 1973, from Dr. Hollien to the author.

“general acceptance in the scientific community by those who would be expected to be familiar with its use,<sup>105</sup> or the modern rule that “all relevant evidence is admissible unless the judge finds that its probative value is substantially outweighed by the risk that its admission will create substantial danger . . . of misleading the jury,”<sup>106</sup> “voiceprint” evidence does not qualify for admission.

Dr. Tosi has been making unwarranted claims of reliability in testifying in favor of “voiceprint” identification evidence. Other knowledgeable scientists have not been willing to testify in opposition to these claims, without having made a detailed analysis of his results. As a consequence a number of recent decisions on “voiceprint” evidence have been based primarily upon Tosi’s unwarranted claims of reliability. Now, however, we have a definitive, unbiased report by six outstanding scientists, indicating clearly that many questions still remain unanswered, and these questions must be answered before any assessment of the “voiceprint” technique’s reliability can be made. As one defense attorney has stated: “I think the updated Bolt Report is probably the most important piece of scientific literature available today [for] checking Tosi and Nash in their Alice in Wonderland efforts.”<sup>107</sup>

The constitutional right to a fair trial is much too important for courts to prematurely accept “voiceprints” as evidence on the basis of embryonic research and limited acceptance of the technique by the scientific community. When, and *if*, “voiceprint” identification research has progressed to the point where there is an adequate demonstration of its reliability, the technique may

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<sup>105</sup> 293 F. 1013, 1014 (D.C. Cir. 1923).

<sup>106</sup> UNIFORM RULES OF EVIDENCE 7(f), 45(b); PROPOSED FEDERAL RULES OF EVIDENCE 402, 403(a).

<sup>107</sup> Letter from James M. Russ, Orlando, Fla., to the author, dated August 7, 1973. Mr. Russ was defense counsel in *United States v. Robert Hara*, Case No. 72-162-Cr-J, United States District Court, Middle District of Florida, Jacksonville, Fla. Mr. Russ said, “A three day pretrial hearing on the admissibility of this evidence as it pertained to the captioned litigation was scheduled in the United States District Court at Jacksonville, Florida, to commence on December 19, 1972. On December 18, 1972 we were advised by the U.S. Attorney’s Office and the trial judge that the government did not intend to proceed with this hearing and instead had decided to dismiss all charges. While it was not specifically stated, it is my belief that this conclusion was reached when the prosecuting attorneys reluctantly reached the same conclusion you did in your article, which is that there has not been a sufficient amount of scientific study done at this point in time to determine the reliability of the method for the presentation of evidence in a judicial proceeding.” Letter from Mr. Russ to the author dated Dec. 26, 1972.

be an invaluable aid in our fight against crime. In the meantime, "voiceprint" identification evidence, with its *uncertain* and *minimal* probative value, and its high potential for misleading the jury,<sup>108</sup> should not be admitted for *any purpose*, not even impeachment, where the freedom of the defendant is at issue.

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<sup>108</sup> See Bolt study, *supra* note 7, at 602.

Court determinations may also depend on the apparent validity of exhibits brought in evidence. Spectrographic evidence may often display features that are overwhelmingly influenced by the words that are spoken rather than by the speaker's identity. Judge and jury may therefore be misled in understanding the evidence and in assessing the expert's testimony. *Id.*