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The Expert Witness: Ethics and Responsibilities

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ABSTRACT: While this paper is being written by a scientist in a specific disciplinary area, the comments to be made undoubtedly transcend that discipline and extend into other fields. As a matter of fact, nearly all of the points reviewed also have been articulated at one time or another by individuals from other areas of expertise. Hence, this effort is based as much on a kind of collective discomfort among expert witnesses as it is on the personal opinions of the author. In any case, the focus is on the problems of the expert witness in general rather than simply upon those difficulties uniquely experienced by a particular specialist. Five problems are addressed. They involve (1) the somewhat checkered legacy imposed upon the modern expert by his or her early counterparts, (2) the lack of specific forensic training for experts within their content disciplines, (3) the widely varying qualifications and professional training of current experts, (4) the pressures experienced by the expert, and (5) the conflicts of interest imposed upon them by the judicial system. Each of these problems presently affect expert witnesses; attempts to resolve or mitigate them would appear appropriate.

KEYWORDS: jurisprudence, witnesses, ethics

Generally speaking, expert witnesses appear to be exerting a greater and greater impact upon the judicial system of the United States. While most individuals who take the witness stand are competent, neutral, and ethical, some exhibit a less than appropriate performance. On the other hand, the system within which they work also appears to impose unfair pressures upon them. Thus, it would appear legitimate to ask questions about the use of expert witnesses—about the effectiveness of their testimony, the structures within which they should operate, the limits that should be imposed on their efforts, and their ethics. These issues ordinarily are written about or reviewed by attorneys, judges, academics/managers within the criminal justice or judicial systems, or some combination of these professionals [1–7]. It is only occasionally that the problems are addressed from the expert's perspective [8,9]. As a consequence, some of the comments to follow may disturb certain members of the legal and law enforcement professions. Quite possibly they should. They certainly involve opinions and positions that must be seriously considered by all of the groups concerned. Indeed, very few of the points that will be made are exclusively the result of the author's experiences, as many other experts have expressed similar concerns.

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A Perspective

There is little doubt that scientific testimony will impress a jury. As a matter of fact, it can be quite compelling if it is ethically and articulately presented by a person who is viewed as an expert in his or her discipline. While the many and varied relationships that exist between experts and the judicial system have resulted in a body of literature much too large to summarize in this short essay, some general perspectives can be postulated [1,4,6,10].

For example, the impact of scientific testimony has led one distinguished attorney to state that “many trials are but a battle among the experts.”² Perhaps so, but he may be imparting a greater advocacy or creditability to them than they deserve—at least on a universal basis. On the other hand, other individuals appear concerned about the ethics (or advocacy) displayed by at least some experts [4,9,11–15]. For example, Ahearne [16] argues that the only “experts” who should be permitted to testify are those who are called by the court—and that all other individuals placed on the witness stand (by either side) should be considered advocates or consultants. Even more to the point, some jurists have displayed negative feelings toward experts. For example, one federal judge [17] included the following statement in his memorandum opinion relative to a civil suit: “both parties called expert witnesses and, as one would expect, the hired guns did what they were hired to do.” Perhaps this judge was expressing feelings more of frustration than of distrust for he also wrote: “The experts, in my opinion, did more to obfuscate the problem than they did to clarify it.”

There appears to be no need to belabor either of these divergent positions. Indeed, it is quite clear that substantial disagreement exists regarding the value of experts—as well as their ability to avoid becoming advocates or indulging in behaviors that are less than impeccably ethical. The reasons for this situation appear obvious. First, there is a long history associated with experts; early on, they operated primarily as witnesses for the prosecution. Second, experts tend not to be specifically and systematically trained in the (correct) procedures to follow when serving as witnesses—or in the ethics associated with litigation. Third, even today the qualifications of “experts” vary widely; some witnesses of this type are not actually experts at all. Fourth, many pressures, both direct and subtle, can be, and are, directed at experts. And last, these professionals face a number of conflicts which, while unnatural to them, are common in the jurisprudence milieu. Other problems also exist; however, it is not possible to explore all of the enigmas and conflicts which face expert witnesses. Rather, responses to the five issues listed above will be attempted here.

Problems Experienced

Legacies from the Past

It is a little difficult to provide a comprehensive review of the first issue cited: that of the history of expert witnessing. For one thing, only a fraction of what actually occurred has been recorded; moreover, at least some of what has been written is self-serving. To complicate things, the courts in different countries handle experts in different ways. In West Germany, for example, the expert witness is nearly always called by the court [18] and is paid from state funds. While expansion of this approach has been suggested as potentially helpful here in the United States [9,16,19], most experts utilized in our state and federal courts are employed by one side or the other. Unfortunately, any such

²Cook, B. L., Atlanta, GA, personal communication, Feb. 1981.

association (that is, with the advocates) tends to degrade an expert's veracity, even when it should not.

In early days, expert witnesses ordinarily were associated with the prosecution. Indeed, as Moenssens et al. point out [6], many of them were "full-time salaried employee(s) of some division of local, state or federal government. [the] expert opinion [was] sometimes controlling on whether or not an arrested person would be prosecuted." Thus, "experts" exhibiting bias or advocacy, and of varying levels of competency, testified in the courts of yesteryear. Again, the effect—rightly or wrongly—has been to burden the modern expert with an aura of advocacy. Currently, however, experts are being called both by the prosecution and the defense, as well as (occasionally) by the court, and this situation has a tendency to somewhat upgrade the technical quality and ethics of their testimony. Yet, signs of bias still can be observed, at least occasionally. To be specific, some expert witnesses are, or appear to become, advocates for the side they are "representing." While sometimes it is obvious that they are doing so, other times they are quite subtle about it. Worse yet, they often err quite innocently; essentially entrapped by their secondary role as consultant rather than by any slippage of ethics. Yet, bias can and does exist. For example, some of the common signs of advocacy in an expert are that he or she: (1) is exclusively, or almost exclusively, a prosecution—or a defense—witness, (2) makes statements that he or she "could not be wrong," (3) does not describe the evaluation procedures utilized (examples: "they are classified"; "they are too complex to understand"), (4) does not bring data, materials, or the results of the relevant examinations to the courtroom, and/or (5) makes unwarranted (and often vague) personal attacks on opposing witnesses.

The author is not suggesting that very many old-time expert witnesses were unethical or biased. The point being made here is simply that they were so closely associated with the prosecution that biases about them often were developed by members of the judiciary and the general public. Ironically, an opinion apparently still harbored by some people is that experts are—and possibly should continue to be—primarily associated with the prosecution [1,2]. It is possible that such beliefs sustain the cited skepticism. Thus, the legacy handed down from the early experts has proven to be a rather awkward one and is probably unfair. Nevertheless, the facts that (1) many of them were part of the criminal justice system, (2) some clearly exhibited biases and advocacy, and (3) most were seen as individuals attempting to please their employers, has led some modern judges, juries, and attorneys to be suspicious of all experts. At best, the cumulative history of expert witnessing is one which leads to varying responses within the judicial system. It also results in some confusion and substantial discomfort among the experts themselves.

The Education of Experts

The second issue listed revolves around the extradisciplinary training of experts. Nearly any well-educated professional will affirm that he or she is competent to testify in court about those data, theories, and relationships that are relevant to his or her specialty. This position is acceptable—but only in part—since some sort of forensic related training or experience should also accompany professional competency. Yet few, if any, universities offer courses (within specific disciplines) that include information about expert testimony itself or about the ethics, responsibilities, and techniques associated with it. This lack is one of several which discourage many capable professionals from participating in the judicial system. It also tends to permit the utilization of some witnesses of dubious competency.

But can the characteristics that an expert must possess be listed? The following inventory is based on logic, plus the specifications and implications articulated by a number

of authors [1,4,6,18,20,21]. In this paper, the author contends that, to be considered qualified, an expert should exhibit at least the following: (1) undergraduate and graduate degrees in the relevant field of expertise, (2) specialized training in the subject area as it relates to forensics, (3) some training in forensics, (4) those professional licenses or certifications universally required by recognized professional groups in the expert's discipline, (5) evidence of experimentation, teaching, publication within the specialty area, or some combination of these, (6) prior disciplinary experience that is direct and relevant to the issue or issues being considered. Also desirable would be (1) postgraduate (or postdoctoral) training, (2) publications which appear in (reviewed) scientific journals, (3) the development of scientifically acceptable tests or procedures, (4) association with, and leadership in, appropriate professional and scientific societies, and (5) experience as an expert witness. As can be seen, this list undoubtedly is incomplete; it certainly suffers from the fact that an attempt is made to describe the requisites for all possible specialties and levels. Indeed, it is quite probable that yet other (forensic-related) characteristics are necessary or, at least, desirable.

But, how can the professionally well-trained individual acquire the specialized experiences required if he or she is to become an "expert"? Unfortunately, they often are learned on an *ad hoc* basis. Of course, some experts also have training in criminal justice programs or as criminologists [3,24,26], but they tend to be individuals whose basic functions involve work associated with crime laboratories. Thus, the question may be asked if there are any routes the professional can follow to obtain the necessary education with respect to forensics and courtroom testimony? There are several. First, appropriate courses, seminars, or workshops should be sought out and attended. Even a single experience of this type can be helpful. Second, the professional can learn a great deal from the books and articles written by attorneys as to how they deal with experts [1,2,4-6,8,21]. Moreover, publications of the "how-to" type (aimed directly at experts) are useful, as are treatises on ethics [12,13,15,22,23,26] and, even, materials focused on issues only tangentially related to the expert witnessing process itself [7,27-29].³ The third, and perhaps most important, type of "training" is that provided by the attorneys with whom the expert works. These individuals will request the specialized examinations/analyses needed (for legal or forensic purposes), as well as advise, brief, and otherwise prepare an expert for his or her role as a witness. By doing so, they provide valuable information relative to the proper, ethical, and effective procedures to be used both in evaluations and in the courtroom. Finally, it can be said that experience teaches. While this area of learning does the beginner little good, actual experiences in the courtroom serve to educate the expert in those approaches which are both effective and ethical. Indeed, there is much to be learned about resistance to advocacy from the assaults of opposing attorneys, about the appropriate presentation of evidence from the reaction of juries, and about the need for strict adherence to proper ethics from observation of the behaviors of attorneys, judges, and other witnesses. Unfortunately, most experts develop their "skills" in a rather haphazard manner, which is one of several reasons why competency can vary so dramatically from person to person. Perhaps some sort of structured training should be established which will permit experts to interface effectively with the law enforcement and judicial systems. Most law schools ignore the problem or only concentrate thrusts of this type on the needs of their own students. Occasionally an attempt to solve the problem is made by individuals responsible for criminal justice programs. However, they usually focus their efforts on the criminologist-in-training rather than on the disciplinary experts. Training! The need is obvious. Not so the solution.

³Russ, J. M., Orlando, FL, personal communication, April 1973.

Definitions of Experts?

The third problem also is a serious one: it concerns the striking variations among the qualification levels and competencies encountered in the modern "expert." For example, one of the problems sometimes faced by scientists and advanced professionals, when they take the witness stand, is that they will have their testimony countered by individuals who are not on their level, yet are offered as experts and so recognized by the court. Indeed, many scientists and practitioners have had the unhappy experience of having to listen to "expert" witnesses who were only policemen or agents (with only a few weeks of "special" training) expound on subjects which they (the experts) had spent a lifetime learning. There have even been some instances in which private detectives have been permitted to testify as "experts" in areas in which they had little background, training, or, for that matter, understanding. Since it clearly is unethical to make negative comments about an "opposing" witness (other than on the content of his or her testimony), most experts dread those trials in which they have to explain their findings and conclusions to a court that is not aware that the witnesses for the other side are only superficially competent and actually lack the scientific or professional expertise necessary to comment on the relevant issues. Small wonder then that many scientists and practitioners simply refuse to testify or even to offer their talents on a consulting basis. Forget that work of this type interrupts the flow of their regular research schedules—and perhaps their teaching, administrative, or professional activities as well. Forget that they will be buffeted (no matter how outstanding they are) during the qualification process and on cross-examination. Forget that they often are pressured or inconvenienced by attorneys, the agency or agencies involved, the client (or client's family), the court schedule, travel times, and accommodations. To many experts, the source of greatest discomfort is to be "challenged" by an opposing witness who actually is not qualified to do so.

Is it possible to develop a simple definition (of an expert), one that will encompass all types of individuals? Perhaps so, as a number of categories and levels appear to exist. That is, it appears necessary to classify experts both as to type and on the basis of the level of expertise. Of course, the criteria for general competency and ethics have been discussed variously in the first two sections; what is to be considered now can be referred to as technical competency.⁴ In any event, if "experts" of various types and levels are to be sorted out, some attempt must be made to structure a system that will permit their classification.

Figure 1 provides an organization of this type. It is a two-tiered model that structures "experts" (of all types) into several categories—technician, practitioner, and scientist—on one continuum and by level—technician, criminalist, and specialist—on the other. As would be expected from the terminology utilized, the group which is common to both systems is that of technician (see Box A, Fig. 1). However, even this domain is one with somewhat generous boundaries. On the one hand, technicians range from police officers who are trained in making radar readings of the speed of vehicular traffic to individuals who perform ballistic tests in a laboratory, and from officers who carry out breath analyzer tests of intoxication to laboratory technicians who operate computers. The scientific bases for, as well as the equipment and procedures used in, most of these forensic examinations are provided by specialists or scientists on other levels. Moreover, technicians usually carry out their tasks under some type of supervision.

The second level of classification is one where the individual is a criminalist first and a specialist second. That is, most of the professionals of this type are criminologists who have had training in a scientific, clinical, or disciplinary specialty. They tend to be divided into the practitioner or scientist categories (see intersecting Boxes B and C in Fig. 1) but

⁴See Footnote 3.

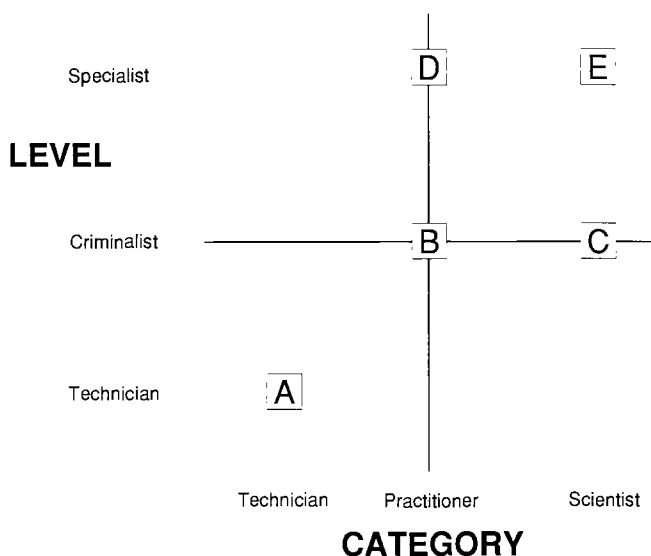


FIG. 1—A suggested two-way classification model of the levels and categories of expert witnesses. Some professionals would prefer to label the second level criminologist, but criminalist undoubtedly is the more accurate term. See text for explanation of the letter blocks.

at the secondary level of criminalist rather than that of specialist. Some of them obtain additional training (usually a doctorate) in order to achieve the higher rank of specialist. The work carried out by this group often overlaps that of the first (the technicians), especially with respect to task. Moreover, these individuals often are the product of criminal justice system programs, and, while some of them gravitate to supervisory and administrative positions, a number are investigators. The specialty areas exhibited by criminalists are many and varied. They can range from ballistics to chemistry, from toxicology to electronics, from handwriting to mechanics. Indeed, the specialties that could be included here are far too numerous to list.

Specialists populate the third level of this continuum. They are individuals who are trained first in their discipline and participate in forensic proceedings on a secondary basis. Of course, they must be well versed in the forensic application of their field and competent to interface with the judicial system. Almost any discipline, or subdiscipline, can be included here. Specialists range from chemists to acousticians, from psychiatrists to engineers, from pathologists to social scientists, and so on.

Once the three-way structuring relative to level is established, a second series, based on category, can be organized. Of course, the first group—that is, technicians—is common to both continua; it is the other two which would appear to require additional description. The second category can be labeled practitioner: this term would include many people who could be drawn from the ranks of both the criminalist and the specialist levels. As a matter of fact, most criminalists would be assigned to this category. But so, too, could many specialists, such as physicians, chemists, psychiatrists, toxicologists, and engineers (for example, see Box D in Fig. 1). The test for membership in this category is whether or not the individual in question spends the greatest portion of his or her time in *practicing* the specialty. Thus, and as probably can be deduced from the discussions about criminalists and specialists, level of education (that is, the number of degrees) is not as important here as the type of work activity being pursued. The third category in

this classification triad is that of scientist; most of them would populate the "specialist" level (See Box E in Fig. 1). Here, the person spends most of his or her time in scholarly activity (experimenting, modeling, interpreting); scientists will publish much (or most) of their work and do so especially in reviewed (scientific) journals. The individuals found in this category virtually always represent well-defined and established disciplines.

As can be seen, these two continua place experts into a category-level paradigm. The first (horizontal) classifies the individual on the basis of task or focus, the second on level of activity. Taken together, five professional levels (Boxes A through E) result, and at least a rough estimate of expected expertise can be generated by use of this model. Admittedly, the structure employed is a somewhat crude one, and the categories established focus more on activity than on level. Indeed, it can be argued that the model is incomplete. However, the issue of an expert's levels/categories is one that must be addressed at some juncture by individuals working in the judicial, forensic science, and criminal justice areas. As a matter of fact, this argument is validated by some authors who appear to be uncomfortable with the current lack of organization but who offer no relief [1,4,6,13]. Still other writers have attempted to provide some structure [21] or contrasts among the types of training [10], whereas yet others either resist attempts at ranking or detail some of the negative reactions to (or about) experts without suggesting structural improvement [4,11,14,15,22]. Thus, the scheme reviewed above is provided as a point of embarkation. Hopefully, it will lead to an even more definitive model.

Functional Conflicts

The final two issues overlap to an even greater degree than did the first three. Thus, even though two problems are represented, they will be reviewed in a single section.

Even the expert who (1) is associated with an appropriate field or discipline, (2) has adequate training, (3) exhibits appropriate experience, and (4) understands the forensic milieu, will face a number of problems when he or she agrees to be an expert witness. They range (1) from the expert's need to resist attorneys who desire opinions or testimony more supportive of their position than can be provided by the available data, to the problem of fending off panicked defendants (or their families), (2) from evaluations that prove disadvantageous to the side which has retained him or her, to the occasional insulting courtroom lawyer, and (3) from attorneys who waste the expert's time with long telephone consultations that interrupt normal work schedules, to the necessary attempts to explain complex results to individuals who do not understand the nature of the processes employed. Many of these situations or events are debilitating even to those of us who are university scientists and who find in the forensic sciences excellent practical application of our research and teaching (as well as a stimulus which motivates new research). It is for these reasons (or related ones) that many scientists and practitioners simply refuse to participate in the criminal justice system—or even in the civil courts.

Yet another important conflict of interest is added to the problems cited: it revolves around the ethical dilemma faced by the expert when approached for a combination of advice, evaluations, and expert testimony. Of course, the process of educating clients is not at issue here. As with many judges and jurors, prosecutors or defense attorneys may not have fundamental knowledge of the expert's field, and there certainly are no ethical conflicts in educating them—especially in providing them with reviews, reprints, interpretations, and reference lists. Nor should requests to carry out tests or evaluations result in conflict or discomfort. Thus, there is little concern if all that is required of the expert is to provide a simple education, evaluations of evidence, and the presentation of relevant findings in court. Rather, the cited conflicts of interest occur as a result of other, but closely related, events.

Problems begin to arise when an expert is (1) invited to “strategy sessions,” (2) asked to assist in the impeachment of experts testifying for the other side, (3) asked to sit with counsel and assist in the cross-examination of these (other) experts, and so on. Apparently, none of these consulting behaviors are considered unethical at any level of the criminal justice system, as they occur quite openly and regularly. Yet, an expert can suffer substantial discomfort as a result of these requests. Indeed, it is quite difficult to participate in a long planning period designed to assist counsel in handling an opposing expert and then take the stand with total objectivity. Also seductive are the effects of extended sessions with prosecution teams organizing evidence for important trials—or spotting a fundamental error made by a prosecution witness in the middle of a defense strategy session. Furthermore, it is just as interesting for a scientist to analyze the data resulting from a forensic analysis as it is to observe the relationships which emerge upon the completion of a laboratory experiment. As might be expected, these events can subtly affect the expert in an undesirable fashion. It must be remembered that the attorneys are the advocates and the only courtroom “combat” in which the expert can participate is to ensure that he or she is allowed to present his or her findings and opinions clearly and to avoid being unfairly impeached in any way. Of course, no violence is done to the expert’s ethics if he or she is employed either as a consultant (only) or warned ahead of time that there will be problems with the presentation of evidence. On the other hand, substantial confusion appears to exist on the part of many attorneys and judges as to the specific role experts should play. There is also disagreement among those who have very strong opinions in this regard. If members of the criminal justice and judicial systems are this perplexed, imagine the experts’ discomfort. Some of them respond to the problem by challenging the ethics involved in the process (especially in those instances where they are forced to alternate their consultant and expert roles back and forth in rapid succession). Others simply withdraw. In any event, the question can be asked whether there are any solutions to these dilemmas. Unfortunately, there do not seem to be many.

One potential among the few remedies available may be the categorization of the types and levels of experts suggested above. A structuring of this type should provide some guidance as to which of the individuals considered would make the best consultant, which would be better utilized as an expert, and, finally, who could be used in both categories. The second, and perhaps most important, remedy resides in the behavior of the expert. He or she should be keenly aware of the bimodal situations that can be faced and continually monitor his or her own intent and behavior. This approach should aid the expert in being appropriately objective when on the witness stand. Third, the limits of the two cited functions should be stressed and restressed (by the expert) to the relevant attorneys and their clients. While attorneys will rarely exhibit unethical behavior, they do not always protect the expert. Clients and their families (or personnel at a particular agency) often do not understand the expert’s dual responsibilities and can attempt to pressure him into becoming an advocate. Thus, care must be taken to explain his (that is, the expert’s) proper functions and the very limited boundaries that exist relative to his contributions.

Yet another potential solution to the cited problem is to retain one individual as a consultant and yet another as the expert witness. This approach is one that can remove the consultant from contact with those behaviors that could lead to bias on the witness stand. It is a solution that has worked well in at least a few instances. Indeed, a remedy of this type has been suggested by several authors [12,16,19,22]. However, this approach will interfere with the activities of too many professionals and the cost may be prohibitive—especially when a large number of evaluations or tests are involved. Moreover, how can the expert testify about examinations he or she has not administered or supervised? Finally, a given expert could limit himself only to those consultative tasks that

result in no discomfort or ethical conflict. However, once retained, this course of action is a difficult one to pursue. Thus, while the dual role of consultant and expert witness does not contain elements that are inherently unethical, the road here can be a difficult one. If these two rather different roles are not carefully controlled, they can lead to bias and a very real ethical dilemma.

Conclusions

This paper has addressed some of the problems faced by expert witnesses when their work results in an interface with the judicial system. Many of these issues are of long standing; few have been adequately addressed. Of course, many of the cited problems are of minimal significance to those experts who are ethical, well trained, and experienced—and carry out only scientifically defensible examinations. Nevertheless, it is clear that many confusions, conflicts, and differences of opinion about them and the roles they should play can be found among members of the judiciary, the legal profession, criminal justice personnel, and the experts themselves. The problems are many, the solutions few.

Finally, it must be stressed that a vigorous structuring (or restructuring) process will have to be developed. It is not without cause that most scientists view testifying as a disagreeable activity—one in which their opinions are distorted and their reputations impugned; one in which they have little to gain (professionally) but have to face all types of conflicts of interest [19]. It is the judicial system that will suffer if attempts are not made to (1) protect the expert from the effects of advocacy, (2) develop objective validation procedures by which his or her testimony may be evaluated, and (3) establish criteria by which those witnesses who are competent can be identified. Indeed, if such efforts are not successful, all that may remain available to the courts will be the unqualified, the charlatans, and the "professional witnesses." In any case, the cited problems will not be mitigated if they continue to be ignored or disavowed.

References

- [1] Cederbaums, J. G. and Arnold, S., *Scientific and Expert Evidence in Criminal Advocacy*, Practising Law Institute, New York, NY, 1975.
- [2] Fallis, S. M., Jr., "Confronting the Expert Witness—The Prosecution Perspective," *Scientific and Expert Evidence*, E. J. Imwinkelried, Ed., Practising Law Institute, New York, NY, 1981, pp. 75–86.
- [3] Higgins, K. M. and Selavka, C. M., "Do Forensic Science Graduate Programs Fulfill the Needs of the Forensic Science Community?" *Journal of Forensic Sciences*, Vol. 33, No. 4, July 1988, pp. 1015–1021.
- [4] Imwinkelried, E. J., "Evidence Law and Tactics for the Proponents of Scientific Evidence," *Scientific and Expert Evidence*, E. J. Imwinkelried, Ed., Practising Law Institute, New York, NY, 1981, pp. 33–74.
- [5] Jenner, J. R., "Meeting Expert Testimony—The Defense Perspective," *Scientific and Expert Evidence*, E. J. Imwinkelried, Ed., Practising Law Institute, New York, NY, 1981, pp. 87–97.
- [6] Moenssens, A. A., Moses, R. E., and Inbau, F. E., *Scientific Evidence in Criminal Cases*, The Fountain Press, Inc., New York, 1973.
- [7] Rosenthal, P., "Nature of the Jury Response to the Expert Witness," *Journal of Forensic Sciences*, Vol. 28, No. 2, April 1983, pp. 528–531.
- [8] Gench, W. J., "Trial Success Linked to Meeting Expert Witnesses' Expectations," *The Expert and The Law*, M. J. Gorman, Ed., Lawrenceville, NJ, Vol. 7, 1987, pp. 5–7 (reprinted from *The National Law Journal*).
- [9] Hollien, H., "Consultant or Expert Witness? A Serious Problem for Scientists," paper presented at the 39th Annual Meeting of the American Academy of Forensic Sciences, San Diego, CA, Feb. 1987.
- [10] Siegel, J. A., "The Appropriate Educational Background for Entry Level Forensic Sciences: A Survey of Practitioners," *Journal of Forensic Sciences*, Vol. 33, No. 4, July 1988, pp. 1065–1068.

- [11] Buckout, R., "Nobody Likes a Smartass: Expert Testimony by Psychologists," *Social Action and The Law*, Vol. 3, 1976, pp. 41-53.
- [12] Hollie, H., "Problems of Ethics," paper presented at the Symposium on the Use of the Language Scientist as Expert in the Legal Setting, New York Academy of Sciences, New York, NY, April 1988.
- [13] Howard, L. B., "The Dichotomy of the Expert Witness," *Journal of Forensic Sciences*, Vol. 31, No. 1, Jan. 1986, pp. 337-341.
- [14] Imwinkelried, E. J., "Science Takes the Stand: The Growing Misuse of Expert Testimony," *The Sciences*, Nov./Dec. 1986, pp. 20-24.
- [15] Schroeder, O. C., "Ethical and Moral Dilemmas Confronting Forensic Scientists," *Journal of Forensic Sciences*, Vol. 29, No. 4, Oct. 1984, pp. 966-986.
- [16] Ahearne, J. F., "Addressing Public Concerns in Science," *Physics Today*, Vol. 41, 1988, pp. 36-42.
- [17] *Virginia Tech Foundation v. Family Group Limited*, U.S. District Court, Western District of Virginia, opinion by Hon. Jackson L. Kiser, 18 March 1987.
- [18] Undeutch, U., "Statement Reality Analysis" in *Reconstructing The Past*, A. Trankell, Ed., Kluwer, Law and Taxation Publishers, Deventer, The Netherlands, 1982.
- [19] Holden C., "Science in Court," *Science*, Vol. 243, 1989, pp. 1658-1659.
- [20] Renshaw, B. and Kaplan, C., *Computer Crime: Expert Witness Manual*, Department of Justice, Washington, DC, 1980.
- [21] Liebenson, H. A. and Wepman, J. M., *The Psychologist as a Witness*, Callaghan and Co., Mundelein, IL, 1964.
- [22] Kates, J. H. and Guttenplan, H. L., "Ethical Considerations in Forensic Science Services," *Journal of Forensic Sciences*, Vol. 28, No. 4, Oct. 1983, pp. 972-976.
- [23] Phillips, K. A., "The Nuts and Bolts of Testifying as a Forensic Scientist," *Journal of Forensic Sciences*, Vol. 22, No. 2, April 1977, pp. 457-463.
- [24] Peterson, J. L., "Teaching Ethics in a Forensic Sciences Curriculum," *Journal of Forensic Sciences*, Vol. 33, No. 4, July 1988, pp. 1081-1085.
- [25] Smith, F. P., Liu, R. H., and Lindquist, C. A., "Research Experience and Future Criminalists," *Journal of Forensic Sciences*, Vol. 33, No. 4, July 1988, pp. 1074-1080.
- [26] Cantor, B. J., "Tips for the Expert Witness," *The Expert and the Law*, M. J. Gorman, Ed., Lawrenceville, NJ, Vol. 6, 1986, pp. 5-6.
- [27] Dean, D. J., "The Presentation of Recorded Evidence," *Proceedings, Conference on Police Applications of Speech and Tape Recording Analysis*, Institute of Acoustics, London, England, pp. 49-55.
- [28] Miller, T. H., "Nonverbal Communication in Expert Testimony," *Journal of Forensic Sciences*, Vol. 28, No. 2, April 1983, pp. 523-527.
- [29] Tanton, R. L., "Jury Preconceptions and Their Effect on Expert Scientific Testimony," *Journal of Forensic Sciences*, Vol. 24, No. 3, July 1979, pp. 681-691.

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