INTRODUCTION

In our system of law, lay juries, not scientists or experts, are asked to evaluate the often highly technical and scientific evidence presented at trial. But are lay juries, in our scientific age, actually competent to understand such complex issues? From my perspective as a medical expert with over twenty years of experience, an average juror, with the help of a competently informed trial attorney, is often able to understand complex scientific, medical, or technical issues. Our system of justice, however, relies on the trial attorney to ensure that lay juries process the highly technical evidence admitted in order to resolve complex issues raised at trial.¹

Consequently, the trial attorney must find ways to explain this technical evidence so that lay juries can process it intelligently when rendering a verdict. As a general matter, attorneys turn to experts when attempting to explain certain complex issues to a jury. Thus expert testimony becomes extremely important, for an average juror, when left to his or her own resources and faced with inadequately explained complex issues, will often be unable to understand those issues and will be forced to render a verdict based on less relevant or even irrelevant factors. The


My article should be read critically in conjunction with the landmark case of Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579 (1993). There, the Supreme Court replaced the standard promulgated in Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923), which held that only scientific evidence that was "generally accepted" could be admitted as evidence at trial. Id. at 1014. In Daubert, however, the Supreme Court rejected that standard for a new "reliability" and "relevancy" standard. There, the Court held that scientific evidence must now meet two requirements before it can be admitted in federal court. First, the evidence must be shown to be "scientifically valid," i.e., reliable. Second, the evidence must "fit" at least one issue in the case, i.e., be relevant to the take at hand. Daubert, 509 U.S. at 591-95.
This essay provides a practical guide to help the trial attorney adequately prepare and present expert testimony to a jury. Part I of this article describes the importance of the jury selection process vis-à-vis expert witnesses. Part II describes the limitations imposed upon juries, which a good expert can help overcome. Finally, part III describes, in detail, how the expert can help the trial attorney, and hence the jury, understand complex scientific issues.

I. THE JURY SELECTION PROCESS

Jury selection is an important precursor to jury comprehension. Though a full discussion is beyond the scope of this article, two jury selection criteria deserve a brief mention. First, a juror should be selected based on language proficiency. If jurors are to have a good opportunity to understand complex issues, they must of course be fluent in English. As a practical matter, jurors who do not easily comprehend English are not likely to understand lengthy discourses of complex issues and should therefore be excluded from such cases, perhaps during the voir dire process. Second, jury selection should take into account the juror's educational background. In a technical civil trial, jurors will be exposed to scholarly material and expert testimony. Thus those selected should demonstrate at least average intelligence. Prior study in any discipline certainly makes for a juror who can better appreciate the process of communicating complex theories.

II. THE HANDICAPPED JURY

Jury members are somewhat handicapped, even when complex issues are not involved, because (i) they are involuntarily confined, (ii) they have no control over the proceedings, (iii) their auditory learning capability is limited, and (iv) the evidence presented to them is subject to certain constraints. We will consider each handicap in turn.

A. IN VOLUNTARILY CAPTIVITY AND SERVITUDE

Involuntarily captivity and servitude, accompanied by limited and variable motivation, tends to result in boredom, impatience, and resentment. While some jurors look forward to jury duty for a variety of reasons, many others are repulsed by the prospect, perceiving it as an unfortunate, unpleasant, and often uncomfortable burden which deprives them of their normal income and removes them from their customary environment. To complicate matters, juries are often subjected to long
delays, drawn-out technical discussions, and repetitious legal monologues by trial lawyers.²

B. PASSIVITY AND LACK OF CONTROL

Jurors are forced to listen to the proceeding of the trial for a duration over which they lack control. They are forced to sit quietly and to listen attentively regardless of fatigue, boredom, or personal concerns. The jury members cannot choose what they are going to hear nor can they choose the pace, order, or the detail of the presentation of evidence. This tends to disrupt the jury’s attention span and perhaps even nullifies the evidentiary impact of the evidence presented. It is the trial attorney’s duty, with the aid of an expert, to present complex scientific issues in a manner that maximizes the jury’s attention span and minimizes the side effects associated with passivity, else the issues will be that much more difficult to understand.

C. AUDITORY LEARNING RATHER THAN VISUAL

Modern humans in Western societies learn primarily through the visual sense by reading books and articles, by watching television, and by looking at computer terminals. The average person’s ability to assimilate knowledge through pure listening is relatively limited in quantity and duration. Yet that is how a jury is expected to learn about the issues of a case at trial. For this reason, exhibits which involve visual stimulation are invaluable tools in helping the jury understand complex scientific issues.

D. LIMITED INFORMATION

The jurors are not privy to conferences at the bar and are not included in behind-the-scenes negotiations. They are not free to peruse, review, and study documents and evidence as the trial progresses. Furthermore, they are usually prohibited from taking notes. During the trial, they usually are enjoined or inhibited from raising questions and discussing the case. They cannot freely ask for repetition or an explanation of an ambiguous point. The expert and the attorney should work in a manner that minimizes any possibility of such unanswered questions or ambiguous points. As explained below, the expert can identify gaps in the evidence and can plan effective exhibits. These tools are invaluable in ameliorating any harmful effects associated with the jury’s inability to interact with the expert witness.

² While many judges see to it that trials progress at an expeditious and efficient pace, many others normally proceed at an intermittent, irregular, and painfully slow pace, thereby, forcing jurors to wait idly long intervals. Not infrequently, the jury’s time and patience is abused as trials drag on for unnecessarily long periods of time.
To better conceptualize the foregoing, contrast the condition of the jury to that of the trial attorney who has the benefits of in-depth study and tutored preparation, often over an extended period of time, and often with repetitive review and expert consultation. The moral is that the trial lawyer and the expert both must be careful not to confuse their understanding of scientific and technical issues with the jury’s understanding and must try to somehow circumvent the jury’s many handicaps. The following section addresses possible solutions to the foregoing problems.

III. STRATEGIC ROLES OF THE EXPERT IN HELPING THE TRIAL ATTORNEY

An expert witness can be of great help to the trial attorney in facilitating jury comprehension of complex issues. The expert is usually cast in the role of expert witness testifying at trial. An expert, however, can provide at least two additional valuable contributions to the trial attorney in complex cases. Three strategic areas in which an expert witness can help the trial attorney ensure the jury’s understanding of complex technical or scientific issues are: (A) indicating missing evidence; (B) helping the attorney understand the evidence fully and prepare for trial; (C) tutoring the jury.

A. INDICATING MISSING EVIDENCE

If all relevant evidence is not discovered, the jury will be disadvantaged and frequently will be inhibited from comprehending the issues of a case. The trial attorney must see to it that a complete and thorough investigation to assemble all relevant evidence is undertaken.

Missing or incomplete evidence may become evident only when the trial attorney has fully analyzed the available evidence and understands the underlying issues. This more often than not requires early consultation with a competent expert. Unfortunately, in many cases an expert is retained and consulted at the eleventh hour, just prior to trial, when it is inconvenient to perform further investigation for missing evidence. This,

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3 The Federal Rules of Evidence define the scope of the expert’s testimony as follows: “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.” FED. R. EVID. 702. In Daubert, the Court reiterated this point when it found that “Rule 702 further requires that the evidence or testimony ‘assist the trier of fact to understand the evidence or to determine a fact in issue.’ This condition goes primarily to relevance. ‘Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful.’” 509 U.S. at 591 (quoting 3 WEINSTEIN & BERGER §702(2), at 702-18).

The Court in Daubert also stated that the “[p]roposed testimony must be supported by appropriate validation—i.e., ‘good grounds,’ based on what is known. In short, the requirement that an expert’s testimony pertain to ‘scientific knowledge’ establishes a standard of evidentiary reliability.” ld. at 590; see also infra text accompanying note 6.
of course, can be a significant shortcoming for the attorney’s case since opposing counsel can capitalize upon that evidentiary gap. The better policy would be to undertake a thorough consultation with an expert at an early stage in the proceedings. This process usually uncovers new evidence that ultimately proves to be helpful, even critical, to the jury’s understanding of the complex issues of a case. This newly discovered evidence can change the complexion of a case dramatically and makes for an informed jury, hence an educated verdict.

B. Tutoring and Preparing the Trial Attorney

It is crucial that the attorney understand the issues properly. There is no substitution for a thorough and detailed analysis of the issues by the attorney. If the trial attorney does not understand the complex issues involved in a case, there is little chance that they can be explained to a jury, even with the help of an expert. Such a situation gives opposing counsel an advantage, assuming they understand the expert’s theories, as they can then cross-examine the expert in such a manner as to undermine his scientific theories. The knowledgeable expert can, of course, respond to said questioning such as to vitiate the appearance of impropriety, but the skilled trial attorney will nonetheless capitalize on the potential ambiguity by using various trial tactics, such as simple yes/no questioning. The uninformed or otherwise unprepared trial attorney will have little chance of succeeding on re-direct.

Unfortunately, some trial attorneys erroneously assume that a lay jury will not understand pertinent complex issues under any circumstances and that, in any event, the jury will decide the case based on issues they can easily grasp and on collateral factors such as sympathy and personality of the witnesses. Such a trial attorney may feel that a convincing, carefully crafted, and emotional opening and summation will be sufficient to convince an average jury. This assumption is often erroneous and may serve as an excuse to avoid the proper preparation necessary to fully understand the issues and to subsequently see that the jury understands them. As explained above, the jury should be selected of average intelligence and should ideally be able to understand complex theories if properly explained. Furthermore, as explained in the preceding paragraph, opposing counsel may understand the complex issues thereby exposing, on cross-examination, potential flaws in the expert’s testimony. If the jury can be swayed by a carefully crafted and emotional opening, they can certainly be swayed by the appearance of impropriety a skilled trial attorney can create.

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1. **One On One Tutoring**

The expert's one to one tutoring of the attorney may supplement or even replace textbook reading. Scientific textbooks and technical literature are often structured differently than law texts and are written in a relatively alien language. Attorneys and lay persons alike may therefore encounter difficulties in finding the one text or treatise that is relatively clear and comprehensive. Moreover, even with good source material at hand, it is often time-consuming to study and analyze the various lengthy articles and texts. Consultation and analysis of the issues through an interactive question and answer session with the expert is the proper alternative which is often more effective than independent research and study. A competent expert can answer questions immediately, clarify ambiguous points, create diagrams on the spot, and suggest ideas for trial exhibits. If the attorney does not understand a concept, the expert can be pressed for immediate explanation. The expert may point out particularly important concepts and ensure that the attorney grasps them, thereby exposing misunderstandings or oversights.

2. **References**

An expert can be an excellent guide to scientific publications such as textbooks, journal articles, guidelines promulgated by professional associations, and reports of governmental agencies. Moreover, computer research of on-line medical databases, many of which are freely available on the Internet, may yield promising and up-to-date results. An effective computerized search often requires using several alternative variations of technical words as search criteria which may be familiar only to an expert.

3. **Referral to Other Experts**

An expert may refer the attorney to other qualified experts who have appropriate expertise in different areas. As in any learned profession, scientists and doctors often specialize in different fields and the attorney should hire the scientist with the appropriate level of expertise in a particular field. Furthermore, it is often the case that multiple experts are hired because of their varying skills in non-scientific areas such as tutoring and testifying. One expert can be retained to help prepare the case and a different expert may be retained to give expert testimony at deposition and trial. This assures that the knowledgeable expert prone to the pitfalls of cross-examination will not be unduly exploited.

4. **The Expert as a Listener**

There is a great tendency to underestimate the importance of the expert's role as a sympathetic critical listener. The trial attorney often
needs adequate time to explain to the expert the particulars of the case. It is essential that the expert understand the facts of the case and reveal to the attorney any potential loopholes from a technical and scientific perspective. This process can be invaluable to the attorney who is preparing for trial, serving as a test of the attorney's understanding of the case and of the soundness of the theories of that side.

C. Tutoring the Jury

As discussed above, when complex issues must be explained to a jury, the trial attorney must obtain the help of a competent expert or experts. The expert's role vis-à-vis the jury will take place during direct and cross-examination.

1. Qualities of an Expert for Trial Testimony

a. Real Expertise

A weighty list of publications simply does not guarantee real practical expertise and experience in a field. In particular, expertise with respect to the specific issues that are involved in the case is essential. The expert's actual knowledge and experience is considerably more important than paper qualifications. The trial attorney can determine true expertise by interviewing the expert at length with respect to the specific issues which require expert assistance.6

b. Honesty

Honesty is invaluable for an expert who testifies at trial. A dishonest expert may, of course, provide misleading information. Members of a jury may or may not fully understand expert testimony but they do have practical life experience in gauging honesty, or lack thereof. Dishonesty will be probed and may be uncovered by opposing counsel on cross-examination. If the jury finds the expert less than fully honest, the expert's testimony is likely to be tainted and the side that introduced the expert's testimony stands to lose valuable credibility.

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6 In Daubert, the Supreme Court summarized that "the [Federal] Rules of Evidence—especially Rule 702—do assign to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands." 509 U.S. at 597 (emphasis added). In other words, the Court concluded that Rule 702 itself imposes the requirement that scientific evidence be shown to constitute "scientific knowledge." 509 U.S. at 590. To constitute "scientific knowledge," the Court said that the evidence must be (1) "scientifically valid," (2) must be "derived by the scientific method," (3) must be "good science," (4) must "rest on a reliable foundation." Id.; see also supra text accompanying note 1.
c. Sufficient Time

The expert should be willing to carefully review and fully analyze all the relevant evidence. In cases which involve compendious records and deposition testimony, an expert may have to spend myriad hours analyzing the data. The subsequent explanation, discussion, and answering of questions with the trial attorney can take many more hours of conferences. Although the expert is by hypothesis skilled in his craft, he must nonetheless have a firm understanding of the particulars of the case in order to properly analyze and apply the science. Furthermore, as in any discipline, various scientific theories are subject to ambiguities which may or may not have been subsequently resolved and published in scholarly journals. Consequently, the expert usually must conduct lengthy independent research to fit the scientific theories to the facts of the case and to be informed of the latest technological or scientific breakthroughs.

d. Effective Communication

The expert should be able to explain the issues clearly and in simple terms first to the trial attorney and then again to the jury at trial. Early one-on-one tutoring of the trial attorney by the expert provides an opportunity for the attorney to gauge the expert's characteristics such as his ability to teach a lay person in understandable terms, his ability to see the big picture yet understand the details, the validity of his assumptions, and his ability to effectively communicate a simple foundation for the concepts presented. This process can be invaluable in deciding whether to hire the particular expert, and in deciding what questions to ask, the length of the expert's testimony, and what exhibits should be utilized.

e. Appearance and Personality

The expert should have a credible appearance as well as a likable and enthusiastic personality. If the jurors are apathetic to the expert or alienated by the expert's appearance or behavior on the witness stand, then they may not be receptive to the expert's testimony, may not pay attention, or may attach insufficient credibility to the expert's testimony. Furthermore, because expert testimony may have an emotional as well as cognitive impact, the potential emotional effect on the jurors should be taken into account when accessing the expert's personality and appearance. In sum, for the expert's testimony to achieve maximum effect, not only must the jury understand it and believe it to be true, but they must also be motivated by it.
2. **Finding an Appropriate Analogy**

A well chosen analogy is of paramount importance. The trial attorney must try to find an appropriate analogy which will best serve as a vehicle for explaining the complex theories. The characteristics of a good analogy vary according to the jury’s intelligence, education, and background. The expert and the attorney should therefore analyze the jury’s background and communicate the science in accordance with that background. There is no bright-line rule for achieving this and the analogy is indeed likely to vary along with the jury composition. An expert with ample experience testifying, as well as an experienced trial attorney, are probably best suited to find such an analogy.

3. **Planning Exhibits**

The trial attorney should plan and assemble appropriate exhibits that involve technical or scientific material and should do so with the help of the expert. Carefully selected and prepared exhibits are a powerful tool in helping the jury understand complex issues at trial. Effective exhibits help explain complex issues and often make a strong impression on jurors because they involve additional sensory stimulation, usually visual, and they organize and present information in a new and convincing way. They are a refreshing new evidentiary tool which break the otherwise monotonous nature of oral witness testimony.

Well prepared and optimally effective exhibits may serve several other crucial functions such as entertaining the jury and maintaining their attention. Exhibits also enhance the jury’s perception of the expert as an interested and sympathetic teacher who is worth listening to. The expert’s actions, such as stepping down from the witness stand and drawing upon a black board, stimulates and entertains the jury thereby increasing their attention span and therefore their understanding of the issues.

Exhibits may consist of actual evidence, blow-ups of documentary evidence, specimens, diagrams, graphs, drawings, photographs, video presentations, and computer generated video or cd presentations. Consideration must be given to size, color, detail, perspective, and medium of communication in the case of diagrammatic exhibits. A poorly conceived or poorly designed exhibit can confuse and even alienate the jury, making the jury members emotionally un receptive to the information presented.

Simple exhibits are often effective in making a point. A common mistake is to make an exhibit excessively complicated. Experts often

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present excess information, include myriad labels, and introduce excessively detailed exhibits. A line drawing of an anatomical cross-section in black and white, drawn on an easel in front of the jury, can indeed be more effective than a professionally prepared, full color, and three-dimensional perspective illustration of the same anatomy.

4. Direct Examination

The trial attorney must not confuse his or her comprehension of the issues, particularly of complex issues, with that of the jury. The jury is usually without advance preparation, without references, and without tutoring. Furthermore, the jury members usually vary in motivation and background. The lawyer must carefully plan and perform direct examination which adequately addresses complex issues. He must do so in simple steps in order to be effective. Effective use of exhibits and analogies can be helpful, especially in eliminating the monotony and resulting disinterest caused by the other aspects of the trial. The trial attorney must decide what evidence to present and how to explain the significance of the evidence to the jury through effective direct examination.

5. Cross-Examination

Effective cross-examination of the expert is often essential to jury comprehension. Cross-examination helps the jury make a fair decision by testing the expert’s qualifications, expertise, character, impartiality, quality, and memory. Opposing counsel will of course attempt to undermine the expert’s theories, yet in the process he will provide the expert with a forum to clarify otherwise ambiguous points and to emphasize the soundness of the latter’s theories. An effective cross examination session whereby the expert adequately and convincingly answers the questions posed strengthens the expert’s case because the jury will undoubtedly assume that if opposing counsel cannot counter the theories posed, then those theories must stand on solid ground. Conversely, if opposing counsel manages to solicit answers favorable to its side then cross-examination will effectively undermine the expert’s theories. In short, cross-examination is a powerful trial tactic and is probably the best method to uncover the “truth,” be it a scientific “truth” or otherwise.

EXAMPLE - CASE STUDY

The importance of a competent expert in achieving the three strategic goals of jury comprehension (identifying missing evidence, tutoring

8 See MAUET, supra note 7, at 71-150.
9 See LEONARD E. DAVIES, ANATOMY OF CROSS-EXAMINATION xxxi (1993) (“Cross-examination is the single most important weapon in determining the truth at trial.”).
the attorney, and tutoring the jury) is illustrated by the following hypothetical personal injury case example.

A fifty-two year old Israeli folk singer was standing at the back of a van parked at Kennedy Airport and was leaning into the luggage compartment while unpacking a soft duffel bag. The automatic transmission of a car parked eighteen inches behind the van was accidentally switched from park to neutral. The parking brake was off and the car slowly rolled toward the van, pinning the folk singer's left lower leg between the two bumpers. He cried out in surprise and pain and bumped his forehead on the soft duffel bag.

The injured folk singer was expeditiously examined at the Kennedy Airport emergency room. No symptoms were given and no signs documented of head or eye injury. Soft tissue injury of the leg was treated. Two months later, the injured folk singer complained of slight blurred vision in his left eye and consulted an ophthalmologist in New York City who diagnosed "a traumatic tear of the retinal pigment epithelium" in her records and in a written report. Over the next six months the injured folk singer lost more vision in his left eye until he had a laser treatment of the retina by a retinal surgeon in Israel, who indicated in a report that the treated condition was a result of the airport trauma. Three months following the laser treatment, the injured folk singer consulted a prominent New York City professor of ophthalmology who also indicated, in his contemporaneous records and in a written report, that the left eye had sustained a severe permanent loss of vision which was the "traumatic" result of the airport accident.

Damages were claimed for a left leg contusion and hairline fracture and for permanent legal blindness in the left eye. The defense attorney was confronted at this point with a case in which liability was conceded, in which the three treating doctors had issued reports attesting to a causal relationship, and in which damages included permanent severe permanent loss of vision of the left eye. The plaintiff demanded compensation for the blind left eye in addition to compensation for injury to the left leg. Strong consideration was given to settlement at this point by the defense, but first the defense attorney obtained an independent medical examination by a competent impartial expert.

The expert ophthalmologist retained by the defense performed a physical examination which confirmed permanent legal blindness in the left eye from retinal scarring. The expert was also retained to review the available medical records and determined: (1) the records of the treating retinal surgeon were missing. Only a report was available for review; (2) photographs of the retina which were taken two months after the accident by the initial treating ophthalmologist who diagnosed "a traumatic retinal pigment epithelial tear" were missing and not available for review; (3)
The interval of two months between the accident and the first visual symptoms made a causal relationship doubtful; (4) The plaintiff had sustained trivial trauma to the forehead and no trauma to the eye; (5) Retinal pigment epithelial tears are almost always the result of degenerative disease and only very rarely the result of direct severe ocular trauma. This was confirmed by a review of the medical literature.

The expert concluded that causal relationship of the retinal damage to the auto accident was not present and recommended further investigation for the missing evidence, the missing medical records, and retinal photographs. A settlement was deferred and an investigation ensued which resulted in the following findings: (1) The plaintiff admitted at examination before trial that he had consulted the treating retinal surgeon in Israel months before the accident; (2) The records of the treating retinal surgeon prior to the accident were "lost"; (3) Only the records of the treating retinal surgeon covering the period of time following the accident were available for review. These records made no notation of a history of trauma nor of any diagnosis of a traumatic condition. Only reference to degenerative disease was noted; (4) The retinal photographs taken two months after the accident did not show a retinal pigment epithelial tear but did show bilateral degenerative disease of the retina in both eyes.

As the case proceeded towards trial, the defense attorney was tutored by the expert with respect to the anatomy, physiology, and pathophysiology of the retina, and the retinal pigment epithelium. The analogy of the eye to a camera was discussed and selected. Simple line drawings with black felt tip pen were planned to demonstrate the anatomy of the retina and the retinal pigment epithelium. Blow ups of the actual retinal photographs taken two months after the accident were prepared as exhibits and used to demonstrate to the jury at trial the degenerative changes in the retinal pigment epithelium of both eyes and the absence of a retinal pigment epithelial tear. A clear plastic overlay over the retinal photographic blow-up of the left eye was used by the expert to demonstrate with a felt tip pen drawing what a retinal pigment epithelial tear would have looked like had it been present.

The trial went to a jury verdict. The jury found liability and awarded $20,000 for the leg injury and nothing for the blind left eye which was not found to be causally related to the accident. This case illustrates the importance of intensive trial preparation by the trial attorney and the three strategic ways that an expert can help the attorney achieve the goal of jury comprehension: (1) detecting missing evidence; (2) tutoring the attorney; (3) tutoring the jury.
CONCLUSION

Jury comprehension of complex issues is in large part the responsibility of the trial attorney. Adequate preparation by the trial attorney with a qualified expert should precede the presentation of any complex scientific issue. The expert can be of great assistance in at least three strategic areas: (i) identifying missing or incomplete evidence, (ii) tutoring the trial attorney so that the trial attorney fully understands all the issues, and (iii) tutoring the jury. Furthermore, complex issues require thorough investigation and careful preparation. Only through such preparation, as well as appropriate consultation with an expert or experts, will the trial attorney be likely to succeed in explaining complex issues to a jury.