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GRAPHICS FOR DAMAGES PRESENTATIONS: PUTTING THE POW INTO OW

LEGAL CONSIDERATIONS REGARDING ADMISSIBILITY OF COMPUTER GENERATED EVIDENCE

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I. INTRODUCTION

For the past two decades technological advances in computers and other telecommunication devices have continued to cause many changes in our society and in the workplace. That technology has steadily worked its way into the courtroom, for better or for worse.[1] Computer generated evidence ("CGE") such as graphics and animations illustrating building collapses, toxic spills, and transportation accidents is being used with increasing frequency.[2] This paper will focus on legal considerations related to what has become common in almost every construction case: the admissibility of CGE.

"Putting The Pow Into Ow" will include three vignettes centered on a common fact pattern, the intent being to use different presentation techniques to illustrate the damages arising from the point of view of owner, general contractor, and an affected subcontractor. In our hypothetical, an owner hires a general contractor to construct a 15-story commercial building that the owner intends to lease out as office space. The construction schedule calls for completion within 16 months of notice to proceed. At the outset of construction, the general contractor encounters numerous construction defect issues associated with honeycombed concrete. This results in a significant critical path delay to the project. Once this initial concrete issue is overcome, the project proceeds upward until the contractor discovers significant conflicts involving HVAC duct work, electrical conduit, and plumbing that the contractor alleges arises from poorly coordinated design documents. The contractor takes the position that these poorly coordinated drawings result in significant conflicts to ensuing trades, including electrical, HVAC, and plumbing, causing significant delay and inefficiencies due to stacking of trades and

multiple mobilizations. In the end, the project is delivered 60 days behind schedule, resulting in claims by the owner, general contractor, and subcontractors for economic damages arising from their competing positions as to the delay.

Owner's Economic Damages

The first vignette will utilize presentation boards with acetate overlays to illustrate and describe the owner's position as to damages. Under the hypothetical fact pattern, the contract at issue does not contain a waiver of consequential damages clause and the owner is free to pursue all consequential damages arising from the alleged 60 day delay which the owner attributes entirely to the general contractor. This vignette will focus on damages only and will not attempt to engage in discussions of schedule analysis. The owner's damages will include carrying costs on loans, costs to temporarily house tenants with signed leases that must now be accommodated, and lost revenue arising from the delay.

General Contractor's Economic Damages

This vignette will make use of an interactive computer presentation to illustrate via photographs, supporting documents, and expert opinion the contractor's position that the 60 day delay is attributable to the poorly coordinated drawings and will illustrate the general contractor's economic damages arising from same.

Subcontractor's Damages

This vignette will focus on a subcontractor's damage claim arising from the poorly coordinated plans. In this vignette, the HVAC subcontractor claims that it suffered damages arising from inefficiencies created by the poorly coordinated damages. We intend to present these damages through the use of an IPad and a litigation app known as Trial Pad™. This particular app allows the user to interact with witnesses and to display graphics in a manner that is similar to a traditional computer projector set-up, with the added benefit of the IPad's unique features and touch screen.

II. ISSUES INHERENT IN ADMISSIBILITY

When considering the admissibility of CGE, one must distinguish between computer animation, computer simulation and other forms of computer generated evidence. At its most basic level, computer generated evidence may be a simple two-dimensional chart or drawing based upon information otherwise admissible during trial. In that sense, the computer generated evidence is nothing more than a fancy chart or diagram that could otherwise be drawn on a chalkboard.[3] Computer simulation involves the use of a program that applies mathematical formulas and other scientific principles such as physics, to calculate or mathematically model an event.[4] One typical use of computer simulations is by accident reconstructionists to determine speed at impact and other information relevant to an automobile accident. Computer simulations do not necessarily include graphics. Computer animation, on the other hand, is a series of computer generated images intended to depict a sequence of events in motion. For example, the 15-story commercial building in the hypothetical could be the subject of an animation to illustrate the 60 day delay. Such an animation would consist of a compilation of information derived from construction schedules, drawings, field notes, witness interviews, and other sources

of information which is then manipulated by a computer animator to create an animation of a building being constructed. The issue facing the litigator offering or opposing such evidence is that computer animations do not fit neatly into the existing categories of evidence. That is, animations are typically a combination of demonstrative, scientific and opinion evidence. The same can be said of computer generated graphics.

A. Demonstrative versus Substantive Evidence

Demonstrative evidence is defined as "physical evidence that one can see and inspect (i.e., an explanatory aid, such as a chart, map, and some computer simulations) and that, while of probative value and usually offered to clarify testimony, does not play a direct part in the incident in question."[5] Therefore, when computer generated graphics are used merely to illustrate and explain testimony of lay or expert witnesses to the fact finder, they are demonstrative evidence. When that evidence happens to be a computer generated animation and is offered as proof of a material fact in dispute, such as the recreation of a historical event, then they become substantive evidence.[6] As substantive evidence, recreations, for example, must be shown to be "substantially similar" to the event illustrated.[7] Under the federal rules of evidence, and most state rules of evidence, demonstrative evidence is subjected to a lower level of scrutiny than substantive evidence.[8] The admissibility of such evidence generally requires only that the demonstrative evidence fairly and accurately reflect the underlying oral testimony and that it will aid the jury's understanding of the facts.[9] As a result of the lower threshold required to admit demonstrative evidence, hearsay, opinions, and even scientific evidence may reach the jury through a computer generated graphic or animation without explanation or challenge.

B. Standard of Review on Appellate Level

One inherent problem in opposing the use of CGE is the standard of review on appeal. Evidentiary findings at the trial level are typically reviewed under an abuse of discretion standard. Therefore, even if one believes that a trial judge has erroneously admitted computer generated graphics or animations, it is difficult at best to reverse that decision on appeal. This is particularly true if the CGE was introduced as demonstrative evidence. Further, an appellate court's review is limited to the description of the evidence contained in the record on appeal. Therefore, it is difficult to convince an appellate court to supplant the ruling of a trial judge who is typically better situated to consider the objections to the CGE as presented.[10] Thus, if opposing the use of CGE at trial, it is of utmost importance that the trial lawyer opposing computer animation be prepared to fully explain and succinctly demonstrate to the trial judge why the animation should not be admitted.

III. OBJECTIONS

As with all evidence, computer generated graphics are subject to the basic requirements of foundation, authenticity, and relevancy. However, because of the unique nature of computer generated evidence, the process of backing up objections or proffers on the various grounds available may pose a significant challenge.

A. Foundation

Whether computer generated evidence is introduced as demonstrative or substantive, certain foundational requirements must be met. Ideally, the proponent of the computer-general evidence should be required to establish the following:

1. Accuracy and reliability of the original data, including formulas, and assumptions used;

2. The accuracy of the source data input;

3. The reliability and capability of computer hardware used in the animation;

4. Reliability of the process or software used to produce the computer graphics;

5. Reliability of the method used to produce the animation in court (e.g. putting the graphics in motion);

6. The accuracy and reliability of the final computer generated evidence.[11]

Whether a trial court is willing to consider all of the criteria listed above may depend on the purpose for which the CGE is to be admitted. If the trial court views the CGE as demonstrative evidence, the review of foundational requirements may be limited to the accuracy and reliability of the original data inputted into a computer along with an expert witness's testimony that the CGE produced fairly and accurately depicts the expert's opinion and would assist the expert in explaining the opinion to the jury.[12] The scope and level of inquiry by the court into the foundation of the animation is likely to be higher if the opponent successfully argues that the animation should be treated as substantive evidence and subjected to the more stringent admissibility standards that apply.

Assuming that the trial court is willing to fully inquire into the six foundational requirements set forth above, the opponent of the evidence faces the challenge of finding a flaw. Although the proponent of the evidence should have the burden to lay a proper foundation, as a practical matter, the burden will be on the opponent to be able to dissect the computer generated evidence and break it down to its most basic elements. Therefore, if opposing CGE, one should be prepared to review each step of the computer generated evidence process and will likely need its own expert to assist in the evaluation of same.

The first step in attacking the foundation is to obtain copies of the data and other supporting documentation from which the computer generated evidence was generated. This

would necessarily include disclosure of the hardware and software used to produce the computer generated evidence. There may be substantial resistance to the opponent's attempt to discover all of the underlying information. There may be legitimate arguments that the proponent of the evidence can make under the attorney work product doctrine, or under the applicable rules of civil procedure pertaining to disclosure of expert opinion. Consideration of the potential ramifications of the work product doctrine or other privilege arguments as they relate to the underlying information used to produce a computer animation is beyond the scope of this paper.

In the process of obtaining the underlying information used to create the computer generated evidence, one should be sure to cover all of the foundational areas discussed above. The party opposing the computer generated evidence will need to know the type of software used and may even need a copy of the source program that generated the software. It is nice to think that the old reliable "garbage in = garbage out" argument would be all one needs to consider. However, assuming that computer hardware and software is infallible and will generate accurate results as long as the input data is accurate is potentially flawed thinking. What goes on inside the computer is as important to the animation as the data that is fed into it.

Once the underlying information is produced, it should be reviewed by the opponent's CGE expert, if one has been retained. If dealing with animation, other experts familiar with the scientific principles that may be used in the animation should be consulted to determine if the scientific theories used in the animation are appropriate. Further, consideration should be given to deposing the computer animation expert and others involved in the preparation of the animation. It may seem unnecessary to go through all the steps outlined above, but one must consider the fact that the proponent of the evidence will be prepared at a motion *in limine* hearing to have its computer animation expert and other witnesses present an explanation of the

animation that will demonstrate the accuracy of the underlying information and the infallibility of the programs used to create the animation of CGE. Unless the opponent does the requisite homework required to challenge the animation at each separate layer in the process, the challenge may be shortlived.

B. Authentication

Another foundational requirement to consider is the authentication of the animation or computer generated evidence. Under the federal rules, Rule 901(a) provides that authentication "is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims." Fed R. Evid. 901(a). Authentication is a foundational requirement that applies whether the evidence used is for demonstrative or substantive purposes. Rule 901 further provides "by way of illustration only, and not by way of limitation, the following are examples of authentication or identification conforming with the requirements of this rule: . . . evidence describing a process or system used to produce a result in showing that the process or system produces an accurate result." Fed R. Evid. 901(b)(9). Because a computer animation consists of a process or system used to put otherwise static two-dimensional images into motion, the proponent of the animation should be required to address the accuracy and reliability of the process. This would necessarily require the proponent to bear the burden of establishing the reliability and accuracy of the computer hardware and software used to produce the animation as well as establishing that the final result produced is accurate.

Challenging the foundational aspects of a computer animation or CGE can prove to be a daunting task. One must look beyond the source data and consider each layer of the creation process in attacking the foundation. Although scrutinizing the facts and data inputted to create an animation or other CGE is a likely place to start an attack on admissibility, the "garbage in =

garbage out" argument may not be enough and may only scratch the surface of potential foundational deficiencies. Just as lawyers have traditionally educated themselves in areas of law with which they were unfamiliar in order to adequately represent a client, lawyers faced with CGE must consider whether they should seek to learn as much as possible about the underlying computer hardware and software programs used to create the animations they are trying to oppose. Some writers have suggested that it may be an ethical violation for a lawyer to fail to understand the workings of computer programs on the ground that the attorney is not competently representing the client.[13]

C. Hearsay

If CGE is offered as substantive evidence, one potential objection is that the animation itself is hearsay. Under the federal rules, hearsay is defined as "a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted." Fed. R. Evid. 801(a). Unless the computer generated evidence is admitted as demonstrative evidence used to illustrate an expert's opinion, or is admitted as scientific evidence, then a legitimate argument may be raised that the animation itself is hearsay. It would be difficult to argue, for example, that an animation proffered as substantive evidence that a 15-story building took 18 months to construct "as built" instead of the original 16 months scheduled "as planned" because of design flaws and owner interference is admitted for something other than the "truth of the matter asserted" in the animation. Thus, the animation must meet an exception to the hearsay rule. The catch-all exception of FRE Rule 803(24) appears to be the only enumerated exception to the hearsay rule which could encompass a computer animation offered as substantive evidence at trial. This catch-all exception, found in both Rules 803(24) and 804(b)(5) provides an exception to the hearsay rule for statements having:

> Equivalent circumstantial guarantees of trustworthiness, if the court determines that (A) the statement is offered as evidence of a material fact; (B) the statement is more probative on the point for which it is offered than any other evidence which the proponent can procure through reasonable effort; and (C) the general purposes of these rules and the interests of justice will best be served by admission of the statement into evidence.

As related to computer animation, the requirements of the catchall exception dovetail into the foundational requirements previously discussed. That is, an attack on the reliability of the animation mitigates against the "trustworthiness" of the animation and its admissibility as substantive evidence under the catch-all exception to the hearsay rule.

Although a hearsay objection may be available, one must remember that computer animations and computer generated evidence are typically admitted alongside the testimony of a witness, usually an expert. As a result, the animation may be classified as demonstrative thus avoiding the application of the hearsay rule entirely. Further, the evidence could be classified as scientific or opinion evidence which also would bypass the hearsay rule.[14]

D. Scientific Evidence: Application of Frye and Daubert

If the computer animation or computer generated evidence is offered as substantive evidence,[15] accompanied by expert testimony, the party opposing its admission should consider the application and possible objections to the evidence under *Frye*[16] and/or *Daubert.*[17] A full discussion of the application of either standard to the admissibility of computer generated evidence is beyond the scope of this paper.

IV. PREJUDICIAL IMPACT (FRE 403)

Under the federal rules of evidence and most state rules of evidence, relevant evidence otherwise admissible as demonstrative or opinion evidence may nonetheless be excluded if the prejudicial effect of the evidence outweighs its probative value.[18] Computer generated evidence potentially provides fertile ground for making an effective argument under Rule 403 to exclude the evidence as being unfairly prejudicial and/or misleading to the jury. Computer animations are a unique form of evidence. Unlike two dimensional charts or diagrams the final computer animation is the result of a multi-step process and much of the information going into the creation of the animation may never be seen by the jury. This raises the potential of misuse of computer animations to confuse and otherwise psychologically impact a jury.

Various studies have demonstrated that an individual's capacity to retain information increases dramatically if information is presented in a visual rather than oral form. The retention is increased even further if the information is conveyed both orally and visually. Further, dynamic visual evidence creates more jury impact and retention than static visual evidence such as charts or diagrams.[19] Other factors such as the use of color, angles, and music may also unfairly impact the jury.[20] As a result, a lawyer opposing the use of CGE should consider raising the issue of unfair prejudice to defeat admissibility. Likewise, the proponent of such CGE should take steps to limit unfair prejudice.

A. Impact of Misinformation on Jury

The ultimate argument made under Rule 403 is that the CGE itself is unfairly prejudicial or otherwise confuses the jury. The greater impact of visual evidence over oral testimony assists in that argument. However, merely because the CGE is a powerful visual form of evidence that may be very persuasive is not nearly sufficient to avoid admissibility under Rule 403. Litigators

do not use evidence unless it is persuasive and in some way prejudicial to the other side. The point to focus on is the impact of assumptions, speculation, and inaccuracies upon which the CGE is based which, if shown to the jury, even with instructions or clarification, would unduly prejudice or confuse the jury. CGE should be intended to assist the jury in understanding the proponent's case. CGE should not be allowed to mislead or confuse the jury to the detriment of the party opposing the evidence.

As previously discussed, studies have shown that visual testimony accompanied by oral testimony greatly enhances a juror's retention. Computer animation is a superior form of visual evidence to static two-dimensional visual evidence. One potential problem with computer animation is that jurors may make assumptions beyond the information purportedly depicted on the animation. *See, Chatterjee* at 43, fn. 35 and 36. The assumptions made beyond the information actually depicted on the animation are called "incidental learning". *Id*. at fn 36, citing Lloyd P. Rieber, ANIMATION, INCIDENTAL LEARNING AND CONTINUING MOTIVATION, 83 J. EDUC. PSYCH. 318, 326 (1991). According to studies, subjects who reviewed computer animation not only recalled the information conveyed by the animation, but also made assumptions beyond the information conveyed in the animation itself.[21] The incidental information conveyed, if inaccurate, can prove to be confusing and misleading to the jury.

Depending upon the scrutiny given to the animation by the court, *e.g.*, admitting it as demonstrative evidence under the traditionally lower admissibility threshold or requiring the animation to pass substantive evidence standards, the animation could reach the jury in an unfettered manner. Studies have shown that animations have a greater persuasive effect on a jury than static visual evidence.[22] The studies have also shown that computer animation is more likely

to be accepted as fact than static diagrams.[23] This may be related to a general perception that computers are infallible devices that produce extremely accurate results.

B. Prejudice to Party Not Using The Animation

Another area to consider in making a Rule 403 argument is the prejudice of CGE on the party not using CGE in its presentation. At least one study indicates:

> If there is any juror prejudice relating to the use of advanced graphics, it appears directed against the party which does not use them. A number of cases where advanced graphics were used by one side, at post-trial interviews the jury praised the use of video exhibits and . . . criticized the other side for not presenting similar materials.[24]

The fact that one side uses CGE and the other side does not should not, by itself, warrant the exclusion of the computer generated evidence. Although there may be a potential for a jury to hold the non-use of computer generated evidence against a party, there should be other reasons for the Rule 403 argument. If there is sufficient potential prejudice because of underlying inaccuracies or other obvious visual effects contained in the CGE itself, then pointing out to the court that the non-use of CGE could be viewed adversely by the jury may assist the court in making an overall decision regarding the prejudicial impact.

V. CONCLUSION

CGE in the courtroom is a reality. Its use in construction litigation is routine. CGE can be and often is a combination of demonstrative, scientific, and opinion evidence. Both the proponent and the opponent of CGE should be prepared to address fundamental issues such as relevancy, foundation, and authentication when addressing concerns about admissibility. Various writers have suggested that uniform standards be adopted by the courts and applied to computer animations.[25] However, until standard rules regarding admissibility are adopted, lawyers dealing with CGE are largely on their own when it comes to identifying flaws and

convincing a judge that such evidence should be excluded. Even the apparent safe harbor of demonstrative evidence is no guarantee of admissibility if the proponent of such evidence fails to safeguard against flaws that could lead to a successful objection.

In the end, "[l]awyers will still need to make good arguments, and cannot rely on a snazzy computer display to turn a flawed argument into a winning one. If you feed a garbage argument into a computer, the output, even if three dimensioned and in bright color, will still be garbage."[26]

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[1] *See e.g.*, James W. Dabney, ANIMATION IS INVADING COURTROOMS, NEW YORK LAW JOURNAL, April 6, 1993, at 4. Clearly, courts and litigants across the country have taken to heart the advice of the New York Court in *People v. McHugh*, 124 Misc. 2d 559,476 N.Y.S. 2d 721, 722 (1984), "A computer is not a gimmick and the court should not be shy about its use when proper .... when the results are useful they should be accepted, when confusing, they should be rejected." Consequently, courtrooms "of the future" are already in use with integrated audio visual systems including large screens and facilities for the use of computers on the bench as well as counsel tables.

[2] *See*, Roy Krieger, SOPHISTICATED COLMPUTER GRAPHICS COME OF AGE – AND EVIDENCE WILL NEVER BE THE SAME, ABA JOURNAL, December 1992, at 92.

[3] This is the position taken in one of the first reported cases that considered the admission of computer generated evidence. *See, People v. McHugh*, 476 N.Y. S.2d 721 (N.Y. Sup. Ct. Bronx Cty. 1984) [where the court ruled that "the evidence sought to be introduced here is more akin to a chart or diagram than a scientific device. Whether a diagram is hand drawn or mechanically drawn by means of a computer is of no importance."]

[4] David W. Muir, DEBUNKING THE MYTHS ABOUT COMPUTER ANIMATION, 444 PLI/LIT 591 (1992).

[5] Definition of demonstrative evidence, BLACK'S LAW DICTIONARY 596 (8th Ed. 2004).

[6] N. Chatterjee, ADMITTING COMPUTER ANIMATIONS: MORE CAUTION AND A NEW APPROACH ARE NEEDED, 62 Def. Couns. J. 36, 38 (1995).

[7] *Di Rosario v. Havens*, 242 Cal. Rptr. 423 (1987).

[8] The lower scrutiny applied to demonstrative evidence has been described as follows:

> A lesser showing is needed to introduce computer generated evidence such as charts, diagrams and simulations that are offered as demonstrative evidence. Because this type of evidence lacks independent probative value, generally all that is required is a demonstration that the evidence is fair and accurate. In short, demonstrative evidence avoids hearsay problems because it is not offered for its truth. Demonstrative evidence can be used independently or in connection with the testimony of an expert witness. Facts or data relied on by experts need not

> otherwise be admissible into evidence if the information is "of a type reasonably relied upon by experts in the particular field." Fed. R. Evid. 703.

David Siegel and Brian Pass, HIGH TECHNOLOGY AT TRIAL: USE IT OR LOSE IT, PLI Order H4-5138, mode 444PLI/LIT 605 (1992).

[9]*See, e.g.*, MCCORMICK'S HANDBOOK ON THE LAW OF EVIDENCE, §212 (2nd Ed. 1972); *Rullo v. General Motors Com.*, 543 A.2d 279, 283 (Conn. 1988) [holding that "the ultimate consideration in determining the admissibility is whether the demonstration evidence will fairly assist the jury in understanding the factual issues placed before them."]

[10]*See, e.g., Strock v. Southern Farm Bureau Cas. Ins. Co.*, 998 F.2d 101 (4th Cir. 1993), where the Fourth Circuit, in an unpublished opinion, upheld a South Carolina District Court trial judge's admission of a computer animation as demonstrative evidence stating:

> This court chooses to rely on the sound discretion of trial judges who are in the best position to consider the relevancy of offered evidence and to weigh its probative value against its potential prejudicial effect. Further, a trial judge's decision concerning the admissibility of evidence will not be reversed without a showing that the judge abused his or her discretion.

The issue in *Strock* was the plaintiff's use of a computer animated videotape simulation at trial. The plaintiff's home was damaged severely by Hurricane Hugo and the plaintiff's insurance policy covered damage caused by wind but excluded damage caused by water. The insurance company contended that the vast majority of the damage was caused by flood and was therefore excluded from coverage. The plaintiff retained a computer expert who animated an engineering drawing to demonstrate the plaintiff's version that wind, rather than flood, caused the damage. Over the defendant's objections, the trial judge admitted the videotape of the computer animation for demonstrative purposes. On appeal, the defendant argued that the court should adopt an admissibility standard for computer animations similar to the standard used in the Fourth Circuit for videotape demonstrations and require the computer animation to "be substantially similar" to the actual events it purported to depict. The Fourth Circuit declined to create a "rigid standard for the admissibility of computer animated videotape simulations." Instead, the court relied upon the sound discretion of trial judges "who are in the best position to consider the relevancy of offered evidence and to weigh its probative value against its potential prejudicial effect."

[11] *See, e.g.,* Muir at 602, Carol E. Powell, COMPUTER GENERATED VISUAL EVIDENCE: DOES DAUBERT MAKE A DIFFERENCE?, 12 Ga. St. U. L. Rev. 577 (1996); David Weinberg, ANIMATION IN THE COURT: SCIENTIFIC EVIDENCE OR MICKEY MOUSE?, 34 No. 2 Judges' J. 11 (1995).

[12]In a case of first impression, a Florida District Court of Appeals established a fairly simple standard for admissibility of computer animation intended as a demonstrative aid to expert testimony. *Pierce v. State*, 671 So. 2d 186 (Fla. 4th DCA 1996). First, the proponent must establish the foundation requirements necessary to introduce the expert opinion itself. Then, the proponent must establish that the facts or data on which the expert relied in forming the opinion expressed by the computer animation are of a type reasonably relied upon by experts in the subject area. *Id*. at 190. (Obviously, an opponent of the evidence will want to cross-examine the expert as to the reasonableness of the expert's reliance on the facts and data.) Secondly, the

proponent must prove that the animation is a fair and accurate depiction of that which it purports to be. *Id.* at 190. On this point, the opponent could raise a Rule 403 objection as to the possibly prejudicial and misleading effect of the animation, as is discussed *infra*.

[13] *See*, I. Neel Chatterjee, ADMITTING COMPUTER ANIMIATIONS: MORE CAUTION AND NEW APPROACH ARE NEEDED, 62 Def. Couns. J. 36, fn 30 (1996).

[14] Under FRE Rule 703 facts or data relied upon by an expert in forming an opinion need not be admissible in evidence provided that the facts or data are "of a type reasonably relied upon by experts in the particular field." FED. R. EVID. 703. Thus, if the animation is used to reflect the opinion of an expert, the underlying information used to create the animation need not itself be admissible. However, an attack on the foundational aspects of the underlying information should still be available. Further, if the underlying information is scientific in nature, an objection under *Frye* or *Daubert* (discussed *infra*) would seem to be available, although such an objection would more likely be addressed to the admissibility of the expert opinion itself, rather than just the animation.

[15] If the animation is offered only as a demonstrative aid to illustrate and explain expert testimony to the face finder, then it is not subject to a *Frye* or *Daubert* analysis. *See, e.g., Pierce v. State, supra*, at fn. 16.

[16] *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

[17] *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 113 S.Ct. 2786 (1993).

[18] FRE Rule 403 provides: "Although relevant, evidence may be excluded if its probative value is substantially overweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury." Fed. R. Evid. 403.

[19]The Wechsler Memory Scale measured immediate recall of logical material orally presented to test subjects. The subjects were asked to recall a passage that contained 24 separate segments of logical information. The information relayed to the test subjects involved the robbery of a woman. According to the logical memory section of the scale, the average subject immediately recalled approximately nine of the 24 information segments. That is, the subjects failed to recall approximately two-thirds of the information orally presented. The Weiss-McGrath Report, which evaluated a juror's retention of information presented in different ways and at different times, showed that the retention level three days after observing the information doubled when the information was conveyed visually rather than orally. The report also demonstrated that the retention level after three days increased six and one-half times when the information was conveyed both orally and visually as opposed to merely orally. *See*, Carol E. Powell, COMPUTER Generated Visual Evidence: Does Daubert Make A Difference?, 12 Ga. St. U. L. Rev. 577, fn 14, 15, and 16 (1996).

[20] *See, Chatterjee* at 44; *Wilson v. Piper Aircraft Co.*, 577 P. 2d 1322, 1331 (Or. 1978) [motion picture declared inadmissible because of use of dramatic music.]

[21] *See, Chatterjee* at fn 35 and 36, citing numerous studies relating to the psychological impact on incidental learning from computer animations.

[22] *See*, Wesley C. King, M. Marie Dent, and Edward W. Miles, THE PERSUASIVE EFFECT OF GRAPHICS IN COMPUTER MEDIATED COMMUNICATIONS, 7 COMP. IN HUM. BEHAV. 269 (1991).

[23] *Id.*

[24] *See*, Selbak at 361, citing Bruce G. Vanyo, COMMUNICATING WITH 'POST LITERATE' JURY ADVANCED GRAPHIC EXHIBITS IN PATENT TRIALS, PLI Order No. G4-3892, mode 349 PLI/PAT 409 (1992).
[25] *See* fn 16, *supra*; Vicki S. Menard, ADMISSION OF COMPUTER GENERATED VISUAL EVIDENCE: SHOULD THERE BE CLEAR STANDARDS?, 6 Soltware L. J. 325 (1993).
[26] Mario Borelli, THE COMPUTER AS ADVOCATE: AN APPROACH TO COMPUTER-GENERATED DISPLAYS IN THE COURTROOM, 71 Ind.L. J. 439, 455 (1996).