THE ROAD TO THE VIRTUAL COURTROOM?
A Consideration of Today's – and Tomorrow's – High Tech Courtrooms

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A Consideration of Today's - and Tomorrow's - High Technology Courtrooms [(1)]

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Abstract

The rapid adoption of courtroom technology is changing the nature of both litigation and adjudication. We are potentially on the road to a virtual courtroom, an adjudication in which none of the participants need be in the same place and which could result in the demise of the courtroom as we know it. This article reviews the nature of the burgeoning courtroom technology revolution, posits some of the critical legal, human, and policy questions that accompany it, and ponders the desirability of a "virtual courtroom."

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As trial reconvenes, the participants blink into existence on the computer monitors that supply the only commonality applicable to them. Judge, counsel, parties, witnesses, and jury appear in virtual form on each person's monitor. Necessary evidentiary foundations are laid by witnesses with distant counsel's questions; documentary evidence is not seen by the jury until received by the court. A real-time, multi-media record (transcript with digital audio, video, and evidence) is available instantly. Sidebar conferences are accomplished simply by switching the jury out of circuit. During the interim, the jurors can head for their kitchens or for restroom breaks. The public can follow the proceedings on the Internet. Should critical interlocutory motions be argued, the appellate court can directly monitor the proceedings.

Or

Having decided to fight his traffic ticket, Mark Calvin schedules his court appearance with the court's automated, World Wide Web docketing system. As the scheduled time approaches, he realizes that he won't make it to the local shopping center computer kiosk, so he uses his boss's office computer and joins the virtual courtroom. Judge and traffic officer appear in windows; each is in a different location. The officer and Calvin present their versions of events, illustrating any points with free hand sketches captured by their attached cameras. The judge rules.

I. Introduction

We are living in a technological age that is increasingly dependent upon computers and related information technology. Although still scarcely more than fledgling steps, commerce is increasingly Web-based,[(3)] political discussions occur in cyberspace,[(4)] and matters of acute national interest such as Independent Counsel Starr's report are released first via the Internet.[(5)] Although prime time media remains television based, the major networks, most notably CNN, have significant web presences. The nation is sufficiently computer dependent that the Year 2000 bug suffices for some to see the end of civilization.

At the same time, the legal system is changing. Most of the nation's lawyers, judges, legal administrators, and support personnel have long ago adopted word processing, electronic legal research, time and billing programs and, increasingly, varying forms of case management software. Electronic filing, already in use in a number of courts, is a topic of discussion in numerous jurisdictions. In Los Angeles and Indianapolis, motorists can pay their traffic fines by dialing in to Internet sites and providing credit card information.[(6)] Some California offenders can go to traffic school on-line.[(7)] There is even a virtual law firm.[(8)]

Yet, until recently, technology largely sidestepped the courtroom. Such technology as was present usually came in the form of ad hoc, case-specific hardware that was brought into the courtroom for use in a single case and was later removed. Although ad hoc

technology use is still common, albeit even frequent, the current trend is toward integrated high technology courtrooms. Depending upon definition, as of April 1998, the Courtroom 21 Project had verified eight qualifying state facilities and approximately thirty-two federal ones. More have come on line since then.

The advent of high technology courtrooms and, in Australia, investigatory hearing rooms,[9] has raised the question of "virtual trials." If we assume, as we shall later in this article, that a "virtual trial" is a trial in which all the participants and all "information," (i.e., evidence, opening statements, closing arguments, and, in jury trials, instructions) are conveyed in real-time electronically to each other as appropriate, a virtual trial, and the virtual courtroom necessary to support it, are still somewhere in the future. Yet, if by "virtual" one means that significant portions of the evidence, including remote witness testimony, is conveyed electronically, such trials and courtrooms are in fact already here.

The common characteristic of all high technology courtrooms is the capability to present evidence electronically, which can be transmitted to anywhere in the world. Further, an increasing number of courtrooms include the capability for remote, two-way testimony via video- conferencing.[10] Indeed as of April, 1998, the Administrative Office of the United States Court reported that at least thirty-four federal district courts, encompassing sixty separate locations, are or will soon be equipped for video-conferencing.[11] At least twenty-nine states use or authorize videoconferencing for various proceedings,[12] and a few have implemented remote, forensic expert laboratory testimony.[13] Even appellate courts are using videoconferencing. The United States Courts of Appeals for the Second, Tenth, and District of Columbia Circuits use videoconferencing for oral arguments,[14] and in *United States v. Salazar*,[15] the United States Court of Appeals for the Armed Forces heard a case in the Courtroom 21 Project's McGlothlin Courtroom with two of the court's five judges appearing via videoconferencing from different states.

Given that judges, counsel, and witnesses need not be in the same location[16], the possibility of trials in which no physical commonality is present is obvious -- and real.[17] Today's technology is such that we are unintentionally on the road to at least the capability for, if not the actuality of, virtual trials and virtual courtrooms.[18] Whether the result is a desirable destination, an unfortunate detour, or a one-way trip to disaster is far from clear. What *is* clear is that we are on our way.

This article reviews the technology that is pointing us in the direction of virtual trials and courtrooms and then ponders the legal, human, and policy questions raised by that possibility. The article is informed by the experience and views of a number of technologically pioneering jurists and court administrators, who were interviewed in preparation for writing it, as well as the insights gathered by the Courtroom 21 Project staff over a six-year period. The article also includes the tentative conclusions of the first Courtroom 21 International Working Conference on Technology Augmented Litigation. As has been oft expressed in the Courtroom 21 Project, this article assumes that technology should be only a means to an end and not an end unto itself. The question then is not what we can do with the technological options available to us, but rather for what purposes may we wish to use technology.

We will address initially the current courtroom technologies that provide the foundation for virtual courtrooms, pause to review the lessons of today's integrated high

technology courtrooms, and then move to a consideration of what may be tomorrow's virtual courtrooms.

II. First, the "Paradigm"

High technology courtrooms and technology augmented litigation are reflections of the understood, but rarely voiced, nature of legal practice. Legal practice, especially litigation and adjudication, is a highly sophisticated form of information management.

> The courtroom is a place of adjudication, but it is also an information hub. Outside information is assembled, sorted, and brought into the courtroom for presentation. Once presented, various theories of interpretation are argued to the fact finder who then analyzes the data according to prescribed rules (determined by the judge through research, analysis, and interpretation), and determines a verdict and result. That result, often with collateral consequences, is then transmitted throughout the legal system as necessary. The courtroom is thus the center of a complex system of information exchange and management.[19]

Ultimately, it is the fact that lawyers and judges deal continuously with "data" that impels high technology courtrooms and which makes virtual courtrooms possible.

III. The Foundation for the Virtual Courtroom: Today's Developing Technologies

A. Case Management, Electronic Filing and Related Information

The courtroom does not exist in a vacuum. The cases that are tried in the courtroom begin with the filing of pleadings, often continue with motions and supporting documents, and only finally arrive in the courtroom complete with often copious evidence.

Modern case management requires systems that help courthouse personnel manage the flow of cases. Cases must be kept current and case information must be routed to a variety of critical administrative personnel and judges.[20] Managing the case effectively requires managing the information that gives rise to the case. In traditional terms that requires storing and routing the originals and copies of what can be huge amounts of paper, especially in a major urban courthouse. If only to achieve the largest money and time economies possible, one can expect court administrators to seek more efficient control over paper by reducing it to electronic data. This gives rise to electronic filing.

In its most basic form, electronic filing, now being experimented with around the nation,[21] either permits or requires that pleadings be sent electronically to the court. Pragmatically, a good system will also provide for the dispatch of copies to all other necessary parties.[22] Although electronic mail easily permits the simple communication of information it is entirely inadequate from a systemic point of view. From the court's perspective, efficiency requires that case name, parties, attorneys, and other data be supplied to the court in an identifiable manner that permits the court to capture that specific information for case management purposes. At the same time, current court rules require that the legal documents themselves be submitted in highly specific formats. Appellate rules, for example, may mandate fonts, type sizes and set page limits. One can

assume that nearly all material written by lawyers is produced using computers. Unfortunately, each software package is unique, and none of the available options can be converted perfectly into another's format. Accordingly, any electronic filing system must accommodate the differing formats. Even if this is done successfully, one must then cope with two critical complications: some documents that must be filed were not produced using a computer and must therefore be converted into an electronic image, and pro se litigants cannot be expected to file personally by computer.

In reality, the electronic filing situation is more complicated. Not all lawyers use computers, and a perfect electronic filing system must either require the largest degree of such filings possible, by coercing the lawyers to participate electronically, or cope adequately with what could be a significant amount of paper. Once electronic information measures are implemented, the likely court solution is to take any paper that is traditionally filed and have the court turn it into electronic data. Members of the public without electronic access must then be assisted by court staff when they wish to take advantage of their right to public access to the filed materials.

The collateral consequences of electronic case management, filing, and related systems are of great potential importance. Scheduling a hearing, for example, will require resort to one or more calendars. The judge's calendar will be critical, but if the judge isn't assigned permanently to a given courtroom, a courthouse calendar will be required as well. At the same time, efficient scheduling should involve access to all other hearings involving the same counsel.[23] At the very least, these needs impel judicial access to more sources of scheduling information, and such access should be available from both chambers and the bench. When electronic filing is implemented as well, calendaring information is augmented by the actual pleading and associated legal documents, all in electronic format. Once this information is available and electronically accessible there is little or no reason to limit it to court personnel. Trials are open to the public, and the status of filed cases, including scheduled public hearings, are matters of public and media interest. Further, the *content* of filings can be of enormous interest to other parties and the public. This is especially true of litigation involving many parties such as the breast implant and tobacco cases. Once the basic information is available, absent special circumstances such as sealed filings, there is little reason not to make it generally available, and the World Wide Web has provided a simple mechanism for doing so.[24] The immediate, world-wide, electronic access to fundamental scheduling information, accompanied by the images of the actual documents, creates a virtual clerk's office, and more. For example, Delaware's Chancery Court is going online. By the end of the year, lawyers, judges and consumers should be able to dial up the business court's Internet Web site to get copies of lawsuits, briefs, and settlement documents.[25] Should the judge respond to pleadings with electronic court orders without in-person hearings, a virtual pretrial court session exists as well.

The currently evolving virtual clerk's office clearly permits faster, more efficient, and cheaper operation. Physical storage costs can be almost entirely eliminated and transmission and notification times are nullified by electronics. At the same time, public access becomes truly meaningful, largely for the first time. Unfortunately, these improvements come at some cost. Technology adoption and training expenses are significant, especially if the number of computer illiterate court *and* bar personnel is substantial. Once embarked on the technological roller coaster, the court will almost

certainly find itself faced with questions of periodic upgrading of both software and hardware, and the risk of having one or more of its systems "orphaned" as the cut-throat world of technology competition eliminates companies. Compatibility may be a major problem, not only among different systems -- will lawyers have to deal with different filing systems for each court -- but also within the court if later upgrades prove to be incompatible with prior versions of the software. The impact on the public is far from trivial as well. Although those people who have access to computers, the Internet, and computer skills will have immediate access to what is taking place in their courts, those without such advantages will be dependant on the clerk's staff, which is, ironically, the present situation. [(26)] One other result will occur, however -- a sharp change in the effective privacy of court documents and court information.

The general public has always had legal access to court records dealing with title to real property. Any interested person can check the status of any parcel of real estate, including any associated liens. As a practical matter, however, this right has been of little value to most. Even if they were aware of the fact that such records exist and are public, they lack the knowledge of how to find specific records. Few would bother to ask the clerk's assistance without special reason.

Electronic data has changed the situation, however. Some years ago LEXIS began to carry such records as part of its database. It took only seconds for me to obtain a description of a friend's house on the other side of the United States, along with a property tax valuation; I even discovered other real estate owned by my friend of which I was unaware. Similarly, at least one newspaper reporter has confidentially reported to me the ability to access court database information of allegations that members of the public had committed highly disagreeable offenses. Before electronic records were made, this information existed but was effectively impossible to search. Now, not only do you not need to travel to the courthouse, Internet searches can retrieve the data almost immediately, and you do not need specialized legal knowledge to obtain it. Electronic court information thus makes real and important changes in the actual degree of privacy that exists in the court process, changes that diminish individual privacy. This result likely would be replicated in the event of easily accessible virtual trials.

Some years ago, Art Buchwald wrote a satirical column [(27)] in which a fictional commuter rail passenger refused to pay for a ticket because his train car was not heated or clean. The conductor summoned the police and the commuter was forced to defend himself in court. The trial was televised. The trial was brief and the commuter was acquitted of disturbing the peace. Subsequently, the commuter found that a surprisingly large number of people had viewed some or all of his case, but that few remembered the details. Instead, they all ascribed major criminal violations to him, eventually resulting in the loss of his job and an offer extended to him as an "ex con." Although today's significantly increased media coverage of trials calls into question Buchwald's tongue-in-cheek view of the impact of television and the average citizen's perception and memory, his basic premise of a change in individual privacy seems sound. Like court records, most trials are effectively private; Court TV and the other television stations and networks have limited carrying capacity. Today's easy data accessibility suggests that virtual trials which could be followed at home via Web-television or computer might replicate the colonial period in which the general public had easy access to cases and regularly attended trials, if only for entertainment.

B. Legal Briefs and Other Legal Materials

Legal research is a critical component of any lawyer's practice, and it is increasingly unthinkable that American lawyers could function successfully without access to electronic legal materials. LEXIS and Westlaw are mainstays for most lawyers. They have brought to attorneys vast and ever current libraries available originally through dial-up telephone connection and now via the Internet. Similar materials, albeit not as current, are available in CD-ROM publications. Firms such as Matthew Bender supply sophisticated electronic form books on disk that further automate legal practice.

Access to electronic legal materials has changed the nature of law practice. It has created virtual law libraries and, through on-line access, has hastened the advent of the virtual law office, one which exists wherever the lawyer may happen to be. Within the high technology courtroom, counsel and judge have immediate electronic access to nearly all legal authorities. Further, and critically, when the courtroom is properly equipped, counsel and judge may display their authorities to each other as an important adjunct to legal argument.

Given the increasingly electronic nature of legal materials, it should be no surprise that lawyers are now creating electronic, multi-media legal briefs. The famous Fish & Richardson *Yukiyo* appellate brief[(28)] was a multi-media CD-ROM brief that contained, on one disk, counsels' brief, hypertext-linked legal authorities, transcript, and evidence. The brief also included all of the necessary documents one would expect in the Appendices, along with diagrams, video clips, and part of a video deposition, with audio. Although the United States Court of Appeals for the Federal Circuit granted the opponent's motion to strike the CD-ROM in favor of a traditional presentation, the Court laid out procedures for later high technology briefs, and such have been received.[(29)] Companies such as West, Lexis, and Pubnetics, among others, now produce or assist in the productions of such briefs.

The advent of electronic legal briefs carries at least three significant implications. The first is that appellate practice may be changing. These briefs are far more comprehensive than their traditional equivalents, and, if used in an appropriately wired courtroom, they permit extraordinary electronic visual interchange of legal authority among judges and counsel.[(30)] The second implication stems from economics. Electronic appellate briefs are in part compilations of materials generated at or presented during trial. To ensure the most inexpensive preparation possible, those underlying *trial* matters, including transcript and evidence, should originate at trial as digital information so that the "data" can be reproduced quickly and cheaply in the brief. Lastly, these briefs can be filed, exchanged, and presented electronically, laying the ground work for a virtual appellate courtroom.

C. Court record

Courts of record in the United States require verbatim records of their proceedings. In general terms, courts can be divided between those which use stenographic or stenomask court reporters to generate the record and those which use some form of electronic voice recording. The record is of importance to both trial and appellate courts and to the

attorneys and parties involved. [31] Recent developments in court record technology show how quickly we are developing the infrastructure necessary to a virtual trial.

Most court reporters have been using modern technology for many years, generating computer assisted transcription. The most capable of court reporters can generate "real-time, "transcript, a contemporaneous, substantially accurate rough draft of the transcript that is made available to judge and counsel on their personal computers. Until recently, only stenographic reporters could produce such a transcript. In 1997, a Louisiana company, Audioscribe, produced the first trainable, speech recognition, real-time system which permits stenomask reporters to produce real-time transcript, albeit at a level not yet equal to better stenographic reporters. Real-time is inherently digital. Transcript results when the court reporter's key presses or voice finds a match in the computer's database; absent such a match, symbols which can later be translated are produced. Because the transcript is electronic, it can be transmitted over telephone lines or, as is increasingly done, can be published to the web for real-time viewing.

The alternative to court reporter-produced transcripts is electronic recording: audio or audio/video. Although analog tape-recorded audio is the most inexpensive recording technology, more useful digital audio is now beginning to replace the older technology. Digital audio has significant improvements over analog, including easier storage and, often, text annotations that can be used as a limited search index. [32] Like real-time, the digital nature of the audio permits transmission to remote locations, either via ISDN or other heavy bandwidth connections, or via the Web. Video records, traditionally videotaped proceedings, have generated more comprehensive electronic records because they include picture and sound; indeed electronic recording inherently supplies information to an appellate court that is not available though a traditional transcript alone. [33] However, video records have not generally been accepted as direct court transcripts in any state other than Kentucky. [34] Accordingly, when a party wishes to appeal, the video record, as is also the case with an analog or digital audio record, must be transcribed. [35]

The same technology that is used to make the court record is often used before trial for discovery purposes. Videotaped depositions have been used for many years in the courtroom either in lieu of in-court testimony or for impeachment of a witness. Combining digital audio and video with a computer-assisted transcript produces a synchronized, multi-media transcript. When such a deposition is played in court, ordinarily from a CD-ROM disk, counsel can present the audio, video and scrolling electronic text transcript. When published to the World Wide Web, the same technology provides a comprehensive real-time record. This virtual "deposition attendance" is an important marker on the road to the digital courtroom.

The same technology that permits multimedia depositions also can be used to create multi-media court records. Because digital video takes up a huge amount of electronic storage space, such a court record has not really been commercially feasible - and the Courtroom 21 Project's McGlothlin Courtroom is believed to be the only courtroom in the world that has a functioning multi-media court record system that combines audio, video, and synchronized real-time transcript. Changing technology, however, should address this in the next few years. [36] At the same time, Internet and network technology is quickly changing our expectations of data access and availability. Working with an Australian company, the Courtroom 21 Project is in the process of completing a system which combines the reporter's real-time transcript with digital audio, [37] along with all

evidence, and relevant case management and electronic filing data, thus providing an immediate, electronically disseminated record.

In the past, the availability of a comprehensive court record that includes voice inflections and body language has raised questions of how the appellate system might be affected. Traditionally, the appellate courts give deference to the evaluation of demeanor evidence by the trial court.[38] A comprehensive multi-media record necessarily forces one to ask whether appeals might become in effect de novo appeals.[39] Although the sheer number of cases alone argues against this result, it can hardly be gainsaid that it is likely that an appellate court would feel far freer in its review if it had available nearly everything that had happened below.[40] Although concern about the scope of appellate review is valid and perhaps even of increasing importance, the fact of such an electronic record also emphasizes our ability to take legal events that occur during trial and instantly record and *transmit* them. Accordingly, if all evidence can be given electronically , the core components of a virtual trial are present.

D. Evidence and Information Presentation

1. In general

Litigation is, of course, a dispute between or among parties. Resolution of that dispute requires that the parties, usually through counsel, prove necessary relevant facts and then persuade the fact finder, judge or jury that when the applicable law is applied to the facts, a verdict in their favor should result. To prove the appropriate facts, counsel present evidence. Evidence normally consists of witness testimony and actions,[41] documents, charts, photographs or other images, and physical objects. When counsel make opening statements or closing arguments they technically do not present evidence. Instead they can be viewed as presenting information to the judge and jury, information, which like evidence, consists of verbal statements often supplemented by use of documents, charts, photographs or other images, and physical objects. Perhaps the core element that characterizes technology-augmented litigation and high tech courtrooms is the use of technology to present evidence and counsel-originated information. The effect of electronically-displayed evidence can be seen in human terms in recent Australian litigation:

> Downtown at 55 King Street, two of Victoria's biggest ever civil trials are in full swing on adjoining floors of the Administrative Appeals Tribunal building, specially leased for the purpose by the Supreme Court.
>
> Both cases are engaging in documentary warfare on an epic scale, but ride the lift from one floor to another and the picture is strikingly different.
>
> On the first floor, the court is wading knee deep through the paper trial tracking the collapse of the Pyramid Building Society.
>
> The courtroom is crowded with shelves overflowing with files - 500 per party. Every time a document is mentioned there's a mad scurry as everyone looks through shelves and leafs through pages looking for the right piece of paper.
>
> Downstairs, where investors in the failed Estate Mortgage are trying to win back some of the $ 1 billion lost by the company in the eighties, the atmosphere is strangely serene for a court ploughing its way through more than 30,000 documents (pared down from the original 1.5 million).

> The room is dominated by computers, rows and rows of them. The smattering of files barely takes up a single shelf. The only sound punctuating the drone of the presenter is the occasional click of a mouse button.[42]

Technology can be installed temporarily for a specific trial or permanently in an integrated, high technology courtroom. Most technology augmented evidence and information presentation originates with document cameras, computers, and computer white boards.[43] Evidence and information can be displayed on large television screens, jury monitors, front or rear projection screens, or any combination thereof.

Although the distinction is an uneasy one, as will be seen herein, we sometimes can legitimately separate the electronic display of evidence and information from questions surrounding the use of electronic evidence per se.

> The most commonplace, and simple, way of presenting material in court via technology is to use a document camera. Often known under the name of the two most common vendors, Elmo and DOAR (Communicator), a document camera is simply a vertically mounted TV camera aimed down at a flat surface. The lawyer puts a photo, document, or object on the surface, and the camera instantly displays the image on the television(s) or monitor(s) to which it is attached. The camera has two buttons permitting easy and fast closeups. . . .
>
> A document camera is normally connected to one or more televisions by a simple cable. However, some vendors often an RF (radio frequency) add-on that permits the camera to transmit its information to a TV connected receiver without wires. This capability can be critical in convincing a judge to permit counsel to bring the equipment into the courtroom.
>
> When a person using the basic document camera wishes to point to an area or point under the camera, he or she can do so with a pointer, pen or pencil, or a finger. An electronic pointer can be added, however. A device such as a DOAR Illustrator or a "Beckler" permits the use of a light pen on a pad or on an attached computer monitor image. .. .[44]

In its simplest form the document camera converts documents and other physical images and objects into television or computer images. Through the use of a document camera coupled to appropriate display devices, counsel can display larger-than-life images immediately, increasing comprehension and sharply decreasing the time necessary to acquaint a jury with the evidence. Further, as the document camera is portable, it can be transported among courtrooms as necessary.

Although the document camera is perhaps the most basic form of electronic evidence presentation, in most respects it is symbolic of all other forms of high tech evidence display. I have elsewhere suggested that "Electronically produced evidence can be defined as that evidence which originates as digital material or which is, regardless of origin, produced in court solely as digital material."[45] If the image produced by the document camera is what is offered in evidence, rather than, for example, the paper document placed under the document camera, there is no difference between the perceived evidence and evidence that originated in digital form.[46]

2. Utility

Electronically-produced evidence that is displayed on a television or computer monitor is perceived as an electronic image. It is also amenable to electronic

transmission, storage, and, if need be, replay. Limited Courtroom 21 Project experimental work shows that jurors are highly satisfied by the electronic display of documents.[47] Indeed our experimental laboratory trials tell us that jurors want evidence to be presented visually to the greatest degree possible. Although they proclaim no preference for electronic visuals over traditional charts, photos, and the like, much of today's exhibits can best be presented electronically.

Judges who preside over high tech courtrooms invariably are proponents of the technology and claim that in addition to speeding trials, the technology provides better justice because it increases juror comprehension. Indeed, in 1998 The Judicial Conference Committee On Automation and Technology released the results of their assessment of certain technologies used in federal courts. On video evidence presentation, defined as simultaneous display of evidence to judge, jury, and court via individual monitors, 83% of judges surveyed felt the technology helped them manage court proceedings better and 90% of jurors surveyed felt that they were able to see evidence clearly, follow attorney presentations, and that the video display was an easier way to present certain evidence.[48]

Anecdotal evidence in this area point to two reasons for better comprehension on the part of jurors: 1) the use of video evidence presentation makes cases more lively and engages the jury more and, 2) display on individual monitors allows jurors to read at their own speed without embarrassment.[49] Our own experience in Courtroom 21 laboratory trials bears this out. In our surveys, jurors preferred visual presentation of evidence on individual jury monitors.

Though better comprehension by jurors is surely a benefit to attorneys, some lawyers have pointed out other benefits to using video evidence presentation systems. Time that might normally be spent sifting through evidence and deciding what will go into evidence books is saved since everything can easily be stored and organized on a CD-ROM. An attorney might also look more organized and competent to a jury when carrying a CD-ROM into court and clicking through exhibits rather than repeatedly digging through piles of paper.[50]

Anecdotal evidence from the United States and Australia also suggests that trials can be shortened by at least 25 to 25% by the use of electronically-presented evidence. Yet, efficiency is not the primary goal of our legal system -- hopefully justice is. Justice requires as accurate a result as possible.

3. A best evidence problem?

Electronic images of evidence that began as or which exist as non-digital physical evidence are ***not*** the same as the image. "Electronic visual images of original non-digital evidence nearly always differ in some particulars from the "hard-copy" originals. Current technology is such that even if a totally accurate image of the original is made or captured, the displayed image will differ in color and resolution."[51] These differences are rarely of significance, however. In most circumstances the color balance difference between the paper document and the electronic image used in court is irrelevant; the information content of the text is what is important.[52] If the electronic display of evidence does not inherently raise troubling concerns, we must ask whether the use of electronic evidence and information is itself problematic.

Electronic evidence usually consists of images of documents, most frequently electronically scanned documents, photographic or other visual images, computer produced animations, and panoramic or 360 degree photographs.[53] Audio and video recordings are also of potential value, and as previously noted, we are increasingly using media-media depositions at trial.

4. Alteration and fabrication

The most frequently raised question concerning electronic evidence is the possibility of alteration through undetectable digital skullduggery. To the best of our knowledge this is technically possible. Whether it is or should be a real concern is by no means clear.

Given sufficient funds and time we believe that the technology exists to permit at least a reasonable possibility of altered or totally fabricated electronic evidence, be it still images, digital audio, or even digital video. Much the same could be true of the possibility of fabrication of traditional evidence, however. It is not clear that the risk of seamless electronic forgery is substantially different from the risk of a document prepared by a highly skillful forger -- at least once we accept that such a thing is possible. The evidentiary system's authentication demands are relatively slight and generally are met simply by the foundational testimony of a "witness with knowledge."[54] What is supposed to suffice to save us from forgery are not evidentiary rules so much as the adversary system's ability to meet evidence with credible adverse evidence, including witness testimony.[55] What the risk of alteration does suggest is the need for early pretrial discovery and disclosure of electronic evidence.[56]

5. Unfair prejudice

Opening statements and closing arguments lend themselves to use of key pieces of evidence, often illuminated by counsel's own interpretation of their meaning. Counsel thus are likely to show evidentiary images to the judge or jury. In addition, as counsel are trying to make clear and persuasive points, counsel may wish to use computer-based presentation media, "slide shows"[57] Electronic slides permit the creative use of electronic text points, often enriched by clip art images, charts or photographs.[58] Such slides raise the possibility of intentional insertion of "visual bias," the equivalent of semantically "loading" the spoken or written message with words carefully chosen to create a specific psychological reaction. In one early Courtroom 21 Project experiment, plaintiff's counsel used a slide show that was designed to bias jurors against the defense. In a civil wrongful death case in which the plaintiff had died in a hotel fire, plaintiff's slides were set against an angry crimson backdrop and designed , among other matters, to subtly suggest a tombstone inscription. The presiding judge, Judge Roger Strand, of the United States District Court for the District of Arizona, quickly sustained the defense objection. Of greater interest, however, was the jury's reaction. When surveyed after the laboratory trial, the jury reported easy recognition of counsel's intent and a significant degree of anger at the effort.

That it is possible to slant exhibits or slides through careful use of text, fonts, colors, and images is hardly news. The law has long been concerned with evidence that is unfairly prejudicial. Whether slide shows or computer animation, the same concerns and

rules apply to electronic media as to gruesome photographs of murder victims. That the jury in our experiment also reacted adversely to counsel's intent to create bias is reassuring; such attempts may always backfire, whether high tech or not.

No one can confidently predict that electronically produced or displayed evidence will be trouble free. More accurately, the most one apparently can hope for is that no new problems will be created, just the same old problems in new guises. But, if electronic evidence and information are not especially problematic, the fact that we can present evidence usefully and successfully by electronic means unavoidably methods that evidence can be presented in a virtual courtroom.

6. Jury deliberations

Electronic marking of a video image is transitory. No record of it exists after the image is altered or erased. When the image needs to shown to a jury again or put in the appellate record, the system should be connected to a video printer and appropriate images printed as the image is changed. This suggests a greater and more troubling concern: how does the jury deal with electronic evidence during deliberations? Anecdotal reports from visitors to the Courtroom 21 Project suggest that at present when a jury wishes to review technology presented evidence, it is most often returned to the courtroom and the evidence replayed there. Sometimes, especially if the technology is straightforward, a court officer plays the evidence in the jury room. High technology courtrooms raise the troubling question of how the jury should review the full panoply of technology-dependent evidence. At present there is no adequate answer to this. Specific pieces of evidence are not troublesome, but in a case with a real-time transcript, and hundreds or thousands of images, perhaps augmented by recordings of remote testimony, the problem is acute. One component of the problem is technical: we must ensure that the jury receives only admitted evidence. The other is a combined matter of people and technology. How can we ensure that jurors can easily find and play the necessary evidence when they may be functionally illiterate, let alone computer illiterate?

Another, more substantial question, also presents itself. Jurors now have only limited access to the evidence. What would happen if they could recall and debate *all* of the evidence presented in the case? Would a verdict result? Would it take less or more time? Would deliberations be improved? There are no answers to these questions at this time, experimental work is critically needed in the area.

E. Remote Witness Testimony

Our discussion of electronically presented evidence is incomplete. Witness testimony is a critical component in most trials, and our evidentiary and information discussion did not address the presentation of live witness testimony. A virtual trial is not possible without that capability.

Video depositions have been commonplace in courts for some years [(59).] Judge McCrystal experimented in Ohio years ago with videotaping testimony and then playing the edited tapes to the jury in lieu of live testimony. [(60)] Recorded testimony lacks, however, the immediacy of live testimony and deprives us of the ability to use testimony from witnesses who are not in the courtroom. Videoconferencing supplies that capability,

and videoconferencing for remote first appearances and arraignment has become commonplace throughout the state courts.[61] Indeed, at least twenty-nine states use or authorize videoconferencing for various proceedings.[62]

Satellite-based videoconferencing supplies near perfect audio and video but is too expensive and inaccessible.[63] Current ISDN (high capacity data line) "dial-up" videoconferencing permits relatively inexpensive, two-way, high-quality remote testimony from anywhere in the world.

> As implemented in the Courtroom 21 Project's McGlothlin Courtroom, a 40 inch diagonal SONY TV/monitor has been installed immediately behind the witness stand. When remote testimony is to be taken, the participants in the courtroom see the life-size image of the remote witness The remote witness sees a multi-frame TV image of four specific portions of the courtroom, the speaker, and a comprehensive image of the entire courtroom. The witness can effectively see everything. And, of course there is two-way audio. Direct and cross-examination proceed as customary. Evidence can be displayed electronically via document cameras, computers, or faxed.[64]

Such testimony is not perfect. Short audio delays that are inherent in the technology prohibit the instant interruptions common in ordinary conversation. Although video resolution and quality are good, extremely rapid movement may not reproduce properly.[65] Notwithstanding these constraints, Courtroom 21 Project experimental use indicates that videoconferencing is highly effective. Four experiments have indicated that jurors perceive remote witnesses just as they perceive in-court witnesses, neither better nor worse. However, we lack any experimental evidence that might indicate whether remote witnesses are more or less likely to tell the truth than in-court witnesses. There are also significant problems with effective administration of the oath; absent a treaty or special statute, cross-jurisdictional perjury may not be subject to prosecution.[66] Further, transmission from commercial videoconferencing centers or business surroundings lacks the traditional judicial surroundings thought to convey the seriousness of court testimony. Notwithstanding this, remote testimony is expanding rapidly.[67] Begun primarily in Australia's federal court,[68] the Federal Rules of Civil Procedure now expressly provide for its use.

> In every trial, the testimony of witnesses shall be taken in open court, unless a federal law, these rules, the Federal Rules of Evidence, or other rules adopted by the Supreme Court provide otherwise. The court may, for good cause shown in compelling circumstances and upon appropriate safeguards, permit presentation of testimony in open court by contemporaneous transmission from a different location.[69]

Insofar as criminal cases are concerned, the United States Supreme Court has accepted, when necessary, child witness testimony via one-way video.[70] In what is almost certainly a major harbinger of the future, the Florida Supreme Court has sustained a robbery conviction based largely upon the two-way video testimony of complainants testifying from Argentina.[71] The Court decided that in order for the testimony to be received despite Sixth Amendment Confrontation Clause limits "the procedure must (1) be justified, on a case-specific finding, based on important state interests, public policies, or necessities of the case and (2) must satisfy the other three elements of confrontation--oath, cross-examination, and observation of the witness's demeanor."[72] Having decided to sustain the conviction, the Court added as a matter of policy,

> We are mindful of the possible difficulty in determining when the satellite procedure should be employed. We are also aware of the possibility that such a procedure can be abused. Therefore, we are establishing the following guidelines to aid in making this decision. The determination is not simply a mathematical calculation, based on the number of alleged public policy interests or state interests. Rather, the proper approach for determining when the satellite procedure is appropriate involves a finding similar to that of rule 3.190(j) of the Florida Rules of Criminal Procedure. Rule 3.190(j) provides the circumstances under which and the procedure by which a party can take a deposition to perpetuate testimony for those witnesses that are found to be unavailable. . . .
>
> Thus, in all future criminal cases where one of the parties makes a motion to present testimony via satellite transmission, it is incumbent upon the party bringing the motion to (1) verify or support by the affidavits of credible persons that a prospective witness resides beyond the territorial jurisdiction of the court or may be unable to attend or be prevented from attending a trial or hearing and (2) establish that the witness's testimony is material and necessary to prevent a failure of justice. Upon such a showing, the trial judge shall allow for the satellite procedure.
>
> ….
>
> However, some important caveats exist in regards to the oath, cross-examination, and observation of the witness's demeanor. First, an oath is only effective if the witness can be subjected to prosecution for perjury upon making a knowingly false statement. . . . To ensure that the possibility of perjury is not an empty threat for those witnesses that testify via satellite from outside the United States, it must be established that there exists an extradition treaty between the witness's country and the United States, and that such a treaty permits extradition for the crime of perjury. . . .
>
> We also acknowledge that possible audio and visual problems can develop with satellite transmission. It is incumbent upon the trial judge to monitor such problems and to halt the procedure if these problems threaten the reliability of the cross-examination or the observation of the witness's demeanor. [(73)]

Harrell demonstrates that in Florida the fundamental concept of remote testimony in criminal cases has been accepted. The decision of the United States Supreme Court to refuse to grant certiorari[(74)] has no precedential impact, of course. The absence of review suggests however either that the Court has no significant problem with the *Harrell* result or wishes further development of the practice and law before ruling on the procedure.

That use of this technology will increase can be seen simply by looking at the nature of current installations. The one area of substantial American use of videoconferencing has been remote first appearances or arraignments in criminal cases. [(75)] No one has made, to the best of our knowledge, an accurate inventory of the number of courts using such systems. The number of installations is, however, at least in the hundreds -- if not far greater. At the same time, the federal courts have experimented with remote appearances by incarcerated § 1983 plaintiffs. [(76)] It was only to be expected that the companies selling these systems would attempt to expand their sales via systems designed for other uses, and that is now occurring. Jefferson Audio Video, Inc., for example, has installed remote witness testimony locations from which police forensic chemists can testify. During the 1998 Australian Institute of Judicial Administration Conference in Melbourne, the State of Victoria demonstrated a two-way connection to its forensic laboratory, illustrating how a forensic chemist, in a lab setting, could testify without coming to court. At the same time, the large number of courts and jurisdictions that have invested heavily in this technology are already seeking additional uses to justify their capital investment. [(77)]

F. Remote appearances by judges, counsel, and others

The courts are using videoconferencing for far more than witness testimony. Police, for example, have sought arrest warrants by two-way television. (78) The courts have shown a greater interest, however, in remote appearances by counsel and judges, an area now developing rapidly.

The Second Circuit (79) has provided remote locations for counsel appearances. The Court first experimented with live, remote video oral argument in a case in October, 1996. The Court then formally adopted remote video oral argument in the Spring of 1997 and established video links in four locations (Albany, Mineola, and Rochester, New York and Hartford, Connecticut). The Second Circuit encompasses New York, Connecticut, and Vermont, and the Court sits in Manhattan, so the advent of remote oral argument has proved a significant benefit to attorneys who could travel all day for a ten-minute argument before the Court. (80) The circuit executive has noted that the judges and most attorneys do not feel there is an advantage to appearing in person in the Court. (81)

Victoria, Australia, has shown the ability in an emergency to bring in a substitute judge via videoconferencing from hundreds of miles away within an hour when the scheduled judge was forced from the bench by family necessity. (82) The Courtroom 21 Project hosted the United States Court of Appeals for the Armed Forces on March 15, 1996. The Court heard *United States v. Salazar* (83) in the McGlothlin Courtroom, with two of its five judges appearing by separate videoconferencing systems.

The use of technology to assist those with hearing, vision, mobility or other problems is of particular importance. Internet-based videoconferencing proved to be critical in one such case. Relying on the decisions in *Harrell, supra* and *United States v. Gigante,* (84) and taking them a step further, a New Jersey Superior Court judge granted a plaintiff's application to testify and observe the trial from his apartment via a videoconferencing link over the Internet. The plaintiff, who is paralyzed from the neck down and breathes with the aid of a respirator, stated that he was too weak to travel from Chicago to New Jersey for his medical malpractice suit against several New Jersey doctors and that the cost and time involved in enabling him to travel would be prohibitive. The judge agreed, and to allay the defense attorneys' fears that the plaintiff could be coached in his testimony, he appointed a retired judge to monitor the plaintiff in his apartment during the proceedings. In a letter accompanying the order, Judge Anthony J. Sciuto stated:

> Why should this court, or any court, fear to tread into an area of advanced technology? To permit the plaintiff to testify via Real Time Video teleconferencing will enable the plaintiff to have the benefit of viewing the trial, and testify live via the Internet where he would otherwise not be present in court due to his medical condition. . . . Permitting this plaintiff to view the trial and testify via the Internet clearly supports our Court's public policy to permit handicapped individuals access to our courts. This, in my opinion, is an essential and appropriate step for modern technology to assist in permitting all people equal access to justice. (85)

The plaintiff did testify via the Internet and the case was settled after that testimony. The same technology permits broader access by the public to trials than ever before. (86)

The assumption that lawyers might be especially reluctant to appear via video appears questionable. The Ninth Judicial Circuit of Minnesota is currently engaged in a pilot videoconferencing project. All courthouses in this large and predominately rural circuit are linked on a T-1 network, and use of videoconferencing is encouraged in civil cases

(court rules forbid the use in juvenile and criminal proceedings). Judge James R. Wilson notes that he finds videoconferencing very beneficial and would like to see the restrictions on its use lifted in his circuit. He also notes that attorneys have embraced it because it was not at all uncommon for them to travel three hundred miles for appearances. There have even been proceedings in which participants have appeared from three remote locations. Judge Wilson does point out one drawback. Some attorneys in his circuit want to appear via videoconferencing for every matter and accommodating their remote appearance in a simple matter can take more time (for setting up and shutting down equipment) than a physical appearance in court would. (87)

Remote appearances and testimony are the key elements in "virtual trials" and "virtual courtrooms." That we are likely to proceed further in these directions might also be extrapolated from the Florida Supreme Court's decision in *Harrell*:

> Our Court is mindful of the importance of today's decision. Yet, we are also mindful that our society, and indeed the world, is in the midst of the Information Age. Computers are the norm in American households and businesses; an infinite amount of information is available at our fingertips through the Internet; and satellite technology allows us to travel the world without ever leaving our living rooms.
>
> The legal profession has also benefitted from these technological innovations. Legal research that once took hours or days is now available in seconds through computer and Internet databases. Clients can reach their attorneys anywhere in the world through the use of cellular and video innovations. The list goes on and on.
>
> Indeed, our very own Court takes pride in the recent technological advancements that have been made. Oral arguments before the Court are broadcast live via satellite throughout the state. These same arguments can be viewed online, along with the parties' briefs. The Florida Supreme Court Website has received worldwide acclaim for opening up the courthouse doors to the general public. All of these steps provide greater access to the judicial system, which in turn increases public trust and awareness.
>
> That being said, it becomes quite clear that the courtrooms of this state cannot sit idly by, in a cocoon of yesteryear, while society and technology race towards the next millennium. Fortunately, the courtrooms of this state have not been idle, nor are they speeding at a reckless pace. Recent changes in the courtroom have included the use of audiotape stenographers as well as video transmission of first appearances, arraignments, and appellate oral arguments, just to name a few.
>
> We recognize that there are generally costs associated with change. Nevertheless, technological changes in the courtroom cannot come at the expense of the basic individual rights and freedoms secured by our constitutions. We are confident that the procedure approved today, when properly administered, will advance both the access to and the efficiency of the justice system, without compromising the expectation of the safeguards that are secured to criminal defendants.
>
> Our nation's Constitution is a living document that has stood the test of time and change. This point is exemplified by the fact that our Constitution is still viable today--some two hundred-plus years after our country's birth. There was no way the founders of this nation could have foreseen the innovations that would take place throughout our country's lifetime--changes that, up to this point, have included advances in communication, electricity, train, airplane, and automobile transportation, and even space exploration. Nor can we predict today the changes yet to come. But we can say with certainty that our Constitution, as well as this great nation, can endure any future changes while at the same time ensuring that individual rights and liberties will be upheld. (88)

IV. The Integrated High Technology Courtroom

A. Introduction and Definition

Thus far, we have reviewed many of the courtroom technologies that already are taking hold in our legal system. The whole is at least the sum of its parts, and sometimes the whole is different, and perhaps even greater. Accordingly, we now turn to what happens when these disparate technologies are brought together in today's integrated high technology courtrooms.

All true high technology courtrooms are characterized by one core capability, a multi-faceted, technology-based evidence presentation system. Ordinarily, such a system will consist of at least a television-based document camera and a display system able to display not only what is placed under the camera but also, and critically, computer output. The computer input may stem from one or more installed desktop units, from a notebook computer supplied by counsel and connected temporarily to the display system, or a combination thereof. The display system may consist of televisions, computer monitors, or large front or rear projection systems. Usually a combination is used. An evidence display system does not alone create a true high technology courtroom, however.

The Courtroom 21 Project definition of a high technology courtroom also requires a high technology court record system and the capability for remote witness testimony by two-way, high-quality videoconferencing. In the past, the Courtroom 21 definition assumed at least significant computer-based research and information retrieval capabilities from the bench. That is now part of the Project's formal definition as well.

In short, today's high technology courtroom is the hub of a substantial amount of electronic information interchange. Although not yet a true virtual courtroom, it is apparent that key aspects of a virtual courtroom are present in the current high tech courtroom. The use and effects of the electronic information exchange that characterize even today's technology augmented courtrooms raise substantial questions, all of which would also accompany any discussion of virtual trials and virtual courtrooms.

V. Troubling Questions

Any evaluation of today's high tech facilities necessarily raise the following questions:

- Do they work?
- Do they improve the administration of justice?
- What is necessary to create and operate these facilities?
- To what extent, if at all, do they disadvantage some parties, counsel, or others?
- What are the collateral consequences of high technology litigation?
- Are technology augmented litigation and high technology courtrooms consistent with traditional humanistic goals?

These are far from unimportant matters; our future depends upon their answers. Deeply concerned about the direction that our legal systems are traveling, largely without planning, in September, 1998, the Courtroom 21 Project, with the support of the William & Mary Bill of Rights Institute and the American Bar Association Sections on Litigation

and Criminal Justice, conducted an international Working Conference on Technology Augmented Litigation. The threshold question to be considered was whether large scale technology use at trial was desirable or hurtful. Attended by judges, lawyers, administrators, support professionals, and experts in the area, the Working Conference concluded that:

- The adoption of courtroom technology was ongoing and likely unstoppable;
- Courtroom technology was desirable;
- Known problems involving electronic incompatibility of evidentiary files required resolution through creation or adoption of standards;
- It is too early in the adoption of technology to attempt to regulate its use in any thorough fashion but that liberal use of pretrial notice and disclosure is at least helpful in avoiding problems.

Upon the unanimous request of the attendees a follow-on meeting has been scheduled for March, 2000. The Working Conference's conclusions support continued use of technology, but emphasize critical questions concerning high technology courtrooms.

A. Do they work?

The technologies, and the courtrooms that use them, work and generally work well. Indeed there is an amazing amount of interest in obtaining these technological capabilities throughout the United States and much of the world. This is not to say that specific technologies or products do not sometimes present difficulties. In general, however, the technologies work. Further, although careful scientific studies are necessary to validate these conclusions, it appears clear that technology use can, and often does, improve administrative efficiency, shorten trials, and improve fact-finder comprehension of evidence. Insofar as we can tell, however, courtroom technology is not itself sufficient to overcome inadequate evidence. Indeed, we suspect that all technology does for an inadequate lawyer is make that inadequacy even plainer.

But, potential technological success is not the same as real success. Anecdotal evidence and internal experience gathered by the Courtroom 21 Project before and during the Working Conference predictably yielded the perhaps obvious, but none the less sobering, conclusion that most lawyers are disinclined to use courtroom technology. Insofar as we can tell, the high tech courtrooms that are the most successful are those in which judges have not only provided training for the lawyers, but also required that counsel use the technology on a mandatory basis. From our interviews and inquiries we conclude that successful high tech courtrooms require that their judges be enthusiasts. Bench-bar partnerships are also essential for success, but it is unclear whether they are sufficient.

We are now seeing the first law school students for whom computer use is routine and self-evident. We would have thought that such familiarity and expertise would be sufficient to result in a desire to use courtroom technology. Although that has helped, it too has not been sufficient.

Beginning with the Class of 1999, the William & Mary Law School added mandatory courtroom technology training to the Legal Skills curriculum, effectively making it a graduation requirement. As a result of small group hands-on instruction during the 1997-98 academic year, we found that the optional use of our courtroom technology during

student trials went up sharply. We initially concluded that small group hands-on instruction was the key to increased technology comfort and use. This seemed quite logical: once student lawyers overcame their lack of familiarity and possible unease and discovered how simple technology use could be, we expected, and received, sufficient quantitative improvements in use. Unfortunately, it appears that the situation is more complicated than originally presumed. Many of those same students are now taking elective Trial Advocacy during which they must try jury trials in front of a sitting federal or state judge. There is less use of the Courtroom's technology in those trials than we would have expected. It may be that the determining factor is that the faculty teaching the course seldom use the technology, [(89)] but we had anticipated greater motivation on the part of the students.

The training situation is still more complicated. At present, a number of high technology courtrooms such as that of United States District Judge Donald Walter supply counsel with orientation training. That training is understandably short and primarily oriented towards equipment operation. The Courtroom 21 Project-preferred litigator training curriculum takes about twelve hours, covers a wide range of associated topics, and integrates equipment operation into trial practice instruction. As observed by Susan Hobbs, Courtroom 21 Project Associate Director for Research & Publications, [(90)] if courts or firms suggest that more than a few minutes of hand-on training is necessary to profitably use high tech evidence presentation options, a major time and psychological barrier to such use may be erected. At the same time, supplying only a few minutes of training erroneously and misleadingly suggests that that is all that is truly necessary.

We conclude that lawyer willingness to use courtroom technology may be the determining factor in its success. [(91)] Such willingness may not remain a problem, however. Setting aside those situations in which the court mandates such use, thereby resolving the problem, increased recognition of the value of the technology for winning one's case is likely to impel its adoption by lawyers. If nothing else, the adversary system should drive adoption as counsel increasingly will be afraid that failure to use technology when one's opponent may do so is an unacceptable risk.

B. Improving the administration of justice

What "improves" the administration of justice is clearly a question of judgment. Initially, decreasing the time and cost necessary to resolve a dispute would appear to be in the interests of judgment. So too should be improvement in fact finder comprehension which should lead to improved accuracy in result. Assuming that these results do in fact flow from the use of courtroom technology, [(92)] problems may yet remain. Most civil or criminal cases are resolved by settlement. At least in the abstract it is possible that decreasing the cost and delay now inherent in adjudication in most jurisdictions could be counter-productive. On one hand, some degree of delay is probably necessary for many litigants so that they can recover from the initial emotional commitment to their ultimate goals and achieve a somewhat greater degree of detachment, permitting a more realistic case appraisal. [(93)] On the other hand, current delay and cost themselves impel settlement. If barriers to trial are lightened it may be that more cases will go to trial. This, of course, is not necessarily bad -- "Justice delayed is justice denied." If we are now discouraging

meritorious cases from trial, we should eagerly embrace increased efficiency even if it causes an increased caseload.

Technology-augmented litigation has been embraced by many trial lawyers largely because the lawyers believe that it enhances their ability to persuade juries. Although we ought to prize and encourage anything that enhances fact finding accuracy, we should be deeply concerned about any technique that increases the risk of a verdict justified more on emotion than fact. *At present* there is reason to believe that technology creates special risks of such an unacceptable result. However, further experimental work - and monitoring of real cases - in this area would be desirable.

C. What is necessary to create and operate these facilities?

Creation of high technology courtrooms requires:

- careful systems analysis, including candid evaluation of the way that trials are conducted in that court
- courtroom-specific design
- technology acquisition
- installation
- operation
- training
- maintenance.

Although adequate funding is obviously necessary, the primary expense in installing these facilities is for the actual wiring -- which can be very costly if the wiring must be retrofitted into an existing, historical facility. When properly designed, maintenance should not be significant; courtroom technology should be straightforward and unlikely to fail

Some form of maintenance is clearly necessary. Normal maintenance is likely to consist of such things as adjusting monitors and correcting altered switch settings or finding where someone has unplugged equipment. If a monitor fails, someone must be able to replace it with a spare. More sophisticated maintenance, perhaps including an outside maintenance contract, is necessary for less likely but more serious failures. (94)

Operation and training are hard to quantify. When designed pursuant to the Courtroom 21 Project's requirement of simplicity, the courtroom should be subject to operation by judge (95) or deputy clerk; no special expert should be needed. Training, however, is likely to be an ongoing necessity in the short term. That responsibility must either be transferred to the bar or institutionalized in the courthouse staff. Any installation that requires new staff should be scrutinized carefully; high technology courtrooms should decrease costs, not increase them.

D. To what extent, if at all, do they advantage or disadvantage some parties, counsel, or others?

One of the most fundamental questions raised by technology augmented technology, and high technology courtrooms in particular, is whether they potentially disadvantage key participants in the process. The threshold question is whether the cost of equipment, and the case-specific preparation that requires office access to technology, effectively

prohibits small firms, solo practitioners, and pro se litigants from technology use. Courtroom technology potentially includes not only inexpensive straightforward methods of evidence presentation such as document cameras, but possibly costly document scanning, and almost certainly expensive methods such as computer animation production. Choosing to proceed via the expensive route is a gamble; even if the case is won the results may not justify expense. In 1995, for example, the California Court of Appeals vacated a jury's award of costs to a prevailing party because it deemed "high-powered computer support" to not fall within the definition of litigation expense.[96] The court focused on a controversial aspect of high tech litigation, noting that "[i]f costs are routinely awarded for high-powered technology, most parties will be unable to litigate."[97] The goal, of course, is to make litigation affordable; certainly not more costly. But even the basics potentially cost money that a lawyer or litigant may not have.

Ad hoc technology use raises the financial question squarely. If we assume that both parties to a trial have access, albeit distinctly uneven access, to trial technology the problem does not appear to be acute. Modern computer technology has gone a long way toward equalizing solo practitioners and large law firms. Although the imbalance remains substantial, it is far narrower than it was before technology. A solo practitioner with computer technology can conduct wide ranging research, prepare and file pleadings and motions, and prepare high technology evidence presentations and exhibits in a fashion incalculable a generation ago. In this circumstances, the differential in ability is arguably quantitative and not qualitative. Further, as United States District Court Judge Kathleen O'Malley has noted, many lawyers from small firms and solo practitioners are more computer-adept than lawyers at large firms because they have to rely on themselves and not consultants or support staff.[98] The real question is what happens when one party has technology and the other has no meaningful access.[99]

An indigent client represented by a solo practitioner who is opposed by an affluent client who has retained a large firm is at a serious potential disadvantage if the large firm uses technology. Even if the large firm provides the courtroom technology and either voluntarily, or under judicial direction, permits technology use by the solo practitioner, the solo practitioner may lack either the training or the outside access to technology to permit effective use. Of course, this is hardly a new dilemma. Unequal legal representation is a constant in our system, and terribly mismatched counsel do not justify relief unless counsel for one party is legally inadequate.

However, even if the mismatch of technology versus non-technology is simply a new form of a continuing systemic deficiency, that does not in itself justify dismissing the problem. Once at trial the question of fairness really becomes one of equal access to courtroom technology. The institutional high technology courtroom is one answer to this dilemma. If all parties are supplied with a courtroom that comes complete with necessary technology rather than just a display system for evidence or presentations created by the litigant's own equipment, the technology imbalance is in large measure redressed. When the court provides a high tech forum it is also providing a level playing field. The only issues left are the lawyers' inclinations and know-how, and this is largely a matter of preparedness. Thus the question is raised, can lack of technology or the training or willingness to use it constitute "inadequacy"?

> Ethically and legally, a lawyer must be *competent*. The definition of competence is open to debate, but surely we can agree on some key points. For example, is a lawyer

> who cannot perform basic legal research "competent"? If not, are we fast approaching the day when a lawyer who cannot perform electronic research will not be competent? As our society becomes more technologically based, our definition of "competence" must adjust. Given such realities I believe that both law firms and law schools must consider how to deal with the impact of legal technology.
>
> At the most obvious level, I would argue that to be "competent," litigators must know what technological assistance is available to them and *how to use it*.[(100)]

It seems unlikely that *current* standards would define an inability or refusal to use courtroom technology as ethical inadequacy or legal malpractice. *But* if courtroom technology continues its expansion into the court system it is increasingly likely that technological proficiency will be such a requirement. Of course, if technological prowess is not yet required, how can we expect the vast multitude of lawyers to cope with a virtual courtroom? The adversary system itself may be at least a partial answer. In a recent trial in Maryland, a defense attorney objected, unsuccessfully, to the prosecutor's use of a computer slide show during closing argument. He admitted to reporters that the enhanced closing argument made his own effort appear "slipshod in comparison."[(101)]

Even if inability to use technology on the part of a lawyer does not constitute an ethical problem we are left with a sobering question of public policy. If technology assists a litigator, and thus the represented party, technology is at least a *significant* factor in representation. What happens when trial includes a pro se litigant who either has no ability to use technology or lacks the access to it? The Courtroom 21 Project approach has been to encourage courts to install basic evidence presentation systems, complete with computers, rather than to just provide connections for laptop computers to the display systems. The Project's rationale is that this affords the pro se litigant or solo, non-computer supported practitioner with at least the opportunity to present a case electronically. This position was ultimately supported by the Courtroom 21 Working Conference because it attempts to redress unequal access to justice. Unfortunately, although well intentioned, it is probable that the position is a makeweight with little practical value. Absent personal and continued access to technology it is unlikely that a litigant or practitioner will be able to successfully use even basic court-supplied technology. This is a qualitative difference and is, or should be, troubling.

Although technology clearly has presented us with a sobering question of access, it has also brought blessings to those who suffer from hearing and other problems. The hard of hearing who can read can serve as jurors, counsel, and judge thanks to real-time transcription, including real-time displayed as closed captioning on motors. Infra-red systems help those who can hear, but not well. The degree to which technology can assist people with other concerns is unclear at present, but is it clear that substantial benefits are available.[(102)] The Courtroom 21 Project recently added a medical doctor to its staff as Assistant Director for Adaptive Technologies and Ergonomics. It is our hope that research in this area will point the way to assisting many of those now disadvantaged.

E. What are the collateral consequences of high technology litigation?

One of the difficulties in evaluating the impact of high technology litigation and courtrooms is that their collateral effects are so unclear. We believe that when used properly technology can improve efficiency and save trial time. On occasion, however, the overall situation might be viewed as a balloon; press in at one point and some other

location on the balloon will bulge out. It may be that the savings in trial time is offset by increased lawyer pretrial preparation. The cost savings at trial may be offset by the cost due to document scanning. We simply don't know enough about the overall economics involved.

At the same time, human questions are pressing. *If* technology use is to be commonplace, how many lawyers and judges will be unable, or unwilling to adapt? Is the process of trying a case electronically different in important ways from traditional modes? When the Courtroom 21 Project conducted a two-day program for the ABA Litigation Section's Trial Evidence Committee, a number of lawyers felt that document display on jury monitors created a form of psychological distance from those documents.

F. Are technology-augmented litigation and high technology courtrooms consistent with traditional humanistic goals?

Courts serve two primary functions in our society: they resolve disputes,[(103)] and, to the degree possible in a system conducted by fallible people, they deliver justice to litigants. Courts are preeminently human creations. People view the courts as places in which justice is administered by the people's agents. The normative model, accepted by most of the nation,[(104)] is a jury sitting as fact finder and verdict giver, a jury that applies judge explained law to the facts as determined by the jury. Trial lawyers apply their understanding of human psychology in an attempt to convince judges and jurors of their case interpretations; the judge and jury determine facts by filtering human evidence through their own experiences. Interestingly, courts have shown themselves hostile to non-blood typing/DNA probability evidence in part because it is thought to remove humanity from adjudication.[(105)]

From the comments of visitors to the Courtroom 21 Project, the ultimate threat that technology-augmented litigation is thought to aim at the judicial system is loss of humanity. Traditional litigation places the lawyer at the focus of fact-finder attention. Papers are shown to human witnesses in the courtroom; charts are placed on easels, and lawyers add emotion to logic in closing arguments. Even the tribulations of the participants, hours wasted by waiting witnesses and inactive jurors, are classic human complaints. Verdicts themselves are sometimes the ultimate example of human conflict as jurors, sometimes literally "locked up" together, struggle to reach resolution, if only to terminate their forced togetherness.

Enter technology- augmented litigation; enter the high technology courtroom. Evidence consists primarily of electronic images; counsel rarely leave the centralized litigators' podium or the counsel tables. Remote first appearances and arraignments, common in hundreds of courts, result in the accused seeing the judge who determines conditions of release and other critical factors by two-way television, perhaps leaving a nagging question in the mind of the accused: if they really cared, *wouldn't they bring me* there*?*

Important testimony at trial is increasingly given by faces in televisions, albeit live interactive faces, and we are beginning to see more and more remote judges and counsel. Could it be that as we improve efficiency we risk minimizing the humanness that has characterized our trials? Absent experimental work that has yet to be conducted, we cannot even hazard a guess as to the reaction of jurors[(106)] or the general public. The

views of the surveyed judges and of the attendees of the Courtroom 21 Project Working Conference on Technology-Augmented Litigation are quite positive about technology use. Conceding lack of sufficient experimental data in the area, we might posit the following:

- Technology use per se is not troublesome;
- Should technology use increase past an (unknown) point in any given case, jurors, observers and perhaps legal professionals may become uncomfortable;
- If highly expansive technology use becomes sufficiently commonplace to penetrate the national consciousness, the courts might lose the degree of general acceptance that currently results in acceptance of most verdicts, ***if*** the changing and increasing nature of national technology use does not itself change general societal expectations.

Assuming the above, it is now appropriate to turn to what may well be the next major step in high technology litigation and courtroom: virtual trials.

VI. Tomorrow's Possible Virtual Courtrooms

Inasmuch as no true "virtual courtroom" exists as yet, one can define the concept with an unusual degree of liberty. We will assume for purposes of this article that a true virtual courtroom is not a physical location but rather is the interchange of high-quality audio, video, text, and graphical information among trial participants without concern, except for jurisdictional requirements, for the physical location of those participants.
The beginning of Web-based interactive instruction makes it clear that a virtual court based upon exchange of text [(107)] is now possible. Indeed, David Johnson, founder of Counsel Connect, has proposed resolution of certain disputes entirely via the Internet. [(108)] We assume that this type of information exchange is per se insufficient as a substitute for the traditional form of courtroom adjudication. This is based upon the assumption that most people would reject as inaccurate or unjust decision making that is not accompanied by contemporaneous viewing of witnesses, jurors, counsel, and judge. [(109)] Certainly, the commercial rush to incorporate audio and video into the Internet suggests the importance of those communication components.

Given our assumption that live video is necessary, we will define a true virtual courtroom as one in which all of the participants can be in different physical locations. All trial components, including opening statements, evidence, closing arguments, instructions, and jury deliberations occur via electronic information exchange. The courtroom itself exists only in the data exchange network. The true virtual courtroom is, therefore, a cyber courtroom.

The true, "virtual courtroom" would be a courtroom in which participants, all of whom might be located physically elsewhere, would appear together electronically with each one perceiving the other, and the courtroom, as if they were all in the same *physical* location. This concept is not a new one - at least in the world of science fiction. Many American television viewers would think quickly of the Enterprise's "holodeck" in the various Star Trek series. Such a concept has more reality than one might expect. Virtual reality now exists via "CAVE," Cave Automated Virtual Environment. "A CAVE is

about the size of a walk-in closet. Step inside, put on 3-D glasses, and suddenly you become part of a computer animation . . .[110] "There are more than 100 CAVEs at universities, government facilities, and companies . . . . They help engineers see 3-D full-size models of cars and enable scientists to walk inside models of single molecules."[111] This would yield a courtroom that exists only in a data network, but one which to all human senses, and thus psychologically, would be experienced as a physical courtroom with all participants present. Such a courtroom exists only in science fiction, however, - at least for the mid-term future. *Today*'s virtual cyber courtrooms must be far more limited in scope. They will permit participants to share the litigation information and to intercommunicate, all while remaining physically distant. This defines *today's* virtual courtroom.

A. Technology: How Close To a Useful Virtual Courtroom Are We?

Our review of the now existing courtroom technologies leads to the unavoidable conclusion that all of the technological pieces necessary to create a virtual courtroom are either in use now or can be expected to be commercially available in the immediate future. To the degree that a significant technology question exists, it concerns the switching and distribution system that would be necessary to "construct" or "carry" a virtual courtroom. Positing a set-up in which all participants can view each other and the evidence requires a system that can receive those images and distribute them as constrained by evidentiary and procedural rules. At present the Internet would be the obvious mechanism, with the "courthouse" acting as central control. An Internet-based system would also answer the need for a "public" trial; even today, huge numbers of people can concurrently view a given Web site. However, today's normal Internet access provides insufficient bandwidth to carry sufficiently high quality video, to say nothing of the many different images required. At the same time, rapidly improving Internet access, including the new Internet II, suggest that the bandwidth issue is only a matter of time.

The technology problem is not the theoretical availability of specific mechanisms which, combined, could create a virtual courtroom. The real problem is the limited access to the technology. Our legal system exists for all people, and we cannot and must not exclude from it those who lack the financial means to afford personal technology or those who for a variety of reasons cannot use technology. A true virtual courtroom presupposes easy access by all potential trial participants, including jurors. Although technology is sweeping the United States, such ubiquitous technology access seems unlikely, if not impossible, any time in the near or intermediate future, at least for jury trials.

To define the virtual courtroom in such a purist fashion as to define it out of existence is to go to far, however. The core of the problem is the jury. The goal of having *every* participant appear remotely from a location of that person's choosing, is simply not likely to be practical any time soon. But, a partial virtual trial could be accommodated and a virtual courtroom created if the jury were to be required to meet in person; or if jurors needing technology support could report to local courthouses[112] for an electronic connection to the proceedings.

This discussion has been focused thus far on jury trials. Although a jury trial is the normative rule in the United States, most of our cases are not jury trials; they are bench

trials of varying importance. Freed of a need for a jury, virtual trials and courtrooms become much easier to institute.

B. Bench trials, including traffic court and administrative proceedings

Most trials and hearings in the United States are without juries. Administrative, civil, or criminal, they are characterized by judge, counsel, witnesses, parties, and associated court personnel and support staff. Although perhaps distressing to some members of the bar, attorneys could be required to use remote appearance facilities. Witnesses and parties could appear either from their own remote, camera-equipped computers, or use public terminals located in high traffic areas such as shopping malls. In some administrative cases, the claimant may even be the only witness. In the simplest criminal case, that of minor traffic infractions, a virtual courtroom would be easy to create and likely would be regarded as a blessing by most. Rather than having to take substantial time from work or other pursuits to challenge a traffic ticket, defendants could use remote equipment to do so. Police officers could appear remotely from their station or other appropriate location. Given its electronic nature and the probable lack of the need for a text- based transcript, electronic recording of the proceeding would make a sufficient record. In the event of conviction and sentence, fines could be paid by electronic funds transfer or credit card. The same would appear to be equally true of the equivalent of small claims court or any other relatively straightforward proceeding. Criminal cases in which incarceration is a possible sentence present obvious problems: jailing a virtual image of a convicted defendant is hardly likely to be satisfactory.

C. Appellate courts

Creation of a virtual appellate courtroom and trial of a virtual appeal present no significant problems and could be readily done today. Use of a multi-point videoconference would suffice today; creation of a multi-participant system in which all parties could see each other at all times would require a more sophisticated electronic structure, and a more expensive one if high-quality video were required, but that too is possible. Further, as is true of the Courtroom 21 Project's McGlothin Courtroom, such a virtual facility would also permit interchange of electronic legal authority, including briefs or components thereof. In short, a virtual appellate courtroom is readily possible, and as we create facilities in which one or more of the participants appear by videoconferencing we are now experimenting across the world with the first, limited, versions of one.

D. Other Technology Problems

It is a rare visit to the Courtroom 21 Project that fails to brings up the question of electronic security. Ordinarily such a concern raises two different matters: the risk of digital alteration or fabrication, already addressed, and the possibility of electronic eavesdropping, up to and including penetration and alteration of the court's electronic records. Electronic eavesdropping is theoretically possible and in some high profile cases must be considered to be a meaningful threat, just as "hacking" is an ever present risk to

every network, even if it is only intended as a prank. It seems unlikely that this is a threat that cannot be dealt with adequately by careful system design. Technologists have learned a great deal about physical and data security. Those lessons and common sense should be sufficient -- *if* implemented.

E. Legal Problems

State constitutions, federal and state statutes, and court rules all potentially limit or prohibit virtual trials. All of these can be amended, however. The most difficult source of applicable law to amend is obviously the United States Constitution, and accordingly a cursory legal review should focus on that.

Any virtual trial will engender at the very least all of the current problems usually associated with high technology courtrooms. If remote testimony by a prosecution witness implicates Sixth Amendment confrontation concerns now, a trial in which all government testimony were to be electronic and remote would obviously pose a more demanding problem.

At least two other constitutional problems are immediately apparent, however. Under the United States constitution all trials are public trials, with closure permitted in only narrow circumstances.[(113)] How can a virtual trial be "public"? Presumably, the public receives access through the ability to view the proceeding electronically as it takes place. If a limited original intent/textual interpretation is applied, this may be inadequate, especially if not everyone has the means for easy and free electronic access. Critically, however, the traditional right to view a trial has never required the government to enable the public to travel to the courthouse. Similarly, today's courthouses do not promise sufficient space for all interested attendees, first-come, first- served is usually the practice. Accordingly, if remote public access is sufficient under the Constitution, there is no current reason why all interested observers must have access.

At an equally fundamental level is the question of the meaning of the right to a jury trial. Section 1 of Article III of the Constitution provides that, "The Trial of all Crimes, except in Cases of Impeachment; shall be by Jury . . . ." The Seventh Amendment specifies that "In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved . . . ." As it appears certain that a "jury "consisting of individuals who do not hear the evidence clustered physically together and, more importantly, do not deliberate together physically is potentially very different psychologically from a traditional jury, it may be that the Constitution would block virtual juries absent waiver by the appropriate parties. Similarly, "due process" is sufficiently vague that the Court could decide that it prohibits involuntary virtual proceedings.

F. Human and Systemic Questions

Ultimately, all of the critical questions that grow out of adjudication are human ones. We can assume technological adequacy, sufficient funds for equipment purchase, maintenance, and operation, but we cannot assume sufficient human access, training, or acceptance. We can cope in a variety of ways with access and operation (training). Acceptance is another matter.

Courthouses have long been considered important if not key pieces of public architecture. They help supply a sense of solidity. They often convey the role of law in American life. Federal courthouses, designed in past years sometimes to include post office facilities, often are the primary representative of the national government. Courtrooms, the center of courthouses, embody the administration of justice.[114] As William Gossett observed, "If respect for the courts and for their judicial process is gone or steadily weakened, no law can save us as a society."[115] Virtual courtrooms and virtual trials threaten that sense of place and solemnity. What might virtual courtroom justice mean to the people?

On the one hand, justice ought to be a real, rather than just a theoretical, right of every person. As the late Learned Hand observed, "If we are to keep our democracy, there must be one commandant: Thou shalt not ration justice."[116] Our imperative must be to increase justice; not decrease it. If we can make the right to justice more meaningful for those who, faced with the demands of work, family, or limited mobility, cannot easily get to the courthouse [117]for what is often a brief hearing, justice would be augmented. Yet, on the other hand, American respect for law and justice, diminished as it sometimes seems to be,[118] might well suffer if the public should perceive that the *process* was not fair. Potential deficiencies include not only possible perceived deficiencies in the truth-finding process, *e.g.* a doubt either that remote witnesses will tell the truth or that jurors can accurately evaluate the testimony of such a witness, but also the risk that the adjudicative system could be seen as no longer human-oriented. I assume that public compliance with legislated societal rules and acceptance of court verdicts requires at the very least a general perception that justice is done, usually, by the courts.[119] If the public perceives that justice is *not* done, whether because of result or process, that general consensus would fail. Even a cursory glance abroad makes it clear that the American adversary system is not the sole process that can command general societal acceptance as a fair adjudicative process. Too many other nations have broadly satisfied populations despite significant and sometimes radically different dispute resolution systems. Yet, the nature of what is acceptable in a legal system is clearly linked to national culture. The legal system in the United States is oriented around the concept of a trial in which the accuser/plaintiff presents evidence in open court in the presence of and subject to searching inquiry by the defense in a process kept reasonably fair by a neutral judge and resolved, by human beings, judge or jury. The Anglo-American system has rejected adjudications conducted on the basis of dossiers, creating a hearsay rule that, however riddled with exceptions, creates an institutional preference for live, in-court, testimony on all sides. It is very much unclear at present whether our population is prepared to interpret live, electronically conveyed, testimony and related evidence as the human equivalent of in-court testimony. If it is not yet willing to do so, a true virtual trial will be viewed with great suspicion.

We ought not, however, be overly-wedded to current courtroom assumptions. As Chief Justice Burger observed in a different context, "We should get away from the idea that a court is the only place in which to settle disputes. People with claims are likely people with pains. They want results and they don't care whether it's in a courtroom with lawyers and judges, or somewhere else.[120]

It is impossible to predict how this or any other nation will react to a virtual courtroom at a future time when telecommuting, virtual offices and libraries, and the like

have become commonplace. Presumably, when adjudication uses the same methods employed in the day-to-day activities by most of the populace, those methods will not be viewed with suspicion. Until then, virtual courtrooms must be viewed with great caution. Of course, given the current rate of technological change, it may not be long before elements of the public find the *lack* of virtual courtrooms to be a visible sign of the law's innate and undesirable conservatism.

VII. So, Where Does This Road Go, After All?

Even the most cursory review of the legal technologies now finding homes in the new, integrated high technology courtrooms leads one to conclude that virtual courtrooms are not idle speculation. Insofar as the public and media are concerned, critical components of a number of different types of court proceedings are already virtual. The direct and cross-examination of the Argentine complainants via satellite-transmitted two-way video in the *Harrell* case [(121)] was in many respects a virtual trial. That testimony was the critical and core prosecution evidence in the case. True, the rest of the trial participants were in the Florida courtroom, but the core was not there. Had the defendant been excluded from the courtroom for misbehavior, for example, and viewed both the Argentine testimony and the courtroom remotely, the virtual trial descriptor would become even more convincing.

As our high technology courtrooms increasingly become technology hubs, and the centers of massive electronic data interchange, we will get ever closer to true virtual courtrooms and virtual trials. It has long been a Courtroom 21 Project truism, however, that just because we *can* do something is not itself a justification to actually *do* it. By eliminating travel, document transmission delay, and evidence presentation inefficiencies, virtual courtrooms could save a great deal of money and time, for all of those involved in trial. They could make trials truly public if any member of the public who wished could "log in" to a trial. And, by making public all of the case evidence, the media could be expected to improve its reporting. [(122)] These substantial improvements in operational efficiency and access are counterbalanced by the risk of the loss of public acceptance of trials as fair and accurate dispute resolution devices - ***if*** the public is unready to accept virtual courtrooms.

The ongoing adoption of courtroom technology is such that we can expect massive systemic change over the next ten years. Insofar as we can tell at the Courtroom 21 Project, that change is largely unstoppable, a conclusion accepted by the Courtroom 21 Working Conference on Technology Augmented Litigation. The sea change we are now undergoing will bring an increasing degree of "virtualism" to our courtrooms and trials. Whether we should in the short term endeavor to create virtual courtrooms for more than experimental purposes is another matter.

If we are correct and the technologies that will permit true virtual courtrooms are already here in substance, the real question is one of total integrated use. As we continue down our legal information highway, the road will increasingly be affected by technology. Remote appearances [(123)] will increase, and the use of electronic based fact-finding will become commonplace. We will have the option of taking a number of early highway forks that would lead us directly and rapidly to virtual courtrooms. The main

highway is likely ultimately to take us to the same destination, but perhaps many years later. Which if any of the forks should we take?

If we are correct in our supposition that full virtual civil and criminal trials would threaten in the short term the somewhat uneasy national consensus that most American trials are reasonably accurate, fair, and just, we ought to use virtual courtrooms and trials for those areas in which the public would perceive an *improvement* in fairness and justice. Proceedings in which the public's ability to participate meaningfully is enhanced by virtual proceedings should be welcomed. The move to kiosk and Internet based legal information delivery and limited court services points the way. If traffic court and similar proceedings, including the vast number of administrative benefit application hearings can be made easier for the public with a perceived improvement in access and fairness, virtual courtrooms and hearing rooms will be accepted as valued improvements to the national adjudicative processes. Such courtrooms should begin as voluntary alternative means to current adjudication. As acceptance increases and the nation moves to even more technology use, we can expect greater use and dependence upon virtual courtrooms.

We are on the road to the virtual courtroom. Unless we take an intentional early exit elsewhere, our final destination is clear. The virtual courtroom is unlikely to replace in the near future our hallowed wood- or marble-paneled inner sanctums, but even those traditional places of law and judgment will see increasing amounts of virtual evidence and adjudication. We have the opportunity, as we travel, however, to build some high technology side roads leading to specialized virtual hearing rooms and courtrooms. As we travel on the main highway, though, we travel with the near certain probability that for many types of cases and in many types of courts and tribunals our eventual destination will be the virtual courtroom.

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3. The Internet-based book seller, Amazon.com, may be the best example of a Web-based, full-service retail establishment of enormous inventory that is accessible to anyone with web access.

4. *See e.g.*, William Booth, *Netizen Kane? More Politicians Use Web to Woo Voters, Donors, Volunteers*, Wash. Post, Oct. 17, 1998 at A1, col. 2. Among many other matters, Mr. Booth reports that "46 percent of likely voters have e-mail addresses." *Id.* at A10, col. 1.

5. The release by Congress of the Starr Report is only the best example of the use of the Internet and web for communication. "The California Secretary of State's election Web site had a mind-bending 1.8 million hits in one 24-hour period on the night of the June primary." *Id* at A10, col. 1.

6. Jan Ackerman, *Lawyers Are Going High Tech*, Pitt. Post-Gazette, Sept. 20, 1998 at B1.

7. *See On-Line Traffic School*, (visited Oct. 31, 1998)<http://www.onlinetraffic.com>.

8. Thierman Law Firm doing business as The Virtual Law Firm. The Virtual Law Firm, a California organization, describes itself as "a bona fide law firm with legal talent collected from around the

world. Our attorneys are either employed by the firm, are members of the firm, or "of counsel" to the firm. We do not have a central attorney office; rather, we have a central office for administrative purposes only. The attorneys associated with the Virtual Law Firm are connected via electronic media. This allows us to tap into a talented pool of attorneys who prefer to work in a remote location or at home." The Virtual Law Firm (visited Nov. 1, 1998), <http://www.tvlf.com>.

9. The Royal Commission Into the New South Wales Police Force hearing room in Sydney is the world's most technologically advanced legal investigatory facility.

10. If one includes remote first appearance or arraignment systems, the number of equipped courtroom would be at least in the hundreds, if not the thousands.

11. Jerry Thacker, Assistant Director for Facilities, Administrator Office of the United States Courts, presentation to William & Mary Law School's Legal Technology Seminar (Williamsburg, Virginia, April, 1998).

12. States include: Arizona, California, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin.

13. Demonstration by David Green, President, Jefferson Audio Video Systems, Inc. during September, 1998, annual meeting of the American Judges Association.

14. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>.

15. 44 M.J. 464 (Armed F. 1996).

16. A telephone call from the office has been sufficient for attorney and party presence in some matters for the Fairfax County Circuit Court in Virginia, which is allowing attorneys to appear via conference calls in motion hearings and other matters. *See* Tom Jackman, *Court Lets Lawyers Make Some Via Phone*, Wash. Post, Jan. 7, 1999.

17. Although complicated, such a trial is not impossible. The Courtroom 21 Project believes that if necessary, and given adequate funding, it could accomplish such a case in a matter of weeks.

18. And potentially virtual courthouses as well.

19. Fredric I. Lederer, *The Courtroom As a Stop On the Information Superhighway*, 4 Aust. J. L. Reform 71 (1997).

20. *See generally, Technology Information Service, Case Management Systems*, National Center for State Courts Web Site, (last modified Oct. 6, 1998) <http: //www.ncsc.dni.us/ncsc/TIS/casemgmt/ case.html. At the same time, lawyers must manage their own cases and frequently will use both firm and individually based management software packages. In an ideal world, *all* of these different software products would interrelate and easily exchange information. We do not as yet live in that world.

21. Wendy R. Leibowitz, *Lawyers and Technology, Courts Electrify Suits, Sparks Fly; New Rules Needed for E-Filings*, Nat'l L.J. September 7, 1998 at B6.

22. The National Center for State Courts, in collaboration with the West Group, are producing a set of model rules for electronic publishing and filing. The work is expected to be published soon.

23. Given the multitude of courts and jurisdictions any single lawyer may practice before a single unified calendar seems fanciful. Accordingly, it is up to counsel to avoid appearance conflicts. Instant access to at least most potential conflicts would likely be of service to all concerned, however.

24. ". . . [B]oth lawyers and members of the public involved in or simply interested in the status of over 40,000 thousand silicon breast plant litigation cases in the United States can access case information via the World Wide Web at <http://www.fjc.gov/BREIMLIT/mdl926.htm>." Fredric I. Lederer, *The Courtroom As a Stop On the Information Superhighway*, 4 Aust. J. L. Reform 71(1997).

25. Jeff Feeley, *Delaware Moves to Put Court Online, Data base to provide access to key corporate findings*, Nat'l L.J. September 21, 1998 at B1.

26. Of course, at present few people can navigate the court without significant help, and all need court staff to obtain most litigation documents.

27. Art Buchwald, *TV Trials and Errors*, Wash. Post, Feb. 10, 1981 at E1.

28. Yukiyo, Ltd. v. Watanabe, 111 F.3d 883 (Fed. Cir. 1997). *See also* Wendy R. Leibowitz, Lawyers and Technology, *When High-Tech Is Over the Top: Is a CD-ROM Brief Fair or Foul?*, Nat'l L. J. Mar. 3, 1997, at B8.

29. *E.g.*, Rodime P.C. v. Seagate Technology, Inc., 45 U.S.P.Q.2d 2023 (Fed. Cir. 1998). The United States Court of Appeals for the Second Circuit is encouraging the submission of appellate briefs in

CD-ROM form. Joanna Glaser, *Second Circuit Unveils Latest Courtroom Tech*, N.Y. Law J., Nov. 10, 1997 at T4.

30. Subject to time constraints. Some years ago while visiting the Courtroom 21 Project's McGlothlin Courtroom Justice O'Connor suggested that this type of interchange might impel a shift towards the far more relaxed time rules customary in the British House of Lords.

31. During deliberation in the much-publicized trial of Louise Woodward, the au pair subsequently convicted for the death of a child in her care, the jury asked to review the testimony of a key defense witness. The judge refused because producing the transcript was a practical impossibility. The stenographers' record had not been transcribed and transcribing the portion requested would have taken too long and interrupted deliberations of a sequestered jury (the witness had testified for two days).

In responding to this issue in the defense motion for a new trial, the judge noted that not having contemporaneous transcripts was the norm for that court and that the attorney could have ordered daily transcripts at the start of the trial or presented the jurors "his own recollection" in closing argument. Commonwealth v. Woodward, 7 Mass.L.Rptr. 449 (1997). This event opened the door to discussions of real-time transcription and contemporaneous records and to criticism of the court for not being technologically up-to-date, especially for such a complex, high-profile case. *See*, Patricia Nealon, *The Au Pair Case: The Judge Hears Appeals/Review of Testimony*, Boston Globe, Nov. 5, 1997 at A19.

In contrast, real-time transcription was used in the equally well-publicized trial of Ruthann Aron, the United States Senate candidate who ultimately pleaded nolo contendere to the charge of contracting to kill her husband. Its impact on the trial was obvious. Judge Paul McGuckian, who received a contemporaneous transcript on his laptop computer as trial progressed, noted that the real-time feed allowed him to gauge his perception of testimony. "Sometimes I'm not sure I understood what a witness said, . . . [T]his allows me to confirm or disabuse myself of something." Candus Thompson, *Instant Transcripts Transform Trials*, Balt.Sun, Mar. 3, 1998 at 1B. The defense attorneys noted that though real-time transcription is expensive, it ultimately saved the defense time and money: time in note taking and preparation for cross-examination and money in being able to keep expert witnesses abreast of developments without having to have them present in the courtroom. *Id*.

Setting aside the issue of who should be responsible for ensuring that an adequate record is produced and the associated costs, it is apparent that court record technology can have an impact on the substance of a trial and perhaps on the administration of justice.

32. But, as the audio cannot itself be searched, this provides only a small fraction of the capability that would be found in a court report's electronic transcript.

33. By their nature, video records display the very matters ordinarily invisible to written transcripts: body movements, facial gestures, vocal intonations, and the like. These movements may prove essential to understanding the impact of information not reflected on the written record. In one well-known case, the judge apparently expressed his disbelief at the alibi testimony of a witness by shaking his head and silently turning his chair away from the jury. Such extremes are not necessary to raise the question of silent judicial communication.[64]Every time the judge makes a movement--each time she knits her brow, yawns, rolls her eyes, scratches her head--it is at some level interpreted as a commentary on the testimony of the witness. That commentary becomes particularly intense because it is, in the main, subliminal[65]

Fredric I. Lederer, *Technology Comes To the Courtroom, and . . .* 43 Emory L.J. 1095, 112 (1994) (citing at note 64, State v. Barron, 465 S.W.2d 523, 527 (Mo. 1971), and at note 65, LaDoris H. Cordell & Florence O. Keller, Pay No Attention to the Woman Behind the Bench: Musings of a Trial Court Judge, *68 IND. L.J. 1199, 1206 (1993).*

34. Ky. R. Civ. P. 98. Kentucky adopted widespread use of video records after it experienced difficulty with inadequate court reporter coverage, untimely transcripts, and excessive transcript charges. Harvard University Kennedy School of Government Case Program, Court Reporting in Kentucky (A) (C16-91-1035.0 1990).

35. *See , e.g.*, Rorie Sherman, Virtual Venues, NAT'L L.J., Jan. 10, 1994, at 1, 30. In part because they were time-consuming and cumbersome, the United States Judicial Conference recommended against use of videotaped records alone. Courts have sometimes tried to choose between reporter and recorder based systems. In most circumstances this is a false dichotomy. No known recording system can yield a transcript as quickly and efficiently as can a competent court reporter using real-time transcription. However, ordinarily transcripts are needed for *court purposes* only for read-backs of testimony during trial, preparation of jury instruction (or verdict consideration in a bench trial), or preparation of an appellate transcript. In courts or cases in which there are few read-backs or appeals, electronic recording is a highly

cost-effective solution. As most courts have a mixture of cases, however, they ought to have an administrative structure that permits skilled court record managers to decide on the most appropriate type of record to be made on a case specific basis. At the same time, it would be extraordinarily insular to fail to note that the lawyers and parties in cases have interests distinct from the courts. Lawyers often want rapid transcript delivery to prepare for witness examination as for preparation of closing arguments and jury instructions. Further, lawyers frequently need a usable transcript to decide *whether* to appeal. At the very least, this dictates the need for rapid and accurate transcription when electronic recording is used.

36. Second and third generation DVD storage may be the breakthrough necessary to make this record financially feasible.

37. As removable electronic storage media increase in size, video will be added.

38. *E.g.*, Fed. Civ. P 52. *See also* Junda Woo, *Use of Trial Videotapes Is Giving New Dimension to Appellate Cases*, Wall St. J., Apr. 14, 1992, at B1, B10.

39. If nothing else, one must wonder how an appellate court would respond to a more complete rendition of the proceedings below. Given sound and video, we must assume that the court might well be more engaged in appellate review. Yet, what, if anything, would be lost compared to review of written transcript, and what would *really* be gained. "Conscientious and competent judges are best supported by accurate trial records. The more accurate the record, the less likely that the case will be reversed. Indeed, one study by the National Center for State Courts has determined that comprehensive video records increase appellate affirmances." Fredric I. Lederer, *Courtroom Technology From the Judges' Perspective* Court Review, August, 1998, citing James A. Maher, National Center for State Courts, Do Video Transcripts Affect the Scope of Appellate Review? An Evaluation in the Kentucky Court of Appeals (1990).

40. Smell and touch cannot easily be recorded during trial. On the other hand, it is a rare appeal that might implicate those senses.

41. To this might be added demeanor evidence -- how the fact finder perceives a witness while testifying.

42. *Netting the Paper Deluge*, Australian Law Inst. J. 1-2 (May, 1997)

43. In their simplest use, a high technology whiteboard transmits writing to monitors fed from the connected computer, in the same color as that used on the board. The writing on the board can be preserved both by saving the image to disk on the attached computer and by printing it on a connected printer. One of the great advantages of the board is that once an image is saved to the computer it can be restored immediately even if the image has been erased in whole or part. Whiteboards can be especially effective for witness drawings or counsel's opening statement and closing argument. Fredric I. Lederer, *Excerpts from An Integrated Approach To Basic Technologically Based Advocacy and Litigation* 27 (August, 1998 Working Edition).

44. *Id.* at 26.

45. Fredric I Lederer, *Some Thoughts On the Evidentiary Aspects of Technologically Presented Or Produced Evidence.*, __ Southwestern L. Rev. _ (1998)(in press).

46. Of course, the presence of the original paper is a check on the possibility that the electronic image has been electronically altered. Although of potential importance, this does not appear critical when speaking of either the fact finder's usual perception or the ability to transmit the image electronically.

47. *See also* The Honorable Deborah K. Chasanow, *Juror Survey*, III ABA Techshow 98 163 (Chicago, Ill. Mar. 28, 1998).

48. *Courtroom Technology draws Positive Response*, The Third Branch 1, ¶3 (Aug. 1998) <http://www.uscourts.gov/ttb/aug98ttb/crttech.html>.

49. *See*, Angela Simoneaux, *Wheels of Justice Grinding Faster With Aid of Computer Technology*, Baton Rouge Advoc., Jun. 1, 1997, at 1A (Judge Donald Walter on courtroom technology "[I]t's just a better way. It's a heck of a lot better for the fact-finder."); Jan Ackerman, *Lawyers Are Going High Tech*, Pitt. Post-Gazette, Sept. 20, 1998 at B1 (Judge Robert J. Cindrich on courtroom technology "I see it as an attempt to increase jury comprehension and decrease the length of trials."); Howard Mintz, *Judges Unveil High-Tech Gadgetry*, Fort Worth Star-Telegram, May 17, 1998 at 15 (Judge James Ware on courtroom technology "Jurors have come to expect that technology in the [Silicon] valley will be used. They like that - they believe in it."); Samar Abuhlhassan, *Electronic Courtroom Galvanizes Lawyers, Jurors*, Austin Amer.-Statesman, Jul. 5, 1998 at A18 (Judge Thomas Hogan notes that jurors are allowed "greater scrutiny of evidence" in his high tech courtroom and the chief deputy for court administration notes that "We have fewer jurors sleeping."); Catherine Trevison, *Judge Gets High-Tech Sidekick*, Tennessean-Nashville, Mar.

18, 1998 at 3B (Judge Robert Echols on courtroom technology "I'm moving out of the 17th century. It's just a way to make presentation of evidence clearer to the jury, speed the trial, and hopefully be much more efficient."); Toni Locy, *Law Meets Technology In Courtroom No. 9*, Wash. Post, Aug. 21, 1997 at J01 (juror Linda Hinnant on technology in Judge Hogan's courtroom "We got to see the evidence while they were talking about it. It gave us more time to know what they were talking about at the same time they were making the statement and asking the questions. It made you feel like you were a part of it."); and Doris Wong, 9 Comp. Counsel 22, 23 (1993)(Judge Carl Rubin explains the benefit of video evidence display for juror comprehension and recounts how one juror told him that jurors may feel embarrassed to take the time they need to read a document that is handed to them and may quickly pass it to the next juror to avoid being the center of attention or consuming too much time.).

50. Of course this presupposes that counsel *personally* is responsible for handling evidence presentation, the favored Courtroom 21 approach. If counsel is dependent upon a technical support team, counsel will lose this advantage as well as the spontaneity that is available to the attorney who can personally adjust to changed circumstances.

51. Fredric I Lederer, *Some Thoughts On the Evidentiary Aspects of Technologically Presented Or Produced Evidence.*, __ Southwestern L. Rev. _ (1998)(in press).

52. In *United States v. Kaczynski*, 1997 WL 567038 (E.D. Cal.)(CR-5-96-259GEB)(the Unabomber case) defense counsel sought unsuccessfully to prohibit electronic images of the paper evidence. The trial judge held that the electronic evidence display system would not be "different from evidence mediums customarily used in court." Order, U.S. v. Kaczynski, 1997 WL 583561 (E.D. Cal.)(CR-5-96-259GEB).

53. IPIX produces a 360 degree photograph which can be rotated about the center point. To the types of evidence one could also add the electronic annotations placed on images by witnesses, as in drawing a colored "x" on an intersection graphic to show where a collision occurred.

54. Fed. R. Evid. 901(b)(1).

55. Though a new group of experts, software forensics consultants, have emerged who can detect forgeries in electronic evidence. See Wendy Leibowitz, *E-Evidence Demands New Experts*, Natl. L.J., Mar. 9, 1998 at A1.

56. *See, e.g.*, Md. R. Civ. P. 2-504.3, Computer-Generated Evidence and Material (adopted Feb., 1998).

57. *E.g.*, Corel Presentations or Microsoft PowerPoint.

58. To be effective, however, counsel should use relatively few slides and forego any images that are not critically and inherently useful.

59. *See, e.g*., Henry H. Perritt, Jr., *Video Depositions, Transcripts and Trials*, 43 Emory L.J. 1071, 1072 (1994).

60. *Id*. at 1082; *See generally* McCrystal & Maschari, *Will Electronic Technology Take the Witness Stand?*, 11 U. Tol. L. Rev. 239 (1980). *See also* Diane M. Hartmus, *Videotrials*, 23 Ohio N.U.L. Rev. 1 (1996).

61. An Illinois court conducted videophone bail hearings in 1972 and a court in Philadelphia installed a closed-circuit television system to conduct preliminary arraignments in 1974. National Center for State Courts Briefing Paper. *Videoconferencing*, <http://www.ncsc.dni.us/NCSC/briefing/vc.htm> visited March 30, 1998). Although first appearances and arraignments can be combined they are ordinarily separate procedural stages. Remote arraignments have existed since at least 1982 when Dade County, Florida, began to use two way television for misdemeanor cases. Jeffrey M. Silbert, Una Hutton Newman & Laurel Kalser, *Telecommunications in the Courtroom: The Use of Closed Circuit Television for Conducting Misdemeanor Arraignments in Dade County, Florida*, 38 U. Miami L. Rev. 657 (1984). Courtroom 21 Report for Performance Engineering Corporation and the Electronic Courtroom Project of the Administrative Office of The United States Courts, *Legal and Technical Issues Associated With Courtroom Technology* n. 1 (April 22, 1998).

62. George Lange III and Lewis M. Smoley, *2d Circuit Is Now First Wired for Video-Argument*. The Nat'l Law Journal, June 9, 1997.

63. Needing access to at least satellite uplinks.

64. Fredric I Lederer, *Some Thoughts On the Evidentiary Aspects of Technologically Presented Or Produced Evidence.*, __ Southwestern L. Rev. _ (1998)(in press).

65. The Courtroom 21 Project uses six-channel, 384 h.320 Tandberg and Intertel videoconferencing. A lesser bandwidth will degrade the connection.

66. Victoria Evidence (Audio Visual and Audio Linking) Act 1997 § 3 (Act No. 4/1997, Victoria, Australia) inserting into the Evidence Act 1958, new Section 42G.

67. Thirty-four U.S. District Courts (encompassing sixty actual sites) use videoconferencing for prisoner civil rights pretrial proceedings. This use was authorized by the Judicial Conference in 1996 and anticipated the 1996 Prison Litigation Reform Act which required the federal courts to make use of video-conferencing technology in pretrial proceedings. Currently, the U.S. Courts of Appeals for the Second, Tenth, and District of Columbia Circuits use videoconferencing for oral arguments. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>.

68. Chief Justice M.E.J. Black, A Court-Based National Videoconferencing Network for Taking Evidence and Aiding in Administration, presentation during The First Worldwide Common Law Judiciary Conference (May 29, 1995).

69. Fed. R. Civ. P. 43(a).

70. Maryland v. Craig, 497 U.S. 836, 853-54 (1990)

71. Harrell v. State, 709 So. 2d 1364 (Fla. 1998); *cert. denied*, 67 U.S.L.W. 3237 (U.S. 1998).

72. *Id.* at 1370 citing Maryland v. Craig, 497 U.S. 836 at 849-51.

73. *Id.* at 1370-72.

74. 67 U.S.L.W. 3237 (U.S. 1998).

75. Statutory authorization exists in many states. *See, e.g.*, VA. Code Ann. § 19.2-3.1 (Michie Supp. 1994).

76. As of 1997 nineteen federal district courts were using videoconferencing for prisoner civil pre-trial hearings. George Lange III and Lewis M. Smoley, *2d Circuit Is Now First Wired for Video-Argument*. The Nat'l Law Journal, June 9, 1997. There are now at least sixty separate installations. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>. The benefits to the system are obvious: time saved in travel, easier scheduling, and fewer security risks associated with transporting and monitoring prisoners. Less obvious is the benefit that may come to prisoners from videoconferenced pretrial proceedings. In geographically remote areas, prisoners may actually have a hearing scheduled sooner and may get a more personal hearing via video-conferencing than they would if they appeared in person in front of the judge. U.S. District Court Judge Fred Biery from the Western District of Texas notes that most of the felony defendants in that district were handled in a courthouse where there was no full-time judge and the defendants were bused from all over the district. The sentencing hearings were held once a month and fifty to sixty sentencings were handled that day, as Judge Biery notes "These weren't complicated cases. But it was very impersonal." Now the court handles eight to ten sentencings each Thursday: We do them individually and we give them the attention I think they deserve. The majority of the defendants don't speak English, so we use a translator. I think with the videoconferencing the defendant has a better perspective on what is happening. Wit the cameras, it's like they are sitting six feet away. There is a one-on-one relationship that just wasn't possible before. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>. Videoconferencing is used in many federal bankruptcy courts for a wide range of matters and is of particular benefit because of the many hearings that are required by federal bankruptcy law. Pilot projects have been undertaken in Florida, Texas, and Iowa. *Id.*

77. Many of the district courts that installed video equipment for prisoner suits are also using their videoconferencing capability to hear witness testimony in trials. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>.

78. Scott Marshall, *Gwinnett Police Go On Line for Warrants; Video Testimony Speeds Arrests; May Not Be Legal*, Atlanta J. and Constitution, April 12, 1995.

79. The tenth and D.C. Circuits also used videoconferencing for remote appearances. *Videoconferencing Links Federal Courts and Public*, The Third Branch 2, ¶10 (June 1998) <http://www.uscourts.gov/ttb/jun98ttb/video.html>.

80. Robin Topping, *Hearings Linked By Videoconferencing*, Newsday, Apr. 23, 1997 at A29; Mark Pazniokas, *Video Justice Is Catching On In Legal Circles*, Hartford Courant, May 7, 1997 at A3.

81. Joanna Glaser, *Second Circuit Unveils Latest Courtroom Tech*, N.Y. Law J., Nov. 10, 1997 at T4.

82. As reported at the Australian Institute of Judicial Administration Conference, Melbourne, Australia, March 23, 1998.

83. 44 M.J. 464 *(Armed F. 1996).*

84. 971 F. Supp. 755 (E.D. New York 1997)(noting the witness' illness as preventing a court appearance and the safety risk a deposition would pose to his placement in the witness protection program).
85. Letter from Judge Anthony J. Sciuto to Counsel in *Turcinovic v. Floch et al*., No. BER-L-16422-90 (N.J. Super. Ct. 1997) (Jan. 6, 1998)(on file with author). *See also* Christopher Mumma, *Paralyzed Man to Testify Using Internet Link*, Record (N.N.J.), Jan. 9, 1998 at L03.

86. Judge William Mauer's courtroom in Kansas City, Missouri has been high tech for a few years (document camera, computer evidence presentation system, enabled for videoconferencing). Now the courtroom will also double as a virtual classroom: additional cameras are being installed to allow broadcast of trials over the Internet for viewing by law school classes. Interview of Judge William Mauer and clerk, by Susan Hobbs on Oct. 26, 1998.

87. Telephone interview with Judge Wilson by Susan Hobbs on Oct. 27, 1998.

88. Harrell v. State. at 1372.

89. Like practitioners, law students also are time demand adverse. If they perceive that technology use, such as preparation of a computer slide show, will take time not necessary for a traditional presentation we can assume that most will forego the opportunity when they do not see visible gain resulting.

90. During a Courtroom 21 Project senior staff meeting, October 29, 1998.

91. We must also distinguish between a lawyer's willingness to *personally* use the technology and the lawyer's desire to have staff sit in the courtroom and do so. We believe that the first is far preferable to the second, but that requires a high level of self-confidence on the part of the lawyer.

92. See note 49 *supra*.

93. There seems little chance that today's technology augmented litigation would be so efficient as to cause such a problem. The same might not be as true for a truly virtual system.

94. The Courtroom 21 experience is that normal courtroom equipment seldom fails. *Networks* can be perennial problems, however.

95. Lawyers operate the evidence presentation equipment under judicial control.

96. *Science Applications International Corp. v. Superior Court of San Diego County*, 46 Cal. Rptr. 2d 332, 337 (Ct. App. 1995). Specifically, the Court allowed recovery of expenses for a "graphics exhibit board" ($57,969) and an evidence video ($101,908) *but not for*: document control and a case management database ($200,000), the production of laser disks for evidence storage ($47,481), rental of graphics communications system equipment for trial use ($9,916), fees for an on-site computer technician during trial ($11,983), and fees for editing video depositions for better jury presentation ($35,652).

97. *Id*. at 338. The court went on to criticize the use of technology in this case, pointing out that the prevailing party was awarded damages of $1 million but had litigation costs of $2 million, and concluding that: "[i]f a party litigant chooses unwisely to expend monies in trial presentation in excess of the value of the case, utilizing advanced methods of information storage, retrieval, and display, when more conventional if less impressive methods are available, the party must stand his own costs." *Id*.

98. Mark Rollenhagen, *A Courtroom Revolution*, Plain Dealer (Clev.), Sept. 21, 1998 at B1.

99. Anecdotal evidence suggests that in criminal cases the defense is permitted to use technology owned or rented by the prosecution. The situation in civil cases is far less clear.

100. Fredric I. Lederer, *Courtroom Technology and Its Educational Implications*, 8 VA Educ. & Practice 3, 1998.

101. Joan Jacobson, *High Tech Justice For All?*, Balt. Sun, June 8, 1998 at 1C.

102. *See* note 25 *supra*.

103. Of course, most cases never make it to trial. One can reasonably argue that the primary function of courts is to impel pretrial settlement on pain of possible trial.

104. Notwithstanding distrust of the system in some population groups.

105. As to probability and the courts generally, *see, e.g.* P. Tillers & E. Green, Probability and Inference in the Law of Evidence (1988).

106. Other than expressed satisfaction with the technology during Courtroom 21 Project experimental lab trials.

107. And audio.

108. Daniel E. Harmon, *Panelists' Wake-Up Call: Future Is Here For Lawyers*, 24 Law PC 1, 1995, reporting on Johnson's presentation to the ABA Tech Show '95.

109. There is also, of course, a compelling Sixth Amendment argument that in criminal cases government testimony without demeanor would fail the "confrontation" requirement of the Bill of Rights. Notwithstanding this, this assumption should be tested scientifically.

110. Kevin Maney, *Virtual Spelunkers' Reality, Business World Exploring CAVEs,* USA Today, November 3, 1998, at B-1, Col.3.

111. *Id*. at B-2, Col. 1.

112. Courthouses too could be made virtual, but a number of courthouse features would lend themselves to physical location. If nothing else jails and the like could easily handle certain additional functions.

113. *E.g.*, Press Enterprise Co. v. Superior Court, 464 U.S. 501 (1984); Richmond Newspapers, Inc. v. Virginia, 448 U.S. 555 (1980).

114. " Courtrooms contain every symbol of authority that a set designer could imagine . . . You wear a costume identifying you as, if not quite divine, someone special, James B. Simpson, Websters' II New Riverside Desk Quotations 74 (1992) (Judge Irving R. Kaufman, United States Court of Appeals for the Second Circuit, in Time, May 5, 1980).

115. David S. Shrager & Elizabeth Frost (ed.) The Quotable Lawyer 65 (1986) (quoting William T. Gossett, President, American Bar Association in a speech to the Canadian Bar Association in Ottawa, September 3, 1969).

116. James B. Simpson, Websters' II New Riverside Desk Quotations 73 (1992) (quoting Learned Hand, To New York Legal Aid Society, February 16, 1951).

117. And then wait their turn, often a lengthy time.

118. *C.f.,* Bob Van Voris, *1998 Juror Outlook Survey, Civil Cases Jurors Do Not Trust Civil Litigants. Period*., Nat'l L.J., November 2, 1998, at A24 ("More than three-quarters [of surveyed persons] agreed with the statement, 'Whatever a judge said the law is, jurors do what they believe is the right thing.'").

119. Elements of this perception are now threatened by suspicions of racially based unfairness. *See, e.g.*, Bob Van Voris, *1998 Juror Outlook Survey, Criminal Cases Poll Elicits Fear of Rogue Jury. Period,* Nat'l L.J., November 2, 1998, at A25 ("Almost one-third of the potential jurors polled don't believe police testimony, with more than half of the blacks and Hispanics saying police usually don't tell the truth under oath"; "As a whole, 43 percent [of those surveyed] said that the system treats minorities unfairly).

120. David S. Shrager & Elizabeth Frost (ed.) The Quotable Lawyer 66 (1986) (quoting Warren E. Burger, address to the American Bar Association meeting in New Orleans as reported in the Los Angeles Times, August 27, 1978).

121. Harrell v. State, 709 So. 2d 1364 (Fla. 1998); *cert. denied*, 67 U.S.L.W. 3237 (U.S. 1998).

122. Judge Donald Walter, United States District Judge in Shreveport, Louisiana has reported to William & Mary Law School's Legal Technology Seminar in March, 1998, that the use of a large wall-mounted screen to display all case evidence resulted in a report to him by a local journalist that she could understand what was really happening at trial for the first time.

123. Much of expert witness testimony may become remote in an effort to reduce litigation costs.