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TECHNOLOGY COMES TO THE COURTROOM, AND . . .

Fredric I. Lederer*

We have seen the future, and it consists of high-tech courtrooms outfitted with teleconferencing devices and computers to aid legal research, provide instant transcripts and help the deaf understand what is being said.¹

Our increasing dependence on technology, particularly computer-based technology, is one of the distinguishing characteristics of late twentieth century American life. Microchip-based information and communications systems are increasingly at the heart of human activities. Because law and law practice are in significant ways forms of information collection, analysis, storage, and processing, one could readily expect the legal profession to be greatly affected by the technological developments of the last twenty years or so. Although the degree to which the profession has been characterized by cutting-edge technological pioneers² is unclear, the extent to which lawyers and law firms have been affected by communications advances,³ particularly the ubiquitous fax, and the personal computer revolution, is apparent.⁴ Could we even imagine legal research without

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¹ *High-Tech Courts*, NAT'L L.J., Jan. 10, 1994, at 16 (editorial accompanying an article highlighting Courtroom 21, discussed *infra*).

² The stereotypes associated with the legal profession are many. Among them, undoubtedly, is an image of the profession as being deliberate, cautious, and traditional; an image certainly based in reality. Few people like change for the sake of change alone, and the legal profession could hardly be faulted if, as an entity, the profession failed to plunge headlong into technological pioneering. Those who work with computers and software are undoubtedly familiar with the adage that in the world of computers the pioneers are those with the arrows in their backs. What may be surprising is the number of pioneers the profession has had.

³ We tend to forget the impact of the telephone itself, especially when put to creative use. See, e.g., J. Allison DeFoor, II & Robert N. Sechen, *Telephone Hearings in Florida*, 38 U. MIAMI L. REV. 593 (1984); Roger A. Hanson et al., *Telephone Conferencing in Criminal Cases*, 38 U. MIAMI L. REV. 611 (1984).

⁴ Generational change is upon us. Not many years ago, my law school offered popular optional training in basic word processing. Now, nearly everyone enters the school with that knowledge, if not his or her own personal computer as well. Of course, some law students, lawyers, and judges still do not or will not use computers. Although undoubtedly a significant number, these technological doubters ought not be given undue attention. Somewhere a few lawyers probably insist on drafting docu-

Lexis and WestLaw? Even the courts are computer-dependent, for the courts are choked with information, and technology holds virtually the only hope for bringing order out of information chaos. Only one precinct of the law has largely foregone the use of technology: the normative, near-sacred heart—the courtroom.

The case should not, however, be overstated. Court clerks often have computerized information retrieval available in the courtroom; many courtrooms have videotape recording systems; and zealous litigators often have brought television sets, VCRs, and, more recently, laserdisk and computer-based display systems into the courtroom to present evidence.⁵ With very few exceptions, however, these uses of electronic technology have been ad hoc developments. The courtroom itself has largely been devoid of significant technological capability. This is now beginning to change.⁶

A number of different trends appear to be coalescing:

- Limited court budgets compel the use of labor-saving technology;
- Increasing general acceptance of high technology in ordinary life weakens the psychological barriers sometimes held by judges and

ments with quill pens. Notably, many of us still have quill pens, but only as mementos of bygone years.

⁵ And, of course, attorneys often have been supported individually by extraordinarily sophisticated litigation support systems, laptop computers, modem communications, cellular phones, and the like.

⁶ See, e.g., Mike McGuire, *Legal Firm KOs Rivals With Multimedia Presentations*, PC WEEK, June 27, 1994, at 49; Rorie Sherman, *Virtual Venues*, NAT'L L.J., Jan. 10, 1994, at 1; Alice LaPlante, *Multimedia Technology Stands Trial, Erases Paper*, INFOWORLD, Nov. 22, 1993, at 58 (all discussing how a Dallas firm uses imaging and video court presentations to sway a jury). One must be careful making predictions. In 1984, Judge DeFoor of Florida's Sixteenth Judicial Circuit wrote:

The use of technology for conferencing between cities is growing as AT&T sets up teleconferencing centers around the country. There is no doubt that widespread availability of such technology in every courtroom and, ultimately, in every office, will revolutionize the ability of attorneys and witnesses to "appear" in court. Regardless of how interesting the experiments are in the area of telephone hearings, those experiments are a passing phase. With more technological advances, the telephone hearing will quickly lose its current status as a "new idea," become widely accepted, and eventually be outmoded by newer communication methods.

J. Allison DeFoor, II, *Introduction to Special Topic: Telecommunications in the Courtroom*, 38 U. MIAMI L. REV. 590, 592 (1984). Judge DeFoor was correct, but the judge may well have expected a somewhat faster rate of change than has actually occurred.

court administrators while creating an expectation of technology use;

- Because of the adversary system, litigators are increasingly confronting courts with the need to manage technology use by lawyers;
- As information is rapidly originating and being maintained in computer-related formats, its courtroom presentation by computer is at least desirable, and in many cases critical information cannot be usefully created, reproduced, or presented without a computer; and
- Both societal attitudes and statutes such as the Americans With Disabilities Act impel the use of technology to compensate for impaired human abilities.

Together, these trends clearly indicate that courtrooms will become increasingly technological in nature. What they do not necessarily show is the type of technology to be employed and its legal and practical consequences. Perhaps the best harbinger of what is to come is Courtroom 21, the most technologically advanced courtroom in the nation, if not the world.⁷

I. COURTROOM 21

Unveiled on September 13, 1993, *Courtroom 21, The Courtroom of the 21st Century Today*, is located in the McGlothlin Courtroom of William & Mary's Marshall-Wythe School of Law in Williamsburg, Virginia. The Courtroom is a joint project of William & Mary and the National Center for State Courts,⁸ and functions as an adjunct to the National

⁷ Although such an assertion is inherently hazardous, numerous visitors to Courtroom 21 from other nations have thus far confirmed the claim. On March 29, 1994, for example, Mr. B.V.L. Ottens of the Dutch Ministry of Justice, accompanied by architect V.C.A. Reijers, visited the courtroom in order to obtain design information to better construct at The Hague a high-technology courtroom for the United Nations Yugoslavian War Crimes Tribunal.

Courtroom 21 does not contain every type of courtroom technology known. Rather, it constitutes the single largest collection of such technology known to exist in one place.

Of particular importance is the fact that Courtroom 21's technology is integrated, making the advantages of disparate products apparent.

⁸ Founded in 1971, the National Center for State Courts supports state and local courts throughout the United States with research, educational, and training programs. The National Center's Research Division includes the Institute on Mental Disability and the Law and the Center for Jury Studies. The Institute for Court Management works to support and improve the performance of judicial, administrative, and support personnel in state courts, while the Court Services Division provides direct support to courts in a wide variety of ways. In recent years, the National Center also has assisted courts and court personnel in many different nations. The National Center is located next

Center's Court Technology Laboratory.⁹ Primarily a trial courtroom, Courtroom 21 also functions as an appellate courtroom, and some aspects of its technology, notably its legal research and real-time transcript capabilities, are also useful in the appellate arena.

In addition to its in-house educational function,¹⁰ Courtroom 21 serves both as an international model¹¹ of integrated mainstream, commercially available technology and as an experimental test-bed for various technologies. The public service goal of the Courtroom 21 project is to provide judges, court administrators, architects, lawyers, court reporters, and others concerned with courtroom activities with a functional model courtroom that they can examine in order to determine technological solutions to their unique needs. Inherent in the concept of Courtroom 21 is the assumption that technology must not be an end in itself; rather it must serve a pragmatically useful function or it will likely prove an expensive and frustrating mistake.

Courtroom 21's present technology base emphasizes three overlapping areas: pretrial activities; the judicial record; and the presentation of information, including trial evidence, to trial participants.¹² As this division

door to the Marshall-Wythe School of Law.

⁹ Funded through a grant from the State Justice Institute, the Court Technology Laboratory assists courts in reviewing and locating hardware and software. The Laboratory includes court applications systems, including case management systems; data and text database systems; imaging components; and network and communications systems. The Court Technology Laboratory also maintains a computer bulletin board service for those interested in court technology.

¹⁰ The courtroom is used for a wide variety of trial and appellate practice and educational activities. The courtroom also lends itself to technologically augmented traditional instruction. As a part of William & Mary's ABA prize-winning Legal Skills Program, all students spend their first two years in one of 12 simulated law firms. The Legal Skills Program teaches ethics, legal research and writing, interviewing, negotiating, drafting, and basic trial and appellate practice and is centered around increasingly complex simulated client representation. Because one of each student's simulated cases goes to trial and appeal, the program generates approximately 45 trials and 45 appeals each year. Using transcripts that student court reporters prepare, appeals are taken from what actually happened at trial.

¹¹ Professionals from over 20 nations have visited Courtroom 21. Foreign visitors have included members of the Dutch Ministry of Justice; the legal advisor to the Arab Emirates; members of the Polish Parliament; judges from several South American nations and Egypt; deans from law schools in Brazil, the Czech Republic and Hong Kong; and a number of lawyers, administrators, and courtroom design professionals from Canada and Singapore.

¹² At present, the one substantial area of courtroom technology not represented in Courtroom 21 is physical security. Whether that will be addressed in the future is unclear. In Phase II of Courtroom 21, the courtroom will be linked to the court and law firms. By computerizing and networking the firms, the court, the courtroom, and the judge's chambers, Courtroom 21 will replicate a legal and

illustrates, and despite the obvious overlaps, technology may be of primary interest to the judge and court administrator on the one hand or to the litigator on the other. The distinction may ultimately prove to be important as budget constraints are apt to limit the amount of technology that may be obtained and installed at any one time, and courts are likely to first install the technology that best directly serves their interests.

Currently, Courtroom 21's major technological capabilities¹³ include:

- Assisted listening device support;¹⁴
- Remote two-way television arraignment and witness examination;¹⁵
- Lexis and WestLaw legal research at bench and counsel tables¹⁶ with JuriSoft software support;¹⁷
- Information storage and presentation via FolioViews;¹⁸
- Concurrent (real-time) Stenograph court reporter transcription,¹⁹ including the ability for each lawyer to mark an individual computerized copy for later use;
- Recorded or real-time televised evidence display with analog optical disk storage using the Doar Presenter and Disk Partner system²⁰

court system complete with information exchange, document imaging, docket control, and other basic components of court administration.

¹³ Courtroom 21's technology base continually changes, often quickly. What the future holds is unclear. Planned upgrades include multi-point remote video lawyer-witness appearances.

¹⁴ Supplied by ConferenceMate, the courtroom's assisted listening system uses a small centralized microphone which picks up every courtroom sound louder than a whisper and transmits it to the listener's headphones. The listener may adjust the headphone volume to match individual needs. Not only does this assist those with diminished hearing ability, it corrects for poor acoustics. This latter capability may be of great value to court reporters.

¹⁵ This system uses the Court Technologies, Inc. multi-frame video system. (See text accompanying note 61 *infra*.) Remote arraignment is demonstrated using the courtroom's real cellblock. Remote witness examination is accomplished by telecasting from a different part of the cellblock in order to avoid unnecessary long-distance telecommunications charges. Installation of a fully functional, substantial video testimony and video counsel appearance (video-conferencing) capability now is scheduled for late 1994.

¹⁶ WestLaw CD-ROMs also can be used.

¹⁷ JuriSoft software has cite checking and document comparison capabilities.

¹⁸ FolioViews, soon also to be available as JuriSoft's LegalViews, can best be described as an electronic book format which permits the creation of fully indexed and searchable text combined with graphic images.

¹⁹ See *infra* notes 48-53 and accompanying text.

²⁰ The Doar Presenter is a vertically-mounted, portable TV camera that transmits images of whatever is placed beneath it, including documents and physical objects. The Doar Disk Partner uses

and the Litigation Sciences videodisc system, which features bar code indexing and light-pen control;

- Built-in video deposition playback facilities;
- Automatic Court Technologies microchip-controlled, multi-camera, multi-frame, video recording of proceedings using ceiling-mounted cameras and Shure Microphone voice-initiated switching; optional synchronization to the real-time transcript;²¹
- Text, graphics, and TV-capable jury computers and monitors²² used to display floppy disk, CD-ROM, laser videodisc, videotape, or real-time live data and images, including multi-media computer animations and graphics, as well as more mundane documents;
- The A.D.A.M.²³ simulation and display of the human body;
- Concurrent computer-displayed transcription for hearing-impaired witnesses, jurors, lawyers, and judges;
- Consecutive translation of up to 143 languages using AT&T's Language Line;²⁴ and
- Teleconferencing via Teleconferencing Systems integrated telephone/audio system.

Evidence presentation was originally directed from the court clerk's master station,²⁵ which controlled the master computer, the Doar presentation equipment, the Litigation Sciences video laserdisk, and the PV-VCR. Control is scheduled to be moved to counsel's podium in the fall of 1994. The courtroom computers are connected via a specialized Stenograph Caseview network and a video network. A more traditional network is scheduled to be added in late 1994.

To the degree possible, Courtroom 21 uses software compatible with Microsoft Windows to permit multiple display windows and

small analog disks that can contain 50 images each. Images can be recorded on the disks before trial for use during the case. The disks also can be used to make a still-image optical appellate record during trial.

²¹ The Stenograph Discovery Video-ZX system is used.

²² These capabilities are augmented by two built-in, wall-mounted, data-capable television monitors. At least one monitor is visible from any location in the courtroom.

²³ Animated Dissection of Anatomy for Medicine by A.D.A.M. Software, supplied by Doar Communications.

²⁴ See *infra* note 28.

²⁵ Easy litigator use of the evidence presentation systems proved to be critical for effective application.

multitasking.²⁶

Courtroom 21's equipment is made available to the Marshall-Wythe Law School for demonstration and experimentation by private-sector companies. Critically, those companies have committed themselves to periodic upgrading of their hardware and software, ensuring that the courtroom will remain technologically current. Additional firms will be added as appropriate.

Although installation and long-term maintenance of much of the equipment requires technically trained personnel, *operation* of the equipment requires little or no technical training;²⁷ a three- to five-minute explanation suffices for operation of most equipment.

No one can predict the future. Courtroom 21, however, reflects technology that is currently available and increasingly being installed in actual courtrooms. Analysis of its technological capabilities, therefore, should shed light on some of the technology-related questions that confront those who wish to improve courtroom design and use.

II. PRETRIAL

A. *Remote First Appearances and Arraignments*

After a criminal defendant is arrested, a judge must advise the defendant of the applicable rights, including the right to counsel and the conditions for pretrial release.²⁸ Either at the same hearing or later, the defendant will be arraigned and asked to enter a plea. Ordinarily, these are brief, routine hearings, which many courts accomplish in great number on any given day. The defendants involved are often incarcerated, and transportation of jailed defendants to the courtroom is in most jurisdictions problematical. The costs of transportation and guards, to say nothing of the effort and possible delay necessary to muster all concerned, can place significant strains on the court system. At the same time, security concerns

²⁶ Multitasking is the concurrent operation of two or more computer programs.

²⁷ An exception is the real-time system, which requires a trained court reporter.

²⁸ First appearances often involve interpretation problems. Few jurisdictions can afford to maintain large numbers of interpreters, even if skilled experts are locally available. AT&T's Language Line permits a subscribing jurisdiction to telephone the service without prior notice and have Language Line identify the language spoken and then connect an appropriate interpreter. Language Line can translate 143 languages. Courtroom 21 uses the service via a duplex speakerphone system.

can be substantial, whether viewed from the perspective of escape or assault.

Remote arraignments²⁹ leave the defendant at the jail,³⁰ ordinarily in a special room designated for the purpose. The judge and prosecution are in the courtroom; depending on the jurisdiction and counsel's personal choice, defense counsel may either be in the courtroom or at the jail with the client. The arraignment is accomplished by live two-way television. The television can be as basic as a two-camera system, with one camera at each location, or as sophisticated as the Courtroom 21 six-camera system, which shows the defendant every aspect of the courtroom.

Remote arraignments have been used in courts since at least 1982 when Dade County, Florida, initiated two-way television first appearances in misdemeanor cases.³¹ Remote arraignment systems appear to be increasingly popular.³² Although there is no central register of courts using them, informal estimates suggest that between 160 and 200 systems are now in operation across the United States,³³ and a number of jurisdictions expressly have authorized them by statute.³⁴ Indeed, a possible change to the

²⁹ The expression "remote arraignment" usually includes remote first appearances.

³⁰ Depending upon the jurisdiction, participation in a remote arraignment may or may not be voluntary on the part of the defendant. Notably, § 4(a) of the American Legislative Council's Remote Video Court Appearance Act provides that at a remote arraignment, "The defendant may not enter a plea of guilty to, or be sentenced upon a conviction of, a felony." See *infra* note 34.

³¹ Jeffrey M. Silbert et al., *The Use of Closed Circuit Television for Conducting Misdemeanor Arraignments in Dade County, Florida*, 38 U. MIAMI L. REV. 657 (1984). Subsequently the Eleventh Judicial Circuit adopted remote misdemeanor arraignment on a regular basis. *Id.*

³² See Rorie Sherman, *Courts Give Technology a Mixed Greeting*, NAT'L L.J., Jan. 10, 1994, at 1 (summarizing cases); Sandra Torry, *Courtrooms Boost Use of Video Camera Technology*, WASH. POST, Sept. 20, 1993, at Financial 7.

³³ Both Florida and Texas have significant concentrations of remote arraignment systems. This information comes from data maintained by the National Center for State Courts.

³⁴ E.g., the Virginia Code provides:

Personal appearance by two-way electronic video and audio communication; standards—(A) Where an appearance is required or permitted before a magistrate or, prior to trial, before a judge, the appearance may be by (i) personal appearance before the magistrate or judge or (ii) use of two-way electronic video and audio communication. If two-way electronic video and audio communication is used, a magistrate or judge may exercise all powers conferred by law and all communications and proceedings shall be conducted in the same manner as if the appearance were in person, and any documents filed may be transmitted by electronically transmitted facsimile process. The facsimile may be served or executed by the officer or person to whom sent, and returned in the same manner, and with the same force, effect, authority, and liability as an original document. All signatures thereon shall be treated as original signatures.

Federal Rules of Criminal Procedure was discussed in early 1994 permit-

(B) Any two-way electronic video and audio communication system used for an appearance shall meet the following standards:

1. The persons communicating must simultaneously see and speak to one another;
2. The signal transmission must be live, real time;
3. The signal transmission must be secure from interception through lawful means by anyone other than the persons communicating; and
4. Any other specifications as may be promulgated by the Chief Justice of the Supreme Court.

VA. CODE ANN. § 19.2-3.1 (Michie Supp. 1994). The American Legislative Exchange Council has likewise prepared a model Remote Video Court Appearance Act, which provides in relevant part:

Section 1. [Title.] This act shall be known and may be cited as the Remote Video Court Appearance Act.

Section 2. [Definitions.] The following words and phrases when used in this act shall have the meanings given to them in this section unless the context clearly indicates otherwise:

(A) "Independent audio-visual system" means an electronic system for the transmission and receiving of broadcast-quality audio and visual signals, encompassing encoded signals, frequency domain multiplexing or other suitable means to preclude the unauthorized reception and decoding of the signals by commercially available television receivers, channel converters, or commercially available receiving devices.

(B) "Electronic appearance" means an appearance in which various participants, including the defendant, are not present in the court, but in which, by means of an independent audio-visual system

(1) all of the participants are simultaneously able to see and hear reproductions of the voices and images of the judge, counsel, defendant, police officer, and any other appropriate participant as well as appropriate visual evidence and or pre-trial information; and

(2) counsel is present with the defendant, or if the defendant waives the presence of counsel on the record, the defendant and their counsel are able to see and hear each other and engage in private conversation via a private telephone line.

Section 3. [Policy and rules.]

(A) Notwithstanding any other provision of law and except as provided in Section 4 of this article and where otherwise Constitutionally mandated, the court, in its discretion, may dispense with the personal appearance of the defendant, and conduct an electronic appearance in connection with a criminal action pending provided that the chief administrator of the courts has authorized use of electronic appearance.

(B) If, for any reason, the court determines on its own motion or on the motion of any party that the conduct of an electronic appearance may impair the legal rights of the defendant, it shall not permit the electronic appearance to proceed. If, for any other articulated reason, either party requests at any time during the electronic appearance that such appearance be terminated, the court may grant such request and adjourn the proceeding to a date certain.

(C) The electronic appearance shall be conducted in accordance with rules

ting not only such arraignments but also pretrial video teleconferences.³⁵ Remote arraignments have survived legal challenge³⁶ except in jurisdic-

issued by the chief administrator of the courts.

(D) When the defendant makes an electronic appearance, the court stenographer shall record any statements in the same manner as if the defendant had made a personal appearance. No electronic recording of any electronic appearance may be made, viewed or inspected except as may be authorized by the rules issued by the chief administrator of the courts.

Section 4. [Conditions and limitations.] Electronic appearances shall have the following conditions and limitations:

(A) The defendant may not enter a plea of guilty to, or be sentenced upon a conviction of, a felony.

(B) The defendant may not enter a plea of not responsible by reason of mental disease or defect.

(C) The defendant may not be committed to the state department of mental hygiene.

(D) The defendant may not enter a plea of guilty to a misdemeanor conditioned upon a promise of incarceration unless such incarceration will be imposed only in the event that the defendant fails to comply with a term or condition imposed under the original sentence.

(E) A defendant who has been convicted of a misdemeanor may not be sentenced to a period of incarceration which exceeds the time the defendant has already served when sentence is imposed.

Section 5. [Approval by the chief administrator of the courts.] The appropriate administrative judge shall submit to the chief administrator of the courts a written proposal for the use of electronic appearance in their jurisdiction. If the chief administrator of the courts approves the proposal, installation of an independent audio-visual system may begin.

Section 6. [Parole hearings.] Notwithstanding any other provision of law, the department may install, maintain, and operate an independent audio-visual system in each correctional institution of the department that has committed persons eligible for parole and at the principal office of the Prisoner Review Board for the purpose of the conduct of parole hearings by the Prison Review Board and the taking of any testimony of victims by means of electronic appearance.

³⁵ The Committee on Rules of Practice and Procedure of the Judicial Conference of the United States proposed in October, 1993, a revision of Rule 10 of the Federal Rules of Criminal Procedure that would declare that video teleconferencing may be used to arraign a defendant not physically in court, provided the defendant waives the right to be arraigned in open court. Rule 43 would be amended to specify that the defendant need not be present when the proceeding is a pretrial session in which the defendant can participate through video teleconferencing and waives the right to be present in court. The rule amendments respond in part to *Valenzuela-Gonzalez v. United States Dist. Ct.*, 915 F.2d 1276 (9th Cir. 1990). See *infra* note 37.

³⁶ See, e.g., *Commonwealth v. Terebieniec*, 408 A.2d 1120 (Pa. Super. 1979). In *Terebieniec*, the court opined:

Appellant's arraignment differed from a traditional arraignment only in that the court communicated with him by way of closed circuit television. The arraignment was no more open to the public than would have been arraignment in person and created no extra publicity. The Rules of Criminal Procedure demonstrate that reliance upon mechanical and electronic devices in pretrial proceedings can be salutary and are permissible so long as

tions with rules that have been interpreted to require in-person arraignment.³⁷ There appears to be substantial, if not unanimous, agreement that remote arraignments have proven greatly successful as a cost-containment mechanism. What is not entirely clear are the human consequences of

they do not impair the rights of the accused. . . . Appellant's arraignment by closed circuit television bore none of the characteristics of the "circus" atmosphere condemned in *Shepard v. Maxwell*, 384 U.S. 333 (1966), and did not in any way subject him to a greater risk of prejudicial publicity before trial. . . . We find no unconstitutional prejudice inherent in appellant's arraignment.

Id. at 1123.

³⁷ *E.g.*, *Valenzuela-Gonzalez v. United States Dist. Ct.*, 915 F.2d 1276 (9th Cir. 1990); *R.R. v. Portesey*, 629 So. 2d 1059 (Fla. Dist. Ct. App.), *review denied*, 637 So. 2d 236 (Fla. 1994) (involuntary use of videotelephone to conduct secure juvenile detention hearing when defense counsel was in chambers with the judge and juvenile defendant was in detention facility was without legal authority). In *Valenzuela-Gonzalez* the federal district court in Phoenix, Arizona, was participating in a pilot program of the Federal Bureau of Prisons:

Under the procedure, arraignment is conducted while the detainee remains in prison. Communication is established between the prisoner and the district court by a sophisticated video-teleconferencing or closed circuit television system with several voice-activated cameras and monitors in the courthouse and the federal prison. The system is designed to allow public viewing as well as confidential attorney-client conferences. It is augmented by fax machines for transmitting documents.

915 F.2d at 1277 n.2. The district court order implementing the program declared:

IT IS ORDERED that for a period of one year from the date of filing of this Order, in the discretion of any district judge or magistrate of the District of Arizona, initial appearances and arraignments of pretrial detainees may be conducted by video-conferencing. The attorney for the defendant may elect to be present by video with the defendant or may appear personally in the hearing room at the District Courthouse. A defendant having his initial appearance before a federal magistrate may be taken before such magistrate by video when authorized by that judicial officer.

Id. at 1277 n.1.

When *Valenzuela-Gonzalez* moved that the district court permit an in-person arraignment, the court held that remote arraignment for the purposes of entering a non-guilty plea did not violate the Fifth or Sixth Amendments or Rule 43 of the Federal Rules of Criminal Procedure. *Id.* at 1277 n.3. Petitioner sought an order prohibiting the remote arraignment. Issuing a writ of mandamus, the Ninth Circuit held that, taken together, Rules 10 and 43(a) of the Federal Rules of Criminal Procedure required the defendant's physical presence. *Id.* at 1280. Interestingly, although the court did not reach the constitutional issues, it noted:

Nevertheless, whether the fifth and sixth amendments prohibit the use of closed circuit television at an otherwise proper arraignment is not immediately apparent. Arraignment is not a procedure required by the due process clause of the fifth amendment. *Garland v. Washington*, 232 U.S. 642 (1914); *United States v. Coffman*, 567 F.2d 960 (10th Cir. 1977). The sixth amendment right to confront witnesses is not implicated, since there are no witnesses. [*Snyder v. Massachussets*, 291 U.S. 97, 107 (1934)]. Moreover, the Supreme Court has held that closed circuit television may satisfy the confrontation clause in limited circumstances. *Maryland v. Craig*, 497 U.S. 836 (1990).

Id. (footnote omitted).

remote arraignment.

In 1983 the main complaint voiced by prosecutors and public defenders was that "video depersonalizes the contact between the parties in the courtroom and those in the jail."³⁸ That complaint was at least partially the product, however, of the equipment used and concerned audio and video shortcomings³⁹ that have now been eliminated. Whether the physical separation remains of concern despite substantial technical improvements remains to be seen, but it does not appear likely to become a significant issue.

The primary question implicated by remote arraignment concerns the adequacy of indigent defense services in a remote arraignment environment. Depending on the jurisdiction, defense counsel may remain with the client in the jail or choose to be present in the courtroom. No problem exists if, as in the original Florida experimentation, counsel stays with the client.⁴⁰ If counsel chooses, however, to join the judge and prosecution in the courtroom, at least some potential for concern arises. To comply with the legal duty to provide effective assistance of counsel, to say nothing of the ethical duty of zealous representation, counsel must adequately interview and advise the client before arraignment and must assist the client during arraignment. Clearly, these functions of counsel can be done even if counsel is in the courtroom during the arraignment.⁴¹ There is a risk, however, that even if effective and secret privileged communications can be provided,⁴² the artificiality and practical difficulty incumbent in their use may chill communications. Absent associate counsel so that the client

³⁸ Silbert et al., *supra* note 31, at 672.

³⁹ *Id.*

⁴⁰ *Id.* at 667. For a suggestion that departure from this approach may be significant, see *R.R. v. Portes*, 629 So. 2d 1059, 1062 (Fla. Dist. Ct. App.), *review denied*, 637 So. 2d 236 (Fla. 1994).

⁴¹ Counsel preferably would interview the client in person. Although remote interview by telephone or two-way video is possible, one must question whether sufficient rapport could be established to satisfy the goal behind zealous representation. A lawyer already has enough difficulty establishing a sufficiently trusting relationship to permit the client to share important and potentially harmful secrets. Establishing the relationship remotely strikes me as undesirable at present. Arguably, the use of life-size imaging might alter this.

⁴² Technically providing for confidential communications is easily possible. Psychologically, it may not be so easy. Counsel and client may feel distinctly uncomfortable using specially "hushed" telephones in the presence of the judge, even if that can be accomplished. If secure communications require that counsel and client move temporarily to another, nearby, location, one or both may be hesitant to take advantage of them.

may be represented in both locations,⁴³ defense counsel may have to choose between client service and courtroom convenience, the latter made far more important than it might seem because of the easy availability in the courtroom of the prosecution for plea bargaining. An already overworked indigent defender may find the choice especially difficult and, the hopefully few, inadequate defense counsel may find themselves more tempted than usual to provide less effective client service.

Where remote arraignments are used, as distinguished from remote first appearances, those arraigned remotely will likely consist only of those who have not been previously released pending further proceedings. Even in those jurisdictions that make substantial use of release on personal recognizance, the release of many defendants requires some form of bail. Nearly by definition, those who cannot secure release will mostly be those too poor to do so. Thus, in some places remote arraignment could prove to be mostly the arraignment of minority members of society. Although it is improbable that remote arraignment can be prejudicial in the legal sense, disproportionate remote appearance of members of one or more racial or economic groups could be troubling.⁴⁴

Although these concerns merit consideration and justify empirical data collection and analysis, they are unlikely to forestall further use of remote arraignment. Indeed, as the cost of two-way communications lines decrease, remote *counsel* appearances are likely to become commonplace, at least for short matters. As remote appearances by court personnel become an accepted matter, concern about remote-party appearance is likely to lessen.

B. Legal Research on the Bench and at Counsel Table

Although on-line computer research is now commonplace and fundamental,⁴⁵ courtrooms proper rarely have legal research capabilities. In theory, providing judge and counsel electronic research should have little or no impact on litigation. After all, most well-equipped courthouses have

⁴³ The Dade County, Florida, Public Defender places one lawyer at each location. Sandra Torrey, *Courtrooms Boost Use of Video Camera Technology*, WASH. POST., Sept. 20, 1993, at Financial 7.

⁴⁴ These concerns have delayed remote arraignment pilot programs in Minnesota.

⁴⁵ CD-ROM-based legal data bases have become increasingly important as time- and cost-saving mechanisms.

ready access to at least basic law libraries. Nevertheless, even though judges may recess the proceedings in order to consult a case, or for that matter send a clerk to retrieve a critical volume, these actions slow or delay trial, something that most trial judges prefer to avoid. The ability to have instant access to a case when unsure as to its applicability may greatly improve the accuracy of legal rulings. Indeed, the mere knowledge by counsel that they may be called on their legal authorities in public by the court may raise the standard of practice.⁴⁶

Legal research facilities at bench and counsel tables, however, raise two possible problems. The first is financial; who will pay the cost of access? Although we anticipate that most electronic reference use during trial will center on CD-ROM-based legal materials, use of billable, dial-up Lexis and Westlaw is unavoidable. The second is human; will a higher probability of courtroom confrontations over differing interpretations of legal text further increase the strain of litigation? The solution to the first might be the use of counsel's already existing billable passwords.⁴⁷ The court could be responsible for any charges incurred as a result of authorities that the judge calls up and distributes to counsel for comment, or those expenses could be assessed against the parties. The latter question of increasing the anxiety level cannot so readily be resolved. It may simply be part and parcel of litigation, regardless of the information retrieval technology involved.

III. TRIAL RECORD

A. *Real-time Transcript*

Real-time transcription is the use of computer-aided transcription equipment (CAT) to obtain a useful transcript of testimony as that testimony is given. Real-time transcription provides near-instantaneous transcripts, both in traditional written form and in computer-searchable electronic form. In addition to providing the severely hearing-impaired

⁴⁶ This type of judicial oversight is similar, of course, to circumstances in which counsel have briefed an issue and can be questioned concerning their differing legal interpretations. Although it runs the risk of delay, use of on-line research facilities by *appellate* judges could also have salutary effects as counsel could more easily be confronted with the specific language in controversy.

⁴⁷ Some counsel are without database subscriptions, and other counsel are presumably still without the necessary electronic search skills. The former can remedy their problem; the latter would simply be at a competitive disadvantage.

lawyer, judge, juror, or witness with sufficient information to function, the transcript serves the usual roles extraordinarily well: disputes as to prior testimony can be resolved immediately, and judge and counsel have an immediate record from which to plan further witness examination and, when applicable, jury instructions.⁴⁸

Real-time transcription is an elegant technology that is more sophisticated than one might expect. When the reporter depresses one or more keys on the computerized stenography machine—the “writer”⁴⁹—the writer’s computerized dictionary compares the steno code input with the reporter’s master dictionary.⁵⁰ If the dictionary finds a match, the writer sends the real word to a computer floppy disk in the machine, other computers, and/or a printer. If no match appears, and the appropriate software instruction was given previously, the computer will attempt a phonetic spelling. If that attempt is unsuccessful, a somewhat cryptic symbol, an “untranslate,” will appear on the computer screen, a symbol which the reporter can read and later translate. The writer makes a traditional paper tape in case of catastrophic failure.

Real-time transcription does not require connection to other computers and is often used at pretrial depositions in locations where computers may not even be available. The courtroom strength of real-time reporting, however, is not just the near-instantaneous production of a transcript with approximately 99% accuracy,⁵¹ it is the ability to electronically distribute the transcript, as it happens, to judge and counsel, each of whom may independently mark aspects on her or his own computer. The transcript

⁴⁸ See generally WILLIAM E. HEWITT & JILL BERMAN LEVY, *COMPUTER-AIDED TRANSCRIPTION: CURRENT TECHNOLOGY AND COURT APPLICATIONS* (1994). At least one other potential use exists. Note taking by jurors is controversial. Although some courts permit it, others prohibit it for fear that inaccurate notes, perhaps taken out of context, may prove unduly persuasive during deliberations. What would be the result, however, if the jury were supplied with a complete transcript? Would verdict accuracy improve or would jury deliberations be unduly lengthened with perhaps an increased number of mistrials?

⁴⁹ Courtroom 21 uses the Stenograph Stentura with Caseview software. The same system is now in use in the House of Representatives. Karen Foerstel, *Computer Age Hits the Floor of House*, *ROLL CALL*, Jan. 31, 1994, at 3.

⁵⁰ Each reporter has a distinct “dialect” so individual dictionaries are required.

⁵¹ Complete accuracy requires that either the same or a different reporter act as scopist and correct any untranslates and review any accidental results. Like any other form of court reporting based upon reporter input, the actual validity of real-time transcription is critically dependent upon the accuracy of the reporter’s initial input.

may be searched electronically and may be taken back to chambers or the office in disk format for further trial preparation. In some cases, the electronic transcript may even be synchronized with videotape so that a computer may cue previously videotaped testimony.

Timely transcription is often a problem in courts, and the expense entailed in making a written record is significant. Indeed, at least one state, Kentucky, largely has attempted to replace it with videotaped proceedings.⁵² Real-time transcription is substantially more efficient and useful than traditional reporting.⁵³ Furthermore, real-time transcripts can be sent electronically over telephone lines to counsel's office or even to an appellate court.

Because real-time reporting is still in its infancy, good real-time court reporters will command a premium for the next few years. However, as more and more real-time reporters are trained, we can expect the usual law of supply and demand to sharply decrease reporting costs, making cheaper, more efficient transcripts available at both deposition and trial.

B. Video Records and Multi-Frame Video

Pretrial video depositions⁵⁴ have been in use for many years.⁵⁵ If not expressly authorized by statute or court rule,⁵⁶ they are generally available via court order. Video depositions are highly regarded by many lawyers because they show the factfinder the demeanor of the recorded witness, often very inexpensively. The same is true of video trial records.

Ordinarily, two justifications are used for video records of trial: cost and scope of record. To the extent that video records are made on inexpensive tape by one or more cameras, the cost of which can be amortized over many cases, the cost of a videotape record is substantially cheaper than a

⁵² See *infra* note 57.

⁵³ Although a transcript often needs editing by a reporter to correct minor transcription problems, a highly competent reporter can produce an extraordinarily clean record that does not need further work.

⁵⁴ See generally WILLIAM E. HEWITT, *VIDEOTAPED TRIAL RECORDS: EVALUATION AND GUIDE* (1990); Henry H. Perritt, Jr., *Video Depositions, Transcripts and Trials*, 43 EMORY L.J. 1071, 1072 (1994).

⁵⁵ See generally GREGORY P. JOSEPH, *MODERN VISUAL EVIDENCE* ch. 3 (1993).

⁵⁶ E.g., FED. R. CIV. P. 30(b)(4).

traditional written transcript prepared by a court reporter.⁵⁷ Because the tape can preserve demeanor, including voice and body language, it is potentially more comprehensive than the traditional written record.⁵⁸

Video records present, however, more complications than might initially seem apparent. One concern is technological quality, including whether the given system has adequate assurance of preserving everything *said* at trial, an audio requirement that can be technologically demanding.⁵⁹ Another concern is whether the cameras themselves will adequately preserve the video record. How many cameras should be installed and who will operate them?⁶⁰ Must every trial have a director? Multiple camera raw footage is wasteful, but human selection is risky. Will there be close-ups that risk undue emphasis or which will miss a critical event happening elsewhere in the courtroom? New technology⁶¹ permits installation of a multi-camera system, with each camera showing up in a small window on the television screen. This approach means that the *entire* courtroom can be preserved without need for a human operator. Further, voice-actuated switching can place the active camera picture in a large window for easier review later.

Perhaps the greatest drawback to video records is entirely human. Judges and lawyers are comfortable with the written word. Video records, unlike written transcripts, ordinarily must be reviewed in real time—the same amount of time it took to record the actual events. Notwithstanding Kentucky's extensive use of video records, video has not proven popular as a medium for recording court proceedings,⁶² and recently the Federal

⁵⁷ 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).

⁵⁸ See generally Ronald K.L. Collins & David M. Skover, *Paratexts*, 44 STAN. L. REV. 509, 537-40 (1992).

⁵⁹ Some courts use audio records, which may present similar difficulties. Videotape records have the advantage of providing a picture of exactly who is speaking.

⁶⁰ California has promulgated court rules dealing with video cameras and other matters. See Perritt, *supra* note 54, at 1079 (setting forth California Court Rule 980.6(c)).

⁶¹ Courtroom 21 uses the Court Technologies, Inc. multi-frame system in which each camera's image appears in a fixed window on the television monitor. The active camera automatically is switched by voice cues into a large window on the monitor.

⁶² But according to the records of the National Center for State Courts, at least 73 courts, exclusive of Kentucky, currently are using video systems. See also Perritt, *supra* note 54, at 1078.

courts have rejected it.⁶³ Given the potentially comprehensive nature of video records, this resistance is unfortunate. The solution can be found not in replacing court reporters with videotape, however, but in combining them. To the degree that key portions of a videotape can be located through the use of written transcript, the combination becomes extraordinarily useful. What may appear catastrophic on the written record may have either been said in voice tones entirely changing the meaning or may even have been virtually inaudible. The ideal use of a video record is, thus, in conjunction with a synchronized real-time transcript. This would allow an appellate counsel or judge to use the electronic transcript to determine the key portion of a tape and to automatically cue the tape to the appropriate location.

The impact of useful video records of trial could be considerable, both in terms of the accuracy of the appellate record and on the burden of proof on appeal. 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,⁶⁴ 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.

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

The difficulty in interpreting the effect of such communication is apparent; that of determining its impact on a jury still greater.⁶⁶ Appellate

⁶³ 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.

⁶⁴ *State v. Barron*, 465 S.W.2d 523, 527 (Mo. 1971).

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).

⁶⁶ See generally Peter David Blanck, *Calibrating the Scales of Justice: Studying Judges' Behavior in Bench Trials*, 68 IND. L.J. 1119, 1120-21 (1993) (testing the conclusion by others that, in some cases, extralegal factors such as judges' nonverbal communications to trial participants have a rela-

judges called upon to review such cases might be grateful for the opportunity to consider a videotape of the trial proceedings along with the written record.⁶⁷

Just as nonverbal communication by the trial judge can be an undesired yet critical factor in an appeal, nonverbal communication by counsel also may play a part, both in the impact of certain evidence on the jury and in considering whether counsel were in contempt of court. An adequate record of *counsel's* behavior is as desirable as that of the judge.

Subject to concerns about finality, one might expect a full video record to render moot the long-expressed rule that in a bench trial the appellate court must defer to the trial judge's determinations of fact⁶⁸ because of the judge's ability to observe the demeanor of the witnesses.⁶⁹ It is by no means clear that this change in appellate procedure would open the appellate floodgates to a sea of reversals, however. In one study of Kentucky appeals, the National Center for State Courts found that appeals based on video records were more likely to yield affirmances than those based on written transcripts.⁷⁰

IV. INFORMATION PRESENTATION

A. *In General*

Communication is the heart of litigation; everything else is secondary.⁷¹ Evidence is meaningless if it cannot be transmitted effectively to the factfinder, and from the perspective of the litigator, evidence may be valueless if it is not transmitted persuasively. Litigators firmly believe as well

tively greater impact on trial outcomes than does the strength of the evidence).

⁶⁷ Unless we wish to imitate the popular conception of the ostrich by carefully ignoring the reality of the courtroom world, we would do well to record what actually occurs at trial and deal with that reality on appeal.

⁶⁸ See, e.g., FED. R. CIV. P. 52.

⁶⁹ See Junda Woo, *Use of Trial Videotapes Is Giving New Dimension to Appellate Cases*, WALL ST. J., Apr. 14, 1992, at B1, B10.

⁷⁰ 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).

⁷¹ Trial communication necessarily includes jury trials and jury instructions. Problems inherent in instructions are well known and present substantial concerns. See Michael J. Saks, *Judicial Nullification*, 68 IND. L.J. 1281, 1295 (1993) (stating that jury instructions are largely incomprehensible and that this conclusion has been evident for quite some time).

that opening statements and closing arguments must be as persuasive as the law will allow. In the past, effective and persuasive communication has included photographs, diagrams, charts, and models. Not surprisingly, therefore, trial lawyers are bringing to the courtroom an enormous variety of documents, photographs, recorded action (including "day-in-the-life" videotapes),⁷² spreadsheets, and computer graphics, including computer animations. Information enters the courtroom in traditional formats and on such innovative formats as videotape, laserdisc, floppy disk, CD-ROM, and analog disk, to mention only some of the options. Such high-technology information is in turn presented on television or computer monitor.⁷³ Usually, rolled-in equipment is used. A few courtrooms are equipped with permanent television and computer installations. More can be expected.

The use of television and computer-related information display systems is important because:

- They present a means of storing, organizing, and presenting vast quantities of information in a relatively inexpensive, simple format;
- Pictorial information can be conveyed in a more effective and often less expensive fashion than otherwise possible;⁷⁴
- Some information could not be presented, let alone in a meaningful form, absent use of computer-related output;
- Scientific studies indicate that visual data may be more likely to be persuasive and more likely to be remembered than other forms of information.

Although these techniques are customarily associated with the presentation of evidence, both opening statements and closing arguments can be enriched.⁷⁵

Any discussion of computer-based evidence presentation systems tends to focus on the extraordinary flexibility of computer editing and image

⁷² Offered on the issue of damages, "day-in-the-life" videotapes often are used to show factfinders aspects of the daily life of personal injury victims.

⁷³ See generally GREGORY P. JOSEPH, MODERN VISUAL EVIDENCE ch. 12 (Supp. 1993).

⁷⁴ Lawyers are not usually graphics arts specialists, but only basic computer skills are required to use programs such as A.D.A.M. (Animated Dissection of Anatomy for Medicine) or even comprehensive illustration programs such as Corel Draw.

⁷⁵ See Rorie Sherman, *And Now, The Power Of Tape*, NAT'L L.J., Feb. 8, 1993, at 1.

production.⁷⁶ This focus can be misleading. Although computer information may have unique persuasive impact—and, on rare occasion, the ability to present scientific or engineering data that could not be otherwise explicated in a meaningful fashion—ordinarily the computer simply is a presentation means. Whether the original image is usable for the desired purpose—not whether the image shown has been altered—would be the question. Absent reason to believe that the image shown is not the image approved, or that the appellate record cannot adequately reflect the image presented, no problem is presented.⁷⁷

As television- and computer-based information becomes more important, courts must come to grips with the simple yet fundamental question of the degree to which the courtroom should contain permanently installed equipment to present it. Such equipment runs the risk of obsolescence and as yet there is no standardization. The mere presence of a computerized display system in a courtroom does not necessarily guarantee the ability to operate any lawyer's particular software. These problems must be overcome for courtrooms to effectively assist, and control, the presentation of this latest form of information. Is such electronic presentation even necessary? Courtroom 21 demonstrates that built-in technology at least eliminates the delays and frequent technological problems inherent in temporary, portable equipment.

If factfinders are to routinely use television- and computer-based evidence, then the installation of playback equipment in the jury room or, in a bench trial, in the judge's chambers will be unavoidable. Special efforts may be necessary to ensure that the jury does not use electronic information and equipment improperly.⁷⁸

⁷⁶ See, e.g., Kathy Sawyer, *Computer Technology—Is It Real or Is It . . . ? Digital-Imaging Fiction Leaves No Footprints*, WASH. POST, Feb. 21, 1994, at A3.

⁷⁷ If a photograph is to be offered in evidence from a CD-ROM disk, the image as displayed on the disk must be authenticated. Absent unusual circumstances, one would not be concerned that the displayed image could be further modified at a later time except insofar as one must always be concerned about the integrity of evidence.

⁷⁸ Media (e.g., floppy disks, CD-ROMs, and videotapes) made available to the jury cannot contain information that has not been admitted in evidence. Avoiding the problem may require production during trial of a CD-ROM or floppy disk for deliberations purposes.

B. Computer Graphics and Animations

Normally, computer graphics, including computer animations, do not present unique problems. In a personal injury automobile collision case, for example, an offer by plaintiff's counsel of a computerized schematic of an automobile ordinarily ought to be treated just as if she had used a more traditional drawing. Similarly, an illustrative videotape of a computer animation of an automobile crash may be handled in the same way as a videotape produced using model cars.⁷⁹ If computer-based information is distinct from other types of information, it is arguably in two areas: in some cases computer-based information may embody scientific or engineering data in an attempt to prove scientifically why or how an incident took place, and in some cases it may be so persuasive as to present special concerns.

Computer animations customarily are used for illustrative purposes. During opening statement and closing argument, counsel use them to illustrate counsel's theory of the case, in which circumstance the usual rules applicable to openings and closings govern the use of animations. They are also used to explain visually, or summarize, the testimony of witnesses, particularly expert witnesses.⁸⁰ Absent undue prejudice, if the witness first lays an adequate foundation and the animation conforms sufficiently to the testimony, the animation ought to be admissible. Computer animations pose substantial evidentiary problems, however, when they are used as proof, especially of causation. Sometimes misleadingly termed "recreation," these animations are used to prove scientifically how and why given events must have occurred. In such a case, the proponent must lay an adequate foundation, which likely would include the underlying facts

⁷⁹ Robinson v. Missouri Pac. R.R., 16 F.3d 1083 (10th Cir. 1994).

⁸⁰ E.g., Datskow v. Teledyne Continental Motors, 826 F. Supp. 677, 685 (W.D.N.Y. 1993). For a general review of the principles applicable to the use of computer-related evidence, see generally GREGORY P. JOSEPH, MODERN VISUAL EVIDENCE § 8.05 (1993); MARK A. DOMBROFF, DOMBROFF ON DEMONSTRATIVE EVIDENCE § 9.8. Although animations often have been used in civil cases, they have been rare in criminal cases. One of the earliest was *People v. McHugh*, 476 N.Y.S.2d 721 (N.Y. Sup. Ct. 1984) (authorizing "computer re-enactment of fatal car crash"). There may be increasing interest in criminal case use. See, e.g., *Putting Animation Software to Work*, PC WEEK, March 21, 1994, at 101 (first use in Florida). In a recent murder case in California, the prosecution used a computer animation against the defendant. Affirming the resulting manslaughter conviction, the court held, however, that the animation was admitted erroneously because it had relied largely upon the erroneously admitted evidence of an expert. Richard Barbieri, *Jim Mitchell Loses Appeal Despite Unreliable Expert*, RECORDER, May 31, 1994, at 3.

relied upon, the underlying scientific assumptions and formulae, the assumptions employed by the computer program(s), and how the program(s) translated the data into the animation. In addition, the evidentiary submission must comply with the jurisdiction's gatekeeping requirements for scientific evidence.⁸¹ The dividing line between "illustration" and "re-creation" is a thin one, and the courts normally defer to the trial judge's discretion.

Persuasive impact is yet another matter. Assuming that an animation can be shown to be sufficiently similar to the relevant circumstances of the case, the animation is likely to be usable.⁸² Litigators like graphical evidence, especially animations, because of their persuasive impact. Can an image be too persuasive? It is not difficult to imagine the use of extravagant Hollywood special effects technology to create an extraordinary simulation, one that could not readily be distinguished from reality.⁸³ In an extreme case, animation evidence might constitute unfair prejudice sufficient to substantially outweigh the probative value of the evidence.⁸⁴ That this prejudicial concern is not unique to computer-related information

⁸¹ *E.g.*, FED. R. EVID. 702. Depending upon the jurisdiction, this may require compliance with either *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1023) or *Daubert v. Merrell Dow Pharmaceuticals*, 113 S. Ct. 2786 (1993) (declaring that Federal Rule of Evidence 702 does not require compliance with *Frye*). According to Professors Giannelli and Imwinkelried, admission of vehicle accident reconstruction visual simulations are admissible with a proper foundation:

consist[ing] of proof of both the validity of the technology and the reliability of the assumptions about the accident in question . . . [and] [w]hen the proponent offers testimony based on mathematical model, the proponent must identify the formulae programmed into the model and demonstrate that the formulae satisfy [the relevant standard].

PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, *SCIENTIFIC EVIDENCE* 515 (2d ed. 1993).

If the court classifies the evidentiary offer as a "re-creation," its likelihood of admissibility drops sharply. *Cf. Hutchison v. American Family Mut. Ins.*, 514 N.W.2d 882 (Iowa 1994). In *Datskow v. Teledyne Continental Motors*, 826 F. Supp. 677, 685 (W.D.N.Y. 1993), an air crash case, the judge took pains to ensure that the jury understood that counsel's videotaped computer animation was not a re-creation; the judge ordered that it be presented without the tower to plane radio conversations and gave the jury a cautionary instruction.

⁸² *See Racz v. R.T. Merryman Trucking, Inc.*, No.1 CIV.A. 90-3404, 1994 W.L. 124,857 (E.D. Pa. April 4, 1994) ("The apparent decision of the accident reconstructionist to discount the testimony of a witness . . . is magnified and given enhanced credibility when such decision becomes part of the data upon which an animated visual representation is based." *Id.* at *5.). Even sufficiently similar and nonprejudicial use of such animation is of course subject to compliance with any of the stricter requirements noted above. *See supra* note 81 and accompanying text.

⁸³ But notably, this accomplishment is not significantly distinct from making a similar movie-type production using film.

⁸⁴ FED. R. EVID. 403.

should be apparent. In an Arizona investment banking case, professionally produced videotape that was intercut with images of the Titanic's fatal voyage supplemented closing arguments.⁸⁵ Clearly, even less advanced technology may present similar issues of prejudice and undue persuasiveness.

C. Remote Counsel Appearances and Remote Witness Testimony

Teleconferencing has long been thought to be a significant way to reduce travel-related costs and delays. Conference call telephone sessions have their place, but the absence of video data limits full understanding and affects the comfort level of those involved. What is needed is television, as remote arraignment systems make evident. Although television hardware has developed to the point that effective teleconferencing is easily possible, bandwidth limitations have sharply limited the inexpensive transmittal of data. Use of dedicated communications lines is economical only between known points that must regularly interchange audio-video data. The economics of teleconferencing, however, are in the process of change⁸⁶ as consistent announcements concerning the information superhighway demonstrate. It would not be surprising if unscheduled video teleconferencing were routinely and economically available within the next five years. The question must then be considered, what useful courtroom purpose would be served by incorporation of that technology?

Setting remote arraignments aside, from a courtroom perspective, video teleconferencing is desirable to permit appearances both by counsel⁸⁷ and by witnesses, especially experts, and, perhaps, those witnesses in criminal trials or domestic relations cases who are afraid of being physically present in the same courtroom as another trial participant. Because remote appearance by counsel outside the trial proper⁸⁸ does not appear to raise

⁸⁵ See *supra* note 75.

⁸⁶ See Rorie Sherman, *Virtual Venues*, NAT'L L.J., Jan. 10, 1994, at 29. (According to a Sprint corporate representative "48 of the 50 states have some sort of video teleconferencing going on at all levels of complexity . . .")

⁸⁷ The appearance of counsel is particularly desirable during administrative matters or motion arguments. Unanticipated consequences of such appearances could emerge, however. Two judges visiting Courtroom 21 opined that arduous court appearances enforce a form of discipline on counsel. The judges expressed concern that absent such difficulties, settlement might become less likely than at present, resulting in an increase in trials.

⁸⁸ This is especially true of voluntary remote appearances scheduled by counsel to save travel

constitutional or practical problems, the better, and more difficult, question concerns the desirability and implications of remote witness testimony.

Although remote witness testimony is not new,⁸⁹ in light of the costs and technical complications involved neither is it commonplace as yet. Assuming compliance with a jurisdiction's specific rules, one must question whether remote testimony would be lawful and desirable. If so, remote testimony by experts in civil cases might be especially probable, given the likelihood that such testimony might substantially cut the costs inherent in such testimony.

In many respects, the ultimate test of the legality of remote testimony is its legality in criminal cases. A practice that is unconstitutional in a criminal case may be entirely lawful in the civil context. If remote testimony were to comply with the protections of the Bill of Rights, however, remote witness examination would surely also comply with civil protections. Accordingly, exploring the harder, criminal case and asking whether remote testimony can satisfy the Sixth Amendment right to confrontation is necessary.

When applicable, the right to confrontation includes the right to cross-examination of the government's witnesses, and, to some extent, the right of defendants to personally confront their accusers. Remote witness examination using two-way television permits the live cross-examination of witnesses. Consequently, the cross-examination aspect of confrontation can be well met. What of the actual confrontation aspect? Ordinarily, one thinks of that aspect of the Confrontation Clause as requiring a government witness to testify from the witness stand, all the while either looking at, or attempting to avoid, the defendant, present some few feet away. This form of confrontation is thought to make it more difficult for the witness to lie.

The Supreme Court has long held that the Confrontation Clause is not co-extensive with the hearsay rule, and thus does not prohibit all hearsay.⁹⁰ Further, while noting that "24 States have authorized the use of

time and cost.

⁸⁹ See, e.g., *In re: San Juan Dupont Plaza Hotel Fire Litig.*, 129 F.R.D. 424 (D.P.R. 1990) (order establishing procedures to receive remote satellite television testimony).

⁹⁰ E.g., *White v. Illinois*, 116 L. Ed. 2d 848 (1992).

one-way closed circuit television testimony in child abuse cases; and 8 States authorize the use of a two-way system,"⁹¹ the Court held in *Maryland v. Craig*⁹² that although "we reaffirm the importance of face-to-face confrontation with witnesses appearing at trial, we cannot say that such confrontation is an indispensable element of the Sixth Amendment's guarantee" ⁹³ The Court went on to hold that "so long as the trial court makes . . . a case-specific finding of necessity, the Confrontation Clause does not prohibit a state from using a one-way closed-circuit television procedure for the receipt of testimony by a child witness in a child abuse case."⁹⁴

One cannot reasonably infer from the Court's narrow, child witness-specific holding that it would hold that two-way television satisfies the Confrontation Clause. Indeed, the Court states "a *preference* for face-to-face confrontation at trial."⁹⁵ Notwithstanding this, the Court has not had the occasion to rule on two-way testimony, including testimony protected by such additional features as a multi-frame system.

An argument might reasonably be made that two-way television would be inherently inadequate in the usual case. After all, as the Court explained in *Maryland v. Craig*,

The combined effect of these elements of confrontation—physical presence, oath, cross-examination, and observation of demeanor by the trier of fact—serves the purpose of the Confrontation Clause by ensuring that evidence admitted against an accused is reliable and subject to the rigorous adversarial testing that is the norm of Anglo-American criminal proceedings.⁹⁶

The best case to test compliance with the Confrontation Clause absent special need would have the witness testify from a remote media room in another courthouse. The room would have an appropriate courtroom appearance, including flags, and a bailiff would be present. The factfinder, and defendant, would see a multi-screen image showing not only the wit-

⁹¹ *Maryland v. Craig*, 497 U.S. 836, 853-54 (1990) (footnote omitted).

⁹² *Id.*

⁹³ *Id.* at 849.

⁹⁴ *Id.* at 860.

⁹⁵ *Id.* at 849 (quoting *Ohio v. Roberts*, 448 U.S. 56, 63 (1980) (emphasis in *Craig*)).

⁹⁶ *Id.* at 846.

ness but also the media room, ensuring that the witness was not being prompted off screen. The witness also would see a multi-screen view of the courtroom, preferably with a large window showing the defendant at all times. The witness would be under oath, of course. Would these precautions satisfy the Confrontation Clause?

Arguably, the proposed procedure might be lacking in three particulars: (1) the factfinder might find the demeanor of the witness toward the defendant too difficult to evaluate;⁹⁷ (2) the electronic media or the physical set up may impair some other sense or senses; or (3) perhaps the very use of remote testimony might suggest a lack of importance that would defeat the hoped-for tendency of direct confrontation, in-courtroom testimony to impel solemn truthfulness.

Indeed, these very concerns suggest the need for serious empirical research.⁹⁸ Even if no legal objections to remote testimony arise, and none may in civil cases, to what extent, if at all, would a factfinder (judge or juror) find remote live testimony more or less persuasive than in-person testimony? Would the evaluation vary by the age of the factfinder or the factfinder's attitude toward or experience with technology? These questions are critical, for decreasing communications costs will rapidly lead to the use of remote testimony in courts,⁹⁹ and having some idea of its practical effects would be helpful for refining and improving electronic courtroom technology.¹⁰⁰

V. CONCLUSION

Increased use of technology in courtrooms is now inevitable. To what degree and how fast fiscally restrained courts¹⁰¹ will act to acquire tech-

⁹⁷ There are those of us who doubt that demeanor evidence is reliable. However, the courts, without a doubt, presume that it is not only reliable, but important. *See Collins & Skover, supra* note 58.

⁹⁸ I hope to undertake such a study in conjunction with the National Center for State Courts in the near future.

⁹⁹ *See* Rorie Sherman, *Virtual Venues*, NAT'L L.J., Jan. 10, 1994, at 29. The Second Judicial Circuit in Tallahassee, Florida, bought 14 videophones in 1993. The phones are now used for judicial communications. The local court administrator noted that he has had discussions with the prosecution and public defender about their use for out-of-state depositions. *Id.*

¹⁰⁰ Studies have dealt with the impact of *videotaped* material. Whether live testimony differs remains to be seen. *See supra* note 98.

¹⁰¹ Retrofitting established courtrooms is far more expensive than installing technology in new

nology is unclear and likely unpredictable. Moreover, in some cases, the various players in courtroom design and renovation may have different motives and interests. Judges are likely to be concerned about court records and time-saving procedures while litigators may sometimes care more about the persuasive presentation of evidence. Court administrators are likely to emphasize document imaging and management. These differences, however, are likely to be differences in degree rather than differences of substance. All share considerable common ground.

As the desirability and affordability of courtroom technology grows, more technology will be installed. Technology for the sake of technology makes no sense, however. Inappropriate technology use can waste precious money and human resources. Before any technology is acquired for a courtroom, therefore, it must not only work as promised, but it must also be useful, in both legal and human terms. People use technology, and people do not always act logically or predictably. Courtroom 21 and other model high-technology courtrooms may serve their most useful function in helping all the parties in the courtroom technology debate to choose intelligently the technology that makes sense for *them*.

In any case, technology is coming to the courtroom, but it is too early to know what its real effect will be. In the immortal words of the television industry, *stay tuned*. . . .

courtrooms. The cost of cabling is usually at the root of the difference. Simply finding space to run wires invisibly in a historic courtroom can be quite difficult.