



The preconference course and workshop, "A Technical Introduction to Digital Video," drew an audience of over 300.

First SMPTE Conference in Seattle Boasts Strong Technical Program and High Attendance

More than 450 people ventured to Seattle in order to attend the 30th Motion Imaging Conference, which took place at the Sheraton Seattle Hotel & Towers from February 1 to 3, 1996. During the three-day event, which ran under the theme, "The Convergence Continues...Computer Technology and Television," attendees were treated to an all-day workshop on digital video and a two-day technical program focusing on topics relevant to the motion-picture, television, and computer industries.

"I'm extremely happy with what turned out to be a very successful conference," said Conference Vice-President Edward Hobson II, Sony Electronics. "I'd like to thank our hosts, the Pacific Northwest Section, for their hospitality, as well as our Local Arrangements Committee which, under the leadership of Mike Scott and Cliff Anderson, provided an enjoyable and informative event for all who attended."

Program Chair Brian Lay, KING-TV, was extremely pleased by the

high attendance. He adds, "We were surprised by the local turnout...I suspect that the presence of members of the local computer industry had an impact on the numbers."

General Arrangements Chair Mike Scott, Bates Technical College, agreed. "There were three very distinct camps represented: the film camp, the television camp, and the computer camp. This conference had something to offer for each of these three groups."

Preconference Course and Workshop Very Well Attended

Prior to the official start of the conference, Charles Poynton, Poynton Vector Corp., offered "A Technical Introduction to Digital Video," a day-long course and workshop. Over 300 television and computer professionals gathered to learn about digital images in computing in order to apply their knowledge of video systems, equipment, and techniques to the emerging area of multimedia.

After laying out the basic principles

of digital video, Poynton touched on such topics as raster images in computing, filtering and sampling, image digitization and reconstruction, component video color, and composite NTSC and PAL.

"What I tried to do," explained Poynton, "was to present material on digital imaging that was important to television engineers in order to help them understand the relationship between television and computing, while at the same time providing computer experts with information to help them see how television relates to their work. I believe the workshop was successful in conveying these messages."

Poynton based the course on his book, *A Technical Introduction to Digital Video*, published by John Wiley & Sons. Each participant was given a complimentary copy.

Technical Sessions

More than 25 technical papers were presented on Friday and Saturday, February 2 and 3. According to Program Chair Brian Lay, the content of

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Samantha Brandt, KCPQ-TV

The Partners Program, put together by Chair Samantha Brandt, offered those who accompanied conference registrants an opportunity to take in Seattle's sights. The program ran from Thursday to Saturday, providing breakfast in the hotel each morning. Among the highlights were the Seattle City Tour on Thursday and the Cruise the Locks boat tour on Friday.

Sponsors

The Society would like to thank the following sponsors for their generosity, which contributed to the success of the 30th SMPTE Motion Imaging Conference: Eastman Kodak Co., Hewlett-Packard Co., Leitch, Inc., Odetics Broadcast, Pacific Bell, Panasonic, Proline Industries, Quantel, Scitex Digital Video, Sony Corp., and Tektronix, Inc.

Magazine Displays

In addition to free copies of the *Proceedings* and the *SMPTE Journal*, complimentary copies of a number of trade publications were made available. The SMPTE would like to thank the following magazines for their support: *Advanced Imaging*, *American Cinematographer*, *Broadcast + Technology*, *Broadcast Engineering*, *Broadcasting & Cable*, *Computer Video*, *Film & Video*, *The Film Journal*, *In-Sync*, *Location Update*, *Mac World*, *Markee Magazine*, *Me!dea Magazine*, *Post*, *Producer*, *Screen Magazine*, *Sight & Sound*, *Television Broadcast*, *TV Technology*, *Video Age*, *Video Systems Magazine*, and *Videography*.

Information Booth

The International Broadcasting Convention (IBC) had a staffed information table at the conference, providing information on IBC '96, which will be held in Amsterdam from September 18 to 23, 1996.

Plan for Next Year

The dates have been set for the 31st SMPTE Advanced Motion Imaging Conference. SMPTE will return to New York City for this event, which will be held from February 6 to 9, 1997. The *SMPTE Journal* and *News & Notes* will provide the most up-to-date information on this conference as it becomes available.

— Aileen Moroney

the four sessions — Storage, Generation and Authoring Tools, Delivery and Distribution, and Presentation and Display — was very well received by those who attended. "It was obvious we touched on a lot of hot topics, such as the movement of pictures across the Internet," he said. "We've gotten a lot of positive comments."

The technical program began with an opening address by Editorial Vice-President Thomas J. Bentsen, NASA; the text of that speech appears in this issue. After an introduction by Brian Lay, the papers presentations began. Among the titles were "Practical Implementation of Advanced Television: Update 1996" by William Y. Zou, PBS, James A. Kutzner, Twin Cities Public Television, and A. Bruce Jacobs, Prairie Public Television; "New DSP-Based Studio Platform" by John Nitzsche and Larry Baxter, Mercury Computer Systems; "Distributed Facility Control Via Ancillary Data" by William C. Miller and Alfred Molinari, Capital Cities/ABC, Inc.; "Aspects of Testing in the Convergence of Television and Telecommunications" by David K. Fibush, Tektronix, Inc.; "Delivery of Distance Learning Content Across High-Speed and Low-Speed LANs in a Campus Environment" by David H.

Dirks and Doug Coffland, Lawrence Livermore National Lab (University of California); "Motion-Picture Delivery Using the Internet" by Bob Davis, Iterated Systems; "Picture-Quality Assessment in Video Compression" by G. M. Drury, NTL; and "Investigation of DMD-Based Display for Integrated Computer and Television Application" by Vishal Markandey, Greg Hewlett, and Greg Pettitt, Texas Instruments.

Proceedings

Those who registered for the full conference received a complimentary copy of the *Proceedings*, which contains all of the papers presented during the technical program. The two-volume set is available from SMPTE Headquarters and is \$30 for members and \$40 for nonmembers.

Social Events

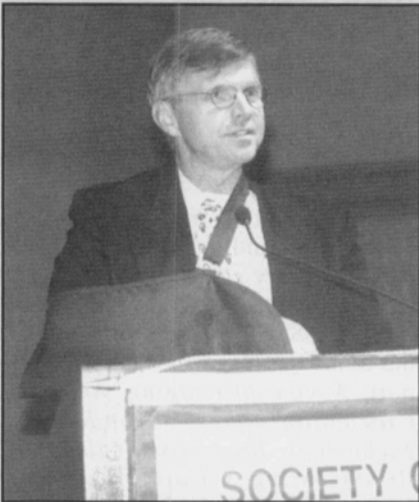
The Get-Together Luncheon was held Friday, February 2, and featured Steve Raney, who holds the title of Video Tools Evangelist at Microsoft Corp. Raney's speech focused on those technologies offered by his company that were directly related to the conference theme. The SMPTE Gala Reception, also held on Friday, took place in the Sheraton Seattle's Cirrus Room.



Program Chair Brian Lay (center) with Session Chairs Don Wilkinson (left) and Blane Huhn.



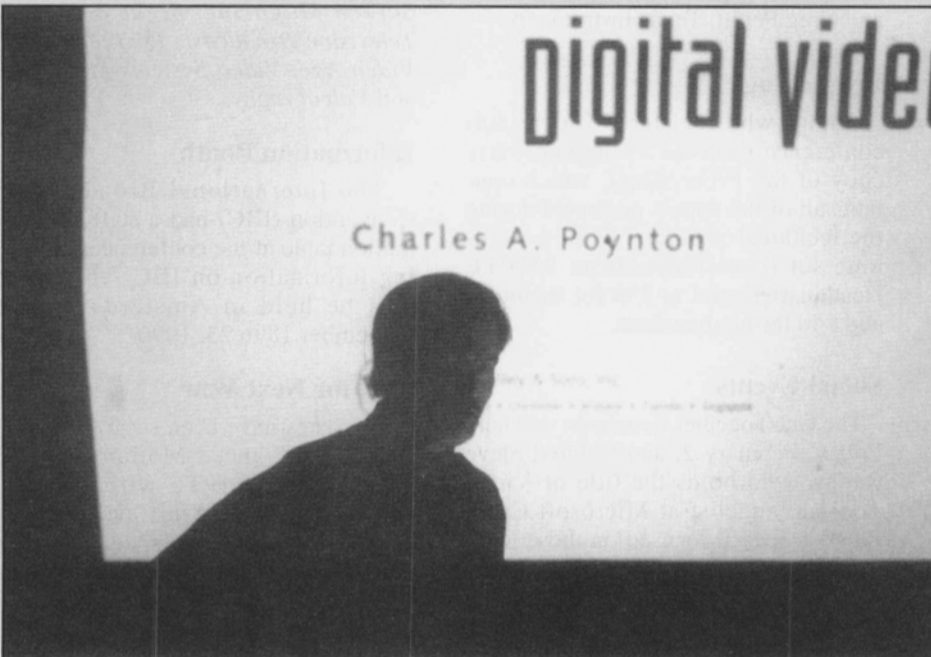
Program Chair Brian Lay (left) with General Arrangements Chair Mike Scott.



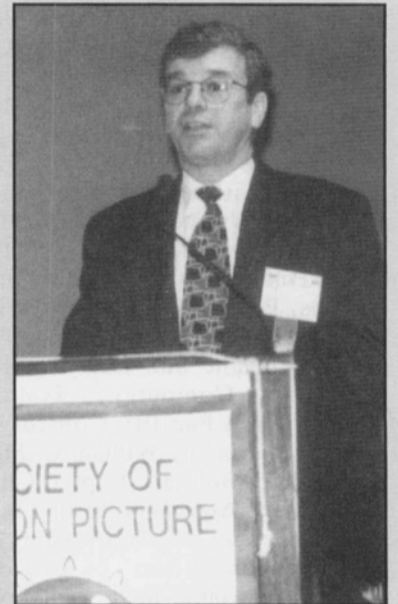
Algie Abrams, Microsoft Corp., introduced Charles Poynton to the workshop audience.



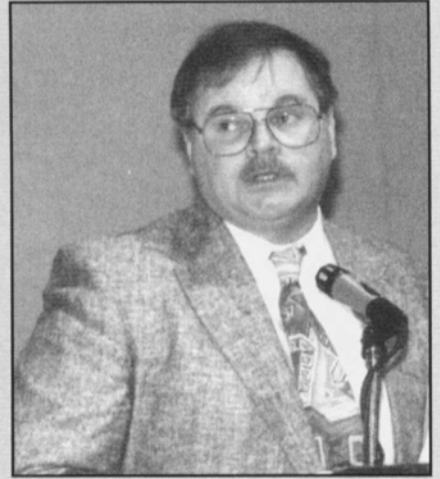
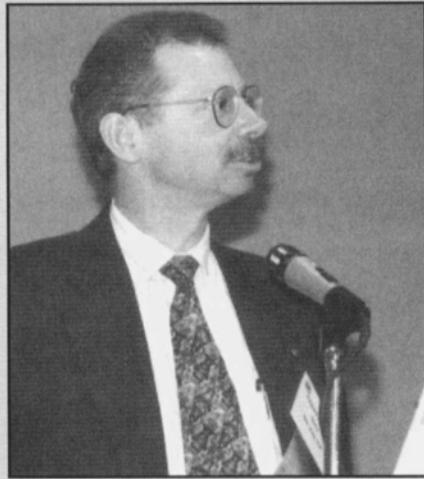
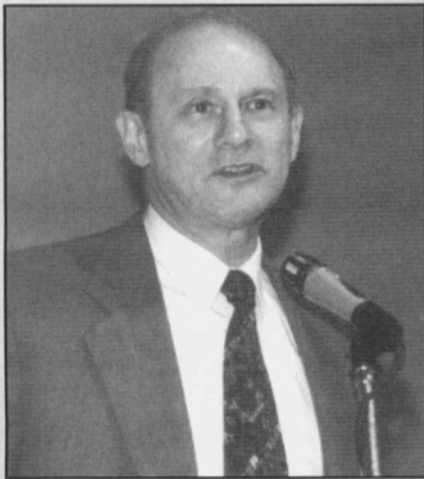
Charles Poynton based the seminar on his book, A Technical Introduction to Digital Video.



Instructor Charles Poynton is silhouetted against the first slide of his presentation.



Program Chair Brian Lay gave some introductory remarks before the start of the technical sessions.



SMPTE President Stanley N. Baron, Conference Vice-President Edward Hobson II, and General Arrangements Chair Mike Scott all said a few words at the luncheon.



A packed room at the Get-Together Luncheon.



Steve Raney, Video Tools Evangelist at Microsoft, was the featured speaker at the luncheon.



Steve Raney illustrated a point by juggling frisbees.



A reception preceded the Get-Together Luncheon.



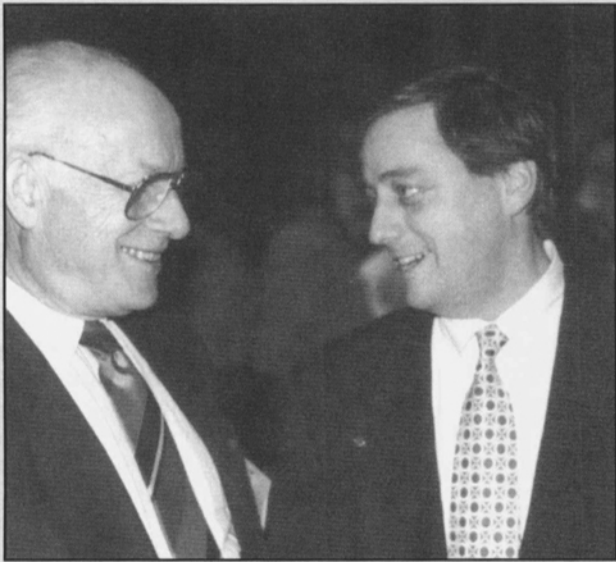
Pacific Bell's Bob Stewart, Charnee Smit, and John Abuan (left to right) at the Gala Reception.



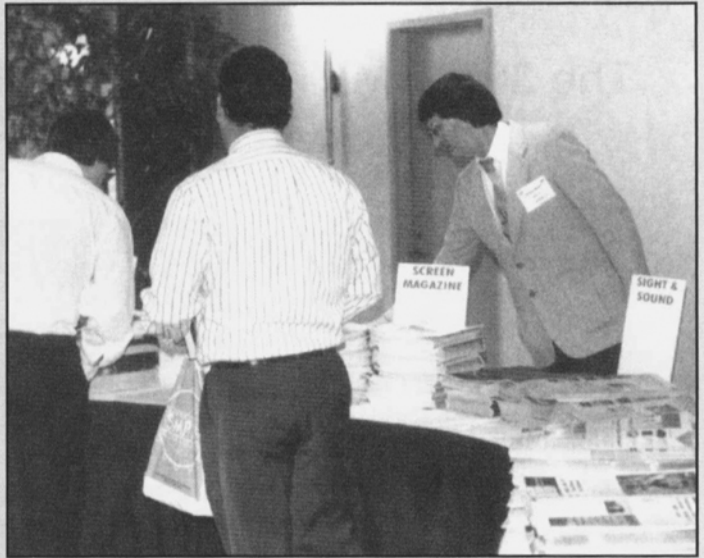
The Gala Reception took place at the Sheraton Seattle's Cirrus Room.



Conference attendees visit the Coffee Club before participating in technical sessions.



Former Engineering Vice-President Kenneth P. Davies, left, in conversation with Mark Richer.



Twenty-two trade publications offered complimentary issues of their magazines at the conference.



SMPTE Director of Engineering Carl Girod, right, helps customers at the SMPTE Store.



Conference attendees waiting in line to register.



Partners gather at the Sheraton Seattle before touring the city. Samantha Brandt, seated left, served as Partners Program Chair.

Opening Address

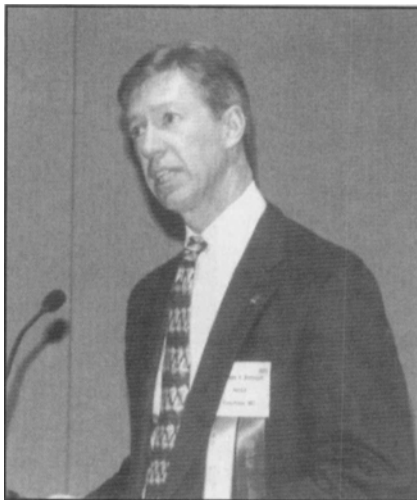
The 30th SMPTE Advanced Motion Imaging Conference

Seattle, Wash., February 2, 1996

Good morning, and welcome to the 30th SMPTE Advanced Motion Imaging Conference; my name is Tom Bentsen. I am excited about the topics and presentations we are about to engage in at this Winter Conference, "The Convergence Continues... Computer Technology and Television." It is no coincidence that an important topic is being examined in a city known for its avant-garde and progressive thinking, not to mention its proximity to companies having some influence on the computer industry...and of course, there is Bill Nye the Science Guy. This month's issue of *Seattle Magazine* illustrates that the city should be denoted "Cyber City," a fitting tribute.

Program Chair Brian Lay and his capable staff have put together the resources necessary to ensure that your convergence experience is competently presented. The chairpersons include Mike Scott and Cliff Anderson as Local Arrangements Chairs, Bill Watt handling audio/visual needs, Larry Brandt overseeing sponsorship, Samantha Brandt capably chairing the Partners Program, and our reception arranged by John Walters. Brian will have more to say about the efforts of his staff momentarily. Besides the appreciation we extend to our generous sponsors, Brian's staff and the SMPTE Headquarters staff should be roundly thanked for the superlative efforts they have made to ensure that this conference is a success.

To further guarantee that success, it is of significant note that yesterday's commencement speaker at this year's Winter Conference on television/computer convergence was selected to be the eminently entertaining and enlightening Charles Poynton. (If you attended yesterday's tutorial, you could say he was il-LUMA-nating.)



Editorial Vice-President Thomas J. Bentsen delivered the opening address prior to the start of the technical seminar.

Mr. Poynton, the 1994 David Sarnoff Gold Medal Award recipient, hails from both industries: television and computer. In this way, he is uniquely qualified to deliver the digital video tutorial that proposed to inform and educate the respective camps about issues that should be addressed to ensure seamless interaction of both technologies. His newly published book, *A Technical Introduction to Digital Video*, will likely be the reference compendium for our industries for years to come, as we deal with this inevitable convergence.

Much is said and written to attempt to describe convergence. The use of the word provokes people to question exactly what is converging, and, of course, how and why and when. It seems plausible that the amount of money is directly proportional to the success rate of the forecast. At this moment in the current state of the industry, one could conceivably propose to converge two widely disparate industries and/or ideas with a fair shot at success. The proposed outcome is left to the license of the proponent and further inspection and likely debate. Since the result is a product of vision and intuition, convergence seems a word for futurists and prognosticators.

At this time every year, prognosticators are plentiful. Forecasts and retrospectives are presented in an attempt to assess, or explain, the current state of the technology and its vector — to determine if the direction it is moving in is forward or sideways, at what rate, and if a correction is needed to bring it back into line with the forecast. Retrospectives are useful to learn how well vision matched reality; they are particularly effective to ensure that history serves as a lesson to us: that the experience doesn't need to be repeated or that the forecasts should be refined using better models. As the saying goes, it is difficult to prognosticate, especially about the future. It has also been written that forecasters tend to overestimate the rate at which developments will take place in the near term, but underestimate longer term progress.

Thomas Jefferson attempted to rationalize this behavior more simply by stating, "I like the dreams of the future better than the history of the past." So, before we examine to what we should be attentive and proactive for the construction of our futures, it is insightful to look at the past, in effect, to become better forecasters as we plan this convergence.

The pioneer of one of our basic and influential industries, Lee DeForest, observed in 1926: "While theoretically and technically television may be feasible, commercially and financially I consider it an impossibility, a development of which we need waste little time dreaming."

Conclusion: Lee DeForest was not a very good forecaster.

Or IBM's Thomas Watson's observation in the 1940's: "The world's computational needs can be handled by four or five mainframes."

This may have indeed been true then since it probably reflected needs at the time and of the immediate future.

But other forecasts have been notable for their inability to consider changes in circumstances or advancements in technology:

Text of the opening address made by SMPTE Editorial Vice-President Thomas J. Bentsen on February 2, 1996, during the 30th SMPTE Advanced Motion Imaging Conference in Seattle, Wash. Thomas J. Bentsen is with NASA, Washington, D.C.



Sections Vice-President Fung Fai Lam (second from right) held a Sections meeting during the conference. He was joined by, from left to right, Ed Schuller (New York), SMPTE Executive Director Fred Motts, Roy Brubaker (Hollywood), Jürgen K. R. Heitmann (Germany), and Ed Holmes (Toronto).

Aircraft flight is impossible. — Lord Kelvin. And: *X-rays are a hoax.* — Lord Kelvin.

Since I work as a television engineer in an aerospace organization, I am particularly fond of using references from that industry to ensure proper perspectives from my colleagues:

Space travel is utter bilge. — Sir Richard van der Riet Wooley, The Astronomer Royal, 1956.

There is no hope for the fanciful idea of reaching the moon, because of insurmountable barriers to escaping earth's gravity. — Dr. F. R. Moulton, University of Chicago, 1932.

Some visionaries attempt to rationalize human shortfallings when dealing with seemingly radical ideas:

"They cannot rise above their intellectual reluctance." — Roger Whittle, as he was attempting to explain to the RAF the advantages of his new turbojet over propellers, 1936.

Then there are forecasts that are truly visionary, but have not reached a closure:

"High-definition television will be in use by consumers before the end of the century." — J. A. Flaherty, CBS, 1982.

At the time this statement was made, it appeared that this could have been attainable — the technology was presented by visionaries, planners,

engineers, and technologists. Because of the perceived breadth of the influence that this new technology — or any, for that matter — could have had on our society, it was inevitable that it would have been acted upon by external forces. This produced an observation that is best understood when presented graphically (see below).

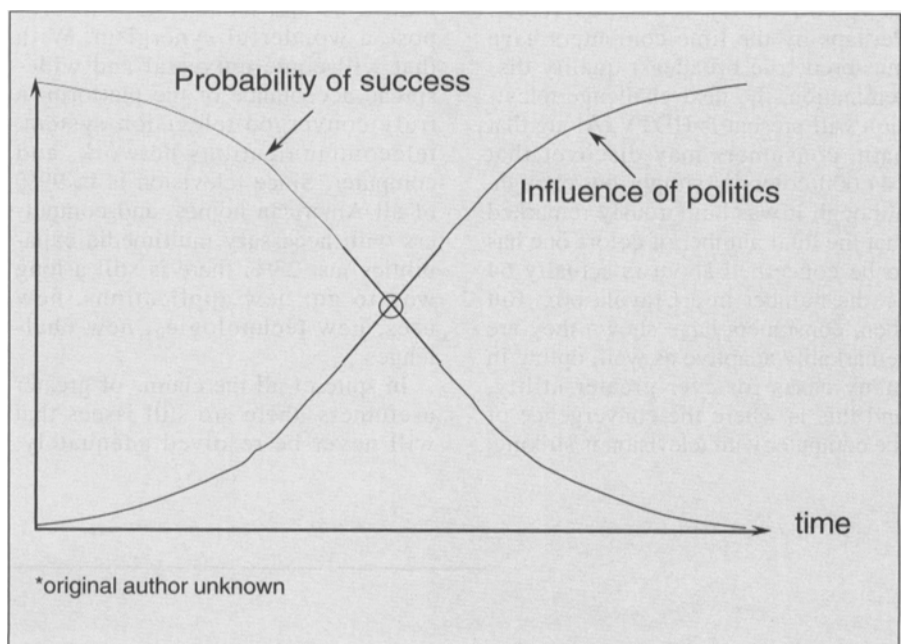
One conclusion can be reached: Decisions made under the influence

of politics always produce suboptimal results. Or, alternately, if you are going to get something done, do it sooner rather than later, but you'd better be right.

The graphic below has relevance to our convergence issue. The rapidity with which the computer industry has created new technologies and industries has virtually outdistanced regulatory processes and influences, and, in effect, has redefined free market activities, strategies, and economic growth. This, coupled with an industry that exists within a regulatory framework to ensure that it operates for the public interest, indeed makes for strange partners in the technological convergence. But these differences need not inhibit the result from being complementary, beneficial, and dynamic. The breadth of possibilities of the partnership is, more accurately, barely within our limited horizon.

What the computer industry offers this technological convergence is expanded utility, interactivity, and empowerment; television offers universal acceptance, entertainment, and information conveyance; together, boundless capabilities.

This cannot happen unilaterally. Television, which has been the predominant conveyor of information as a content provider, is teaming with a partner that virtually did not exist just 15 years ago — a partner that was so ill-defined as to invite criticism of its



The "Window of Opportunity."

usefulness or need. One relegated to controlling refrigerator temperatures and sequential blinking lights in response to switched input commands, the equivalent of amino acids before lightning struck. That is, until the technology caught up to the visionaries.

As a result, what we have seen and experienced cannot even be adequately described as revolutionary. The computer has redefined limits, possibilities, and expectations; it can learn, grow, adapt, and contribute. No other development in our history has created such extensive effects on our lives or set the stages to do so. It has influenced every other industry, and now is setting its sights on television, and television is a willing participant. Its interaction with television, however, is still in relatively formative stages. True broadcast-quality television's presentation and dissemination are still formidable technical challenges to computers, evidenced by the current quality of teleconferencing video and limited color and motion playback of highly compressed files. It is only a matter of time until the hurdles are cleared.

Computers will continue to aggressively challenge its technological partners for new applications and uses. Its ability to continually adapt, seemingly limited only by designers' imaginations, is its most impressive characteristic. Television also has been a vibrant and dynamic industry as it constantly redefines itself. Perhaps by the time computers have mastered true broadcast-quality dissemination, the next challenge television will present is HDTV. Along that path, consumers may discover that 144,000 colors is simply not enough, although it was humorously remarked that the total number of colors one has to be concerned about is actually 64 — the number in a Crayola box. But then, consumers have shown they are remarkably adaptive as well, opting in many cases for ever greater utility, and this is where the convergence of the computer with television is striking.

Although there is considerable information to be learned about television to do it well — evidenced in Mr. Poynton's brief tutorial — it is significant that the convergence of two powerful industries will eventually yield a product much greater than its components. This is only one step of many in this technological convergence.

As the computer industry prepares to exit its current second wave (the first being mainframes), the pace of growth for the third wave, the Internet and the fulfillment of the prospect of \$500 Internet browser terminals, will easily eclipse that of any previously measured development and approach true exponential rates. It is hard to believe that just five years ago, a two-million-dollar U.S. Government investment in the High-Performance Computing Act would have energized private companies to bootstrap research networks into a vast global interconnection framework creating immense economic liberty.

The computer and television, coupled with a converging telecommunications industry, can offer unlimited possibilities far in excess of the current capabilities. Just yesterday, Congress approved a new telecommunications bill to open new markets for the television, cable, and telecommunications industries. This suggests that the television and computer industries have already been linked and have swept in other ancillary industries and technologies to propose a wonderful synergism. With that will come universal and widespread acceptance of the platform: a truly converged television system, telecommunications network, and computer. Since television is in 99% of all American homes, and computers with necessary multimedia capabilities just 23%, there is still a long way to go: new applications, new uses, new technologies, new challenges.

In spite of all the claims of greater usefulness, there are still issues that will never be resolved adequately,

such as: Is the computer terminal the place where people will watch their movies? Probably not, because the computer represents a singularly personal experience, and television, more often than not, is watched in groups from a distance. Changing this relationship will take time and acceptance. Will the computer ever be trained in the fine art of gamma? Or luma? And what about 3:2 pulldown?

All this serves to remind us that the Winter Conference can only examine a mere microcosm of this evolutionary convergence. We are here to learn, participate in the process, and contribute to its success. The SMPTE serves as the forum and catalyst for these events to advance the motion imaging arts and sciences, in effect, to place the capabilities of the technology in the hands of the users, and, in the process, improve the prospects for success through education and interaction.

True enough, the television and computer industries will converge. The road map for this convergence will likely be littered with broken companies and dreams, failed implementations and missed or moving targets, but it also will create fantastic opportunities, capabilities, and fortunes. This is always the case when two dynamic and powerful forces converge rather than collide. It is our job to reduce the possibility of the former and ensure the success of the latter. One will not overtake the other, but rather, powerful allies will be created, each profiting from the strengths of the other.

With every new convergence, there is a possibility that what we create is not what we had envisioned. As we jointly participate in the construction of new eminently powerful industries and technologies as a result of this convergence, we must ensure — no, promise — that we do not lose sight of the purity of our purpose or perspective, or the depth of our commitment to serve the public interest ultimately as a service to our humanity.

Thank you.