JTS Open Forum

June 26, 2004

Unidentified Speaker: With all respect to Alan, who's furiously scribbling notes for his next rebuttal, from my perspective the future of film acquisition for movies -- my wild guess -- is five years. In five year's time, you're not going to see a single Hollywood *movie*. Set aside art films, set aside Bollywood, set aside production in other places (and I'm not really a huge fan of mainstream Hollywood films) -- in five year's time you're not going to see a Hollywood moving picture *originated* on film. This kind of entertainment is going to be shot with a digital camera, posted with digital software in a computer and it's going to be a digital master. It's still going to be recorded to film for release printing. And I know we could get Josh Pines up here to talk about how the archivists are going to deal with that material. But it's going to take – again, my wild guess -- ten years for the majority of North American commercial theaters to switch to digital projection. Anybody today would be absolutely crazy to spend $35,000 on one of those film projectors when they can get the latest Texas Instruments 2048x1080 digital cinema projector for -- wild guess-- $120,000. That's not ten times as expensive; it's only four times as expensive. And no, the development of these digital cinema projection systems are not following Moore's Law, because they have optics, machinery, light source and other components whose development is not based on the rapid evolution cycle of computer chips. But movies are going to go the same way that the digital still camera has gone. Last year, digital still camera sales exceeded still film camera sales. The motion picture transition is just the same transition but delayed N years. So N=8, or N=12, but it's a relatively low number. The future of film acquisition is limited.

Josh Pines: I have a feeling that the remainder of the afternoon is going to turn into a replay of last night's movie, "The Good, the Bad, and the Ugly." Which, by the way, was shot on Techniscope and still looks fabulous today. I think that most cinematographers would probably disagree with your time frame. There are a lot of efforts being made to produce electronic acquisition cameras for cinema. And these cameras are not so good now mainly because they're hybrids, spin-offs of news cameras and HD cameras. The manufacturers are finally, after ten years, beginning to listen to some of the requests of cinematographers and slowly making headway. Right now, film is the acquisition medium because of its extended dynamic range. And the ability to capture that dynamic range without compression in digital cameras is probably going to take longer. Five years is probably over-optimistic. With respect to digital projection, perhaps you're right. I'm not sure platter projectors that are now in all the cineplexes are quite as expensive as you suggested. The problem is that there are a lot of film projectors out there, and replacing them at a cost of $120,000 apiece is a forbidding prospect for the exhibition industry. My biggest fear about the digital transition is the archival issue. What's near and dear to my heart is going out -- on Friday, Saturday, every other night of the week -- to the cinema to see movies, especially if it's to a repertory theater to see a gorgeously restored print of an old film.   They still have a few of those theaters around. But when someone comes out with a digital projector that provides a reasonably good image and costs $5,000, the cinema chains will decide that it's good enough and we'll be forced to watch digital surrogates as a replacement for film. I'm going to get off my soapbox, now.

I actually had several technical disagreements with some of the things in the past presentation, but I agreed so much with the spirit. Keep the film forever, don't digitize as an archival medium (but perhaps use digitizing as an access mode for users).

Howard Besser, NYU: I'd like to comment briefly in relation to the digital projection issues, but my comment is valid for the broader range of issues we've been discussing. All of these things that we've been discussing are subject to market forces. We've heard a lot about that in the discussions about Kodak and in Nicola Mazzanti's presentation. Market forces and other, larger socio-political forces are running the show and we can't compel them to accept our agenda. Instead, we have to respond to these forces. When it comes to something like digital projection in theatres, there are battles over who's going to pay for it -- are the distributors or the theater owners going to pay for it? Because the biggest savings is going to come from no longer having to strike prints or ship them, theater owners say distributors should pay for the conversion to digital. The distributors say the theater owners, who own and use the equipment, should pay for conversion. When that logjam breaks, it's going to be a flood. The conversion is going to happen very quickly if, for example, the distribution companies decide to subsidize this process.
The question is when and how is that tripping point to going arrive? Once it arrives, all the chains will install digital projection quickly – it'll happen fast. But the more general point is that this situation and the others we have discussed are determined by forces that we can't control and that we have to be prepared to respond to. I really appreciated the comments about the loss of film stocks, changes in projection venues, and so on. We don't control these things and we never will.

Paul Read: The only thing I want to add is to reiterate that film archives and libraries are not alone in their problems. There are lots of other people out there with parallel problems and perhaps we should be talking to them, as well.

Nicola Mazzanti: It's true we don't control these things, but we're compelled to take them into consideration in a strategic perspective. And by posing certain questions, we can set certain dynamics in movement. For example, exposing the public and specialized audiences to information about the assets and interests of the archives has, in the case of FIRST, produced a number of limited but interesting responses. When we expressed our data storage requirements, the storage industry started to take an interest in the archives as a potential market. When we discussed the holdings of the archives, it caught the attention of Belgacom, the telecom, which was at that moment looking for content to match their new technical capacity. And while archive content may only appeal to niche markets, that doesn't mean that they should be dismissed. Instead, we need to discover or create the ways to reach new generations of users. We can start small and expand as we become more effective at understanding our users and at matching their needs to our holdings in intelligent, cost-effective ways. But it would be useful to have a strategy and objectives. And my take on it is access is the key to our objectives: making people aware of our collections and opening them for users in ways that are appealing to them. Our collections begin to be valuable when people know about them and want to use them.

Ray Edmondson: I would like to say something completely different while we're speculating on the future of technology. While we're thinking about where technology is going, we should also think about the context, which this meeting represents. We have people here from all seven of the federations that are part of the CCAAA. We have people from all over the world, many of whom have come for the first time to a gathering like this. They're working together more closely now, which is a very good thing. And as Greg asked earlier, "Are we doing this often enough?" The issues that we're discussing exist in a larger context which is also changing. We might reflect on that context and where our respective federations are heading.

Michael Friend: I'd like to address Howard's comment. The chaos that will be introduced by the advent of digital cinema is something we have to be careful of and something we've got to deal with. We need to determine what our own archival needs are in terms of conservation and in terms of access and in terms of the specificity of those media that we conserve and continue to show. The biggest danger is not the advent of digital cinema, the biggest danger to Eastman Kodak's film production is not digital cinema, but rather a situation where that monopoly which produces all this cinema entirely disappears in a matter of years. It didn't take very long for the cinema to displace the panorama absolutely and definitely as the most important visual spectacle. And when a studio can sell directly to the home directly over cable or some other medium and cut out the intermediary physical costs and the middlemen, they're going to be looking at profits they can only dream of right now. And that will be the motivation, not the $100,000 per cinema, but the $10,000 per year that they will get directly from every household in the United States. That will be their motivation to circumvent this entire system of film production and distribution. So I don't really fear electronic cameras, digital cinema, or any of these developments. And I think that Eastman Kodak's work on film stock is very important and has a future no matter what happens.

We're looking at one form of fast-approaching, possibly catastrophic change, but if we turn around we might see a much larger change looming. We should refocus on what an archive is and what an archive needs, on what our resources are and what we can do with them. Not in terms of disasters of the future but in terms of our responsibilities and in terms of planning a future for these resources now. Our speakers over the last three days have been inching toward talking about what we need to do. But it's important to step back a bit historically and realize that digital cinema may never come. That doesn't mean that's the end of the cinema-as-we-know-it is not coming. We may be watching films with goggles, or getting things projected directly into the brain somehow before the end of this century. There are people working on these technologies now, probably many more than those working on film stock.

This should bring us back to the media that we work on and their specificity, their historical content, what we feel we need to address as preservation issues that will allow these media to survive into the indefinite future. And if that means boutique production of motion picture film in collaboration with a motion picture division that's very much smaller than it is today, then we'll have to do that. But the possibilities are perhaps a bit greater than just the advent of digital cinema.

Josh Pines: One thing I'd add that we need to be clearer in articulating what it is we do and what our goals are. Film preservation is a pretty nebulous term. What are we really trying to do? Are we trying to show films in the way that they were shown originally? That gets us into really tough territory. Do we have silent film accompanyists, piano players? Do we have scratchy noise on the soundtrack? Are we trying to do that? Are we trying to preserve some kind of artifact that can be projected in different ways? Are we trying to preserve actual stocks and physical artifacts so that film can be projected as it has been historically? We don't have to choose one of these over any other, but we do have to be more articulate about what our field is really about. And that, in part, is a role the professional associations need to further develop for themselves.

Nicola Mazzanti: Some of those questions can only be answered by the kinds of research projects, for example, that FIRST has proposed. From the point of view of a major media corporation, you'll want to sell your library in every media that's profitable, and it doesn't matter if it's DVD or on a screen in a theater or in some other medium. It'll be a quality experience insofar as possible. But what we should be asking is whether or not, for example, digital cinema is adequate to represent the "essence" of historical cinema, or whether you need to go to the Bridges Theater in Los Angeles, or to MOMA to see film projected on a screen to get that essence. You know, the experience of a live piano player can be quite superior to a pre-recorded

soundtrack for a silent film, because there is a manifest difference, there is that quality of a live performance that was, at one point in film history, a part of its "essence" or its specificity as an art-form. We need to talk more and to explore the questions of how the historical cinema can be most accurately represented in the archival sense, which is an issue that is apart from the commercial availability of copies in new media forms, however good those forms may be.

Josh Pines: But if we're going to understand better what we need to do as archivists, the answers will come out of FIRST research projects, and your teaching, and forums for conducting this kind of research.

Unidentified Speaker: Just a point, too, is that archives are often about opportunity. We have to make the most of whatever is available to us and we are often at the end of the production chain. Archives don't necessarily dictate the ideal formats for preservation. Production is based on a set of business decisions, a set of technical and artistic requirements, which hopefully align closely in some ways with those of archives and often don't align in any way. So I guess it behooves us to respond to the opportunities that technology in the current production industry offers us. The other thing, too, just to try to widen this debate a little bit because it's not just about feature film, there's television and sound in the equation as well. One encouraging example, I'm not taking a stance on film or digital or electronic media, but just recently with the introduction of HD broadcasting in the television industry, a lot of long form production is, in fact, going back to film. This Super 16 is quite widely used. And archives now have a wonderful opportunity to either acquire uncut original camera negative, or perhaps a HDCAM master or perhaps an MPEG file. And of all the myriad of extra technical work that goes into the chain of looking after film, even once it gets into an archive, we now have this prospect of a kind of a hybrid, or multimedia management and preservation process. Just think of the task of technical selection, just to name one step in the process. You'll no longer have three reels of maybe some duplicate negative and a print running through a synchronizer. You will have a file as well as a neg. And you'll have a lot more opportunity to make life interesting. So it's not going to get easier, but we have to be able to respond to all these technical challenges and not lose sight of the end goal.

Thomas Bakels, Alpha-Omega: I want to pick up on what Mr. Mazzanti said before; it should be re-emphasized. I'm very happy to hear in a technical symposium some concern about the fact that our children hardly know the cinema any more. If I had not introduced my 14-year old to "Twelve Angry Men," he would not be aware of that kind of cinema. He would know "Spiderman," but that's not the same. He needs to see and understand the art of directing, to understand where our films come from in terms of a tradition, and I could not have exposed him to that history if the film hadn't been available on DVD.

I want to emphasize how important it is to make the contents of archives, feature films and historical documentation, more accessible. Archives should think seriously about providing access, not in some indefinite future, but now. And this means digitizing collections now. I would rather watch Martin Luther King's "I Have A Dream" speech on Umatic than not at all, and I don't want to wait until it has been scanned to 4k or 8k. We need to open the archives of Europe and America to the young generation of viewers, who perhaps need them the most. We need to foster a sense of entitlement, so that younger people use the archives, but in order to do this, we also need to do our part, which is to make the contents of our institutions available to them effectively, so that the content which we have been protecting for all these years forms a part of their education and culture.

Michael Pogorzelski, Academy Film Archive: I want to make an observation, not about the future or the past, but about the present -- a plea of sorts. What this symposium has taught us over the last three days is that the role of the archives has been changing over the last few years

and will continue to evolve. The debate that's been taking place over this weekend is a healthy one. But between the lines, in some of the presentations and comments that have been presented here, and that are typical of those being made generally among film lovers in the world today is the idea that there's an either/or relationship of film versus digital, and you're either for one or the other. It's such an ingrained way of thinking that it has become unconscious, and it colors our dialog. It seems evident from the presentations at this symposium that we can no longer talk as if we can simply choose between film and digital media. We're already dealing with both types of media in terms of originating material and formats for distribution and access, and both are going to be around for a very long time. We can't afford the luxury of that kind of discussion anymore, given what's at stake in how we frame these discussions. Everyone needs to be especially aware of how we continue this debate among our own colleagues, but perhaps as importantly how we communicate archival issue for the people we're trying to educate and serve.

Bonnie Willett, Bono Film and Video: My colleague before me expressed much of what I was going to say. Although I work in a film laboratory, I also represent the field of media education, and I'm attending the JTS for the first time. It's been valuable to come into the debates and observe various camps and their positions. I think these discussions are very healthy and this dialogue needs to happen on a more continuing basis. It would also be useful to hear more about the archival issues bearing on non-mainstream, non-fiction films, such as animation, home movies, medical films, and so forth. Those are important, too, and we need to be creative problem solvers and facilitators for those archives, too, and they can't afford some of the big solutions. I feel like most of the discussion has centered on very expensive solutions, and that it would be valuable to structure part of the discussion around cost-effective solutions for these other types of film and media collections. We should perhaps explore non-industrial models of financing, such as that of the National Archives, which asks clients to help pay for the creation of digital intermediate from their films; clients who want access to a certain piece of film essentially support access for subsequent users.

Nicola Mazzanti: First I'd like to respond to Thomas Bakels. I agree there is a desperate need to make historical programming accessible immediately. But there is a completely different issue, which is what FIRST is trying to make clear, and that is the importance of the medium itself in our long-term strategy, and I'm talking, for the moment about film and not sound or television. It's not clear that we can afford to wait forever to begin the conversion of archives, but if we don't get it right for any reason now, we'll have to do it again later, perhaps at much greater difficulty. So we have to set the bar high, and we have to think about two things in particular. First, what aspects of film as a medium must be preserved in archives, and secondly, how do we define what is adequate insofar as the presentation of historical film in another medium? Because we need to have a clear idea of how we want this film to be reformatted for access in new media. This links to what Howard pointed out earlier, that when the moment of change in projection comes, it may happen very quickly and leave us with little choice or influence in the matter. We have a problem because we have no theory and no defining terms for film preservation and restoration. And more, there is no adequate definition of many film practices, such as projection. When you want to compare digital projection with film projection, to do a side-by-side test or whatever, you have to ask what kind of film projection is intended. It's hard to argue about "authenticity" or the adequacy of a digital system without some definition of the terms of comparison. These issues are recognized in the FIRST report, but the answers are deferred.

This is a problem particularly if you are an archive or other historical media institution (as opposed to a commercial entity, where widespread consumer acceptance is the goal). If you want to preserve a media artifact, which had an emotional – and therefore cultural or historical -- impact on a number of people, you have the issue of authenticity. This issue hasn't been discussed here on the pretext that we are here to discuss "technical" issues. But there is a

parallel inquiry which seeks to understand the theoretical and methodological basis for presenting older media material in a historical context, and which is focused on the technical issues of how to reformat historical media for purposes of scholarship and research.

Michael Friend: AMIA has an annual conference, and it has a much broader purview than the Joint Technical Symposium. It's an excellent place to raise many of these issues. There is also an ongoing technical discussion, which is called the Real Thing, which often occurs at AMIA. So this JTS is not the last time you'll be able to get a snapshot of what's happening technically. There will be another in the fall of 2005 at AMIA in Austin at The Reel Thing, and that will continue to happen annually at AMIA. We encourage you to attend AMIA and the Reel Thing, and to participate in The Real Thing as a presenter, but also as correspondents who raise questions, pose ideas, and make us aware of issues and technologies that the community should be looking at.

There are other initiatives within the motion picture industry that address some of the archival issues. The presentations of Josh Pines and Phil Feiner, or those coming from the digital audio panel, represent responses to problems identified by the industry. Many of these industry initiatives are part of a larger framework of technical committees and commissions, other bodies within the motion picture industry and the archival community, including FIAF's technical commission. So our JTS conversation does not exist in a vacuum, and all of us need to bring these concerns to entities such as SMPTE, BKSTS, CCAAA, ACE, AMIA and so on.

Unidentified Speaker: If you want to get involved in a real debate between film and digital, SMPTE and ASC (American Society of Cinematographers) are still thrashing it out as we speak. And they actually make and screen test materials side-by-side so you can do your own comparisons. That's a really exciting forum right now.

But I'd also like to caution archives against trying to predict the future. Certain productions may end up on digital, others on film, still others as a combination of both. If we end up deciding we want to go back to scan a Super 35mm film in 50 years when everyone's getting 4K downloads on their mobile phone, at least we'll have the film. But many times in the past we have made the mistake of committing to a technical pathway that seemed to hold great promise, and yet never developed. DBX Delta encoding for audio is a good example. It was supposed to be the way of the future. That was 20 years ago, but DBX Delta never happened, never became the key technology many predicted. There are plenty of examples where people tried to second guess how technology is going to unfold. The fact is you've got to be pretty broad minded about what may happen.

Jim Lindner: Before I got involved in the restoration field, I was involved in the dark ages of computer animation. One thing that was true then and is true now is that no matter how much computer power you have, artists will want know about the square of the amount of computer power available. It was almost impossible to quantify and define exactly what an artist would want to put into an image, in terms of detail. I found the PowerPoint slide that assessed industry needs at about 42 petabytes very reassuring, because it's <u>defined</u>. We know what the scale of the problem is, and because of the continual evolution of technology, we can reasonably expect to plan and to meet that need. I find that much more reassuring than trying to figure out how much detail an animator will put into a frame, because it will forever be the square of the amount of computer power you have. I don't see either a financial or a technological roadblock for film archives that intend to digitize their collections at whatever resolution they need. It may be a question of time, but I don't see any fundamental technological impediment to such a project. It's very encouraging thing for our field to think that we can put media resources in archival storage knowing that a solution will materialize in the foreseeable future.

Howard Besser: Following up on Greg Lukow, I think four years is too long to wait for another JTS. I'd like the organizers to consider two years as a horizon. But also maybe if we can have some kind of communication forum that happens in between now and then, possibly some kind of blog or messaging system specifically oriented towards technical developments, operated by the Library of Congress. We need a forum for communication of technical issues. The AMIA listserve is too broad.

A second suggestion for the next JTS would be to approach the questions of how to manage digital information over time, particularly moving image digital information. The entire digital library community is struggling with those issues now. We expect an announcement very shortly of a project specifically managing digitized video over time. But we need to reach out to that community and get their participation.

Nicola talked about authenticity, which is a critical issue. The paper archives or electronic records and archives community has an international project called InterPARES, one part of which looks at the arts broadly defined, including film. InterPARES is looking at technical methods for ensuring authenticity in film and multimedia material. Outreach to InterPARES could be important for a future JTS.

Paul Read: The work that the Digital Library Federation has done on defining preservation metadata (and there are a few other standards out there worthy of presentation) could be a topic for future discussion. There is an opportunity to encourage further research into preservation of moving image and AV content, which has been provided very kindly by Mr. Lindner through several trust funds, which are currently managed by AMIA and FIAF and SEAPAVAA and perhaps shortly a number of other archive associations. The idea of the James A. Lindner Award is to provide a small grant, approximately every two years, through interest earned on these trust funds, either as a combined award jointly from several of the member archive associations, or individually, to fund research which may be drawn from any community. It doesn't have to be within the archive community. It could be within libraries, universities, research centers, broadcast engineering and I believe the first round of requests for nominations will be coming out within the next few months, coordinated through the AMIA office.

David Pierce: We've seen a mixture of high-end solutions, such as "The King and I" restoration, and the research on color separations, which represent a certain level of perfection or a preservation ideal, and some discussions of work that will be good enough, such as the PrestoSpace Project, when you're faced with economic limitations, a variety of contingencies, and enormous volumes of material.

Looking at these proposals and conclusions, these technical possibilities, we have to determine practically how to make decisions. If you only get one chance to make a decision on a major collection initiative, how do you ensure that you've made a choice you won't regret twenty years from now? At the National Film and Television Archive at the British Film Institute, we have one very big collection, and we're constantly making decisions regarding that collection.

There are underlying curatorial problems, in that each title costs the same amount to preserve; 9,000 feet of black and white will cost the same whether it's a good or a bad film. I can get support for the well-known or popular, but not for more marginal holdings such as the thousands of hours of coal mining films. Costs at the preservation end, and at the access end, are independent of what it costs to make that artifact in the first place, but also are independent of the amount of revenue recoverable from various access schemes. A corporate entity such as Sony can afford to do all of their films because they have a distribution system that will make them all available and return income on all of them. Non-profit archives may have only a single user for a

given film or video artifact, which will not generate revenue sufficient to subsidize the preservation of the object in question. So the relationship between preservation costs and a realizable revenue stream is more problematic for an archive, and it is this perspective which induces us to adopt low-cost conversion schemes. So end-user value factors into our selection process.

Selection is becoming increasingly critical for us, too. There's always already some kind of selection process taking place. We know that not all films or television programs are going to make it to the next level of preservation and then the next level of access, and curatorial activity has always been based on making choices, making selections. We have outtakes from the television series "Hollywood, the Pioneers," produced by Kevin Brownlow and David Gill, in 16mm. We received a grant which allowed us to preserve all the outtakes, all the interview footage. But we couldn't have preserved it all if we'd copied it all to 16mm. We talked to the directors, and they said, "Well if we were shooting those interviews now, we'd do it on video. So just go ahead and 'preserve' it on video." We've retained the original outtakes on film, as FIRST recommends, but because we have knowingly accepted a lower standard in order to preserve the all of the material, we are not entirely comfortable with the trade-off.

An interesting fact that came out of the PrestoSpace discussion is that some people are only interested in the content of the film or video artifacts, and not interested in their original format. That is, the cinematic specificity of "talking heads" interview footage may be irrelevant to all conceivable future uses, and thus the right decision may be to reformat such material in high quality digital video. The standards of quality and use value and the critical dimensions of authenticity will not be the same for every type of material in the archives, and so there is a fairly constant need to make intelligent, technically informed choices in the archives.

There will never be enough money to reformat all of the legacy media to the highest standard. Thomas, Nicola and David have all touched upon the issue in different ways, which is to say, how can we assess the user base interest in the thousands upon thousands of hours of material that we're conserving, and how can we understand the technical issues of quality and authenticity that we're grappling with now in terms of needs of the future audience.

Thomas Christensen, Danish Film Institute: I'd like to address the issue of analog versus digital. I love the smell of nitrate in the morning, I love handling nitrate, I love looking at the originals. They do have a certain texture, they are something special and I'm happy to work for an archive where we will have those elements for hundreds of years to come because we've built a cold storage unit to freeze these films. However, I'm also quite aware that digital projection will probably be the only way that I can present them to most audiences, and the only way I can control what they look like on screen. Intermediate stocks allow us to make durable preservation masters. However, they're not always the perfect material to recreate or maintain a film's authenticity, in terms of a specific look. Digital projection and digital intermediate technology will enable us to better preserve the theatrical experience of our originals in a lot of cases, by allowing us to adjust the image and record it out the way we intend for it to look, and with greater fidelity than we are able to achieve, at least at this point in the history of film emulsions, by photomechanical means. We hope that standards can be put into place regarding the presentation of legacy media – specifically, preserved nitrate films. This includes variables of the projection room, where frequently 35mm prints are not focused or projected properly. We are finding that, for some historical films, digital projection at 1.3K and 2K can be a very good experience when compared with 35mm projection of analog prints. It's an issue of appropriate use of available technologies as well as an economic issue.

Charles Poynton: Most of the professionals that I work with agree that the images produced by the 2k projectors now becoming available exceed the quality of typical commercial cinema projection, and approach the quality of the specialized screening rooms. But this discussion is not

without its political dimension. A 4K proposal has been made by several powerful interests in Hollywood. We can characterize the Hollywood movie industry as seeking a standard that will allow them to have product differentiation from what's going to be available in living rooms in five year's time. They've never quite made that explicit. For me, there's no doubt whatsoever that the 2K experience matches that afforded by current release prints that people see in the theatres, and there's no need to go to 4K to approximate that experience. It's more a question of holding on to the ticket-buying audience when HD or 2K comes into the home.

Unidentified Speaker: I would disagree somewhat because the powers that be that you refer to really don't care. If it's 2K and it works for the consumer, then fine, because the fact of the matter is there are no consumers whatsoever going to the theater and plunking down their dollars and saying "I only want to see this if it's digitally projected."

Unidentified Speaker: This 4K proposal, which is coming out of the DCI Group in coordination with the European counterpart, originates with companies represented on that committee. We were fortunate enough to have in that consortium of studio representatives, people who care about quality of presentation. The 4K proposal was not based on the economic motivation, the idea that we have to provide something better than what's going to be available in the home a few years from now. It had to do with maintaining the quality of projection, and in fact exceeding the quality of projection that you currently get with the standard release print.

Charles Poynton: The differentiation is not necessarily between the theater and the home; it's between Hollywood product and other product. Because, the way things generally go with these technologies, you can put a 4K projector in the home about two years after you can put a 4K projector in the theatre. But you can't make a $180,000,000 film outside of Hollywood. You can make one a decade, maybe, and you usually lose a lot of money. I think that the higher quality levels speak to the desire to control the product flow itself on the part of Hollywood.

Unidentified Speaker: But those are not the current production standard, for example, for Digital Intermediates.

Charles Poynton: But they will become a production standard.

Unidentified Speaker: There's a pretty clear demarcation between mastering, distribution and exhibition. There's a digital master, and what goes into that and how it is processed and output can be differentiated. The people in Hollywood use the words "future proofing" with respect to the choice of color-coding.

But concerning people buying tickets for these things, I think it's an absolutely deliberate and very sensible decision that in inaugural digital cinema exhibition, there are roughly 130 or 140 digital projectors of the 1.3K variety installed worldwide. Exhibitors do not want consumers to understand the difference between film and digital projection yet because there's no way that they can accommodate the need (if there is a need). There are people who think that digital is superior just because of that word, without having any reference to what it looks like.

Grover Crisp: There has actually been one study about that aspect of projection here in Canada. A study was made to determine which form of projection theatergoers prefer. And they always preferred "digital projection" regardless of what they were watching. If the stimulus was digital and they were told it was "digital," they preferred that to the other screen. And if the stimulus was film and they were told it was "digital," they preferred the film. This tells us the consumer or theatergoer can't yet differentiate on the basis of image quality between traditional print projection and digital projection.

Unidentified Speaker: My point about the theatergoer is that the economics of exhibition are not being driven by the consumer's search for the best quality. It's strictly the economics of production and distribution.

Unidentified Speaker: There was a good example of how this works when a colleague on Thursday got up and talked about the OpenEXR format. At present, there's no digital exhibition venue where you can actually realize 30 stops of dynamic range. But it's nice to have it up your sleeve, especially if you're doing lots of processing and algorithms in the background. This kind of reserve also explains why there's a tendency in Hollywood to go to HD level scanning for DVD reissues that end up at 525 line video and MPEG 2 at six megabits variable bit rate. The HD scan may seem like overkill, but it gives the digital post-production chain a super-sampling advantage that resembles in some ways the way film works in the analog domain. The fact is, you get a better end result if you've got higher quality upstream to start with. And archives are very much upstream. That's the kind of "second-guessing the future" I was talking about earlier. We simply don't know how archival media resources may end up being used, but we will be in an optimal position if we retain the highest quality in the reformatting process.

Kurt Deggeller, President of IASA: I would come back to the need for a permanent information platform. This issue has been raised before in many different situations; it was a question within AMIA at one point recently. I think logically it should be CCAAA who should construct this platform. But that would require coordination with all of the associations which form CCAAA, because CCAAA is basically an umbrella organization for bringing many cultural NGOs together. It is hard for this parent organization to ask for funding, because then it in some ways competes with its members, so CCAAA functions virtually without money. I would suggest that if you find CCAAA should have a more active role organizing this kind of event, that JTS or similar forums should be staged more frequently, then the CCAAA must be strengthened.

I have another reaction and I don't know if it's particularly European. I feel quite comfortable with the solutions I have heard about here. I feel less comfortable when I go back to my own archive and have to face budget cuts. Audiovisual archiving is a cultural necessity, and despite its neglect, has the potential to become a political issue. We should have a symposium on political marketing, how our technical, aesthetic, and cultural concerns can be crafted into political policy. The economic environment in Europe is so difficult that I doubt many of the solutions we spoke about at this conference can be realized. That's a real danger, because films and other audiovisual documents do not wait, and they are fading away as we speak. The larger public is not conscious of the state of things within our community, and so the question of a political component to these solutions is a very serious concern.

Dietrich Schuller: Having attending all of the Joint Technical Symposia since 1987, I sense a great enthusiasm in these gatherings, which I attribute the synergy and inspiration that grows out of the assembled film, video and audio archivists who are all talking to one another and bringing such a range of experience to bear on what are inevitably common problems. What I see is the big conversion which we did not anticipate in Berlin, when there was the first real Joint Symposium. In the past, only a few technicians and archivists felt there was a benefit from this kind of exchange of information, but today, we see many positive results that derive from these discussions. And I think this sense of the value of these meetings is behind the idea that the JTS should be staged more frequently.

On another subject, and with all due respect for what the big film archives, the national archives, and the European Commission is doing in the larger perspective, it should not be forgotten that the audiovisual document is the document proper for the cultural and linguistic diversity of mankind. You can only properly record and store specifically orally transmitted cultures only by audiovisual media. We can see that over the last five decades an enormous wealth of audio and

video documents have been accumulated in small cultural and research collections, almost all notoriously under-funded, almost all with little knowledge about preservation needs.

And these collections will disappear if action is not taken within the next ten to twenty years, because the old media will not be replayable any longer. The machines will not exist. And so we should not forget this constituency, and at future JTS talk about low-cost, small-scale approaches to digitization and to safeguarding these collections for the long term. This is not meant to be in lieu of the great archives and their projects, which also lead the way in terms of technical innovation. But we have to look at solutions which make it possible to apply these technologies for those who do not have substantial financial support.

Further, in light of what we must see as our global obligations, I want to suggest that JTS be held consecutively in the Western Hemisphere, in Europe and Asia. I've just been to Singapore, where I spoke to the Asian Broadcast Radio Archivists group. Their problems and needs are no different than are ours. Therefore, JTS should become a wandering circus.

Kwame Sarpong, Guyana, West Africa: I wish to thank the organizers, most especially John Ive, Laura Rooney, and UNESCO, who made it possible for me to be here, and to the resource persons who gave us all the talks. I learned a lot about sound restoration that is useful. Presently we are digitizing our collection of the Guyanan "highlife" and traditional music with a grant from the Daniel Langlois Foundation, located here in Canada. And I'm so happy to have my mentor behind me, who supported us from the beginning. I hope by the next JTS conference I'll be able to report on the status of our project, which is still in its early stages. By then, we hope to have a substantial part of the collection on the web. I'm meeting Langlois on Wednesday in Montreal and we're going to start work on the website presentation. But I wanted to thank everybody here who has provided useful information and given advice and support so that we can play a role in the community of archives and also enrich the experience of the larger public by making our musical traditions widely available. .

Ishumael Zinyengere, National Archives of Zimbabwe: I would like to thank UNESCO for making it possible for me to come here and AMIA, and also thank Laura Rooney and Jeannette Kopak, my mentor. My main concerns as the representative of a small archive, especially looking at our own African scenario, are the problems of funding and technical expertise. This Joint Technical Symposium has been quite fulfilling to me as an audiovisual archivist and I would like to hear more about how you can help us preserve our own audiovisual heritage.

Grover Crisp: These proposals we've been hearing are good ones. The idea of addressing the specific needs of smaller archives has occurred to us, and we've begun to address it in certain ways. I want to end with the plea that people get more involved with organizations like AMIA, and with symposia like the Reel Thing, because we are very open. We've devoted sessions, for example, to small gauge and we can devote sessions to any specialization, including international issues in archiving, that we so choose. We're looking for ways to make AMIA and the Reel Thing more valuable, and we're open to your suggestions. That does not preclude finding or creating other venues for this discussion, but you are all invited to participate both in AMIA and in the Reel Thing, to bring us your ideas. We work hard on these events and we've benefited from the support of a tremendous number of people who are, for the moment, invisible, but who did a great deal of the work, and who are indispensable to the process. It's a lot of work to put something like this together, and we need the critical mass of your participation, we need your ideas and we need your energy. Each and every one of those people who had an idea for a seminar should come forth and help organize a seminar with us. The JTS was not designed only for the major archives, and we tried to address a wide range of issues pertinent to all archives, although we did examine some very large projects. So there's no resistance here. We're about solving problems.

The idea for this JTS began two years ago, with initial discussions within AMIA. So there is a substantial lead time involved in the planning, the preparation of the presenters, and the fund-raising process. If everyone who belongs to CCAAA expresses the desire to see the JTS staged more frequently, then it can happen.