

Kim H. Veltman

Panel: Prometheus Unbound Again: More Questions than Answers

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I'm honoured to be back. I have only three points today. I want to say a little bit about some of the amazing things that are happening. I want to talk for a few minutes about dangers and I want to say that what we think of, or talk of, as if it was finished, is really only beginning.

About the revolution. Most of us aren't aware of just how great this is. The Vatican library, run by a Canadian, Father Boyle, is being scanned in page by page, 20 megabytes a page, 150,000 manuscripts and this is going on. IBM is doing this. It's being paid for, not by IBM, but by a collection of Catholics at the University of Rio de Janeiro.

But IBM has a vision to work on the digital library and so just to be sure they're not just dealing with Catholics, they are also scanning in 50,000 manuscripts of the Luther Library in Wittemberg. And just to make sure it's not just Eurocentric they've also scanned in 10 million images of the Edo Museum in Tokyo.

One of the very dramatic things at the G-7 Information Society exhibit last year was that they had a little high definition television that was linked by satellite to Tokyo and another monitor here that was linked by the Internet to the Vatican - to Rio de Janeiro, actually, - and showed those images simultaneously. IBM is one brilliant example of this global vision. But it's only one.

The Bibliotheque Nationale de la France is in the process of scanning in full text - 400,000 books. The Bibliotheca Nazionale in Florence has already scanned in 1,200,000 pages. The Louvre has scanned in every single one of its paintings. The Uffizi has scanned in every one of its 1,300 paintings and is in the process of scanning them in high definition - 1.4 gigabytes per square metre. That means you can go right down and check the tiniest of details.

Those who saw my talk three years ago; those pictures were really at about half a megabyte each. So the quality of these images is 2,000 times the quality of the images you saw on the screen a few years ago. This is part of a global vision. And people think that they can make a lot of money on this. About three and half years ago a man by the name of Bill Gates walked into the office of Monsieur Mitterrand and offered him \$2 billion in American for rights to the whole of French culture.

Since copyright in France is an inalienable right, it never occurred to Monsieur Mitterrand that Monsieur l'America could possibly mean that he was going to have exclusive rights. But, of course, that's what Mr. Gates had in mind. And when he discovered that this was not the case, Monsieur Mitterrand picked up the phone, talked to the director of the Musées nationaux de la France and basically had a 'interdiction totale'

against this thing.

That could have stopped things, but it didn't. In fact, in late October he [Mr. Gates] was seen walking around in the Parliament in Budapest. A friend of mine from the European Commission, who I happen to be advising on these matters, asked his friend: "What's Mr. Gates doing here?"

Well, Mr. Gates has just made us a very interesting offer of giving us several thousand copies for educational purposes of his Microsoft Windows in return for which he has made the modest demand of having rights to all of our art. Two weeks ago in London I had a talk with the head of the Moscow Historical Museum and he showed me a contract with Corbis, Mr. Gates's company, unsigned, that had been proposed to him.

The European Commission, worried about this - worried that small museums would get bullied by these tendencies has created a Memorandum of Understanding. It's a kind of intellectual union, signed now by 250 great museums of Europe. This was signed on the fifth of June of this year.

It basically says that, if I'm a little museum you can bully me, Mr. X or Y, but if you do so I'm going to tell all my other partners and my other partners happen to include the Louvre and the British Library and so on. This is one way in which the great museums and the great libraries are protecting themselves against these things. The revolution that's going on is in books, in libraries and all these things.

IBM, when it first went to the Vatican, again assumed that they could control this.

One of the problems is that we have a notion of content as something to do with Hollywood. And in Hollywood, you own films and you own videos and you own things.

One of the reasons why the European Commission is so concerned about this whole revolution, and it's one of the things that is driving their tremendous investments in this area - investments in Europe now total \$100 billion in the field of new technologies, if you include not just the European Commission but all the things in the research institutes, as well. There's a feeling - and I'm speaking now on the part of a man like Peter Johnston in DGXIII B, which is Advanced Communications Technologies; there's a feeling that Europe can't really replicate a thing called Hollywood, nor should it.

On the other hand, if we think of Hollywood as content only and if we think that content is limited to a few films that have been made the last 100 years, as compared to the thousands of years of things that we have in our libraries and our museums - if we don't make that visible then it's our fault that we have such a narrow notion of what content is. And so Europe is trying to get its act together to make that content, that extraordinary content, visible. So, there's a great amount of politics involved in this.

And this links up also then with the G-7, because the G-7 now has 11 pilot projects. Number five is specifically culture, while three is education, four is bibliotheca

universalis, the notion of a universal library and five is multi-media access to world cultural heritage, or museums. And that started just with the G-7 countries.

But in May in Midrand, just north of Johannesburg, there was a meeting of the Information Society and Developing Countries (ISAD) and 42 countries from around the world were there to see how this could affect not just the Europeans, or Japan or North America, but the vast other countries.

While there I became aware that there are technologies most of us don't know about. There's a company called World Space. At the moment all the rage is about the \$500 computer that's soon going to come and make us be able to plug into things without having everything there. But World Space is working on another gadget. It's about the size of a transistor radio, but in the centre there's a little screen and you're going to be able to plug into a satellite. The initial cost will be \$100, but by the end of 1998 this instrument will cost \$20.

Expected market? Four billion people. And this is another dimension of the revolution. Most of us are just aren't aware of how extraordinary the implications of that \$20 gadget could be.

The dangers are that people are trying to create consortia and assume that they're going to control everything. When the G-7 discussions got under way, France Telecom put a proposal about how much it was going to cost to browse through information. It would have cost so much that nobody would have been able to do serious study, and to write a book would cost hundreds of thousands of dollars - if you were doing a scholarly book with lots of images. That's one of the reasons France was moved out of the cultural side and this responsibility was moved over to Italy.

This is not a three hour lecture, so I'll talk now about some of the challenges. People seem to talk often about the revolution as if it's just a matter of getting this book here, scanning it and then I've got it on the Internet. What I want to leave you with is a sense that the real revolution hasn't in a sense begun yet.

One of the four projects that were connected with G-7 pilot project five on museums is a new capture instrument produced by the National Research Council of this country. It's a new camera. This allows you to take an image in 3-D and look at it and turn it around on your screen. But this instrument also allows you to take a picture of a painting and actually see the brush strokes and actually see the cracks and look at what we think of as a two dimensional surface of a painting as a three dimensional surface. This completely changes what it means to have a photograph.

There are new developments in terms of autostereoscopic display, so that you can see objects 3-D without even needing glasses, or these big head-mounted displays. There are new methods - new breakthroughs now - in virtual reality. One was made about six weeks ago in Rome, which is now the world centre for virtual reality with a little company called InfoByte working with ENEL, the second largest hydro company in the

world. They have a new technique where you can zoom right to within one centimetre of a painting and get totally clear resolution. So they are reconstructing the *School of Athens* by Raphael, in fact all the *Stanze* of Raphael in the Vatican, and you're going to be able to go right up there, then enter the painting and have a discussion with Aristotle, Plato, or Euclid or any of the other figures in that painting.

We're trying to get ENEL and Infobyte to work with IBM, because they're scanning in the whole thing so you go into a virtual Vatican, walk to the library book, touch it and then use the IBM technology to actually read it.

But once you scan the book in that's only the beginning. You need to translate it. Not many people are talking about that. I cope somewhat with 15 languages, but there are 340 major languages India alone. The library of the Vatican is mainly in Latin and Greek, but there's Ethiopian and Assyrian and many other languages.

We need not only to translate, but to reconstruct. We need to interpret what these things mean. We need to recontextualize and we need to see whole new patterns. I would say these are the real new industries that are coming ahead.

But, I'd say the revolution that we think of has perhaps not even begun. We're very excited about modems. We have before us one of the great pioneers that's helping to make these things possible, but in a sense when you think of it to get the kind of virtual reality that we're talking - that's being done in Rome at the moment - you'd need. at least OC12 - 622 megabits a second. To do IMAX online takes 80 gigabytes a second. This is not science fiction anymore. It's possible.

There are demonstrated examples that have gone into the terabyte level. But all I'm saying is that the revolution is only starting and all of these things, translation, reconstruction, interpretation, recontextualization, seeing patterns - these are all human based things.

The computer cannot fully replace the humane dimension and we need to protect our vision of the value of that, because that is really where the true content, the true collective memory of our society is.

Mr. Lind, there are Web crawlers that are capturing great deals of personal information [about] people who are accessing it. Will your marketing include a plan to notify your subscribers of this capacity to capture information that may then be used for marketing purposes? Secondly, if you do that, [will you] give them the option of making a choice as to whether they wish to have their information used or not? But first and foremost [will you] make them aware of the process?

Lind: Privacy is a great concern to not only our customers as individuals, but governments and rules are being put in effect that would ensure that any kind of record keeping of commercial transactions, anything like that kept internally by the company. not [be] made available to anybody or any other commercial entity. I think to the extent

that we are dealing with transactions, I think we can endeavour to protect customers against exploitation of those records.

But it's a far broader question than that. The whole Internet thing raises enormous questions of privacy, because the Internet itself kind of defies most boundaries. I don't know that there are the forms of protection that exist. In fact, the Internet is a kind of dangerous place from time to time. It has some really bad stuff on there; some really oddball and zany, and I suspect sometimes dangerous, kinds of communications. But, you know, that's what happens anarchy.

If we accept the concept of information as power, how do we ensure that this revolution, as Mr. Veltman described it, is a broad-based revolution and not one that due to business interests produces limited access and possibly even a new information class?

Veltman: There's no simple answer. What has happened is that the corporations began with the assumption that they're just going to go in there and control everything.

Part of what the European Commission has been doing has been to say, wait a moment, it's not that simple. And part of what G-7 is trying to do is move this up a level to make sure that this is not just a European bun fight but, in fact, that it is a global one.

There have been tensions within Italy itself, because there are at least four different views as to what should be happening in G-7. There's the view that it should just be narrow Italian culture; a view that it should be broader; a view that it should include the whole world, and then there's the view it should be an Italian consortium of companies called Civita that should control this.

None of these has been finally decided on. I think all we can do 'is to keep insisting on trying to find out what's happening and be aware that there are major fights in this area. One of the very exciting things about the South African meeting was that it was an attempt to say, this is not just G-7, this is really the great countries around the world. I can give you a nice glib answer, oh, it's all been solved. I can tell you there are fights going on on this subject governmentally, business-wise. I think the great corporations are trying to push - IBM has been trying some deals that just focus on their narrow interests. But, I think IBM at its best is a magnificent citizen and actually realizes that this is far more complex. So, what we need to do is remind people just how vast this material is. And so that no single individual gets into this megalomaniac notion that they can control it all.

Pacey: The issue of equality of access is obviously a big concern for us in education. One of our concerns is that we could be at risk of isolating people and moving all of our strategies to high-end new technologies.

The strategy that we've taken for the last six years has been to continually put forward the argument that the students we serve are spread all over the province of British Columbia. Our biggest concern is those people in the northern regions and on the isolated islands.

We continually see that as the infrastructure gets laid down we get it running through our major centres. That's how the marketplace is pushing the evolution of the infrastructure. That's not good enough for us. And, of course, when we argue with the providers their response to us is that we're being irresponsible and we're asking them to take on bad business deals. Our response is we don't have a choice. In order for us to be able to deliver education, we need to make sure that same kind of infrastructure is available to everyone in the province.

What that requires is a hybrid solution and you're not going to be able to achieve that with only a single kind of wire. So, we've always looked to our cable partners as being very important pieces of the puzzle for us. That's always been a bit of heresy when we talk to the telephone company. They don't want to hear that. But when we point out to them that there are cable infrastructures in other parts of the province where they are unwilling to provide services to the extent that we need them, they feel that we're being unreasonable. The satellite and a wireless solution is going to have to be part of the overall mix. So, it can't be only one kind of a solution.

Lind: I think that's right. I think that's one of the most exciting aspects of this. You can worry about everything, but I think the positive side of Internet access and the new technologies is that students in 100 Mile House or Williams Lake - places like that - are going to have the same degree of access to educational materials that kids may get in Vancouver, Portland, Seattle, San Francisco.

That has really profound implications for how we deal with education in this country. We can always worry as to whether we're going to create two classes. What I find encouraging is that we're moving this more and more into mass streams. The degree of limits that have been placed on access to information by distance, technologies, everything like that in the past has been astonishing. Now we're going to be able to lower those limits and allow more and more people greater access to all kinds of information.

Veltman: One of the strategies in Europe now is to say, let us have free access to just looking at the image as long as it's for educational purposes. If you want to download that and print it out as a poster, that's where the expense comes. So, you can study it free of charge, but if you want to have images of it and do other things with it, that's where the costs come in then where the business viability comes in. That's one way of protecting both sides of that story.

Is there a danger that we in the developed world forget that we cannot eat information? And, is it possible that there's a terrible scenario for the future where a century from now you have a planet - or mankind has 10 billion, two billion on the Internet and eight billion starving?

Veltman: All these things are dangers. One of the exciting moves is a project I was telling you about with World Space. That there are people working very hard at the moment to get that technology out to all the people and not just to people who can afford million

dollar machines.

That's one strand of it. This does not solve the food problem. The food problem is a problem in itself. If you look at the Internet now, it is starting to become world-wide. It is spreading enormously. You can find lots of facts about Africa, about South America, Asia, the people of China. It's not nearly as widespread as here. but there is an awareness that this is important these countries.

Countries like China are still trying to contain it and to use the Internet for censorship. As the speaker last night said, it is not really the technology, it's how we use it. And there are a lot of people I met several hundred of them in South Africa at the world level - who are thinking very profoundly how this can be applied around the world. It's no longer just an American or European thing. I can assure you there are a number of people thinking about it.

Mr. Veltman, since the topic of this conference is citizens of the Electronic Village, perhaps you representing the McLuhan Program could talk about McLuhan's vision of the Global Village as it's unfolding to our surprise and delight and horror. How does McLuhan's vision relate to what's happening right now?

And going much more to the issue of citizenship, and beyond the whole issue of the Internet. but electronics is more than the Internet – It's telephones, it's television, it's basic electricity, it's VCRs, etc. I understand right now in India there's an explosion of television into the more remote parts and to the poorest villages, so that suddenly images of the world are coming to places where people can't travel more than 10 miles from the village. How is that going to affect the citizenship in that country, or a country like Indonesia. which has great problems right now, or China? How does the exploding Electronic Village affect the role of citizens in [these] individual national societies?

Lind: Dr. McLuhan would have been quite charmed with how things are turning out. He would have been comfortable as his predictions were coming more and more true. He, after all, did say that it was an anytime, anywhere thing and that it was going to be delivered by electronic means and that's exactly what's happening.

How does this talk about citizenship? Well, it gets messages to populations in a way that was never before possible. We're able to impart very powerful messages to everyone now. And they are beginning to be more and more impacted by it. I think there's some real potential here for having a relatively civilized and non-war-like society, one that's far more educated than we could have believed possible a decade or two ago and one that hopefully will be able to use knowledge to feed the world and get along with each other better.

On the other hand, you can see that he predicted tribalization, too. He was very comfortable with the notions of tribalization and clearly the electronic means of communication fosters tribalization in a way that can sometimes be enormously destructive. It's a bit of a paradox.

Pacey: I recently spent some time in Malaysia meeting with the public broadcasters from around the world and the challenges that they face are very important challenges because, of course, people from Africa, people from some of the other countries, are looking at the public television medium as the method by which they can promote citizenry and as a method by which they can help people understand concepts of democracy and government. And their biggest fears are that [it] is being undermined and there are risks of that aspect being privatized. .

When we work international countries it's very important for us not to just take from Canada the things we do and assume that it's going to work in those other countries. It's critical that we begin to work from the perspective of the countries and the people we're working with.

So, often times we go and move back to what some people might consider to be old technology. Television is something that works very well for us in the field of education. There are many people who believe it doesn't because there are other options and other alternatives available. But it may not be a good option for a particular country.

Veltman: To talk about McLuhan is a bit difficult. I really should leave that to Eric McLuhan, who is his son. But, I'd say this. His notion of the Global Village emphasized things like television.

The computer is extremely different because - what I want to constantly remind you of is that the computer is in fact a metonymy; it's a whole series of different things mixed into one, because you could use it as a television, or a telephone, or as a radio. But you can also use it as a book. It's not just a screen. It's also a device for printing objects in book form, or it can come out in sound.

It can take all these traditional cultures, where the one was replacing the other, all of these different technologies now come out of the same machine. I found it very interesting that our keynote yesterday has this latest of all devices and what does he want to do? He wants a printout.

This is quite different from the paperless society that we heard about in the '60s, when Marshall McLuhan was at his height. This device is doing something much more profound. It's not just about getting it on the screen. It's about being able to manipulate it in all these different ways, so I don't think Marshall could have foreseen the magnitude of that revolution. And he was talking intuitively about it being a Global Village.

I think the difference now is with the gadgets that I keep talking about, these new kinds of devices that are going to cost \$20, it's thinkable that every human being - almost every human being - could some day have such a device. Twenty dollars is still an enormous sum of money for some people, but the devices at the frontiers of technology at the moment still cost a million dollars and most of us can't afford that.

The citizenship question is a very profound one and there the most interesting developments I've seen are in Italy. In the town of Bologna there are serious discussions about giving every citizen of the city a free Internet access so that they can have discussions. If you go to Bologna's home page you'll find that there are discussion groups on city politics, on environment, on all the key topics they think are important to citizens.

The turn side of this is that the Italian Communist Party has a special disk on policy for multi-media as a way of spreading communism. I do not tell you this to convert you, but simply to make you aware. I'm just saying it's not an easy question and this can be used in many ways.

Information technology is changing extremely rapidly. Is human nature changing fast enough to adapt to it? Man is a gregarious animal. He needs to talk to other men and women. The information technology and everything that goes with it seems to me to be providing isolation...I find it difficult to see schools without teachers, without other kids the classroom: that I am somewhere at a computer getting information from everywhere and learning without this human contact. I think the danger of lacking human contact is that you internalize. It's this lack of human contact through aU this new medium that worries me.

Veltman: Your concern is a very good one, but may I remind you that there's a great tradition of using libraries where people don't talk to each other. Evolution is embracing, not replacing. I think it's a totally mistaken notion that computers are going to make us somehow isolated individuals that don't have communication anymore.

There are isolated individuals, but that has nothing to do with them using computers. I think the gadget gives us lots of openings, but it cannot replace a real teacher. There are cases where if you're in a remote community and you don't have any access that this is a way of substituting for some aspects.

But, given a choice between having a great master to talk to directly or a machine, I don't think there's a choice. At the moment The Vatican, one of the greatest libraries of the world, has 2,000 people that visit it a year terms of reading books. I happen to be one of them. But when you think of how many people there are in the world that's very few. So, if you can put that on line and give other people a chance that opens the playing field a bit.

Pacey: I can only speak to the way our students relate to us. We're located in the lower mainland of British Columbia. Over 60 per cent of our students are actually individuals who have access to either four universities or seven community colleges in that lower mainland. However, they choose to study with us and there are obviously good reasons from their perspective as to why they do that.

But when I speak to my students that are located in some of the northerly regions or some of the more remote areas, their mind they don't feel that the technology is actually

isolating them. Their perspective is that it's actually opening up the options for them. Though they may not be able to kneel at the feet of a guru, some of them would choose not to do that. They prefer to have a little more self-discipline and a little more control over the way they learn.

So, from our perspective, the technology actually opens up communications for them. Our experience has been, like Kim's, that once we give our students Internet access they are constantly on line. And when we monitor it they're on at 4 o'clock, at 5 o'clock in the morning. They're shifting their time to fit their own needs.

There are others who prefer not to study that way and that's why I think we continue to have conventional institutions that are campus based that will serve those people and those learning needs.

Dr. Veltman. assuming that what you said is true about this just [being] the very beginning...could you speculate what society and all these electronic phenomenon are going to look like 2020 or 2025?

Veltman: If it all goes positively and I think we have to say if, because there are forces out there that are just trying to make this into a profit thing. We need great industry. There's no doubt. In fact, that's the whole notion of the Memorandum of Understanding.

The truth is we have great museums. We have places like the Deutsches Museum in Munich. Here's probably the greatest history of science museum in the world. It has two acres of instruments in the basement. I've spent a week down there with their leaders and they do not know what they have.

We have the Royal Ontario Museum; 96 per cent of it is still invisible. Most Torontonians have not a glimmering that we have one of the great fish collections of the world, let alone that we discover at least three new species per year.

If we can make this material visible, then I think we have a chance and a whole new concept of what learning is about. The next breakthrough is going to be when we get the courage to say what we happen to know in the West isn't enough. We've now got to look at this thing - at a global thing - and actually translate these great texts from all the countries.

There are breakthroughs now in terms of virtual reality. They've just reconstructed the whole of the Colosseum. The Italians have just produced a little book as their visi~n statement. They see recreating the whole of Pompeii and then running hypothesis of what Pompeii was doing. We all have these theories about what happened with the fall of the Roman Empire, or what happened in this or that society, But these are just conjectures. But some of these conjectures, just as with scientific visualization we are now able to see how this might work. They want to do this with culture so that we actually see whether our theories of what happened in Pompeii, or Greece or Babylon actually could work.

These are all things that are technically possible and could open a completely new world to that which we know today. Most of us grow up with our home context - our horizon depends on the school library, or on the few teachers who are around us. If we have a great teacher, well great. If not, well, tough luck. The teachers can help us. I do not ever want to get rid of teachers because the teachers can just remind us there's a little more out there each time. But these techniques can help us to make that playing field much more vast.

My question is about language; specifically about linguistic Imperialism. The facts that I've seen suggest that an overwhelming percentage of material currently available on the Internet is English language material and that the language of discourse on the Internet is also conducted in the English language. Is it good or bad? Does it allow all of the global citizens to communicate in a common discourse maybe for the first time? Do those benefits outweigh the acculturation effect?

Veltman: English should not be the only language and, fact, there are great efforts now to make sure that that's not the case. There's a tremendous amount of material being produced by the French, who are determined that France remains an international presence in French. But, it's not only France. It's no co-incidence that culture has been put into the hands of the Italians. The Italians have, in fact, one of the most brilliant cultural networks in place right now. It's called Video on Line (www.vol.it) it's worth looking at. The Germans are putting out an enormous amount. In fact, all the major countries of Europe have systematic programs to put things out in their own language.

The G-7, in terms of pilot projects for the Bibliotheca universalis has at present the national libraries of Britain, France, Belgium, Portugal, and Spain working at a systematic co-relation of their names and their methods of access. The matter is something that is being considered and the Japanese, the Chinese, the Vietnamese are working about getting sites up in their languages. And so are the Indians, actually. That's the short answer.

I'm somewhat dismayed, Mr. Veltman, that you're not using any Canadian examples when you're talking about the advances that are being made in digitization. The Canadian Museum of Civilization in Ottawa has over a million objects in its collection, only a third of which can ever go on the floor at any given time. They are digitizing their entire collection and it is being turned into a virtual museum. In a lot of ways Canada stands head and shoulders above the rest of the world, both in digitizing their collections [and] in making it as accessible as possible to the greatest number of people.

*I [also] want to challenge Mr. Veltman on the concept of mediated experience that this gentleman referred to earlier. Yes, we are digitizing our content. Yes, we are making it available to a greater number of people, but the reality is no matter how brush strokes and cracks in the canvas that you can see on a painting or how much detail you can get, there is no match for seeing Cezanne's *Afternoon at le Grand Jat* on a 17 or 22-inch monitor if you're lucky to have that, as opposed to seeing it in the grandeur of how it fills a whole wall.*

The concern that I have is that we're seeing with young kids 5, 6, 7, who are growing up with computers, who are working in a virtual reality all the time, is that there is a confusion between the mediated experience of the Internet and the real experience.

The Museum of Nature has a tremendous amount of information on wetlands and all kinds of stuff like that. We are finding that kids most often prefer to do the research on the computer and stay on the computer, rather than printing out the research papers and going out into a wetland to actually do field research. What can we do to ensure a balance so that for the young generation, the ones coming after us, don't make that mistake?

Veltman: In terms of your first question, we had agreed amongst the panelists that I would represent the international [perspective] today. I've been working with CHIN (the Canadian Heritage Information Network) and with all kinds of Canadian organizations. It was thanks to Industry Canada that I went to South Africa to represent our country. I've not forgotten Canada.

I actually was making some rather strong political statements and rather than name local companies, I thought it would be wiser to mention that at the international level and people can take the consequences back.

The second question is an important one. I guess there's two sides to this. Of course, you're right! It (the Internet) can't ever replace real experience. We have to make people aware of what those differences are.

But there are at least two areas where these mediated things can be great use. One is that most of us never get to see the great things anyway. Even people that fly to France to the home of the Duc D'Orleans and want to see the treasure of the Due de Berry go to that room and they see the beautiful manuscript, [or, so] they think. The real one is actually in the vault. There's a brilliant model there for the public. The reason is that if you had the public turn the actual manuscript within one year the manuscript would be "dead." I mean it would be destroyed.

We need mediated methods to give those of who can't hope to go to these cultural sites and to these books that would fall apart and give us a chance to do that. We still need education. There's no replacement for the original.

Lind: I want to talk about something that we're doing modestly, compared to some of the things Kim is talking about.

We have a thing called Rogers Art Wave on our web site. Starting this fall we will have the exhibitions of all the major art museums in the country, coincident with their fall show openings. [People] will be able to see the art works and how they're displayed the various museums.

I agree with Kim. There are a fair amount of people who are interested in what is going

on in contemporary art in Canada. I don't think there are too many people who are going to be able to get around to all those sites this fall to that exhibition calendar. Eventually, we'll be able to go much deeper. In fact, there's a hot link between the Art Wave at Rogers and the institution, so if you want to go deeper you click and you're into their web site and you can access what they're doing.

We're providing experiences that are basically unreplicable. Sure, human interaction is terrific. I don't think this takes away from it. But, I think we offer so much more electronically; so many more opportunities than people would get in their normal lives. I think it's a fantastic opportunity to enlighten and delight people as they learn more and more about their country, their society and their universe.

In this country we spend a lot on public education. I think, in fact, we are the highest on a per capita basis among OECD countries. That also coincides with a time when people are very concerned with how we compare internationally. What I was listening for in the long list of things you are doing in British Columbia was whether all of that is smarting us up, or dumbing us down? Do you have any way of describing to us what are the benefits to the students who are your customers? How do you know whether they're getting smarter as a result of this, or whether you're just dumbing them down with more plates the smorgasbord?

Pacey: Two measures we use - and they are only two of many. In the conventional educational world when an individual completes an undergraduate university degree we know that many of them aspire to move on to graduate studies.

We've used that as a benchmark on a regular basis to ensure that the quality of our education is good. To date we've had none of our students refuse to move into graduate work in any of the conventional institutions in the country. So, we see that as one important piece of evidence that what we're doing is useful to the learner.

The other example I'm going to give you is related to young people. We have examples where students who were studying a math course totally on computer write the provincial examinations. These were a group of students who would have been seen to be students at risk; individuals who likely would not have passed a mathematics course in a classroom.

They wrote the provincial examinations and were compared to a group of students who were a classroom. Their success rate was 80 per cent. The students in the classroom [had a] success rate of 60 per cent: So, we have evidence that the technology does work well with certain groups of students.

Mr. Lind, I'm interested in your view on the role of public policy in this enterprise we call the Internet. There s a range of alternatives... from full-scale regulation. Ervin Duggan last night implied. he didn't suggest directly, some forms of stop, hold the horses regulation. Others have different forms in mind, more along common carrier lines. On the far end of the spectrum is relative neutrality, if you like, through indirect programs

like scientific research tax credits. but not direct.

In the middle is a facilitation of technology, such as the things that are being done at Justice by mounting the Statutes of Canada on the Web; Strategis, the Industry Canada initiative, and others. The reality is without the facilitation involved with government funds, ARPANET and the Internet would never be here. Yet, the wide reaching impact of the Internet has been fuelled by commercial interests and tremendous investment in the last six to eight months to a year. Where in that spectrum do you see your view and how should public policy intervene into this debate, particularly on the Internet?

Lind: Probably in the middle. You've got to be aware before you begin thinking about that question that there a lot of things you can't control. When I started in this the government told us - and they still do - what television stations can be delivered on cable TV. We have to go and appear before the tribunal and ask them, can we please put a television station on this undertaking? To this day, they still say no. Even stations that are over the air, they still say, no, we don't like that station, or it's American, or whatever.

For better or worse, they can't do that on the Internet. That's just not in their capabilities. No one's sitting there counting the number of hours that are Canadian, or local.

So, it defies a lot of regulation. I think we do have to define some kinds of codes of conduct. I think we have to be encouraging, getting Canadian messages, themes and stories and things like that on the Internet.

But, I think for the first time we have to factor in [that] this is being driven by the marketplace. I know it's a radical thought for Ottawa, but it's happening and, before they construct these parameters, they have to first understand what's going on before they wade into regulation.

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