

Program Information:

Title: Edward Burtynsky: The 10,000-Year Gallery

Location: San Francisco, CA, The Long Now Foundation

Date: Jul 23 2008

Good evening. I am Stewart Branch of the Long Now Foundation. And a couple of things that is coming up that you should know about. One is that there is a reception afterwards over at Long Now Museum and Shop, a half block. The next speaker, Leinad Zareus is actually Daniel Suarez for dyslexics. He wrote a novel which you could get outside called Daemon or Demon, being the computer technical term for a kind of quasi, AI-Bot. My wife is reading the book right now and it is defeating sleep for her. It is incredibly a well-written book. And he is going to come and do something for the first time which is talk about the ideas behind that book and the sequel which is coming called Freedom™, trademark.

September 9th, Neil Stevens' new book, Anathem will be world-launched from here with Long Now and that is partly because he got the idea for the book from the Clock of the Long Now. And there will be live music. This is sort of a monastic order that goes with the the 10,000 Millennium Clock. And they do a certain kind of singing which is highly mathematical. And there is singers who have developed that sort of music and they are going to perform it live. Neil will read from the book; and Danny Hillis and Neil will talk about the book and everything else. That will be September 9th. We are not sure where it is at. We will have it somewhere echoey so the music reverberates the way it should. September 9th, that is a Tuesday night.

The Clock Daniel Hillis' 10,000 Year Clocks is a work of

art. It is a piece of land art in a way, a piece of conceptual art in a way and a piece of engineering, more importantly and art is about art. So, the sign that you got some art that is up to something is when it makes other artists do things they might not otherwise have done. So, Neil Stephenson's book is one of those. And what we will see tonight is another, a great photographer, Edward Burtynsky.

Thank you, Stewart. It is really exciting to be here in San Francisco again. I always enjoy coming to San Francisco. And I re-found on how I ended up doing this talk and it came as a result of two dinners. One was a dinner with Danny Hollis about a year ago. And he was telling me more about the 10,000 Year Clock and the idea of it, the conception of it, what the intention of it is and how it was supposed to function out there which I was all ears. And on that conversation I said, "...Do you know that it really reminds me of some other things that I have heard about which James Turrell's Roden Crater, the Lighting Fields of Walter De Maria and other types of land art pieces out there that kind of encourage a pilgrimage to it for those who are interested in the arts, are interested in conceptual ideas, are interested in land art or interested in concepts that this kind of place that has something very special going on I think captures our imagination today when we are inundated with homogeneity and everything is becoming more and more of the same with the things we buy, the things we drive, the things we live in. so, and also how we

think about things of this particular project captured my imagination because at first, I thought, now in a day and age when we are all talking about global warming and figuring out how to make it to the next 50-100 years, it doesn't seem to be a little odd to be talking about a clock that could run by itself for 10,000 years. And I just thought that is this really where we should be paying out attention right now when we got a fire in the kitchen and we are kind of thinking about how to design our next living room out on the edge of our house. And I thought, "This is kind of odd place to be right now especially if we are thinkers like Danny and Alexander and in the Long Now" and then I started to hear more about why. What is it that makes this a compelling idea for our time? And I think again, it is what it is has the foundation has come to that we have. I was just reading a press release that Brian Eno had done when he talked about doing the times. the way, the music you are hearing were experimental chimes that would be part of the Clock when you are coming in. but he was saying that we have come to a point, both our politicians, our corporate leaders, everybody is thinking in very short terms "next quarter, the next election, the next " but it is not any distant future. It is not thinking even 10, 20, 30 years out which is thinking just ahead of where we are just right now which is a kind of thinking that kind of gets us into serious trouble as we all I think can appreciate that there are definite issues that kind of short-term thinking.

And so, when I was talking to Danny at this dinner, I said, "Well, I like the idea that you begin to start to shape the way you think because everything then, all you materials, all the way you are thinking is about this future. It is not only very optimistic. It is also very creative. Well, how do we begin to make something of enduring quality? And that making of something of enduring quality forces us out of short-term thinking. And it is a simple really as that. So, I heard this. I said, "Well Danny, I think it would be really interesting if someone is going to make a pilgrimage to see this Clock and this mountain, this chamber in this mountain. Wouldn't it be interesting to do something more? To give that person who made the pilgrimage a little bit more to digest when they get there? Why not do a gallery of images within the chamber of the Clock?" and then he kind of turned to me and said, "In all the ideas and I get a lot of ideas of what to do along with the Clock. I really liked this idea. But I am sorry, Danny would want to be here tonight but he is extremely busy right now. He has promised to look at the video. So, I expect you to look at the video. So Danny,

So anyways, So, he really thought that this was a beautiful coming together of ideas. He liked it. He said, "I would like you to think more about that and find out more about that." So, I started researching. And so that was the first dinner that got me to stand here tonight. The second one with Stewart about five months ago, six months ago here in San Francisco and it was after an exhibition of mine on quarries. We were having a dinner and Stewart, we were talking about this. And he said, "I think you should talk about this at one of our talks. And I went, "Gee, I never thought I would do a talk on it. But sure, I will certainly try to put these thoughts together and present them to the audience here."

So, this is the first time I am presenting this idea. It has been an interesting journey in that I didn't know where I was going to end up. I just started to pull away at tug ideas and I will talk about them as I go through it.

But the Gallery of the 10,000 Year Clock, this is a quick little proposal that I put forth. It is a proposal to create a gallery of permanent images to be exhibited on the chambers of

the 10,000 Year Clock. This clock will have the ambition and the capacity to keep accurate time without human intervention for a period of 10,000 years. The clock would be installed in a chamber within a mountain and be powered with the cycles of day and night. The gallery will display 20 plus imaged curated by a variety of current thinkers and image specialist who will be asked to just let the group of images that would reflect the impulse of the cave painters of Lascaux that could loosely be defined by this quote by Wensel Van Hausen who is an expert in the caves. The paintings are the oldest symbol of human imagination. And they certainly have some religious and mythological meaning. They tell us who are direct ancestors were, what they thought and what they could do. They tell us about imagination, about creativity, about consciousness and about the Creator. The Clock and the mountain that contains that would enter into the realm of destinations worthy of pilgrimage to witness and experience. Those who make that effort will be rewarded not only with the marvel of the Clock but also with a contemporary update to the impulses of the cave painting of Lascaux, the exhibition of images the curators believe represents the creative expressions, values, desires and concerns of our current culture. The images that are selected will not necessarily be a complete companion of our value systems, thus reading like a time capsule for future generations. Rather, it will reflect the contemporary manifestation of our individual and collective will. I can imagine the exhibitions on the following lines; Our Built World, Using Natures, Science and Technology, Objects of Desire, Notions of Beauty, Mobility, Energy, Freedom and the Middle Class, Conflict, Darwin versus God, The Pursuit of Outer Space and the Cosmos, and so on. And unlike the painters of Lascaux, we are not painting for the enlightenment of future generations but for the benefits and values we today live with extended consciousness and can not help and consider what might be interesting to leave behind as symbolic representation of who we are and what we aspire to. So, that is kind of the working parameter of what I was beginning to think about in doing the Clock. And so the Clock itself, I don't know how many but I am sure many of you are familiar with it. This is the first prototype and it exists in the Science Museum in London. And, is that correct? Is it in London? Yeah. So, it is in the Science Museum. And this is obviously a pared down version. And what is interesting about this Clock is again the materials that are being used, how it is being conceived, to keep accurate time over a period of 10,000 Years without human intervention is a really fascinating scientific, a problem in physics and materials. And I think it is again something of incredible curiosity that something can kind of again drive itself over that period of time. And I thought and I kept asking Danny, "Well, what it is going to be? Is it going to be like a windmill or solar?" No, none of that stuff is more than 50-100 years. And we were talking about that!

So basically, the premise here is that they are going to have some type of wires that expand and contract on a higher rate outside that can capture the energy of expansion and contraction to the sun and to the cold of the night and the heat of the day. Also, there is going to be slot within the mountain that a zenith would be able to set the time so it can recalibrate itself on a daily basis. So, this is something to be kept a very accurate time over a long period of time.

The mountain itself, Mount Washington is currently the mountain of choice. And one can go to this mountain today and I think that if I am not mistaken that somewhere along up

into this area, a slot will be cut where the zenith of the sun can be picked up and it can recalibrate itself from that. Here are some other shots of the mountain. So, this mountain is also now in possession I think of or available to be developed into a chamber and has the conditions of, you know that rock is solid enough, that it is impermeable, that it can withstand a fair amount of jostling should an earthquake occur and still maintain its structure. All these conditions of the chamber, how the chamber can be built to withstand this chamber's conditions change over time to what they are now. And so, all these types of thinking are being

brought to the creation of the chamber within this mountain.

Now the chamber itself, there is no current design but Danny was nice enough to send me a whole bunch of things that he found interesting as chambers, as underground structures.

This is the Russian subway system being constructed. This is the Salt Chambers outside of Warsaw that were there. These large chambers and sculptures are there for the public viewing. This is in France. It is a cathedral in France. These are the sewers in Japan. I

don't know if you have seen them. They are pretty wild. And this is more of an organic type of chamber entering down into a cave. This is in France as well.

So, the gallery of 10,000 paintings. So, the Caves of Lascaux in a way, these are some of the earliest paintings. Some of them date back 20,000 to 30,000 years. They are beautifully drawn. And this is one of the few figures that appeared. And it is actually a figure of a fallen hunter. But most of them are just animals and spears. But here is one of the few figures. Again, probably representing the greatest consequence of the hunters to lose a battle to the animal and to give up their life in pursuit of the hunt. And again, I have not had a chance to every see them but they are the impulse of the painters again was not send messages to us but to again lay down what their system of thinking, what was important to them during their lives. And again, I wanted to keep to that idea that I don't want necessarily a time capsule with the images but to try to call out the kinds of things that reach truly represent our culture.

And then the big question was: Well I am a photographer, and why not go back to these types of painting? Why photography? And so for a long time, I kept thinking, can I make a case for photography being the medium of choice to have an exhibition of the photographic process? Some of you may be familiar with Nicéphore

Niépce's first

photographs. This is the first fixed image ever that still exists today. In 1838 was the date that this was formed very primitively. It took a whole day to expose it. But from this image, all images have cascaded forward. I mean, before that was a camera obscura where they could still see the image on the back of the brown glass. For almost 200 years, no one knew how to fix in. and finally, there was a way to capture, again primitive but all of the sudden it was, yes, it could be done. And the capturing of this image is that all

future images came out of. So, if we think of the still, motion picture, video, multimedia, all of that starts with this very simple primitive image. And what I started to think about is, well, it is a direct outcome. The photographic images that is the direct outcome of

the industrial revolution is really part of the process, part of the handling of chemicals and materials and plastic and dichromate and light-sensitive things, materials,

understanding cameras and optics and lenses. All of that is all really a direct result. And that photography coming into being, we shape it as human beings. We create the images and find ways to refine them. But at the same time, those images are shaping us in a powerful way. and I think if I look back at the last 150 years of photography, it has told us more about ourselves than any previous histories and painting or anything; that all of a sudden, the photograph is a ubiquitous form that wasn't too expensive to make, that wasn't just an enclave of a bourgeois and the church and the state. Now all of a sudden, everyone have a chance to make images or be an image through a portrait. And it changed the way we saw ourselves. It changed the way we began to understand the world around us. And it began to bridge many of the things that we couldn't understand or didn't see because they were outside of our consciousness. So, the photographs

So, if there was a war, Boer War or any, all of the sudden, these images, the Vietnam War, all of the sudden these images started to come back to us and we began to learn from these images what these consequences were, what that other world that is going on out there that we hear about but don't see. And when we see, I think because photography is part of everyone's life now. I think if I was to say that everybody is this room, when you think of yourself and growing up. What kinds of things come to mind? And I bet you many of the things of the images of your past homes and your bedroom when you were five and the bike you rode and the clothes you wore when you were young are all probably attached to early images that we have memories of that time. But a picture of you are five when you look back at it when you are 50 will tell you more and key you back into that place like nothing else will. And our histories, our personal histories are linked to photography as is our larger collective social histories linked to photography. And that is through that medium that I believe we interpret our world and again shape our world as photography shapes us. And that was really the reason why I felt that the indexical relationship that the photography is the imprint of the world and that this print represents that imprint that again made the justification for wanting to use that as the key medium within the 10,000 Year Cave.

So, then I thought, Well, carbon transfer print. That brings me to Well, if I was going

to do a photographic print, what print would I do? And at first I thought, Well, I wanted

to do something that is reasonably practical and that I could actually have some confidence that it will be there in the cave. Now, I am assuming that a cave is going to be in dark storage for a long period of time. I am also making an assumption that cabinets can be built so that when the exhibition is brought down, it could be pushed into cabinets that are very well sealed from humidity as well as the cave and the clock needs to have a fairly stable temperature and humidity as well. So, I am assuming that the conditions for the clock are also going to be fairly ideal conditions for a print. And I talked to Danny.

And he said that is a fair assumption to make. So then I said, Okay. Well, based on that assumption, what is the most permanent process I could find that is practical? and I thought, Well, inkjet. We all know what inkjets are. We all know that there are a lot of

developments in that field. And I started to think, Well, if there were an inkjet printer

that had pure, very good CMYK cyan-magenta-yellow-black. And if it could jet these pigments onto a material that doesn't corrode paper or Mylar or something that I felt had a 10,000-year stability to it, then bingo! I have got it. And I just have to find that. But in my search of inkjet printers that could jet the same inks that would be used to paint a car. So, I was saying, "If you think of a car out there in the sun everyday being blasted by the sun and not changing color very much, whatever is in those pigments should withstand the centuries and millennia of time in a fairly quality-controlled or humidity-controlled cave. The thing I could not find was any process that had evolved the kinds of technology that would spray on the paint on to cars, onto a perfect CMYK printing process. And even it were there, there were kind of noises that somebody was close to it, I didn't feel at this point and time that with all the other types of materials that would have to be brought in to bring those pigments to a point that could be jettable. And the breaking down of that pigments, that there would be anything to have in the next five to 10 years that could be give me any kind of assurance that kind of a Henry Wilhelm test, any assurance that this has a go forward stability. So that was my first pursuit and it kind of ended in, "No, I don't think I have got an answer here" - so, I continued to pull away at things and I did

look at the dye-transfer process which no longer is possible because Kodak dropped all the dye-transfer process and they made all the matrices for it. And so that, in the late 80s, early 90s was a process that was no longer there.

So then, I went further and actually went back to a process that was developed around 1855. And it is called the carbon transfer process. And I am going to read you a bit about it, the history. The carbon transfer process is considered by most persons who know it to be one of the most beautiful of all photographic processes. Carbon prints are capable of a wide-range of image characteristics that could be virtually any color or tone. And the final image can be placed on a wide variety of surfaces including glass, metal, paper as well as various kinds of synthetic surfaces. When the final support has a smooth surface, carbon, I am sorry, when the final support has a smooth relief that gives them a real dimensional quality, especially prominent when the photograph is held sideways to the light. Carbon is without question is the most distinctive and stable of all photographic processes with the capability of presenting images with a wide-range of image characteristics of virtually any color or tone on a wide variety of surfaces. Finally, carbon transfer prints which are made up of inter-pigments is suspended in a harden gelatin colloid are the most stable of all photographic prints.

So, what you are looking here is a carbon transfer print. And what I would like to show you quickly are basically, I have to jump out of my program to show this to you. This is on the web. So, this is basically what is happening when you create, at the size of that image, you create a negative digitally. So, what used to be done filmily by separating a color slide or whatever through an RGB and making negatives. Nowadays, we digitize the transparency or the negative, and then you convert it into four black and white, high contrast lithographic negatives through a digital process. And that is what you are seeing in the tray here or on the light table is a digitized black and white negative. Once you have the negatives made, you then move to, and I have samples of it there. That is actually the carbon pigments. So, these are, I brought some as well. These are the pigments. So, you have your cyan blue. Now, these all come from quarries. These are

stones ground up into very, very fine, fine powder and then suspended in an emulsion. So, that is your cyan, your yellow and your magenta. So, those are your primary colors. And then you also have a black. But those are the key colors. Black is very ubiquitous. It is not hard to find, black carbon. But those colors come from specific mines that have stone of that color that are ground up and there is nothing else in them. And they are just suspended. And once the stones are suspended, they are turned into these types of sheet. These are light-sensitive sheets. So that this then they are a mixture of sugar that the pigment is suspended in, and dichromate and also the light-sensitive aspect of it, and also there is a gelatin. And then they are mixed to a certain viscosity and then rolled out into this paper. Once it is rolled out onto the paper, you expose it. So, this is a typical exposing device. So, it is a very high-intensity light. So, you are exposing through the negative to the material that once any light that comes through, hardens that color. And once that color is hardened, it could then be washed out so you know got a negative. What you do here is you wash out all of the material that hasn't been exposed to light. And it washes away. And what you are left with is the material. So, these are the four layers being shown. This is the how it is being built up. Each layer is pulled and transferred. And what is happening is that you are using this here which is gelatin. And this gelatin has been around which is basically marrow from the bones of a cow. And so, that gelatin, it is a pure gelatin... it doesn't yellow. It doesn't crackle. It has been around for 1500 years. And this is what allows the different layers to adhere to each other. And then once you have all these layers adhering to each other, then you can all of them together and transfer them onto a watercolor paper. The watercolor papers, there are really two sources of watercolor papers that are known to be able to withstand the test of time. They are about 300 grams, some of the thickest papers that you can find out there built extremely well. And you know, papers that Van Gogh was using, the Fabriano and Arches of the two key, one is Italian, Fabriano and Arches is French. These are the two key suppliers of paper. When I looked at possibly doing this, one can transfer this into porcelain which is a much more stable material. One of the issues is that porcelain that I voted for porcelain down would be a beautiful print. But one of the reason was; one, human intervention. Somebody could drop the porcelain and it would disappear and it would be shattered into many, many pieces. The second concern about porcelain was that if there were a lot of temperature variation over time that the gelatin silver maybe tested. In other words, the layer, the emulsion layer maybe tested against that layer is on the expansion and contraction is much higher than the images. And you can start breaking the bonds between the image and the material that is holding it together. Whereas, when you get this gelatin against this paper, the bonds go very, very deep into the structure of the paper. Therefore, if you have temperature variations, the chances of failure of the image where it begins to let go and curl up or break away from the paper is reduced to nil. It is almost impossible to separate the image from the paper. So, as long as nothing happens to the paper that the containment that the paper sits after the exhibition is in a water-tight, pretty air-tight, dark chamber. I can imagine that if you open that chamber regularly and then. But anytime, you can open up all the time under dim light and never see it changed, I would think that as long as water never got in there and damage the paper that these would indeed still be there 10,000 years from now on this paper, on this pigment.

There is a chance as well that something in 10 years; five or 10 years may come about some kind of inkjet process that may all of a sudden have a breakthrough. And that I think would be an exciting moment. Right now, just to give you an idea, this is one of the largest sizes they can go without a lot of failure. They can't do it, there is really about three places in the world that can do this. One is in Cornwall in the UK. One is in Seattle and one is in Toronto. I have been dealing with both the Seattle and Toronto. I also went to see the gentleman doing, Gerard doing in the UK. But the one that is most promising is Todd who is doing them in Seattle. And that is the website you are seeing is Art and Soul. That is his site where he does his prints. You can do it in that size. The prize for one of them at that size is about \$2000, 30 x 40, is he is up to doing them. And it is very difficult to do them. It wouldn't be full 30 x 40. It would be 30 x 40 watercolor paper. I think the price will jump to \$4000 to \$5000 per print. So, that is very, very labor-intensive. It takes about five days from beginning to end of process to get one color image in the carbon. So, it is very artisan, very hands-on, very, very few. There is a handful I think that there is less than 10 people probably on the planet today that could make that print. So, it is again something that if the 10,000 Year gallery were to become a real thing, there maybe a chance to revive a craft I think for this to find a way to capture the materials for a long period of time until some other permanent process comes into play.

So, that is and if anybody wants to come up later and just look at the prints or fell them and knows the different colors, you are welcome to play with that. So, what I did to keep it interesting is I said, "Okay. Well, I wouldn't want to curate every show. I think that

would be a huge burden. I don't think that would be very interesting." So, I asked a

couple of my colleagues nearby who would do it without charging me. And I said, "Would you just put together an idea?" If I said, "Here is the chamber, you have curated,

you are a professional curator. You have curated shows, spend the week or so. Think about it. Put something together. You know call your own work and what you have done in the past." So, Vid Ingelvics is a great friend of mine. And he has curated many, many. He is interested in museology. He is interested in very interesting views of how we look at the world. So, his working title was called The Museum of the Mundane. And this is what he writes.

It is relatively recently that questions about representation, class, gender and the nature of the everyday have come together to influence the scope of history, whether written or as the subject of museological display. The turn to the everyday past as an object of study has meant an expansion of interest beyond the activities of royalty. The extraordinary, to include the prosaic occupation of the shoemaker, baker or office clerk. The greater the temporal distance between ourselves and the past, the more intense popular and professional interest in the mundane seems to become. As one example, the graffiti, often pornographic found on the walls of ruined Pompeii now attract more attention from both tourist and archeologist as the elegant mosaic floors that the town once wealthy inhabitants. Accordingly, I would propose to work with the elements of the banal, the mundane and the everyday of our era. There are two possible approaches I am considering for this initial proposal. The first would produce a kind of photographic

museum of the mid-century banal to highlight ordinary commercially available products popular in the mid-20th century as drawn from photography collections found in two major Canadian archives. Those are the Library and Archives, Canada; the National Design Council Archives; and the Archives of Ontario, Eaton's department store archives. Eaton's is actually one of the largest department stores that went out of business about 10 years ago. It has been in Canada for almost a hundred years.

The accompanying 20 images are drawn from these two sources. For the research at other sites could of course be carried out if deemed necessary. The second approach would involve reproduction in some visual form of the material goods and ambience found in the typical corner convenience store or dollar store. The two sites each have their attractions. The very notion of convenience is itself part of the ethos of our time with a range of products functioning by default as a kind of unofficial poll of what we feel are the true necessities of life; cat food, milk, bread, lottery tickets, double A batteries, cigarettes, etc. As for the dollar store, it can be seen as being a repository of simulacra based on the world of commercially-derived objects outside its doors. The dollar store shelves are packed with goods that are basically cheap reproductions of existing things, thus engaging in issues of representation, desire and class in our time. I would propose that for North Americans that these kinds of places that unerringly provide the authentic texture of the ordinary life of our time.

So, what is interesting is when I first saw this proposal, I thought, "Gee, these aren't the

most exciting pictures I have ever seen. But they are interesting in that I kept thinking of them if we were doing an archeological dig of some civilization 10,000 years ago, we would be digging up their spearheads or arrowheads. We would be digging up; you know their pots or shards of pots. And these were the things that will comprise their daily lives. In many ways, these are the things that are part of our daily lives and that archeologist will be digging up, you know if they are out there in 10,000 or 15,000 or 20,000 years and going to our dumpsites. They will be finding just these kinds of things and obviously different states of decay. But I did think it was a different way to begin to again lie something down for a museum of the 10,000 Clock or the gallery to put something that would somehow isn't, how you should say, a celebration of what we do.

But it is really

more of an archeological dig of who we are and the kinds of things that we surround ourselves with in our day to day lives to lead the kind of lives that we lead. Of course, I know that some of you have these hockey games or this is a Canadian thing or not. I am not sure. These are all the animals in Canada that you could find, the alternative plastic animals. So, something that everybody should have.

So, I went to another friend of mine, Marcus Schubert and said, "Can you go and see what what you can come up with? Again, just apply yourself to it." And he came up with something where he didn't want to use any of his own imagery because he is a photographer in his own rights. But he wanted to go. So, he really went on to the web. So, none of this has copyright or approval. These are all just hypothetical. So, he went and collected all this stuffs. And he referred to the project as Observations from a Blue Planet. And he took the line and exhibition in my proposal, an exhibition that represented creative expressions, values, desires and concerns of our current culture in my proposal

and he kind of ripped off of that. And this is what he says.

Presented in the form of diptychs, photographs in this presentation explore a range of similarities and differences both within the framework of each pairing and in consort with the other diptychs of the series. All the images are called from internet sources then re-contextualized by juxtaposition to create discrete meanings to relate to the dynamics of our human condition. These specific collections maybe seen as sketches to hint at what could be a more comprehensive investigation; a world is cosmic oasis blessed with an atmosphere profoundly rare in the universe sustaining a vast system of biodiversity that is nothing short of miraculous. However, we live in a world of extreme; extreme of technological development, impoverishment, wealth, extremes of weather, of violence against one another and of beauty. In a few short centuries, we have ventured forward from the first printed page to telephone networks, and now the internet. We evolved from the use of horses as transportation to the pioneering of mechanical flight and scientific deep space exploration to manned-landing upon the moon. Since the discovery and development of fossil fuel as a plentiful and versatile source of energy, civilization has experienced staggering population growth and technological advancement, along with equally staggering polarization of wealth. I see the earth and its inhabitants as participants of an unfolding of a great dramatic experiment, the experiment of diversification and consumption. In less than a century, for the first time in recorded history, we have becomingly increasingly aware of our actions directly affect the viability of our existence and that of our fellow creatures. Human kind in this century can now effectively be considered powerful as a force of nature in the scale and consequence of effects and the consequences of our action upon the planet. These images are mere shadows on a cave wall that intimate life as we know it. The question remains what kind of life is it. Ideally my vision for an exhibition for the 10,000-year Clock gallery would be to project 10,000 diptych images in a grid forming a random rolling sequence of images throughout the space. However, it electrical power constraints in such a remote location inhibits the use of computers and projectors, alternatively the production and the exhibition of the set of archival prints has specification set forth by the organizers when it comes to the final form of this presentation.

Upon further talking to him, he thought that it would be interesting to use the site of the Long Now to bring in these types of diptychs and to have a constant while all of this is functional to have a constant exhibition of these diptychs as part of the project as well. So, again as you can see, he is finding images that many of them are within the have and have not categories as I have said to you. These things are also paradise or the power of the forces of nature. It is mostly tranquil and idyllic paradise and it is damaging forceful nature. So, there were again some of his ideas that he felt were salient and powerful representations through the photographic medium that talked to the things that affect our time. This is one of the first switchboards. And on the right is an artist rendering of the World Wide Web.

So, this brings me around to the project I am calling In the Wake of Progress which is I've edited down. I think I have got a few more of the 20 plus. But I had a hard time getting it. But what I wanted to show in this work, in my own work is to again look at the survey of my work. But if I had to pick some 30 plus images, what would I pick and why? And as some of you may know, my work has always been interested in trying to

reconnect us to what I call the great ages of man; the Stone Age, the Iron Age, the Copper Age, the Bronze Age and now we are in the Industrial Revolution-Technological Information Age. But those earlier ages are still alive and well and functioning in a scale in our planet that I think many of us, I felt even I was unaware of until I began this project over 25 years ago. And so, I began to rethink of what has happened? What has changed? We have always taken from the earth but something has happened in the last couple of years, particularly the last century. A lot of what I feel that has happened is the one that the discovery of oil and the internal combustion engine. Together, the cheap source of fuel, this incredibly powerful tool, the internal combustion engine has been able to accelerate our abilities to expand. And I think that like any life force, a life force expands into its energy footprint. And that energy footprint reduces and so does that life force. And I believe we are in this massive century of expansion as a result of that energy, of that discovery of that non-renewable resource called oil. And I think that if I go back a hundred years where the population was just breaking a billion and in a century where now is 6.5 billion; that increase that even in my 50 plus years. When I was born, the population was around two plus billion. Now, it is 6.5 billion. So, that is almost you know ten billion a decade, eight billion a decade. And that kind of growth is... and I asked myself, ... Well, how did that happen? Well, if we look at the transportation, if

we look at fuel and ships and trains, cars, farming equipment, all of those things have allowed us the ability to expand at that dramatic rate. So when I went to think about how I begin to represent this, one of the places I thought was... well, the Railcut series was one of the first significant series that I have shot in 1983. And it was really the up of the North America that I was thinking about that Europe was in a doldrums. It was moving towards North America to replenish its resources. And so, I think America was born of a European plunders, so to speak of a little bit with the European North America. And that the rail is the thing that opened up the West. And it opened up rapidly. This was put in place about 107 years ago. These are the rails that are going to the rocky. But I wasn't... photographing it as kind of a heroically. I was kind of showing it straight on. I wanted to have us contemplate with that line; that gesture through the landscape meant to the landscape and to us. And so, it was more of an image that makes us meditates upon that engineered line. And if one looks at the actual, you know the train, what it is bearing is a load. What is in the load is the same color as the mountain. So, it is this kind of mountain is kind of pouring into the cars, filling them with the materials to be brought back to the East, be brought back to Europe to fuel their continued expansion. So to me, it was an interesting way to begin to look at that landscape and tell a story about what it means to us and the significance it has to human kind and to nature itself.

By then, I am including several pictures of mines. And one of the things when I photograph mines, to move from the idea of the kind of general... What is the biggest copper mine in the world? What is the biggest iron-ore mine in the world? How do I go from that to the specific? And bigger is the key word. I went in search of the largest examples of mines in the worlds. And this is in North America. This is the largest copper mine. It is a Kennecott copper mine, just outside of Salt Lake City. And what to me was interesting about this picture and why I wanted to include it is that when one looks at it, one really begins to see almost like an inverted pyramid. It is a big amphitheater. But

when you begin to look at the scale of it and you see the trains, these are actual trains in here and there is a banana bus somewhere here. So, you can actually see the print. You can see these actual bits of information, what they are and their size. And then the size begins to present itself. And what I was thinking was that, well these are in a way; these are a great sublime of our time. That the sublime has been subverted from one that during Turner's period, during the romantic period where man was still dwarfed by nature, the Moby Dick story of the shipping lost at sea in a Turner painting that this is no longer the fearful sublime. We have now built cars and planes and ships to be able to withstand the test of forces. So this to me is the new sublime, the force of human engineering and capacity to be able to capture these materials and convert them and isolate ourselves from the elements. And in isolating ourselves from the elements, we have become an element in and on ourselves. So to me, this is one of the ideas that I like to think about when I started to photograph these mines. This is in South America. The Chuquibambilla mines and shot this a year ago. Again, this is one of the largest mines, the last two argue on who is the biggest. But I think that this is the biggest. There are 25,000 men that work here. They claim that 30% of all copper in the world comes from this one mine. Where I am standing, the opposite wall of this mine is five kilometers away. So, just to give you a sense of the scale here and it is only about a third of the way down. There is two-thirds to go.

This is in Australia. I just got back last year, again photographing this mine. This is a place called Mount Whale Back, one of the largest, richest iron-ore deposits known in the world. It still isn't a big mine, but the deposit itself is on a world-class level that it is where it is found. The iron-ore coming out of it is, I mean, actually the darker, just to show you this darker. This is the iron-ore here. When you are down in that area, you just pick up a chunk of rock and it just feel that you are picking up a chunk of steel. It is 65% iron-ore. And it is supplying pretty much 50%, it is the BHP. This is the biggest mine in the world. It is trying to buy Tech Resources. No, no, no. it is trying to buy Let me think

for just a minute. They are trying to take over. This should become, by large scale the largest mine in the world. But they supply about a major amount of iron-ore for China, Korea and Japan. So, all of these stuff are being shipped from Northern Australia to Port Headland into those three market places directly from here. And I found this place by photographing the largest steel plant in China. And I said, "Where are all your iron-ore coming from?" and they said, "Mount Whale Back in Northern Australia." They ended up in Mount Whale Back. So, often trace them as back that way as well. I want to show that any mine has a consequence of mining is I think called tailings if you are familiar with the mining process. This is a tailings pond in Northern Ontario. And so, what I am standing on here is about the 70-meter high, 6000-acre pond. And what they do is they flow out when they take ore out, whether it is copper-ore or nickel-ore, the actual ore itself is a very small percentage, maybe five percent of the ore. The rest of it is just ground up rock. And they have to through autolysis or different processes, it extracts the minerals out and they flow the rest of the rock out. They can't put it back in the hole that they dug because they would continue to dig. Those consequential holes are still highly

mineralized so that the ores here are actually iron-ore that hasn't been used because it is not worth it to take iron-ore from these particular tailings because they have iron-ore mines like the ones I have showed you. So, they just flow these irons back into the tailings because it is not worth capturing. But all the silver, the nickel, the copper has been taken out. So, these are the consequences of any mining operations is the tailings operation. So, you can't have really one without the other. And so, a representation of tailings pond became I think an important aspect to show in my exhibit.

I also felt that our built worlds, our cities use dimensional stones versus stuffs that are converted to metal but we use concrete. But stones are also a very important component of our buildings. So, I went in search of the largest dimensional stone quarries in the world. And I ended up doing a lot of work in Vermont. So, this is granite coming out of a granite quarry. It is kind of in their last legs. They are kind of doing some work in the foreground but most of this has been abandoned. The reason why they have abandoned it is because the fractured stone that you see doesn't allow for them to pull block big enough to be viable within the market place. So, once they get viable blocks out, then they leave and go to areas that are again less fractured, more solid and they begin to quarry that.

So, this is an example of a quarry in North America. This is in Vermont. Then I also went to Carrara. And these quarries were made famous by Michelangelo where he went to find his marble. But again, some of the finest marble in the world are being quarried here. And again, I wanted to show this kind of inverted architecture, the scale of our taking. I think that both as an image, images that make us want to look at these places that draw us to consider these kinds of places. I also feel a great amount of information about how we are extracting these materials that become present in the work as well. and I think that is one of the beauties of photography is that it can be a fairly aesthetic work of art, aesthetically seen but within it embodies a lot of information that could be drawn out of those photographs by those who spend the time to look at them and to try to understand what is actually going on in these pictures.

This is also a recent, this is a different point of view but these are recent pictures I took from Australia. And again, I kind of see the extraction of this and it is almost to me like a cavity that is showing the withdrawal of material from the surface of the planet. And then this to me, again around the same mines, this is how we are reshaping to grab this material. It is almost kind of looking at the inner organism of ourselves, of an intestinal kind of tract that again I felt to show that our body, the human body and the landscape share a kind of visual similarity when seen through the photographic medium. And that the surface of the earth is really a skin as well and how we kind of shape that skin has a profound effect on the planet. And then I think, well, at this point in time where we sit today, the story can't be complete if we didn't bring in the idea of oil.

And this is a photograph I took recently in Canada, in Northern Alberta. And as some of you may have heard, this is the oil sands. If you look at this, this is actually one of the most significant deposits of oil in the world. Northern Alberta has the second largest source of oil, known oil in the planet after Saudi Arabia from their drilling test. Basically, the difference here though is that this here is the over burden. In the back here is the Boreal Forest which is the second largest forest, unadulterated forest in the planet after

the Amazon and equal at the carbon sink to the Amazon. These are two if the Amazon is considered the right lung of the world; the Boreal Forest is the left lung. So, it is a very important track of forest. And then, this is the forest is being cleared for this area. This is the over burden, about 20 or seven meters or 20 feet. And then here is where the oil in coming from. This is the oil sands. This is about 60 to 70 feet deep. And the area that could be mined, this way is close to the size of Florida. And what is happening is that here is a truck carrying this 12% of that, the bitumen that could be converted into oil. And the rest of it is sand.

So, what we have happening here is that companies from all around the world are now buying leases in Northern Alberta to extract this particular fairly dirty oil. And I think Al Gore spoke about the oil sands at the last Ted Conference. I thought what he said was quite interesting. He said, "If we look at our human addiction to oil as a junkie addicted to heroine, going for the oil sands is like shooting up between our toes." So, I kind of said it clearly. So anyways, what is happening is and what a lot of people don't understand, in fact, recently what is spurt out government, the Alberta government just to throw \$2 billion at it is California. Thank you, California. California is saying, "We are not going to accept this oil. It has got too much of a carbon footprint for our liking to accept it." So, they are now trying to find ways to sequester the carbon. But what is happening is that to get this oil out, they have to create vast amounts steam. And so basically, for whatever the CO2 footprint for a barrel of oil conventionally like Saudi Arabia oil, this is about four times more of CO2 footprint to get this oil out. So, we are burning natural gas to create a dirty an oil which is a fairly clean-burning fossil fuel for a very dirty-burning fossil fuel.

And so, there are a lot of discussions about sequestering this. And I think it is high time that discussions were to happen. And I was very encouraged that California actually stood up and said, "We have problems with the CO2 footprints." And the fact of the

matter is every lease that is out there right now that is sold off during the last government, the provincial government in Alberta, they sold off so many leases that each lease needs a steam plant. That they built every steam plant that is on the books right now, there are 30 million Canadians. If we all went to zero footprint and another where we are all able to go to zero carbon footprint and all of the 30 projects came on stream, Canada would still be out of compliance for the Kyoto accord. So that being said, I know we are not going to go to zero footprint, if this goes ahead, I think Canada will have the dirtiest CO2 footprint on on the planet. So, I am kind of a little upset about that myself. And so, that is one of the key things that there are tons of toxic lakes in Canada. It has created the largest surface engineering project on the plane, the largest toxic lakes in Canada and possibly on the planet as well. And the size of the forest being affected is unprecedented. And they have only touched one percent. So, there are still 99% that they still know of that they haven't explored the whole region.

This is another massive oil field. This is the one where it was seen on There Will Be Blood. This is around Bakersfield. This is the current oil fields. This is the first oil fields that have been discovered and the beginning of the big oil boom in California. And so, again this oil field is still alive and well. It is still producing over a billion barrels of oil per year. And so, but it is doing a few jack pumps. So, the first kind of half of the well

life is under pressure. So, they just turn on the tap when they need it. And when they don't need it, they turn it down a bit. But then, the pressure runs out and there is still oil half way down there. So, that is when they begin to pump it. And then now, what they are doing is that they are doing a similar thing that is happening in Alberta. They are pumping steam down into the area where the oil is. And the steam is creating a more viscous flow of that oil and the oil is coming up. So, in a way that landscape of oil and what brought this dirty century into being is oil. And I felt again that it was very important to begin to show where these key sources of oil were coming from.

This is in Azerbaijan in the Caspian Sea. Many of you probably didn't know it because I didn't know it until I got there myself. That it is there that off-shore platform was invented by a Polish engineer because the fishermen about 30 kilometers off of the shore of Baku knew this place as Oily Rocks. And there is always a skin of oil along the surface of the water. So they knew that there was oil on the land in Baku. So, they figured that there must be oil seeping out of the rocks, out of the Caspian Sea. How do we get it? They brought in a Polish engineer who figured out how to do an off-shore platform. It was about 20 meters deep. So, these are all 20-meter kind of stilts. They would take this barge out onto sea, drop the stilts, build the platform on top and start to drill. So, it was a fairly easy drill. But it was the beginning of off-shore oil.

And then at Baku where I went on to shore, all of that oil field had been exhausted and exploited. And it was a dead zone, a totally dead zone. The water, the reflection that you are looking at here is a pool of oil. So, when the Russian left this area 20 years ago because it was largely, this oil field propelled Russia through the Second World War and even through the First World War. It was a key resource. And it was a light, sweet crude as well which is the desired oil. So, this was, these were the field that fueled the Russian Empire during its last 80 years and it has been left for dead. So, this is a dead oil field. So, this is to me are some images of the end of oil. So, these are all, this is the great oil fields again in Baku.

Interestingly enough, when I got here at \$70 a barrel, which when I was here, it was \$70, there was still enough to pump. So, they started reigniting a lot of these wells because even at low levels, even at that price point, they could make it profitable. And I can imagine that these things are totally resurrected by now because of the price of oil over a hundred.

Refineries that are going further down the process now, the materials that have been gathered and to the oil that has been gathered. And if we look at any material in the world in terms of weight, if you look at sand used for building or if you look at stone or if you look at copper-ore or iron-ore, any of those, the heaviest amount of the most amount of material, the heaviest material that we move on the planet is oil. So, refineries all around the world are taking that material and converting it into fuels, plastics, fertilizers, all of those things. Again, these are what goes places that we made look like.

This is in Texas City. It is the largest refinery row in the world I think in terms of outside of Houston. It was shot from a helicopter. These are all the tanks where the oil is being held. This is at a refinery where different oils come in. so, if you read the labels, you can see that different types of crude are coming in. we got West Texas Crude come in. you can get stuff from East Coast Canada. You can get stuff, whatever you need. If you need asphalt, you can go for Sour Crude. If you need more high lubricants or high octane fuels,

you can get your oil for a spot price. And the oil refinery opens and closes based on the orders of the customers.

Then I began to also think, "What is the direct outcome of all of these fuel it changed our cities. It changed our infrastructure. This is in Los Angeles. This is the 110 and the I5.

This is the biggest intersection and the biggest, busiest in the world and where the freeway was pretty much invented as well as probably the suburb. So, again you know the development of all this technology, the fuel created a world in which we transport ourselves at fairly high speed mobility has been the key driving force of the middle class.

So, we have actually able to create middle class, I think directly as a result of the automobile able to move us around and the economy that came out of that of that building of that infrastructure and the making of that car and production and the money that was paid for oil proceeds had allowed us to have a large affluent middle class.

What fuel the highways are cars. This is the logistics yard for VW, again showing what you know, what is feeding this great infrastructure. And so, this is outside of Houston.

These are all Volkswagens. They all appear white because when they come off of ships, they are coated in white plastics so the paint doesn't get scratched. And once they deliver them to the dealership, they pull the white plastic off and you have an unscratched car.

And then again, the consequence of all these cars is vast collection of the waste of the car. This is just outside of San Francisco. It was shot in 99 I think around Modesto. It

Wesley has got a small gas station. It is just in behind the tire pile that was

discovered by me while reading a book by John McGee called The Duty of Care. It was an essay. And his description of the first paragraph is so compelling that I said, "I have to go photograph that place." And this is one of the images I made from that place.

And three months after I photographed it, it was hit by lightning and caught fire. So, you may have heard of this. The flames were about 40 million tires. I figured there were, its peak were at 40 million tires. And then the California Environmental Protection Agency didn't like that many tires in one place. And they said that they got to figure out something. And they did a pilot project where they were burning the tires and creating enough electricity for 14,000 homes. And they have reduced the pile, when I got there; the pile had been reduced from what they figured at 40 million down to about 20 million. And so, I was shooting at out of 20 million scales. And then three months after I have photographed, it got hit by lightning. And it all cut fire. And the project was over.

The other types of expressions that I feel are direct result of not only a production of our interest but once are built a big middle class; we needed a way to protect it, particularly in the United States of America. This is in just outside of Tucson, Arizona an area called AMARC where they have over 4000 military jets that are either mothballed in preparation for active duty. So, you know they have everything from the be ready in one-week, two-week, three-month, half-year. And some are just for parts. And some are just decommissioned. There are totally decommissioned transport planes that the military will all be going to recycling.

But again, it is that incredible infrastructure and the tools that we have invented to not only protect our interest and to protect ourselves from aggression that technology and industrial revolution has brought this type of expression forward.

These are fighter jets. Again, these are all decommissioned in the same yards. I went to

photograph the suburbs. I thought the fastest growing suburb in North America right now is Las Vegas. So, I did a flyover at Las Vegas last year to take a look at how the suburb is expanding. And I understand that it is expanding largely because Nevada has a very small property tax and it is still very cheap too. And personal tax is still very cheap to buy a home. So, a lot of people might sell a home either here or in LA and buy something there for half the price and bank the rest and live there inexpensively.

Lake Mead there and the Hoover Dam again, what was interesting to me about this picture was the white rim on the edge of the lake and it is beginning to tell the story that Lake Mead is going down about six inches a week. It is at its lowest point ever. And if it continues at its current rate, the dam is going to stop being efficient very soon. And if anything should happen to that lake, the whole idea of Las Vegas is just a dream.

This is ship wrecking in Bangladesh. I do a jump. This is again a direct relationship to the Industrial Revolution. To me, this is where first-world ships go to die in a third-world country under very primitive conditions. So, it is almost stepping back and looking at the world through Dickens's eyes in our current contemporary world. And the scenes that are created seem surreal that they seem that they are from another world. And I felt that that was somehow, and it shows in the figures in the center who were the players within this theater of the insane where there taking down oil tankers and ships with nothing more than a cutting torch and bare feet, not even a cutting goggles. They are just cutting these ships down and no crane is in sight. And they are using as a way to bring all the parts up, these are all little winch that are all build from salvaged part of the ships. And that is only the really high specific technology that they have. But everything, the whole process is driven by parts they could find from ships.

And then, one of the largest engineering projects in the planet, the Three Gorges dam. I did a project on that. And I thought that would be important to include this image as well. it is not only a representative of China kind of coming of it, coming of age after what we call a 200 year, kind of hiatus of being very powerful and significant. And then, receding for a couple of hundreds of years and now coming back. And China even refers to this dam as the Second Great Wall of China. And so to again, represented in the gallery I think is an interesting to show the scale in which again man was operating but this dam bigger than 50% and probably I would guess I suspect that this would be the biggest dam ever built. I don't think something this big will ever be attempted again. Even when this one was built, they said that they were able to detect a wobble on the planet when they filled the reservoir. And each one of these turbines is 700 megawatts. The nuclear reactors are about 1000 megawatts. So, each one of these is almost a nuclear reactor in terms of power output. And they have 32 of these turbines. So, it is a massive, massive project. And if you ever get to see the print itself, you can see small figures all throughout, working their way like ants, a massive ant farm.

Again, we are all of our products coming from. This is a big running shoe factory. The total force for Yu Yang Shoe Factory was 250,000. This particular compound has 45,000 workers. And this is 20,000 of them going to dinner. So, that is quite something.

Again, China's Coal, a key material and a key energy source for China. And again, one of the things I think when we look at all of the things that are happening out there to make coal is the scariest of them all in terms of there is as they say about 1000-megawatt dirty coal burning, a power station being built for a week in China. And they are still

being built all over the place in North America and each one of those dirty, coal-burning, 1000-megawa